

Volume 10: Enclosed Control

EATON

Powering Business Worldwide

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Dimensions, Weights and Ratings

Dimensions, weights and ratings given in this catalog **are approximate and should not be used for construction purposes**. Drawings containing exact dimensions are available upon request. All listed product specifications and ratings are subject to change without notice. Photographs are representative of production units.

Terms and Conditions

All prices and discounts are subject to change without notice. When price changes occur, they are published in Eaton's *Price and Availability Digest* (PAD). All orders accepted by Eaton's Electrical Sector are subject to the general terms and conditions as set forth in Appendix 1—Eaton Terms & Conditions.

Technical and Descriptive Publications

This catalog contains brief technical data for proper selection of products. Further information is available in the form of technical information publications and illustrated brochures. If additional product information is required, contact your local Eaton Products Distributor, call **1-800-525-2000** or visit our website at **www.eaton.com**.

Compliance with Nuclear Regulation 10 CFR 21

Eaton products are sold as commercial grade products not intended for application in facilities or activities licensed by the United States Nuclear Regulatory Commission for atomic purposes, under 10 CFR 21. Further certification will be required for use of these products in a safety-related application in any nuclear facility licensed by the U.S. Nuclear Regulatory Commission.

WARNING

The installation and use of Eaton products should be in accordance with the provisions of the U.S. National Electrical Code® and/or other local codes or industry standards that are pertinent to the particular end use. Installation or use not in accordance with these codes and standards could be hazardous to personnel and/or equipment.

These catalog pages do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Eaton Products Distributor or Sales Office. The contents of this catalog shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Eaton's Electrical Sector. The warranty contained in the contract between the parties is the sole warranty of Eaton. Any statements contained herein do not create new warranties or modify the existing warranty.



Powering Business Worldwide

Eaton is a global leader in power distribution, power quality, control and automation, and monitoring products.

At Eaton, we believe a reliable, efficient and safe power system is the foundation of every successful enterprise. Through innovative technologies, cutting-edge products and our highly skilled services team, we empower businesses around the world to achieve a powerful advantage.

In addition, Eaton is committed to creating and maintaining powerful customer relationships built on a foundation of excellence. From the products we manufacture to our dedicated customer service and support, we know what's important to you.

Solutions

Eaton takes the complexity out of power systems management with a holistic and strategic approach, leveraging our industry-leading technology, solutions and services. We focus on the following three areas in all we do:

- Reliability—maintain the appropriate level of power continuity without disruption or unexpected downtime
- Efficiency—minimize energy usage, operating costs, equipment footprint and environmental impact
- Safety—identify and mitigate electrical hazards to protect what you value most

Using the Eaton Catalog Library

As we grow, it becomes increasingly difficult to include all products in one or two comprehensive catalogs. Knowing that each user has their specific needs, we have created a library of catalogs for our products that when complete, will contain 15 volumes. Since the volumes will continuously be a work in progress and updated, each volume will stand alone. Refer to our volume directory, MZ08100001E, for a quick glance of where to look for the products you need. The 15 volumes include:

- Volume 1—Residential and Light Commercial (CA08100002E)
- Volume 2—Commercial Distribution (CA08100003E)
- Volume 3—Power Distribution and Control Assemblies (CA08100004E)
- Volume 4—Circuit Protection (CA08100005E)
- Volume 5—Motor Control and Protection (CA08100006E)
- Volume 6—Solid-State Motor Control (CA08100007E)
- Volume 7—Logic Control, Operator Interface and Connectivity Solutions (CA08100008E)
- Volume 8—Sensing Solutions (CA08100010E)
- Volume 9—Original Equipment Manufacturer (CA08100011E)
- Volume 10—Enclosed Control (CA08100012E)
- Volume 11—Vehicle and Commercial Controls (CA08100013E)
- Volume 12—Aftermarket, Renewal Parts and Life Extension Solutions (CA08100014E)
- Volume 13—Counters, Timers and Tachometers (CA08100015E)—Available in electronic format only
- Volume 14—Fuses (CA08100016E)—Available in electronic format only
- Volume 15—Solar Inverters and Electrical Balance of System (CA08100018E)

These volumes are not all-inclusive of every product, but they are meant to be an overview of our product lines. For our full range of product solutions and additional product information, consult Eaton.com/electrical and other catalogs and product guides in our literature library. These references include:

- The Consulting Application Guide (CA08104001E)
- The Eaton Power Quality Product Guide (COR01FYA)

If you don't have the volume that contains the product or information that you are looking for, not to worry. You can access every volume of the catalog library at Eaton.com/electrical in the Literature Library.

By installing our Automatic Tab Updater (ATU), you can be sure you always have the most recent version of each volume and tab.

Icons



Green Leaf

Eaton Green Solutions are products, systems or solutions that represent Eaton benchmarks for environmental performance. The green leaf symbol is our promise that the solution has been reviewed and documented as offering exceptional, industry-leading environmental benefits to customers, consumers and our communities. Though all of Eaton's products and solutions are designed to meet or exceed applicable government standards related to protecting the environment, our products with the Green Leaf designation further provide "exceptional environmental benefit."



Learn Online

When you see the Learn Online icon, go to Eaton.com/electrical and search for the product or training page. There you will find 100-level training courses, podcasts, webcasts or games and puzzles to learn more.



Drawings Online

When you see the Drawings Online icon, go to Eaton.com/electrical and find the products page. There you will find a tab that includes helpful product drawings and illustrations.

Contact Us

If you need additional help, you can find contact information under the Customer Care heading of Eaton.com/electrical.

Enclosed Control



1.1 Enclosed Control Products

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Welcome

Welcome to the latest edition of the Enclosed Control Catalog from Eaton’s electrical sector. In this updated edition, you will find complete details on our extensive line of enclosed products.

Eaton Corporation

Eaton Corporation is a diversified industrial manufacturer ranked among the largest Fortune 500 companies. The electrical group is Eaton’s largest division and is a global leader in electrical control, power distribution, power quality, automation and monitoring products and services. Eaton’s electrical products include brands such as MGE Office Protection Systems™, Powerware®, Holec®, and MEM®. Eaton provides PowerChain® solutions to serve the needs of the industrial, institutional, IT, data center, mission critical, utility, residential and OEM markets worldwide.

PowerChain Management solutions help enterprises achieve sustainable and competitive advantages through proactive management of the power system as a strategic, integrated asset throughout its life cycle. With Eaton’s distribution, generation and power quality equipment; full-scale engineering services; and information management systems, the power system is positioned to deliver powerful results: greater reliability, operating cost efficiencies, effective use of capital, enhanced safety and risk mitigation.

Eaton Support and Service Center Capabilities

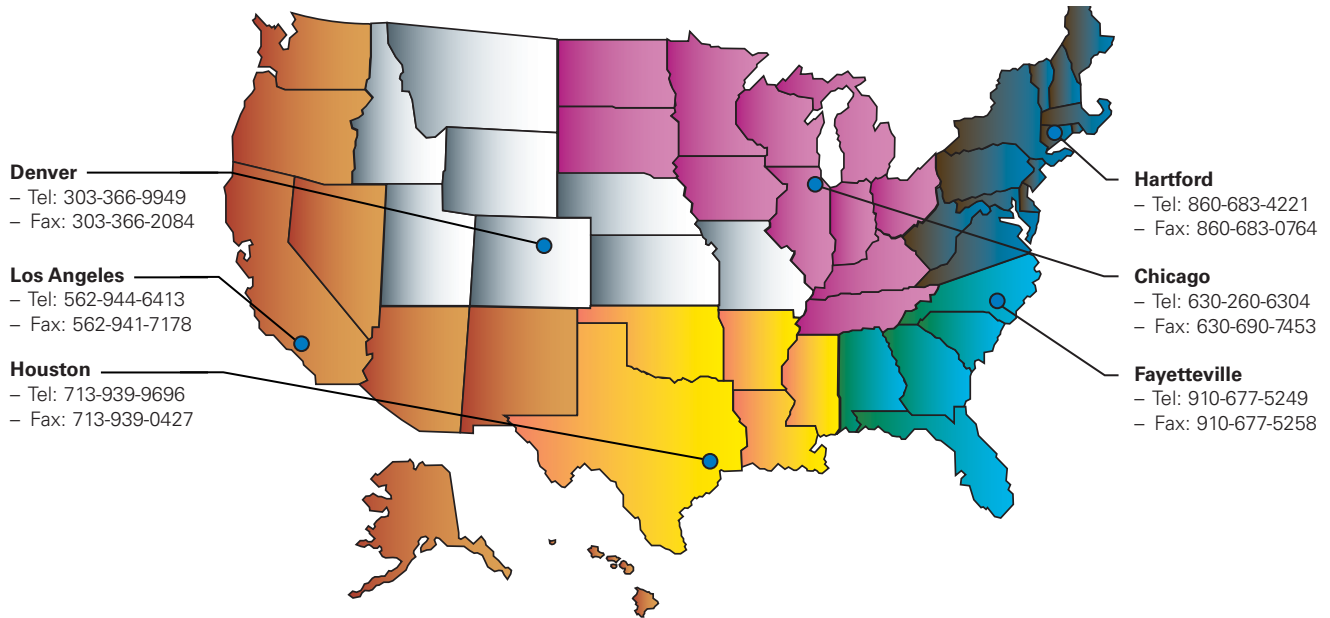
Enclosed Control Service Center Product Offering

- Type 1, 12, 3R, 4, 4X and 7/9 enclosures
- Non-combination starters
- Combination starters—non-fusible/fusible and circuit breaker
- Full voltage non-reversing, reversing and multi-speed
- Freedom™ (NEMA® Size 00–5), vacuum contactors, soft starters, lighting contactors, motor control centers and MCC aftermarket
- Modifications including cover control, CPTs, auxiliary contacts, heaters and more

Eaton Provides Enclosed Control Solutions That Are Unmatched In The Industry

- Local assembly and manufacturing capabilities
- Assembly and wiring of enclosed control and motor control centers
- Customized enclosed motor starting and lighting panels
- Modified pump panels
- Engineering support
- Custom AutoCAD® drawing capabilities
- Quick-ship capabilities
- Customer visits are welcome!

Six regional service centers



Technical Reference

Enclosure Types

Enclosures provide mechanical and electrical protection for operator and equipment. Brief descriptions of the various types of enclosures offered by Eaton are given below. See NEMA® Standards Publication No. 250 for more comprehensive descriptions, definitions and/or test criteria. All Eaton enclosures are NEMA ICS 6 compliant.

Enclosure Type Overview



Type 1 (Conforms to IP40)— for Indoor Use

Suitable for most applications where unusual service conditions do not exist and where a measure of protection from accidental contact with enclosed equipment is required. Designed to meet tests for rod entry and rust resistance. Enclosure is sheet steel, treated to resist corrosion. Depending on the size, knockouts are provided on the top, bottom and sometimes on the side.



Type 3R (Conforms to IP52)— for Outdoor Use

Primarily intended for applications where falling rain, sleet or external ice formations are present. Gasketed cover. Designed to meet tests for rain, rod entry, external icing and rust resistance. Enclosure is sheet steel, treated to resist corrosion. Depending on the size, a blank cover plate is attached to the top (for a conduit hub) and knockouts are provided on the bottom. Cover-mounted pilot device holes are provided and covered with hole plugs.

Type 4 (Conforms to IP65)— for Indoor or Outdoor Use

Provides a measure of protection from splashing water, hose-directed water and wind blown dust or rain. Constructed of sheet steel with gasketed cover.

Designed to meet tests for hose-down, external icing and corrosion protection. When conduit connections are specified, enclosure has two watertight hubs (power) installed top and bottom or one control hub installed in bottom—depending on size.

Cover-mounted pilot device holes are provided and covered with hole plugs.



Type 4X (Conforms to IP65)— for Indoor or Outdoor Use

Provides a measure of protection from splashing water, hose-directed water, wind blown dust, rain and corrosion. Constructed of stainless steel with gasketed cover.

Designed to meet same tests as Type 4 except enclosure must pass a 200-hour salt spray corrosion resistance test.

304-grade stainless steel provided as standard. Select 316-grade option for improved corrosion resistance.



Type 7/9— for Hazardous Gas Locations

For use in Class I, Group B, C or D; Class II, Groups E, F and Class III indoor locations as defined in the National Electrical Code®. Type 7/9 enclosures must withstand the pressure generated by the explosion of internally trapped gases and be able to contain the explosion so that gases in the surrounding atmosphere are not ignited. Under normal operation, the surface temperature of the enclosure must be below the point where it could ignite explosive gases present in the surrounding atmosphere. Designed to meet explosion, temperature and hydrostatic design tests.



Type 12 (Conforms to IP62)— for Indoor Use

Provides a degree of protection from dripping liquids (non-corrosive), falling dirt and dust. Designed to meet tests for drip, dust and rust resistance. Constructed of sheet steel. Hole plugs cover pilot device holes. There are no knockouts, hub cover plates or hubs installed.

Safety Interlock

The Type 12 enclosure can be ordered with a safety interlock on the door that can be padlocked off. A vault-type door latch system is used. A tapered plate holds the gasketed door tight against the case edge to provide a positive seal. The special door interlock consists of the door handle and a screwdriver operated cover defeater.

The cover defeater and the disconnect interlock defeater are both recessed screwdriver operated devices that cannot be manipulated with other types of tools.

Enclosure Ratings

IEC IP Index of Protection Ratings

First Number	Description	Second Number	Description
0	No protection	0	No protection
1	Protection against solid objects greater than 50 mm	1	Protection against vertically falling drops of water
2	Protection against solid objects greater than 12 mm	2	Protection against dripping water when tilted up to 15 degrees
3	Protection against solid objects greater than 2.5 mm	3	Protection against spraying water
4	Protection against solid objects greater than 1 mm	4	Protection against splashing water
5	Total protection against dust—limited ingress (dust protected)	5	Protection against water jets
6	Total protection against dust (dust-tight)	6	Protection against heavy seas
		7	Protection against the effects of immersion
		8	Protection against submersion

The UL®, NEMA and IEC organizations (and other international groups) define degrees of protection provided by electrical enclosures with respect to personnel, equipment within the housing and the ingress of water.

Subtle differences do exist between the test procedures and specifications of these organizations.

To claim ratings to NEMA type specifications, the testing is performed and certified by the manufacturers themselves.

To comply to UL and IEC specifications, the manufacturers must submit product samples, materials used and other data to an independent testing laboratory before ratings can be claimed.

In addition, IEC “IP” ratings differ from NEMA type in that they do not apply to protection against the risk of explosion or conditions such as humidity, corrosive gases, fungi or vermin. In addition, different parts of the equipment can have different degrees of protection and still comply.

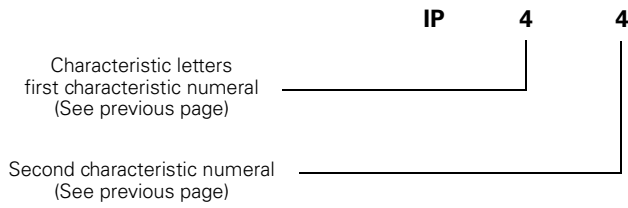
The table below is a comparison of the NEMA/UL/IEC enclosure specifications to be used as an approximate reference only. **Do not use the table to convert from IEC to NEMA designations.**

NEMA/UL/IEC Enclosure Type Cross-Reference—Approximate

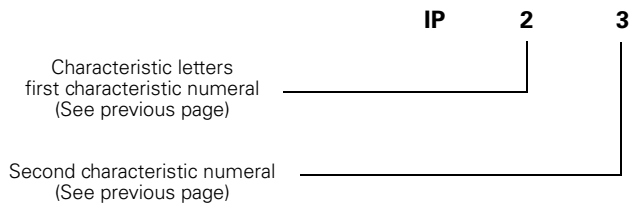
IEC 529 does not specify equivalents to NEMA enclosure types 7, 8, 9 or 10.

NEMA Enclosure Rating	IP10	IP20	IP21	IP22	IP23	IP30	IP31	IP32	IP33	IP40	IP41	IP42	IP43	IP50	IP51	IP52	IP53	IP54	IP55	IP56	IP60	IP61	IP62	IP63	IP64	IP65	IP66	IP67	IP68
1	■	■	■	■	■	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	■	■	■	■	■	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3R	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4X	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6P	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
12	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
13	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

IEC Environmental Enclosure Ratings—Examples of Designations



An enclosure with this designation is protected against the penetration of solid objects greater than 1.0 mm and against splashing water.



An enclosure with this designation is protected against the penetration of solid objects greater than 12 mm and against splashing water.

Motor Circuit Elements

Disconnect Switch—horsepower rated—located in sight of controller—arranged for padlocking in open position—disconnects motor and controller from ungrounded power conductors—position indicating—readily accessible—115% carrying capacity of full load motor current—interrupting capacity of stalled motor current—may serve as disconnect for more than one motor if motors are driving parts of a single machine or motors are all in a single room within sight of disconnecting means, must equal sum of horsepower ratings to be disconnected—device may be general use switch, motor circuit switch or circuit breaker meeting code requirements—disconnecting means should contain motor branch-circuit short-circuit and ground fault protection.

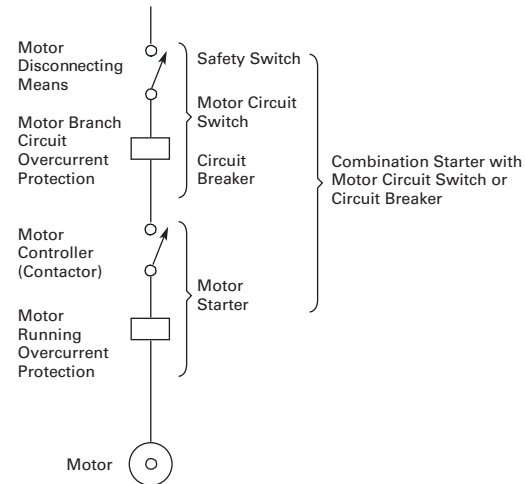
Motor Running Overcurrent Protection—called overload relay—protects motor and control apparatus against overheating due to motor overload—does not protect against short-circuits or ground faults—selected to trip at not more than 125% full load motor current, 40°C rise motors—115% all other motors—continuous duty motor protection—intermittent duty motors protected by branch circuit protection—sufficient time delay to permit motor to start and accelerate load without tripping—sensing devices (heater coils) in ungrounded conductor for single-phase—three sensing devices (heater coils) required for three-phase.

Contactor—starting, stopping motor it controls—interrupt stalled motor current—horsepower rated—not lower than horsepower of motor controlled—contactor not in sight of connected motor must have disconnect capable of locking in open position or manually operable switch that will prevent contactor closing within sight of motor—interrupt all ungrounded power lines—manually or magnetically operated.

Controller or Starter—non-combination contains contactor and motor running overcurrent protection in one enclosure—starts, stops, protects and regulates motor—combination starters contain disconnecting means, branch short-circuit protection in same enclosure. (See motor control sections—three-phase, single-phase and DC.)

Reduced Voltage—restrictions in power supply capacity or machine design may require reduced voltage starting—motor connected to power supply at voltage lower than supply voltage—requires use of primary resistance, reactance or use of autotransformer—special motor designs such as part winding and wye-delta considered as reduced voltage starting.

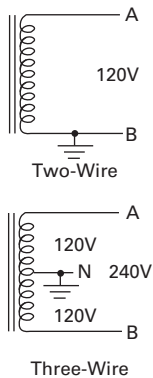
Typical Motor Circuit



Power Supplies

All electrical power supplied as AC or DC—primarily AC—generation, transmission and some distribution of power at high voltage—most power distribution at use voltage for industrial and residential is 600V and under—AC power generally at a frequency of 60 Hz—50 and 25 Hz used in some specific areas—AC distribution at use location single- or three-phase—limited areas have two-phase.

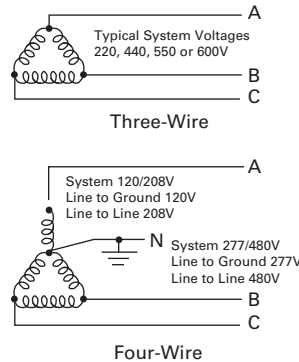
Single-Phase Power Supply



Single-Phase—

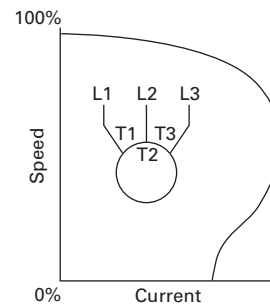
two-wire, 120V one line grounded—120/240V three-wire center line grounded—residential distribution, lighting, heat, fractional horsepower motors, business machines.

Three-Phase Power Supply



Three-Phase—three-wire delta 220/440V, 550V—four-wire wye 120/208 and 277/480V neutral line grounded—primary industrial power distribution—main motor drives, integral horsepower motors, lighting, heating, fractional horsepower motors, business machines—used as three-phase or single-phase power supply.

Squirrel Cage Speed



AC Squirrel Cage Motor—

single- or three-phase—single-phase requires starting winding—three-phase self-starting—stationary stator winding—no electrical connection to short circuited rotor—torque produced from magnetic reaction of stator and rotor fields—speed a function of supply frequency

and number of electrical poles wound on stator—considered as constant speed even though speed decreases slightly with increased load—high inrush currents during starting on full voltage—rugged construction—easily serviced and maintained—high efficiency—good running power factor when delivering full load—requires motor control only for stator windings.

Functions of Control

Controller functions to start, stop, reverse, regulate and protect connected motor—when functions do not include speed regulation, device is known as a starter rather than controller—**general** applications of control functions on fans, pumps, heating and applications of variable torque and horsepower where relatively infrequent cycling is necessary—functions usually starting and stopping with or without motor running overcurrent protection—

manual or magnetic control—**Commercial and Industrial** control functions for constant horsepower, constant or variable torque machine loads, constant torque metal working machinery, variable torque and horsepower fans and blowers, constant power heating, lighting, pumps and motors for all types of applications—may include speed regulation—good for cycling or infrequent starting and stopping—manual or magnetic.

Remote and Local Control

Local Control—controlling or sensing device, master switch or pilot device initiating operation located in same enclosure as controller.

Remote Control—controlling devices located at some other point than controller—may have more than one operating point with control devices connected in parallel or in series, depending on operating sequence required.

Wiring Diagrams

A symbolic representation of operation and function of control devices.

Jogging, Inching, Plugging Service

Jogging or inching—momentary operation of driven machine for small movement or positioning—requires non-maintained operator and electrical control circuit—control subject to motor inrush current on each jog or inch cycle—contactor derated where the contactor is opened or closed more than five times per minute or more than ten times in a 10-minute period.

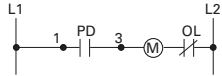
Plugging—plugging stop or plugging reverse—reverse power supplied to motor—motor generates braking—contactors subjected to higher than normal motor inrush during plugging—requires reversing contactors—contactor derated for plugging service.

1

Two- and Three-Wire Control

Two-Wire Control

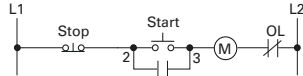
Two-Wire Wiring



Two-wire control is a control function that uses a maintained contact type of pilot device to provide low voltage release (LVR).

Three-Wire Control

Three-Wire Wiring



Three-wire control is a control function that uses a momentary contact pilot device and a holding circuit contact to provide low voltage protection (LVP).

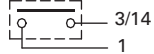
Panel Diagram—wiring, panel and pilot device layout—actual position of devices—power line bold and control lines light—circuit symbols show basic construction details.

Line Diagram—connection representation but not wiring configuration—sequence and function of devices but not location—symbols do not represent physical construction of device.

Typical Line Diagram

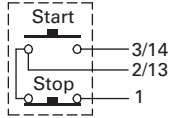
Remote Pilot Devices

Two-Wire Control

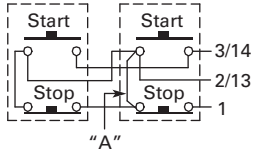


Not for Use with Auto Reset OL Relays

Three-Wire Control

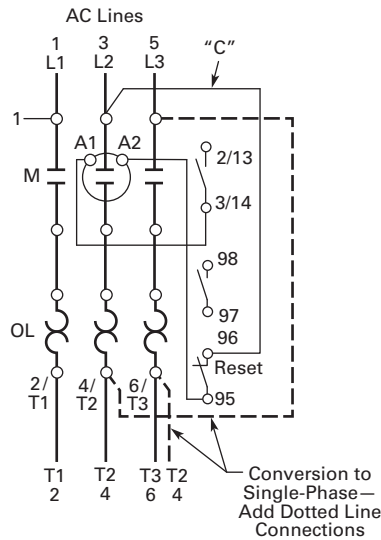


When More than One Pushbutton Station is Used, Omit Connector "A" and Connect per Sketch Below



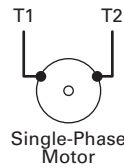
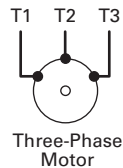
Connections for Non-Reversing Starter

Front View of Panel



Separate Control

Remove Wire "C" if Supplied and Connect Separate Control Lines to the Number 1 Terminal on the Remote Pilot Device and to the Number 96 Terminal on the Overload Relay



**Freedom Breaker Combination—
Bi-Metallic OL**



**Freedom Fusible Combination—
C440 SSOL**



2.1 Freedom Full Voltage Controls

Product Description	V10-T2-2
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Reversing Contactors	V10-T2-16
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Combination Starters—Fusible and Non-Fusible	V10-T2-25
Combination Starters—Circuit Breaker	V10-T2-39
Wiring Diagrams	V10-T2-50

2.2 A200 Full Voltage Controls

Product Description	V10-T2-58
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Standards and Certifications	V10-T2-58
Additional Reference	V10-T2-58
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Product Selection	V10-T2-60

2.3 Freedom Multispeed Starters

Product Description	V10-T2-64
Features	V10-T2-64
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Freedom Full Voltage Controls

2



Product Description

Eaton's Freedom Series™ starters and contactors feature a compact, space-saving design, high strength, impact and temperature resistant insulating materials.

Features

- C440 solid-state electronic overload providing reliable, accurate and value-driven protection, including communication capabilities, while reducing inventory carrying costs with wide FLA adjustment (5:1) and selectable trip class
- Adjustable bimetallic ambient compensated overload relays with interchangeable heater packs—available in three basic sizes, covering applications up to 900 hp
- Fixed heater overloads optional
- A full line of snap-on accessories—top and side mounted auxiliary contacts, solid-state and pneumatic timers, and so on
- Straight-through wiring—line lugs at top, load lugs at bottom
- Horizontal or vertical mounting on upright panel for application freedom
- Screw type power terminals have captive, backed-out self-lifting pressure plates with ± screws—reduced wiring time
- Accessible terminals for easy wiring. Optional fingerproof shields available to prevent electrical shock
- Top located coil terminals convenient and readily accessible. 45 mm contactor magnet coils have three terminals, permitting either top or diagonal wiring—easy to replace European or U.S. style starters or contactors without changing wiring layout
- Encapsulated dual voltage/frequency magnet coils—permanently marked with voltage, frequency and part number
- Designed to meet or exceed UL, CSA®, IEC, VDE, BS and other international standards and listings

Contents

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Wiring Diagrams	V10-T2-50

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL® Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Certified Type 2 Coordination

Eaton's Freedom Series NEMA starters are UL Certified to achieve IEC 947 Type 2 coordination against 100,000 A short-circuit fault currents. Any brand of properly selected fuse can be used. Type 2 coordination means that the starter will be suitable for further use following a short-circuit fault.

ISO 9001 Certification

When you turn to Eaton’s products, you turn to quality. The International Standards Organization (ISO®) has established a series of standards acknowledged by 91 industrialized nations to bring harmony to the international quest for quality. The ISO certification process covers 20 quality system elements in design, production and installation that must conform to achieve registration. The enclosed control is manufactured in our Fayetteville, NC plant, and this facility is registered ISO 9001. This commitment to quality results in increased product reliability and total customer satisfaction.

Freedom NEMA contactors and starters are extremely rugged products built for any application. Their long electrical/mechanical life is extended through easy maintainability.

- Meets and exceeds all UL and CSA standards
- Sized based on standard NEMA size classifications
- Designed and built for a variety of demanding applications
- Easy coil change and inspectable/replaceable contacts
- Available open and in Type 1, 3R, 4, 4X, 7/9 and 12 enclosures

Short-Circuit Protection

Fuses and inverse-time circuit breakers may be selected per Article 430, Part D of the National Electrical Code to protect motor branch circuits from fault conditions. If higher ratings or settings are required to start the motor, do **not** exceed the maximum as listed in Exception No. 2, Article 430-52.

Additional Reference

Other Magnet Coils	V10-T2-4
Cover Control	V10-T2-6
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Catalog Number Selection

NEMA Freedom Line Enclosed Control

2

EC N 22 2 1 A A F -

Design	
N	= Freedom NEMA
2	= A200

Class	Page
01 = Non-reversing contactor—three-pole	V10-T2-10
Non-reversing contactor—two-pole	V10-T2-12
Non-reversing contactor—four-pole	V10-T2-14
Non-reversing contactor—five-pole	V10-T2-15
02 = Reversing contactor—three-pole	V10-T2-16
05 = Non-combination non-reversing starter	V10-T2-18
05 = Non-combination single-phase non-reversing starter	V10-T2-20
06 = Non-combination reversing starter	V10-T2-21
07 = Non-combination non-reversing starter with CPT	V10-T2-23
16 = Combination non-reversing starter—fusible disconnect	V10-T2-25
Combination non-reversing starter—non-fusible disconnect	V10-T2-27
Special enclosure combination non-reversing starter—fusible/non-fusible disconnect	V10-T2-29
17 = Combination reversing starter—fusible disconnect	V10-T2-31
Combination reversing starter—non-fusible disconnect	V10-T2-33
18 = Combination non-reversing starter—fusible disconnect with CPT	V10-T2-35
Combination non-reversing starter—non-fusible disconnect with CPT	V10-T2-37
22 = Combination non-reversing starter—circuit breaker	V10-T2-39
Special enclosure combination non-reversing starter—circuit breaker	V10-T2-42
23 = Combination reversing starter—circuit breaker	V10-T2-44
24 = Combination non-reversing starter—circuit breaker with CPT	V10-T2-47

NEMA Size		
A = Size 00	3 = Size 3	7 = Size 7
0 = Size 0	4 = Size 4	8 = Size 8
1 = Size 1	5 = Size 5	9 = Size 9
2 = Size 2	6 = Size 6	

Modification/Overload Codes	
All modification codes, see Tab 15 .	
For solid-state overload codes, Page V10-T2-5	

Disconnect Fuse Clip Ratings		
A = None	G = 100 A/600 V R	N = 600 A/600 V R
B = 30 A/250 V R	H = 200 A/250 V R	P = 800 A/600 V L
C = 30 A/600 V R	J = 200 A/600 V R	Q = 1200 A/600 V L
D = 60 A/250 V R	K = 400 A/250 V R	R = 1600 A/600 V L
E = 60 A/600 V R	L = 400 A/600 V R	S = 2000 A/600 V L
F = 100 A/250 V R	M = 600 A/250 V R	T = By description

Circuit Breaker Ratings		
A = None	H = 150 A	R = 3000 A
B = 3 A	J = 250 A	T = By description
C = 7 A	K = 400 A	5 = 3 A ①
D = 15 A	L = 600 A	6 = 7 A ①
E = 30 A	M = 800 A	7 = 15 A ①
F = 50 A	N = 1000 A	8 = 30 A ①
W = 70 A	P = 1200 A	9 = 50 A ①
G = 100 A	Q = 2000 A	I = 100 A ①

Cover Control	
Type 1 non-comb. (NEW BOX 1 only), Page V10-T2-6	
Type 1 non-comb., Page V10-T2-7	
All others, Page V10-T2-8	
Contactors	
3 = Three poles	

Coil Voltage and/or Control Transformers	
See code tables below	

Enclosure Type	
1	Type 1—General purpose
2	Type 3R—Rainproof
3	Type 4—Watertight (painted steel)
4	Type 4X—Watertight (304-Grade stainless steel)
5	Type 4X—Corrosion (non-metallic)
6	Type 7/9—Bolted hazardous location
7	Type 7/9—Threaded hazardous location
8	Type 12—Dust-tight
9	Type 4X—316-Grade stainless steel

Magnetic Coil Codes (System Voltage) ②

Code	Magnet Coil	Code	Magnet Coil	Code	Magnet Coil
A	120/60–110/50	K	240/50	U	24/50
B	240/60–220/50	L	380/50	V	32/50
C	460/60–440/50	M	415/50	W	48/60
D	575/60–550/50	P	12 Vdc	X	104–120/60
E	208/60	Q	24 Vdc	Y	48/50
G	550/50	R	48 Vdc	Z	By description
H	277/60	S	125 Vdc		
J	208–240/60	T	24/60		

Notes

- ① Use for 0–3, HMCP 600 V applications only.
- ② When control power transformer modification codes (**C1–C11**) are used or when starter class includes CPT (that is ECN07, 18) see the table at right for system voltage code.

Control Power Transformer Codes (System Voltage)

Code	Primary	Secondary
B	240/480–220/440 wired for 240 V	120/60–110/50
C	240/480–220/440 wired for 480 V	120/60–110/50
D	600/60–550/50	120/60–110/50
E	208/60	120/60
H	277/60	120/60
L	380/50	110/50
M	415/50	110/50
Q	208/60	24
R	240/480–220/440 wired for 240 V	24
S	240/480–220/440 wired for 480 V	24
T	600/60	24
U	277/60	24
V	380/50	24
W	415/50	24
X	240/480/600 wired for 480 V	120
Y	240/480/600 wired for 480 V	24
Z	By description	—

C440 Solid-State Overload Modifications

Reliability and Improved Uptime

- C440 provides the users with peace of mind knowing that their assets are protected with the highest level of motor protection and communication capability in its class
- Extends the life of plant assets with selectable motor protection features such as trip class, phase unbalance and ground fault
- Protects against unnecessary downtime by discovering changes in your system (line/load) with remote monitoring capabilities
- Status LED provides added assurance that valuable assets are protected by indicating the overload operational status

Flexibility

- Improves return on investment by reducing inventory carrying costs with wide FLA adjustment (5:1) and selectable trip class
- Design incorporates built-in ground fault protection thus eliminating the need for separate CTs and modules
- Flexible communication with optional I/O enables easy integration into plant management systems for remote monitoring and control

Monitoring Capabilities

- Individual phase currents RMS
- Average three-phase current RMS
- Thermal memory
- Fault indication (overload, phase loss, phase unbalance, ground fault)

Safety

- IP20 rated terminal blocks
- Available in Eaton's industry leading FlashGard MCCs
- Tested to the highest industry standards such as UL, CSA, CE and IEC
- RoHS compliant

For solid-state overload enclosed control, add R63 or R64 modification code after the base Catalog Number. (Example, ECN0501AAA-**R63/B**).

Modification	IEC Size	NEMA Size	Full Load Current Adjustment Range (A)	Three-Phase without Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30	Three-Phase with Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30
Solid-state electronic overload relay ^①	B and C	00	0.33–1.65 ^②	R63/A	R64/A
			1–5	R63/B	R64/B
			4–20	R63/C	R64/C
	C and D	0 and 1	0.33–1.65 ^②	R63/A	R64/A
			1–5	R63/B	R64/B
			4–20	R63/C	R64/C
			9–45	R63/D	R64/D
	D	2	9–45	R63/D	R64/D
	D, F and G	3	20–100	R63/E	R64/E
G	4	28–140	R63/F	R64/F	
N/A	5	60–300	R63/G	R64/G	
N/A	6	120–600	R63/H	R64/H	

Notes

- ^① Features:
 - Self-powered
 - Phase loss protection
 - Current adjustment knob
 - ±1% repeat accuracy
 - 1NO and 1NC isolated contacts
- ^② Not UL Listed.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Cover Control

Product Selection

2

Type 1 Non-Combination Cover Control (Box 1 Only)

- Cover control for non-combination starters uses M22 style devices as standard
- Pushbuttons are momentary type
- Field convertible selector switches from momentary to maintained operation and vice versa
- Cover control kits include hardware, M22 pushbuttons, bracket and pre-wired wire harnesses
- See Volume 7, Tab 1, for more details on M22 pushbuttons

Type 1 Non-Combination Cover Control (Box 1 Only)

Box 1 offering includes FVNR contactor sizes 00–2, electronic FVNR starters size 00–2 and bi-metallic FVNR starters size 00–1.



Description	Factory Installed Flange Control Position 9 Cover Control Code	Field Installation Kits Catalog Number
Non-Reversing		
No cover mounted pilot devices	A	—
STOP/START oval pushbuttons	B	C600M1
With red RUN pilot light	C	C600M101_①
With red RUN/green OFF lights	D	C600M102_①
OFF/ON oval pushbuttons	E	C600M2
With red RUN pilot light	F	C600M201_①
With red RUN/green OFF lights	G	C600M202_①
STOP/START selector switch	S	C600M13
With red RUN pilot light	T	C600M131_①
With red RUN/green OFF lights	U	C600M132_①
OFF/ON selector switch	V	C600M14
With red RUN pilot light	W	C600M141_①
With red RUN/green OFF lights	X	C600M142_①
HAND/OFF/AUTO selector switch	H	C600M12
With red RUN pilot light	J	C600M121_①
With red RUN/green OFF lights	K	C600M122_①
Green START pushbutton	L	C600M3
Red STOP pushbutton	Y	C600M7 ①
Green ON pushbutton	M	C600M4
Red OFF pushbutton	N	C600M5
Red RUN pilot light	P	C600M9_①
Green OFF pilot light	Q	C600M10_①
Red RUN/green OFF lights	R	C600M11_①
TEST/OFF/AUTO selector switch	—	C600M8

Note

① Add code letter from the table below to catalog number for voltage. Example: C600M101**A**.

Rating	Code Letter
85–264 Vac	A
480 Vac	C
12–30 Vac/Vdc	T

Type 1 Non-Combination Cover Control (Box 2 and Larger Enclosures Only)

- Cover control for combination starters uses 10250T style devices as standard
- Selector switches are maintained with lever operators
- Pushbuttons are momentary type with extended pushbutton
- The kit includes hardware and connecting wires (where possible)
- For factory installed control devices other than shown below, refer to modification codes, **Tab 15**

Type 1 Cover Control



Type 1 Non-Combination Cover Control (Box 2 and Larger Enclosures Only)

Box 2 and Larger Enclosure offering includes contactors size 3–5, electronic starters size 3–5 and bi-metallic starters size 2–5.

Description	Factory Installed Flange Control ① Position 9 Cover Control Code	Field Installation Kits Catalog Number
Non-Reversing		
No cover mounted pilot devices	A	C400GK0
STOP/START pushbuttons	B	C400GK1
With red RUN pilot light	C	C400GK12 ②
With red RUN/green OFF lights	D	C400GK16 ②
HAND/OFF/AUTO selector switch	H	C400GK3
With red RUN pilot light	J	C400GK32 ②
With red RUN/green OFF lights	K	C400GK36 ②
Red RUN pilot light	P	C400GK42 ②
Green OFF	Q	C400GK41 ②
Red RUN/green OFF pilot lights	R	C400GK46 ②
Reversing		
No cover mounted pilot devices	A	C400GK0
FOR/REV/STOP pushbuttons	B	C400GR1
With two red pilot lights	C	C400GR14 ②
UP/STOP/DOWN pushbuttons	E	C400GR2
With two red pilot lights	F	C400GR24 ②
Two red pilot lights	P	C400GK44 ②
One green pilot light	Q	C400GK41 ②

Notes

- ① For more available factory installed flange control, see **Page V10-T2-8**.
- ② Add code letter from the table below to catalog number for voltage—kits only. Example: C400GK0B.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	277 V 60 Hz	H	480 V 60 Hz	C
208 V 60 Hz	E	380 V 50 Hz	L	600 V 60 Hz	D
240 V 60 Hz	B				

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

2

Type 1 Combination and All Type 3R, 4X and 12 Cover Control

- Cover control for combination starters uses 10250T style devices as standard
- Selector switches are maintained with lever operators
- Pushbuttons are momentary type with extended pushbutton
- The kit includes hardware and connecting wires (where possible)
- For factory installed control devices other than shown below, refer to modification codes, **Tab 15**

10250T Cover Control Kits



Type 1 Combination and All Type 3R, 4X and 12 Cover Control ^①

Description	Factory Installed Flange Control Position 9 Cover Control Code	Field Installation Kits Catalog Number
Non-Reversing		
No cover mounted pilot devices	A	—
START/STOP pushbuttons	B	C400T1
With red RUN pilot light	C	—
With red RUN/green OFF lights	D	—
ON/OFF pushbuttons	E	C400T2
With red RUN pilot light	F	—
With red RUN/green OFF lights	G	—
HAND/OFF/AUTO selector switch	H	C400T12
With red RUN pilot light	J	—
With red RUN/green OFF lights	K	—
START pushbutton	L	C400T3
ON pushbutton	M	C400T4
OFF pushbutton	N	C400T5
Red RUN pilot light	P	C400T9 ^②
Green OFF	Q	C400T10 ^②
Red RUN/green OFF pilot lights	R	C400T11 ^②
START/STOP selector switch	S	C400T13
With red RUN pilot light	T	—
With red RUN/green OFF lights	U	—
ON/OFF selector switch	V	C400T14
With red RUN pilot light	W	—
With red RUN/green OFF lights	X	—
Reversing		
No cover mounted pilot devices	A	—
FOR/REV/STOP pushbuttons	B	C400T6
With two red pilot lights	C	—
With two red/one green pilot lights	D	—
UP/STOP/DOWN pushbuttons	E	—
With two red pilot lights	F	—
FOR/OFF/REV selector switch	H	C400T15
With two red pilot lights	J	—
With two red/one green pilot lights	K	—
Two red pilot lights	P	③
One green pilot light	Q	C400T10 ^②
Two red/one green pilot lights	R	—
OPEN/OFF/CLOSE selector switch	V	C400T16
With two red pilot lights	W	—
With two red/one green pilot lights	X	—

Notes

- ① For Type 1 non-combination field installation kits, see **Page V10-T2-7**.
- ② Add code letter from the table below to catalog number for voltage—kits only. Example: C400T9**B**.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	277 V 60 Hz	H	480 V 60 Hz	C
208V 60 Hz	E	380 V 50 Hz	L	600 V 60 Hz	D
240 V 60 Hz	B				

- ③ Order quantity (2) of **C400T10**.

Type 1 Non-Combination Empty Enclosure (Box 1 Only)

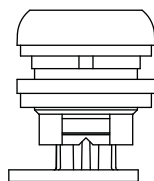
There is a universal empty enclosure for the non-metallic Type 1 Non-Combination Box 1 regardless of the starter or the contactor needed. The only difference is the length of the easily interchangeable reset rod. The reset rod kit provides everything needed to install the correct reset rod, including all the reset rod lengths, a protective shroud, a paddle and a reset button with nut.

Box 1 offering includes FVNR contactors size 00–2, FVR contactors size 00–0, FVNR electronic starters size 00–2, and FVNR bi-metallic starters size 00-1.

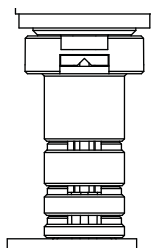
Empty Enclosure Stocking Needs	Catalog Number
Empty enclosure	C899B001
Reset rod kit	RESET001

The table below shows which reset rod is used with each starter or contactor.

Starter or Contactor	Reset Rod Length
NEMA FVNR Size 00–2, solid-state overload	0.43-inch reset
NEMA FVNR Size 00–1, bi-metallic overload	1.68-inch reset
All NEMA FVNR and FVR contactors	No reset needed



FVNR Solid State
OL Reset—0.43 inches



FVNR Bi-Metallic
OL Reset—1.68 inches

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Contactors

Non-Reversing Contactors

2

Features

- One-phase or three-phase magnetic
- Two-, three-, four- or five-pole non-reversing or three-pole reversing
- 600 V maximum

Product Selection

Class ECN01 – Non-Reversing Contactor – Three-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial Catalog Number	Component Contactor (Open) Catalog Number
00	9	—	—	120	ECN01A1A3A	ECN01A2A3A	(Select contactor from Size 0 listing)		CN15AN3AB
		200	1-1/2	208	ECN01A1E3A	ECN01A2E3A			CN15AN3EB
		230	1-1/2	240	ECN01A1B3A	ECN01A2B3A			CN15AN3BB
		460	2	480	ECN01A1C3A	ECN01A2C3A			CN15AN3CB
		575	2	600	ECN01A1D3A	ECN01A2D3A			CN15AN3DB
0	18	—	—	120	ECN0101A3A	ECN0102A3A	ECN0104A3A	ECN0108A3A	CN15BN3AB
		200	3	208	ECN0101E3A	ECN0102E3A	ECN0104E3A	ECN0108E3A	CN15BN3EB
		230	3	240	ECN0101B3A	ECN0102B3A	ECN0104B3A	ECN0108B3A	CN15BN3BB
		460	5	480	ECN0101C3A	ECN0102C3A	ECN0104C3A	ECN0108C3A	CN15BN3CB
		575	5	600	ECN0101D3A	ECN0102D3A	ECN0104D3A	ECN0108D3A	CN15BN3DB
1	27	—	—	120	ECN0111A3A	ECN0112A3A	ECN0114A3A	ECN0118A3A	CN15DN3AB
		200	7-1/2	208	ECN0111E3A	ECN0112E3A	ECN0114E3A	ECN0118E3A	CN15DN3EB
		230	7-1/2	240	ECN0111B3A	ECN0112B3A	ECN0114B3A	ECN0118B3A	CN15DN3BB
		460	10	480	ECN0111C3A	ECN0112C3A	ECN0114C3A	ECN0118C3A	CN15DN3CB
		575	10	600	ECN0111D3A	ECN0112D3A	ECN0114D3A	ECN0118D3A	CN15DN3DB
2	45	—	—	120	ECN0121A3A	ECN0122A3A	ECN0124A3A	ECN0128A3A	CN15GN3AB
		200	10	208	ECN0121E3A	ECN0122E3A	ECN0124E3A	ECN0128E3A	CN15GN3EB
		230	15	240	ECN0121B3A	ECN0122B3A	ECN0124B3A	ECN0128B3A	CN15GN3BB
		460	25	480	ECN0121C3A	ECN0122C3A	ECN0124C3A	ECN0128C3A	CN15GN3CB
		575	25	600	ECN0121D3A	ECN0122D3A	ECN0124D3A	ECN0128D3A	CN15GN3DB
3	90	—	—	120	ECN0131A3A	ECN0132A3A	ECN0134A3A	ECN0138A3A	CN15KN3A
		200	25	208	ECN0131E3A	ECN0132E3A	ECN0134E3A	ECN0138E3A	CN15KN3E
		230	30	240	ECN0131B3A	ECN0132B3A	ECN0134B3A	ECN0138B3A	CN15KN3B
		460	50	480	ECN0131C3A	ECN0132C3A	ECN0134C3A	ECN0138C3A	CN15KN3C
		575	50	600	ECN0131D3A	ECN0132D3A	ECN0134D3A	ECN0138D3A	CN15KN3D

Notes

① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0104A3A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN01 – Non-Reversing Contactor – Three-Pole, continued

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X Watertight and Dust-Tight Stainless Steel ^②	Type 12	Component Contactor (Open)
					General Purpose	Rainproof		Dust-Tight Industrial	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	135	—	—	120	ECN0141A3A	ECN0142A3A	ECN0144A3A	ECN0148A3A	CN15NN3A
		200	40	208	ECN0141E3A	ECN0142E3A	ECN0144E3A	ECN0148E3A	CN15NN3E
		230	50	240	ECN0141B3A	ECN0142B3A	ECN0144B3A	ECN0148B3A	CN15NN3B
		460	100	480	ECN0141C3A	ECN0142C3A	ECN0144C3A	ECN0148C3A	CN15NN3C
		575	100	600	ECN0141D3A	ECN0142D3A	ECN0144D3A	ECN0148D3A	CN15NN3D
5	270	—	—	120	ECN0151A3A	ECN0152A3A	ECN0154A3A	ECN0158A3A	CN15SN3A
		200	75	208	ECN0151E3A	ECN0152E3A	ECN0154E3A	ECN0158E3A	CN15SN3E
		230	100	240	ECN0151B3A	ECN0152B3A	ECN0154B3A	ECN0158B3A	CN15SN3B
		460	200	480	ECN0151C3A	ECN0152C3A	ECN0154C3A	ECN0158C3A	CN15SN3C
		575	200	600	ECN0151D3A	ECN0152D3A	ECN0154D3A	ECN0158D3A	CN15SN3D
6	540	—	—	120	ECN0161A3A	ECN0162A3A	ECN0164A3A	ECN0168A3A	CN15TN3A
		200	150	208	ECN0161E3A	ECN0162E3A	ECN0164E3A	ECN0168E3A	CN15TN3E
		230	200	240	ECN0161B3A	ECN0162B3A	ECN0164B3A	ECN0168B3A	CN15TN3B
		460	400	480	ECN0161C3A	ECN0162C3A	ECN0164C3A	ECN0168C3A	CN15TN3C
		575	400	600	ECN0161D3A	ECN0162D3A	ECN0164D3A	ECN0168D3A	CN15TN3D
7	810	—	—	120	ECN0171A3A	ECN0172A3A	ECN0173A3A ^③	ECN0178A3A	CN15UN3A
		230	300	240	ECN0171B3A	ECN0172B3A	ECN0173B3A ^③	ECN0178B3A	CN15UN3B
		460	600	480	ECN0171C3A	ECN0172C3A	ECN0173C3A ^③	ECN0178C3A	CN15UN3C
		575	600	600	ECN0171D3A	ECN0172D3A	ECN0173D3A ^③	ECN0178D3A	CN15UN3D
8	1215	—	—	120	ECN0181A3A	ECN0182A3A	ECN0183A3A ^③	ECN0188A3A	CN15VN3A
		230	450	240	ECN0181B3A	ECN0182B3A	ECN0183B3A ^③	ECN0188B3A	CN15VN3B
		460	900	480	ECN0181C3A	ECN0182C3A	ECN0183C3A ^③	ECN0188C3A	CN15VN3C
		575	900	600	ECN0181D3A	ECN0182D3A	ECN0183D3A ^③	ECN0188D3A	CN15VN3D
9	2250	—	—	120	ECN0191A3A	ECN0192A3A	ECN0193A3A ^③	ECN0198A3A	CN15WN3A
		230	800	240	ECN0191B3A	ECN0192B3A	ECN0193B3A ^③	ECN0198B3A	CN15WN3B
		460	1600	480	ECN0191C3A	ECN0192C3A	ECN0193C3A ^③	ECN0198C3A	CN15WN3C
		575	1600	600	ECN0191D3A	ECN0192D3A	ECN0193D3A ^③	ECN0198D3A	CN15WN3D

Notes

① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0144A3A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.

To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 7–9.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

2

Class ECN01 – Non-Reversing Contactor – Two-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial Catalog Number	Component Contactor (Open) Catalog Number
00	9	115	1/3	120	ECN01A1A2A	(Select contactor from Size 0 listing)			CN15AN2AB
		—	—	208	ECN01A1E2A				CN15AN2EB
		230	1	240	ECN01A1B2A				CN15AN2BB
		—	—	480	ECN01A1C2A				CN15AN2CB
		—	—	600	ECN01A1D2A				CN15AN2DB
0	18	115	1	120	ECN0101A2A	ECN0102A2A	ECN0104A2A	ECN0108A2A	CN15BN2AB
		—	—	208	ECN0101E2A	ECN0102E2A	ECN0104E2A	ECN0108E2A	CN15BN2EB
		230	2	240	ECN0101B2A	ECN0102B2A	ECN0104B2A	ECN0108B2A	CN15BN2BB
		—	—	480	ECN0101C2A	ECN0102C2A	ECN0104C2A	ECN0108C2A	CN15BN2CB
		—	—	600	ECN0101D2A	ECN0102D2A	ECN0104D2A	ECN0108D2A	CN15BN2DB
1	27	115	2	120	ECN0111A2A	ECN0112A2A	ECN0114A2A	ECN0118A2A	CN15DN2AB
		—	—	208	ECN0111E2A	ECN0112E2A	ECN0114E2A	ECN0118E2A	CN15DN2EB
		230	3	240	ECN0111B2A	ECN0112B2A	ECN0114B2A	ECN0118B2A	CN15DN2BB
		—	—	480	ECN0111C2A	ECN0112C2A	ECN0114C2A	ECN0118C2A	CN15DN2CB
		—	—	600	ECN0111D2A	ECN0112D2A	ECN0114D2A	ECN0118D2A	CN15DN2DB
2	45	115	3	120	ECN0121A2A	ECN0122A2A	ECN0124A2A	ECN0128A2A	CN15GN2AB
		—	—	208	ECN0121E2A	ECN0122E2A	ECN0124E2A	ECN0128E2A	CN15GN2EB
		230	7-1/2	240	ECN0121B2A	ECN0122B2A	ECN0124B2A	ECN0128B2A	CN15GN2BB
		—	—	480	ECN0121C2A	ECN0122C2A	ECN0124C2A	ECN0128C2A	CN15GN2CB
		—	—	600	ECN0121D2A	ECN0122D2A	ECN0124D2A	ECN0128D2A	CN15GN2DB
3	90	115	7-1/2	120	ECN0131A2A	ECN0132A2A	ECN0134A2A	ECN0138A2A	CN15KN2A
		—	—	208	ECN0131E2A	ECN0132E2A	ECN0134E2A	ECN0138E2A	CN15KN2E
		230	15	240	ECN0131B2A	ECN0132B2A	ECN0134B2A	ECN0138B2A	CN15KN2B
		—	—	480	ECN0131C2A	ECN0132C2A	ECN0134C2A	ECN0138C2A	CN15KN2C
		—	—	600	ECN0131D2A	ECN0132D2A	ECN0134D2A	ECN0138D2A	CN15KN2D
4	135	—	—	120	ECN0141A2A	ECN0142A2A	ECN0144A2A	ECN0148A2A	CN15NN2A
		—	—	208	ECN0141E2A	ECN0142E2A	ECN0144E2A	ECN0148E2A	CN15NN2E
		—	—	240	ECN0141B2A	ECN0142B2A	ECN0144B2A	ECN0148B2A	CN15NN2B
		—	—	480	ECN0141C2A	ECN0142C2A	ECN0144C2A	ECN0148C2A	CN15NN2C
		—	—	600	ECN0141D2A	ECN0142D2A	ECN0144D2A	ECN0148D2A	CN15NN2D

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECN0104A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN01 – Non-Reversing Contactor – Two-Pole, continued

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1	Type 3R	Type 4X Watertight and Dust-Tight Stainless Steel ①	Type 12	Component
					General Purpose	Rainproof		Dust-Tight Industrial	Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	270	—	—	120	ECN0151A2A	ECN0152A2A	ECN0154A2A	ECN0158A2A	CN15SN2A
		—	—	208	ECN0151E2A	ECN0152E2A	ECN0154E2A	ECN0158E2A	CN15SN2E
		—	—	240	ECN0151B2A	ECN0152B2A	ECN0154B2A	ECN0158B2A	CN15SN2B
		—	—	480	ECN0151C2A	ECN0152C2A	ECN0154C2A	ECN0158C2A	CN15SN2C
		—	—	600	ECN0151D2A	ECN0152D2A	ECN0154D2A	ECN0158D2A	CN15SN2D
6	540	—	—	120	ECN0161A2A	ECN0162A2A	ECN0164A2A	ECN0168A2A	CN15TN2A
		—	—	208	ECN0161E2A	ECN0162E2A	ECN0164E2A	ECN0168E2A	CN15TN2E
		—	—	240	ECN0161B2A	ECN0162B2A	ECN0164B2A	ECN0168B2A	CN15TN2B
		—	—	480	ECN0161C2A	ECN0162C2A	ECN0164C2A	ECN0168C2A	CN15TN2C
		—	—	600	ECN0161D2A	ECN0162D2A	ECN0164D2A	ECN0168D2A	CN15TN2D
7	810	—	—	120	ECN0171A2A	ECN0172A2A	ECN0173A2A ②	ECN0178A2A	CN15UN2A
		—	—	208	ECN0171E2A	ECN0172E2A	ECN0173E2A ②	ECN0178E2A	CN15UN2E
		—	—	240	ECN0171B2A	ECN0172B2A	ECN0173B2A ②	ECN0178B2A	CN15UN2B
		—	—	480	ECN0171C2A	ECN0172C2A	ECN0173C2A ②	ECN0178C2A	CN15UN2C
		—	—	600	ECN0171D2A	ECN0172D2A	ECN0173D2A ②	ECN0178D2A	CN15UN2D
8	1215	—	—	120	ECN0181A2A	ECN0182A2A	ECN0183A2A ②	ECN0188A2A	CN15VN2A
		—	—	208	ECN0181E2A	ECN0182E2A	ECN0183E2A ②	ECN0188E2A	CN15VN2E
		—	—	240	ECN0181B2A	ECN0182B2A	ECN0183B2A ②	ECN0188B2A	CN15VN2B
		—	—	480	ECN0181C2A	ECN0182C2A	ECN0183C2A ②	ECN0188C2A	CN15VN2C
		—	—	600	ECN0181D2A	ECN0182D2A	ECN0183D2A ②	ECN0188D2A	CN15VN2D
9	2250	—	—	120	ECN0191A2A	ECN0192A2A	ECN0193A2A ②	ECN0198A2A	CN15WN2A
		—	—	208	ECN0191E2A	ECN0192E2A	ECN0193E2A ②	ECN0198E2A	CN15WN2E
		—	—	240	ECN0191B2A	ECN0192B2A	ECN0193B2A ②	ECN0198B2A	CN15WN2B
		—	—	480	ECN0191C2A	ECN0192C2A	ECN0193C2A ②	ECN0198C2A	CN15WN2C
		—	—	600	ECN0191D2A	ECN0192D2A	ECN0193D2A ②	ECN0198D2A	CN15WN2D

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN0154A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② Type 4 (painted steel) sizes 7–9.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN01—Non-Reversing Contactor—Four-Pole

2

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1	Type 3R	Type 4X Watertight	Type 12	Component
					General Purpose	Rainproof	and Dust-Tight Stainless Steel ①	Dust-Tight Industrial	Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	9	—	—	120	ECN01A1A4A	(Select contactor from Size 0 listing)			CN15AN4AB
		200	1-1/2	208	ECN01A1E4A				CN15AN4EB
		230	1-1/2	240	ECN01A1B4A				CN15AN4BB
		460	2	480	ECN01A1C4A				CN15AN4CB
		575	2	600	ECN01A1D4A				CN15AN4DB
0	18	—	—	120	ECN0101A4A	ECN0102A4A	ECN0104A4A	ECN0108A4A	(Select contactor from Size 0 listing)
		200	3	208	ECN0101E4A	ECN0102E4A	ECN0104E4A	ECN0108E4A	
		230	3	240	ECN0101B4A	ECN0102B4A	ECN0104B4A	ECN0108B4A	
		460	5	480	ECN0101C4A	ECN0102C4A	ECN0104C4A	ECN0108C4A	
		575	5	600	ECN0101D4A	ECN0102D4A	ECN0104D4A	ECN0108D4A	
1	27	—	—	120	ECN0111A4A	ECN0112A4A	ECN0114A4A	ECN0118A4A	CN15DN4AB
		200	7-1/2	208	ECN0111E4A	ECN0112E4A	ECN0114E4A	ECN0118E4A	CN15DN4EB
		230	7-1/2	240	ECN0111B4A	ECN0112B4A	ECN0114B4A	ECN0118B4A	CN15DN4BB
		460	10	480	ECN0111C4A	ECN0112C4A	ECN0114C4A	ECN0118C4A	CN15DN4CB
		575	10	600	ECN0111D4A	ECN0112D4A	ECN0114D4A	ECN0118D4A	CN15DN4DB
2	45	—	—	120	ECN0121A4A	ECN0122A4A	ECN0124A4A	ECN0128A4A	CN15GN4AB
		200	10	208	ECN0121E4A	ECN0122E4A	ECN0124E4A	ECN0128E4A	CN15GN4EB
		230	15	240	ECN0121B4A	ECN0122B4A	ECN0124B4A	ECN0128B4A	CN15GN4BB
		460	25	480	ECN0121C4A	ECN0122C4A	ECN0124C4A	ECN0128C4A	CN15GN4CB
		575	25	600	ECN0121D4A	ECN0122D4A	ECN0124D4A	ECN0128D4A	CN15GN4DB

Note

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0104A4A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN01 – Non-Reversing Contactor – Five-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight and Dust-Tight Stainless Steel ①	Type 12 Dust-Tight Industrial	Component Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	9	—	—	120	ECN01A1A5A	(Select contactor from Size 0 listing)			
		200	1-1/2	208	ECN01A1E5A				
		230	1-1/2	240	ECN01A1B5A				
		460	2	480	ECN01A1C5A				
		575	2	600	ECN01A1D5A				
0	18	—	—	120	ECN0101A5A	(Select contactor from Size 0 listing)			
		200	3	208	ECN0101E5A				
		230	3	240	ECN0101B5A				
		460	5	480	ECN0101C5A				
		575	5	600	ECN0101D5A				
1	27	—	—	120	ECN0111A5A	ECN0112A5A	ECN0114A5A	ECN0118A5A	CN15DN5AB
		200	7-1/2	208	ECN0111E5A	ECN0112E5A	ECN0114E5A	ECN0118E5A	CN15DN5EB
		230	7-1/2	240	ECN0111B5A	ECN0112B5A	ECN0114B5A	ECN0118B5A	CN15DN5BB
		460	10	480	ECN0111C5A	ECN0112C5A	ECN0114C5A	ECN0118C5A	CN15DN5CB
		575	10	600	ECN0111D5A	ECN0112D5A	ECN0114D5A	ECN0118D5A	CN15DN5DB
2	45	—	—	120	ECN0121A5A	ECN0122A5A	ECN0124A5A	ECN0128A5A	CN15GN5AB
		200	10	208	ECN0121E5A	ECN0122E5A	ECN0124E5A	ECN0128E5A	CN15GN5EB
		230	15	240	ECN0121B5A	ECN0122B5A	ECN0124B5A	ECN0128B5A	CN15GN5BB
		460	25	480	ECN0121C5A	ECN0122C5A	ECN0124C5A	ECN0128C5A	CN15GN5CB
		575	25	600	ECN0121D5A	ECN0122D5A	ECN0124D5A	ECN0128D5A	CN15GN5DB

Note

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0114A5A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Reversing Contactors

Product Selection

2

Class ECN02—Reversing Contactor—Three-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X Watertight and Dust-Tight Stainless Steel ^②	Type 12	Component
					General Purpose	Rainproof	Catalog Number	Dust-Tight Industrial	Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	9	—	—	120	ECN02A1A3A	(Select contactor from Size 0 listing)			CN55AN3AB
		200	1-1/2	208	ECN02A1E3A				CN55AN3EB
		230	1-1/2	240	ECN02A1B3A				CN55AN3BB
		460	2	480	ECN02A1C3A				CN55AN3CB
		575	2	600	ECN02A1D3A				CN55AN3DB
0	18	—	—	120	ECN0201A3A	ECN0202A3A	ECN0204A3A	ECN0208A3A	CN55BN3AB
		200	3	208	ECN0201E3A	ECN0202E3A	ECN0204E3A	ECN0208E3A	CN55BN3EB
		230	3	240	ECN0201B3A	ECN0202B3A	ECN0204B3A	ECN0208B3A	CN55BN3BB
		460	5	480	ECN0201C3A	ECN0202C3A	ECN0204C3A	ECN0208C3A	CN55BN3CB
		575	5	600	ECN0201D3A	ECN0202D3A	ECN0204D3A	ECN0208D3A	CN55BN3DB
1	27	—	—	120	ECN0211A3A	ECN0212A3A	ECN0214A3A	ECN0218A3A	CN55DN3AB
		200	7-1/2	208	ECN0211E3A	ECN0212E3A	ECN0214E3A	ECN0218E3A	CN55DN3EB
		230	7-1/2	240	ECN0211B3A	ECN0212B3A	ECN0214B3A	ECN0218B3A	CN55DN3BB
		460	10	480	ECN0211C3A	ECN0212C3A	ECN0214C3A	ECN0218C3A	CN55DN3CB
		575	10	600	ECN0211D3A	ECN0212D3A	ECN0214D3A	ECN0218D3A	CN55DN3DB
2	45	—	—	120	ECN0221A3A	ECN0222A3A	ECN0224A3A	ECN0228A3A	CN55GN3AB
		200	10	208	ECN0221E3A	ECN0222E3A	ECN0224E3A	ECN0228E3A	CN55GN3EB
		230	15	240	ECN0221B3A	ECN0222B3A	ECN0224B3A	ECN0228B3A	CN55GN3BB
		460	25	480	ECN0221C3A	ECN0222C3A	ECN0224C3A	ECN0228C3A	CN55GN3CB
		575	25	600	ECN0221D3A	ECN0222D3A	ECN0224D3A	ECN0228D3A	CN55GN3DB
3	90	—	—	120	ECN0231A3A	ECN0232A3A	ECN0234A3A	ECN0238A3A	CN55KN3A
		200	25	208	ECN0231E3A	ECN0232E3A	ECN0234E3A	ECN0238E3A	CN55KN3E
		230	30	240	ECN0231B3A	ECN0232B3A	ECN0234B3A	ECN0238B3A	CN55KN3B
		460	50	480	ECN0231C3A	ECN0232C3A	ECN0234C3A	ECN0238C3A	CN55KN3C
		575	50	600	ECN0231D3A	ECN0232D3A	ECN0234D3A	ECN0238D3A	CN55KN3D
4	135	—	—	120	ECN0241A3A	ECN0242A3A	ECN0244A3A	ECN0248A3A	CN55NN3A
		200	40	208	ECN0241E3A	ECN0242E3A	ECN0244E3A	ECN0248E3A	CN55NN3E
		230	50	240	ECN0241B3A	ECN0242B3A	ECN0244B3A	ECN0248B3A	CN55NN3B
		460	100	480	ECN0241C3A	ECN0242C3A	ECN0244C3A	ECN0248C3A	CN55NN3C
		575	100	600	ECN0241D3A	ECN0242D3A	ECN0244D3A	ECN0248D3A	CN55NN3D

Notes

① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0204A3A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN02—Reversing Contactor—Three-Pole, continued

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X Watertight and Dust-Tight Stainless Steel ^②	Type 12	Component
					General Purpose	Rainproof		Dust-Tight Industrial	Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	270	—	—	120	ECN0251A3A	ECN0252A3A	ECN0254A3A	ECN0258A3A	CN55SN3A
		200	75	208	ECN0251E3A	ECN0252E3A	ECN0254E3A	ECN0258E3A	CN55SN3E
		230	100	240	ECN0251B3A	ECN0252B3A	ECN0254B3A	ECN0258B3A	CN55SN3B
		460	200	480	ECN0251C3A	ECN0252C3A	ECN0254C3A	ECN0258C3A	CN55SN3C
		575	200	600	ECN0251D3A	ECN0252D3A	ECN0254D3A	ECN0258D3A	CN55SN3D
6	540	—	—	120	ECN0261A3A	ECN0262A3A	ECN0263A3A ^③	ECN0268A3A	CN55TN3A
		200	150	208	ECN0261E3A	ECN0262E3A	ECN0263E3A ^③	ECN0268E3A	CN55TN3E
		230	200	240	ECN0261B3A	ECN0262B3A	ECN0263B3A ^③	ECN0268B3A	CN55TN3B
		460	400	480	ECN0261C3A	ECN0262C3A	ECN0263C3A ^③	ECN0268C3A	CN55TN3C
		575	400	600	ECN0261D3A	ECN0262D3A	ECN0263D3A ^③	ECN0268D3A	CN55TN3D
7	810	—	—	120	ECN0271A3A	ECN0272A3A	ECN0273A3A ^③	ECN0278A3A	CN55UN3A
		230	300	240	ECN0271B3A	ECN0272B3A	ECN0273B3A ^③	ECN0278B3A	CN55UN3B
		460	600	480	ECN0271C3A	ECN0272C3A	ECN0273C3A ^③	ECN0278C3A	CN55UN3C
		575	600	600	ECN0271D3A	ECN0272D3A	ECN0273D3A ^③	ECN0278D3A	CN55UN3D
8	1215	—	—	120	ECN0281A3A	ECN0282A3A	ECN0283A3A ^③	ECN0288A3A	CN55VN3A
		230	450	240	ECN0281B3A	ECN0282B3A	ECN0283B3A ^③	ECN0288B3A	CN55VN3B
		460	900	480	ECN0281C3A	ECN0282C3A	ECN0283C3A ^③	ECN0288C3A	CN55VN3C
		575	900	600	ECN0281D3A	ECN0282D3A	ECN0283D3A ^③	ECN0288D3A	CN55VN3D
9	2250	—	—	120	ECN0291A3A	ECN0292A3A	ECN0293A3A ^③	ECN0298A3A	CN55WN3A
		230	800	240	ECN0291B3A	ECN0292B3A	ECN0293B3A ^③	ECN0298B3A	CN55WN3B
		460	1600	480	ECN0291C3A	ECN0292C3A	ECN0293C3A ^③	ECN0298C3A	CN55WN3C
		575	1600	600	ECN0291D3A	ECN0292D3A	ECN0293D3A ^③	ECN0298D3A	CN55WN3D

Notes

^① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0254A3A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ Type 4 (painted steel) sizes 6–9.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Starters

Non-Combination Starters

2

Features

- C440 Solid-State Overload or Bi-Metallic Overload offering available
- Three-phase or single-phase magnetic
- Three-pole non-reversing or three-pole reversing
- 600 V maximum

Product Selection

Class ECN05—Non-Combination Non-Reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
				General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^②	Dust-Tight Industrial External Reset	
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	ECN05A1AAA	ECN05A2AAA	ECN05A4AAA	ECN05A8AAA	AN16AN0AC
	200	1-1/2	208	ECN05A1EAA	ECN05A2EAA	ECN05A4EAA	ECN05A8EAA	AN16AN0EC
	230	1-1/2	240	ECN05A1BAA	ECN05A2BAA	ECN05A4BAA	ECN05A8BAA	AN16AN0BC
	460	2	480	ECN05A1CAA	ECN05A2CAA	ECN05A4CAA	ECN05A8CAA	AN16AN0CC
	575	2	600	ECN05A1DAA	ECN05A2DAA	ECN05A4DAA	ECN05A8DAA	AN16AN0DC
	0	—	—	120	ECN0501AAA	ECN0502AAA	ECN0504AAA	ECN0508AAA
200		3	208	ECN0501EAA	ECN0502EAA	ECN0504EAA	ECN0508EAA	AN16BN0EC
230		3	240	ECN0501BAA	ECN0502BAA	ECN0504BAA	ECN0508BAA	AN16BN0BC
460		5	480	ECN0501CAA	ECN0502CAA	ECN0504CAA	ECN0508CAA	AN16BN0CC
575		5	600	ECN0501DAA	ECN0502DAA	ECN0504DAA	ECN0508DAA	AN16BN0DC
1		—	—	120	ECN0511AAA	ECN0512AAA	ECN0514AAA	ECN0518AAA
	200	7-1/2	208	ECN0511EAA	ECN0512EAA	ECN0514EAA	ECN0518EAA	AN16DN0EB
	230	7-1/2	240	ECN0511BAA	ECN0512BAA	ECN0514BAA	ECN0518BAA	AN16DN0BB
	460	10	480	ECN0511CAA	ECN0512CAA	ECN0514CAA	ECN0518CAA	AN16DN0CB
	575	10	600	ECN0511DAA	ECN0512DAA	ECN0514DAA	ECN0518DAA	AN16DN0DB
	2	—	—	120	ECN0521AAA	ECN0522AAA	ECN0524AAA	ECN0528AAA
200		10	208	ECN0521EAA	ECN0522EAA	ECN0524EAA	ECN0528EAA	AN16GN0EB
230		15	240	ECN0521BAA	ECN0522BAA	ECN0524BAA	ECN0528BAA	AN16GN0BB
460		25	480	ECN0521CAA	ECN0522CAA	ECN0524CAA	ECN0528CAA	AN16GN0CB
575		25	600	ECN0521DAA	ECN0522DAA	ECN0524DAA	ECN0528DAA	AN16GN0DB
3		—	—	120	ECN0531AAA	ECN0532AAA	ECN0534AAA	ECN0538AAA
	200	25	208	ECN0531EAA	ECN0532EAA	ECN0534EAA	ECN0538EAA	AN16KN0E
	230	30	240	ECN0531BAA	ECN0532BAA	ECN0534BAA	ECN0538BAA	AN16KN0B
	460	50	480	ECN0531CAA	ECN0532CAA	ECN0534CAA	ECN0538CAA	AN16KN0C
	575	50	600	ECN0531DAA	ECN0532DAA	ECN0534DAA	ECN0538DAA	AN16KN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

Cover control is indicated by the ninth digit. For example, ECN0511AJA is a HOA switch with red run light.

See the cover control table on **V10-T2-6–V10-T2-8** for full offering.

^① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0504AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN05—Non-Combination Non-Reversing Starter, continued

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter
				General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^②	Dust-Tight Industrial External Reset	(Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	—	—	120	ECN0541AAA	ECN0542AAA	ECN0544AAA	ECN0548AAA	AN16NN0A
	200	40	208	ECN0541EAA	ECN0542EAA	ECN0544EAA	ECN0548EAA	AN16NN0E
	230	50	240	ECN0541BAA	ECN0542BAA	ECN0544BAA	ECN0548BAA	AN16NN0B
	460	100	480	ECN0541CAA	ECN0542CAA	ECN0544CAA	ECN0548CAA	AN16NN0C
	575	100	600	ECN0541DAA	ECN0542DAA	ECN0544DAA	ECN0548DAA	AN16NN0D
5	—	—	120	ECN0551AAA	ECN0552AAA	ECN0554AAA	ECN0558AAA	AN16SN0AB
	200	75	208	ECN0551EAA	ECN0552EAA	ECN0554EAA	ECN0558EAA	AN16SN0EB
	230	100	240	ECN0551BAA	ECN0552BAA	ECN0554BAA	ECN0558BAA	AN16SN0BB
	460	200	480	ECN0551CAA	ECN0552CAA	ECN0554CAA	ECN0558CAA	AN16SN0CB
	575	200	600	ECN0551DAA	ECN0552DAA	ECN0554DAA	ECN0558DAA	AN16SN0DB
6	—	—	120	ECN0561AAA	ECN0562AAA	ECN0564AAA	ECN0568AAA	AN16TN0AB
	200	150	208	ECN0561EAA	ECN0562EAA	ECN0564EAA	ECN0568EAA	AN16TN0EB
	230	200	240	ECN0561BAA	ECN0562BAA	ECN0564BAA	ECN0568BAA	AN16TN0BB
	460	400	480	ECN0561CAA	ECN0562CAA	ECN0564CAA	ECN0568CAA	AN16TN0CB
	575	400	600	ECN0561DAA	ECN0562DAA	ECN0564DAA	ECN0568DAA	AN16TN0DB
7	—	—	120	ECN0571AAA	ECN0572AAA	ECN0573AAA ^③	ECN0578AAA	AN16UN0AB
	230	300	240	ECN0571BAA	ECN0572BAA	ECN0573BAA ^③	ECN0578BAA	AN16UN0BB
	460	600	480	ECN0571CAA	ECN0572CAA	ECN0573CAA ^③	ECN0578CAA	AN16UN0CB
	575	600	600	ECN0571DAA	ECN0572DAA	ECN0573DAA ^③	ECN0578DAA	AN16UN0DB
8	—	—	120	ECN0581AAA	ECN0582AAA	ECN0583AAA ^③	ECN0588AAA	AN16VN0AB
	230	450	240	ECN0581BAA	ECN0582BAA	ECN0583BAA ^③	ECN0588BAA	AN16VN0BB
	460	900	480	ECN0581CAA	ECN0582CAA	ECN0583CAA ^③	ECN0588CAA	AN16VN0CB
	575	900	600	ECN0581DAA	ECN0582DAA	ECN0583DAA ^③	ECN0588DAA	AN16VN0DB
9	—	—	120	ECN0591AAA	ECN0592AAA	ECN0593AAA ^③	ECN0598AAA	AN16WN0A
	230	800	240	ECN0591BAA	ECN0592BAA	ECN0593BAA ^③	ECN0598BAA	AN16WN0B
	460	1600	480	ECN0591CAA	ECN0592CAA	ECN0593CAA ^③	ECN0598CAA	AN16WN0C
	575	1600	600	ECN0591DAA	ECN0592DAA	ECN0593DAA ^③	ECN0598DAA	AN16WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0544AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ Type 4 (painted steel) sizes 7–9.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

2

Class ECN05—Non-Combination Single-Phase Non-Reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset Catalog Number	Component Starter (Open) Catalog Number
00	115	1/3	120	ECN05A1AAA-S29	(Select contactor from Size 0 listing)			AN16AN0AC
	230	1	240	ECN05A1BAA-S29				AN16AN0BC
0	115	1	120	ECN0501AAA-S29	ECN0502AAA-S29	ECN0504AAA-S29	ECN0508AAA-S29	AN16BN0AC
	230	2	240	ECN0501BAA-S29	ECN0502BAA-S29	ECN0504BAA-S29	ECN0508BAA-S29	AN16BN0BC
1	115	2	120	ECN0511AAA-S29	ECN0512AAA-S29	ECN0514AAA-S29	ECN0518AAA-S29	AN16DN0AB
	230	3	240	ECN0511BAA-S29	ECN0512BAA-S29	ECN0514BAA-S29	ECN0518BAA-S29	AN16DN0BB
2	115	3	120	ECN0521AAA-S29	ECN0522AAA-S29	ECN0524AAA-S29	ECN0528AAA-S29	AN16GN0AB
	230	7-1/2	240	ECN0521BAA-S29	ECN0522BAA-S29	ECN0524BAA-S29	ECN0528BAA-S29	AN16GN0BB
3	115	7-1/2	120	ECN0531AAA-S29	ECN0532AAA-S29	ECN0534AAA-S29	ECN0538AAA-S29	AN16KN0A
	230	15	240	ECN0531BAA-S29	ECN0532BAA-S29	ECN0534BAA-S29	ECN0538BAA-S29	AN16KN0B

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECN0504AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN06—Non-Combination Reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
				General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^②	Dust-Tight Industrial External Reset	
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	ECN06A1AAA	ECN06A2AAA	ECN06A4AAA	ECN06A8AAA	AN56AN0AC
	200	1-1/2	208	ECN06A1EAA	ECN06A2EAA	ECN06A4EAA	ECN06A8EAA	AN56AN0EC
	230	1-1/2	240	ECN06A1BAA	ECN06A2BAA	ECN06A4BAA	ECN06A8BAA	AN56AN0BC
	460	2	480	ECN06A1CAA	ECN06A2CAA	ECN06A4CAA	ECN06A8CAA	AN56AN0CC
	575	2	600	ECN06A1DAA	ECN06A2DAA	ECN06A4DAA	ECN06A8DAA	AN56AN0DC
0	—	—	120	ECN0601AAA	ECN0602AAA	ECN0604AAA	ECN0608AAA	AN56BN0AC
	200	3	208	ECN0601EAA	ECN0602EAA	ECN0604EAA	ECN0608EAA	AN56BN0EC
	230	3	240	ECN0601BAA	ECN0602BAA	ECN0604BAA	ECN0608BAA	AN56BN0BC
	460	5	480	ECN0601CAA	ECN0602CAA	ECN0604CAA	ECN0608CAA	AN56BN0CC
	575	5	600	ECN0601DAA	ECN0602DAA	ECN0604DAA	ECN0608DAA	AN56BN0DC
1	—	—	120	ECN0611AAA	ECN0612AAA	ECN0614AAA	ECN0618AAA	AN56DN0AB
	200	7-1/2	208	ECN0611EAA	ECN0612EAA	ECN0614EAA	ECN0618EAA	AN56DN0EB
	230	7-1/2	240	ECN0611BAA	ECN0612BAA	ECN0614BAA	ECN0618BAA	AN56DN0BB
	460	10	480	ECN0611CAA	ECN0612CAA	ECN0614CAA	ECN0618CAA	AN56DN0CB
	575	10	600	ECN0611DAA	ECN0612DAA	ECN0614DAA	ECN0618DAA	AN56DN0DB
2	—	—	120	ECN0621AAA	ECN0622AAA	ECN0624AAA	ECN0628AAA	AN56GN0AB
	200	10	208	ECN0621EAA	ECN0622EAA	ECN0624EAA	ECN0628EAA	AN56GN0EB
	230	15	240	ECN0621BAA	ECN0622BAA	ECN0624BAA	ECN0628BAA	AN56GN0BB
	460	25	480	ECN0621CAA	ECN0622CAA	ECN0624CAA	ECN0628CAA	AN56GN0CB
	575	25	600	ECN0621DAA	ECN0622DAA	ECN0624DAA	ECN0628DAA	AN56GN0DB
3	—	—	120	ECN0631AAA	ECN0632AAA	ECN0634AAA	ECN0638AAA	AN56KN0A
	200	25	208	ECN0631EAA	ECN0632EAA	ECN0634EAA	ECN0638EAA	AN56KN0E
	230	30	240	ECN0631BAA	ECN0632BAA	ECN0634BAA	ECN0638BAA	AN56KN0B
	460	50	480	ECN0631CAA	ECN0632CAA	ECN0634CAA	ECN0638CAA	AN56KN0C
	575	50	600	ECN0631DAA	ECN0632DAA	ECN0634DAA	ECN0638DAA	AN56KN0D
4	—	—	120	ECN0641AAA	ECN0642AAA	ECN0644AAA	ECN0648AAA	AN56NN0A
	200	40	208	ECN0641EAA	ECN0642EAA	ECN0644EAA	ECN0648EAA	AN56NN0E
	230	50	240	ECN0641BAA	ECN0642BAA	ECN0644BAA	ECN0648BAA	AN56NN0B
	460	100	480	ECN0641CAA	ECN0642CAA	ECN0644CAA	ECN0648CAA	AN56NN0C
	575	100	600	ECN0641DAA	ECN0642DAA	ECN0644DAA	ECN0648DAA	AN56NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0604AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

2

Class ECN06—Non-Combination Reversing Starter, continued

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
				General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^②	Dust-Tight Industrial External Reset	
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	—	—	120	ECN0651AAA	ECN0652AAA	ECN0654AAA	ECN0658AAA	AN56SN0AB
	200	75	208	ECN0651EAA	ECN0652EAA	ECN0654EAA	ECN0658EAA	AN56SN0EB
	230	100	240	ECN0651BAA	ECN0652BAA	ECN0654BAA	ECN0658BAA	AN56SN0BB
	460	200	480	ECN0651CAA	ECN0652CAA	ECN0654CAA	ECN0658CAA	AN56SN0CB
	575	200	600	ECN0651DAA	ECN0652DAA	ECN0654DAA	ECN0658DAA	AN56SN0DB
6	—	—	120	ECN0661AAA	ECN0662AAA	ECN0663AAA ^③	ECN0668AAA	AN56TN0AB
	200	150	208	ECN0661EAA	ECN0662EAA	ECN0663EAA ^③	ECN0668EAA	AN56TN0EB
	230	200	240	ECN0661BAA	ECN0662BAA	ECN0663BAA ^③	ECN0668BAA	AN56TN0BB
	460	400	480	ECN0661CAA	ECN0662CAA	ECN0663CAA ^③	ECN0668CAA	AN56TN0CB
	575	400	600	ECN0661DAA	ECN0662DAA	ECN0663DAA ^③	ECN0668DAA	AN56TN0DB
7	—	—	120	ECN0671AAA	ECN0672AAA	ECN0673AAA ^③	ECN0678AAA	AN56UN0AB
	230	300	240	ECN0671BAA	ECN0672BAA	ECN0673BAA ^③	ECN0678BAA	AN56UN0BB
	460	600	480	ECN0671CAA	ECN0672CAA	ECN0673CAA ^③	ECN0678CAA	AN56UN0CB
	575	600	600	ECN0671DAA	ECN0672DAA	ECN0673DAA ^③	ECN0678DAA	AN56UN0DB
8	—	—	120	ECN0681AAA	ECN0682AAA	ECN0683AAA ^③	ECN0688AAA	AN56VN0AB
	230	450	240	ECN0681BAA	ECN0682BAA	ECN0683BAA ^③	ECN0688BAA	AN56VN0BB
	460	900	480	ECN0681CAA	ECN0682CAA	ECN0683CAA ^③	ECN0688CAA	AN56VN0CB
	575	900	600	ECN0681DAA	ECN0682DAA	ECN0683DAA ^③	ECN0688DAA	AN56VN0DB
9	—	—	120	ECN0691AAA	ECN0692AAA	ECN0693AAA ^③	ECN0698AAA	AN56WN0A
	230	800	240	ECN0691BAA	ECN0692BAA	ECN0693BAA ^③	ECN0698BAA	AN56WN0B
	460	1600	480	ECN0691CAA	ECN0692CAA	ECN0693CAA ^③	ECN0698CAA	AN56WN0C
	575	1600	600	ECN0691DAA	ECN0692DAA	ECN0693DAA ^③	ECN0698DAA	AN56WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0654AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ Type 4 (painted steel) sizes 6–9.

Class ECN07—Non-Combination Non-Reversing Starter with CPT

NEMA Size	Primary Voltage ^①	Maximum hp Rating ^②	Secondary Voltage Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) Catalog Number
				General Purpose Catalog Number	Rainproof Catalog Number	Watertight and Dust-Tight Stainless Steel ^③ Catalog Number	Dust-Tight Industrial External Reset Catalog Number	
00	208	1-1/2	120	ECN07A1EAA	ECN07A2EAA	ECN07A4EAA	ECN07A8EAA	AN16AN0EC
	240	1-1/2		ECN07A1BAA	ECN07A2BAA	ECN07A4BAA	ECN07A8BAA	AN16AN0BC
	480	2		ECN07A1CAA	ECN07A2CAA	ECN07A4CAA	ECN07A8CAA	AN16AN0CC
	600	3		ECN07A1DAA	ECN07A2DAA	ECN07A4DAA	ECN07A8DAA	AN16AN0DC
0	208	3	120	ECN0701EAA	ECN0702EAA	ECN0704EAA	ECN0708EAA	AN16BN0EC
	240	3		ECN0701BAA	ECN0702BAA	ECN0704BAA	ECN0708BAA	AN16BN0BC
	480	5		ECN0701CAA	ECN0702CAA	ECN0704CAA	ECN0708CAA	AN16BN0CC
	600	5		ECN0701DAA	ECN0702DAA	ECN0704DAA	ECN0708DAA	AN16BN0DC
1	208	7-1/2	120	ECN0711EAA	ECN0712EAA	ECN0714EAA	ECN0718EAA	AN16DN0EB
	240	7-1/2		ECN0711BAA	ECN0712BAA	ECN0714BAA	ECN0718BAA	AN16DN0BB
	480	10		ECN0711CAA	ECN0712CAA	ECN0714CAA	ECN0718CAA	AN16DN0CB
	600	10		ECN0711DAA	ECN0712DAA	ECN0714DAA	ECN0718DAA	AN16DN0DB
2	208	10	120	ECN0721EAA	ECN0722EAA	ECN0724EAA	ECN0728EAA	AN16GN0EB
	240	15		ECN0721BAA	ECN0722BAA	ECN0724BAA	ECN0728BAA	AN16GN0BB
	480	25		ECN0721CAA	ECN0722CAA	ECN0724CAA	ECN0728CAA	AN16GN0CB
	600	25		ECN0721DAA	ECN0722DAA	ECN0724DAA	ECN0728DAA	AN16GN0DB
3	208	25	120	ECN0731EAA	ECN0732EAA	ECN0734EAA	ECN0738EAA	AN16KN0E
	240	30		ECN0731BAA	ECN0732BAA	ECN0734BAA	ECN0738BAA	AN16KN0B
	480	50		ECN0731CAA	ECN0732CAA	ECN0734CAA	ECN0738CAA	AN16KN0C
	600	50		ECN0731DAA	ECN0732DAA	ECN0734DAA	ECN0738DAA	AN16KN0D
4	208	40	120	ECN0741EAA	ECN0742EAA	ECN0744EAA	ECN0748EAA	AN16NN0E
	240	50		ECN0741BAA	ECN0742BAA	ECN0744BAA	ECN0748BAA	AN16NN0B
	480	100		ECN0741CAA	ECN0742CAA	ECN0744CAA	ECN0748CAA	AN16NN0C
	600	100		ECN0741DAA	ECN0742DAA	ECN0744DAA	ECN0748DAA	AN16NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① Other control power transformer primary and/or secondary voltages, see **Page V10-T2-4**.

② Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN07A4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

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NEMA Contactors and Starters

Freedom Full Voltage Controls

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Class ECN07—Non-Combination Non-Reversing Starter with CPT, continued

NEMA Size	Primary Voltage ^①	Maximum hp Rating ^②	Secondary Voltage Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter
				General Purpose Catalog Number	Rainproof Catalog Number	Watertight and Dust-Tight Stainless Steel ^③ Catalog Number	Dust-Tight Industrial External Reset Catalog Number	(Open) Catalog Number
5	208	75	120	ECN0751EAA	ECN0752EAA	ECN0754EAA	ECN0758EAA	AN16SN0EB
	240	100		ECN0751BAA	ECN0752BAA	ECN0754BAA	ECN0758BAA	AN16SN0BB
	480	200		ECN0751CAA	ECN0752CAA	ECN0754CAA	ECN0758CAA	AN16SN0CB
	600	200		ECN0751DAA	ECN0752DAA	ECN0754DAA	ECN0758DAA	AN16SN0DB
6	208	150	120	ECN0761EAA	ECN0762EAA	ECN0763EAA ^④	ECN0768EAA	AN56TN0EB
	240	200		ECN0761BAA	ECN0762BAA	ECN0763BAA ^④	ECN0768BAA	AN56TN0BB
	480	400		ECN0761CAA	ECN0762CAA	ECN0763CAA ^④	ECN0768CAA	AN56TN0CB
	600	400		ECN0761DAA	ECN0762DAA	ECN0763DAA ^④	ECN0768DAA	AN56TN0DB
7	240	300	120	ECN0771BAA	ECN0772BAA	ECN0773BAA ^④	ECN0778BAA	AN16UN0BB
	480	600		ECN0771CAA	ECN0772CAA	ECN0773CAA ^④	ECN0778CAA	AN16UN0CB
	600	600		ECN0771DAA	ECN0772DAA	ECN0773DAA ^④	ECN0778DAA	AN16UN0DB
8	240	450	120	ECN0781BAA	ECN0782BAA	ECN0783BAA ^④	ECN0788BAA	AN16VN0BB
	480	900		ECN0781CAA	ECN0782CAA	ECN0783CAA ^④	ECN0788CAA	AN16VN0CB
	600	900		ECN0781DAA	ECN0782DAA	ECN0783DAA ^④	ECN0788DAA	AN16VN0DB
9	240	800	120	ECN0791BAA	ECN0792BAA	ECN0793BAA ^④	ECN0798BAA	AN16WN0B
	480	1600		ECN0791CAA	ECN0792CAA	ECN0793CAA ^④	ECN0798CAA	AN16WN0C
	600	1600		ECN0791DAA	ECN0792DAA	ECN0793DAA ^④	ECN0798DAA	AN16WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Other control power transformer primary and/or secondary voltages, see **Page V10-T2-4**.

^② Maximum horsepower rating of contactors for 380 V 50 Hz applications.

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

^③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN0804AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^④ Type 4 (painted steel) sizes 6–9.

Combination Starters—Fusible and Non-Fusible

Features

- Three-phase magnetic
- Three-pole non-reversing or reversing
- Standard interchangeable heater OLR
- Optional electronic overload
- 600 V maximum
- 100,000 rms short-circuit rating with fuses

Product Selection

Class ECN16—Combination Non-Reversing Starter—Fusible Disconnect

NEMA Size	Motor Voltage	Maximum hp Rating		Fuse Clip Amps	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
		Dual Element Fuses	Magnet Coil Voltage		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ①	Dust-Tight Industrial External Reset ②③	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	30 A	ECN16A1AAB	ECN16A2AAB	ECN16A4AAB	ECN16A8AAB	AN16AN0AC
	200	1-1/2	208		ECN16A1EAB	ECN16A2EAB	ECN16A4EAB	ECN16A8EAB	AN16AN0EC
	230	1-1/2	240		ECN16A1BAB	ECN16A2BAB	ECN16A4BAB	ECN16A8BAB	AN16AN0BC
	460	2	480		ECN16A1CAC	ECN16A2CAC	ECN16A4CAC	ECN16A8CAC	AN16AN0CC
	575	2	600		ECN16A1DAC	ECN16A2DAC	ECN16A4DAC	ECN16A8DAC	AN16AN0DC
0	—	—	120	30 A	ECN1601AAB	ECN1602AAB	ECN1604AAB	ECN1608AAB	AN16BN0AC
	200	3	208		ECN1601EAB	ECN1602EAB	ECN1604EAB	ECN1608EAB	AN16BN0EC
	230	3	240		ECN1601BAB	ECN1602BAB	ECN1604BAB	ECN1608BAB	AN16BN0BC
	460	5	480		ECN1601CAC	ECN1602CAC	ECN1604CAC	ECN1608CAC	AN16BN0CC
	575	5	600		ECN1601DAC	ECN1602DAC	ECN1604DAC	ECN1608DAC	AN16BN0DC
1	—	—	120	30 A	ECN1611AAB	ECN1612AAB	ECN1614AAB	ECN1618AAB	AN16DN0AB
	200	7-1/2	208		ECN1611EAB	ECN1612EAB	ECN1614EAB	ECN1618EAB	AN16DN0EB
	230	7-1/2	240		ECN1611BAB	ECN1612BAB	ECN1614BAB	ECN1618BAB	AN16DN0BB
	460	10	480		ECN1611CAC	ECN1612CAC	ECN1614CAC	ECN1618CAC	AN16DN0CB
	575	10	600		ECN1611DAC	ECN1612DAC	ECN1614DAC	ECN1618DAC	AN16DN0DB
2	—	—	120	60 A	ECN1621AAD	ECN1622AAD	ECN1624AAD	ECN1628AAD	AN16GN0AB
	200	10	208		ECN1621EAD	ECN1622EAD	ECN1624EAD	ECN1628EAD	AN16GN0EB
	230	15	240		ECN1621BAD	ECN1622BAD	ECN1624BAD	ECN1628BAD	AN16GN0BB
	460	25	480		ECN1621CAE	ECN1622CAE	ECN1624CAE	ECN1628CAE	AN16GN0CB
	575	25	600		ECN1621DAE	ECN1622DAE	ECN1624DAE	ECN1628DAE	AN16GN0DB
3	—	—	120	100 A	ECN1631AAF	ECN1632AAF	ECN1634AAF	ECN1638AAF	AN16KN0A
	200	25	208		ECN1631EAF	ECN1632EAF	ECN1634EAF	ECN1638EAF	AN16KN0E
	230	30	240		ECN1631BAF	ECN1632BAF	ECN1634BAF	ECN1638BAF	AN16KN0B
	460	50	480		ECN1631CAG	ECN1632CAG	ECN1634CAG	ECN1638CAG	AN16KN0C
	575	50	600		ECN1631DAG	ECN1632DAG	ECN1634DAG	ECN1638DAG	AN16KN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN16A4AAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

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NEMA Contactors and Starters

Freedom Full Voltage Controls

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Class ECN16—Combination Non-Reversing Starter—Fusible Disconnect, continued

NEMA Size	Motor Voltage	Maximum hp Rating		Fuse Clip Amps	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
		Dual Element Fuses	Magnet Coil Voltage		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ①	Dust-Tight Industrial External Reset ②③	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	—	—	120	200 A	ECN1641AAH	ECN1642AAH	ECN1644AAH	ECN1648AAH	AN16NN0A
	200	40	208		ECN1641EAH	ECN1642EAH	ECN1644EAH	ECN1648EAH	AN16NN0E
	230	50	240		ECN1641BAH	ECN1642BAH	ECN1644BAH	ECN1648BAH	AN16NN0B
	460	100	480		ECN1641CAJ	ECN1642CAJ	ECN1644CAJ	ECN1648CAJ	AN16NN0C
	575	100	600		ECN1641DAJ	ECN1642DAJ	ECN1644DAJ	ECN1648DAJ	AN16NN0D
5	—	—	120	400 A	ECN1651AAK	ECN1652AAK	ECN1654AAK	ECN1658AAK	AN16SN0AB
	200	75	208		ECN1651EAK	ECN1652EAK	ECN1654EAK	ECN1658EAK	AN16SN0EB
	230	100	240		ECN1651BAK	ECN1652BAK	ECN1654BAK	ECN1658BAK	AN16SN0BB
	460	200	480		ECN1651CAL	ECN1652CAL	ECN1654CAL	ECN1658CAL	AN16SN0CB
	575	200	600		ECN1651DAL	ECN1652DAL	ECN1654DAL	ECN1658DAL	AN16SN0DB
6	—	—	120	600 A	ECN1661AAM	ECN1662AAM	ECN1663AAM ④	ECN1668AAM	AN16TN0AB
	200	150	208		ECN1661EAM	ECN1662EAM	ECN1663EAM ④	ECN1668EAM	AN16TN0EB
	230	200	240		ECN1661BAM	ECN1662BAM	ECN1663BAM ④	ECN1668BAM	AN16TN0BB
	460	400	480		ECN1661CAN	ECN1662CAN	ECN1663CAN ④	ECN1668CAN	AN16TN0CB
	575	400	600		ECN1661DAN	ECN1662DAN	ECN1663DAN ④	ECN1668DAN	AN16TN0DB
7	—	—	120	⑤	ECN1671AAU	ECN1672AAU	ECN1673AAU ④	ECN1678AAU	AN16UN0AB
	230	300	240		ECN1671BAU	ECN1672BAU	ECN1673BAU ④	ECN1678BAU	AN16UN0BB
	460	600	480		ECN1671CAU	ECN1672CAU	ECN1673CAU ④	ECN1678CAU	AN16UN0CB
	575	600	600		ECN1671DAU	ECN1672DAU	ECN1673DAU ④	ECN1678DAU	AN16UN0DB
8	—	—	120	⑤	ECN1681AAU	ECN1682AAU	ECN1683AAU ④	ECN1688AAU	AN16VN0AB
	230	450	240		ECN1681BAU	ECN1682BAU	ECN1683BAU ④	ECN1688BAU	AN16VN0BB
	460	900	480		ECN1681CAU	ECN1682CAU	ECN1683CAU ④	ECN1688CAU	AN16VN0CB
	575	900	600		ECN1681DAU	ECN1682DAU	ECN1683DAU ④	ECN1688DAU	AN16VN0DB
9	—	—	120	⑤	ECN1691AAU	ECN1692AAU	ECN1693AAU ④	ECN1698AAU	AN16WN0A
	230	800	240		ECN1691BAU	ECN1692BAU	ECN1693BAU ④	ECN1698BAU	AN16WN0B
	460	1000 ⑥	480		ECN1691CAU	ECN1692CAU	ECN1693CAU ④	ECN1698CAU	AN16WN0C
	575	1000	600		ECN1691DAU	ECN1692DAU	ECN1693DAU ④	ECN1698DAU	AN16WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1644AAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
- ④ Type 4 (painted steel) sizes 6–9.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
- ⑥ For 1250 and 1600 hp ratings at 460 V, consult Eaton.

Class ECN16—Combination Non-Reversing Starter—Non-Fusible Disconnect ^①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Disconnect Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{③④} Catalog Number	Component Starter (Open) Catalog Number
00	—	—	120	30 A	ECN16A1AAA	ECN16A2AAA	ECN16A4AAA	ECN16A8AAA	AN16AN0AC
	200	1-1/2	208		ECN16A1EAA	ECN16A2EAA	ECN16A4EAA	ECN16A8EAA	AN16AN0EC
	230	1-1/2	240		ECN16A1BAA	ECN16A2BAA	ECN16A4BAA	ECN16A8BAA	AN16AN0BC
	460	2	480		ECN16A1CAA	ECN16A2CAA	ECN16A4CAA	ECN16A8CAA	AN16AN0CC
	575	2	600		ECN16A1DAA	ECN16A2DAA	ECN16A4DAA	ECN16A8DAA	AN16AN0DC
0	—	—	120	30 A	ECN1601AAA	ECN1602AAA	ECN1604AAA	ECN1608AAA	AN16BN0AC
	200	3	208		ECN1601EAA	ECN1602EAA	ECN1604EAA	ECN1608EAA	AN16BN0EC
	230	3	240		ECN1601BAA	ECN1602BAA	ECN1604BAA	ECN1608BAA	AN16BN0BC
	460	5	480		ECN1601CAA	ECN1602CAA	ECN1604CAA	ECN1608CAA	AN16BN0CC
	575	5	600		ECN1601DAA	ECN1602DAA	ECN1604DAA	ECN1608DAA	AN16BN0DC
1	—	—	120	30 A	ECN1611AAA	ECN1612AAA	ECN1614AAA	ECN1618AAA	AN16DN0AB
	200	7-1/2	208		ECN1611EAA	ECN1612EAA	ECN1614EAA	ECN1618EAA	AN16DN0EB
	230	7-1/2	240		ECN1611BAA	ECN1612BAA	ECN1614BAA	ECN1618BAA	AN16DN0BB
	460	10	480		ECN1611CAA	ECN1612CAA	ECN1614CAA	ECN1618CAA	AN16DN0CB
	575	10	600		ECN1611DAA	ECN1612DAA	ECN1614DAA	ECN1618DAA	AN16DN0DB
2	—	—	120	60 A	ECN1621AAA	ECN1622AAA	ECN1624AAA	ECN1628AAA	AN16GN0AB
	200	10	208		ECN1621EAA	ECN1622EAA	ECN1624EAA	ECN1628EAA	AN16GN0EB
	230	15	240		ECN1621BAA	ECN1622BAA	ECN1624BAA	ECN1628BAA	AN16GN0BB
	460	25	480		ECN1621CAA	ECN1622CAA	ECN1624CAA	ECN1628CAA	AN16GN0CB
	575	25	600		ECN1621DAA	ECN1622DAA	ECN1624DAA	ECN1628DAA	AN16GN0DB
3	—	—	120	100 A	ECN1631AAA	ECN1632AAA	ECN1634AAA	ECN1638AAA	AN16KN0A
	200	25	208		ECN1631EAA	ECN1632EAA	ECN1634EAA	ECN1638EAA	AN16KN0E
	230	30	240		ECN1631BAA	ECN1632BAA	ECN1634BAA	ECN1638BAA	AN16KN0B
	460	50	480		ECN1631CAA	ECN1632CAA	ECN1634CAA	ECN1638CAA	AN16KN0C
	575	50	600		ECN1631DAA	ECN1632DAA	ECN1634DAA	ECN1638DAA	AN16KN0D
4	—	—	120	200 A	ECN1641AAA	ECN1642AAA	ECN1644AAA	ECN1648AAA	AN16NN0A
	200	40	208		ECN1641EAA	ECN1642EAA	ECN1644EAA	ECN1648EAA	AN16NN0E
	230	50	240		ECN1641BAA	ECN1642BAA	ECN1644BAA	ECN1648BAA	AN16NN0B
	460	100	480		ECN1641CAA	ECN1642CAA	ECN1644CAA	ECN1648CAA	AN16NN0C
	575	100	600		ECN1641DAA	ECN1642DAA	ECN1644DAA	ECN1648DAA	AN16NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Field installed fuse clips available, see **Tab 13**.

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN16A4AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

^④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

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NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN16—Combination Non-Reversing Starter—Non-Fusible Disconnect, continued ^①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Disconnect Amps	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^②	Dust-Tight Industrial External Reset ^{③④}	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	—	—	120	400 A	ECN1651AAA	ECN1652AAA	ECN1654AAA	ECN1658AAA	AN16SN0AB
	200	75	208		ECN1651EAA	ECN1652EAA	ECN1654EAA	ECN1658EAA	AN16SN0EB
	230	100	240		ECN1651BAA	ECN1652BAA	ECN1654BAA	ECN1658BAA	AN16SN0BB
	460	200	480		ECN1651CAA	ECN1652CAA	ECN1654CAA	ECN1658CAA	AN16SN0CB
	575	200	600		ECN1651DAA	ECN1652DAA	ECN1654DAA	ECN1658DAA	AN16SN0DB
6	—	—	120	600 A	ECN1661AAA	ECN1662AAA	ECN1663AAA ^⑤	ECN1668AAA	AN16TN0AB
	200	150	208		ECN1661EAA	ECN1662EAA	ECN1663EAA ^⑤	ECN1668EAA	AN16TN0EB
	230	200	240		ECN1661BAA	ECN1662BAA	ECN1663BAA ^⑤	ECN1668BAA	AN16TN0BB
	460	400	480		ECN1661CAA	ECN1662CAA	ECN1663CAA ^⑤	ECN1668CAA	AN16TN0CB
	575	400	600		ECN1661DAA	ECN1662DAA	ECN1663DAA ^⑤	ECN1668DAA	AN16TN0DB
7	—	—	120	^⑥	ECN1671AAA	ECN1672AAA	ECN1673AAA ^⑤	ECN1678AAA	AN16UN0AB
	230	300	240		ECN1671BAA	ECN1672BAA	ECN1673BAA ^⑤	ECN1678BAA	AN16UN0BB
	460	600	480		ECN1671CAA	ECN1672CAA	ECN1673CAA ^⑤	ECN1678CAA	AN16UN0CB
	575	600	600		ECN1671DAA	ECN1672DAA	ECN1673DAA ^⑤	ECN1678DAA	AN16UN0DB
8	—	—	120	^⑥	ECN1681AAA	ECN1682AAA	ECN1683AAA ^⑤	ECN1688AAA	AN16VN0AB
	230	450	240		ECN1681BAA	ECN1682BAA	ECN1683BAA ^⑤	ECN1688BAA	AN16VN0BB
	460	900	480		ECN1681CAA	ECN1682CAA	ECN1683CAA ^⑤	ECN1688CAA	AN16VN0CB
	575	900	600		ECN1681DAA	ECN1682DAA	ECN1683DAA ^⑤	ECN1688DAA	AN16VN0DB
9	—	—	120	^⑥	ECN1691AAA	ECN1692AAA	ECN1693AAA ^⑤	ECN1698AAA	AN16WN0A
	230	800	240		ECN1691BAA	ECN1692BAA	ECN1693BAA ^⑤	ECN1698BAA	AN16WN0B
	460	1000 ^⑦	480		ECN1691CAA	ECN1692CAA	ECN1693CAA ^⑤	ECN1698CAA	AN16WN0C
	575	1000	600		ECN1691DAA	ECN1692DAA	ECN1693DAA ^⑤	ECN1698DAA	AN16WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Field installed fuse clips available, see **Tab 13**.

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1654AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

^④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

^⑤ Type 4 (painted steel) sizes 6–9.

^⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

^⑦ For 1250 and 1600 hp ratings at 460 V, consult Eaton.

Class ECN16—Special Enclosure Combination Non-Reversing Starter—Fusible/Non-Fusible Disconnect

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Fuse Clip Amperes ^①	Type 1	Type 4X	Type 12	Component Starter (Open)	
					General Purpose	Watertight and Dust-Tight Stainless Steel	Dust-Tight Industrial ^②	External Reset Catalog Number	Internal Reset Catalog Number
Horizontal Enclosure—Fusible									
1	—	—	120	30 A	ECN1611AAB-E13	—	ECN1618AAB-E13	ECN1618AAB-E13R5	AN16DN0AB
	200	7-1/2	208		ECN1611EAB-E13	—	ECN1618EAB-E13	ECN1618EAB-E13R5	AN16DN0EB
	230	7-1/2	240		ECN1611BAB-E13	—	ECN1618BAB-E13	ECN1618BAB-E13R5	AN16DN0BB
	460	10	480		ECN1611CAC-E13	—	ECN1618CAC-E13	ECN1618CAC-E13R5	AN16DN0CB
	575	10	600		ECN1611DAC-E13	—	ECN1618DAC-E13	ECN1618DAC-E13R5	AN16DN0DB
2	—	—	120	60 A	ECN1621AAD-E13	—	ECN1628AAD-E13	ECN1628AAD-E13R5	AN16GN0AB
	200	10	208		ECN1621EAD-E13	—	ECN1628EAD-E13	ECN1628EAD-E13R5	AN16GN0EB
	230	15	240		ECN1621BAD-E13	—	ECN1628BAD-E13	ECN1628BAD-E13R5	AN16GN0BB
	460	25	480		ECN1621CAE-E13	—	ECN1628CAE-E13	ECN1628CAE-E13R5	AN16GN0CB
	575	25	600		ECN1621DAE-E13	—	ECN1628DAE-E13	ECN1628DAE-E13R5	AN16GN0DB
Horizontal Enclosure—Non-Fusible									
1	—	—	120	—	ECN1611AAA-E13	—	ECN1618AAA-E13	ECN1618AAA-E13R5	AN16DN0AB
	200	7-1/2	208	—	ECN1611EAA-E13	—	ECN1618EAA-E13	ECN1618EAA-E13R5	AN16DN0EB
	230	7-1/2	240	—	ECN1611BAA-E13	—	ECN1618BAA-E13	ECN1618BAA-E13R5	AN16DN0BB
	460	10	480	—	ECN1611CAA-E13	—	ECN1618CAA-E13	ECN1618CAA-E13R5	AN16DN0CB
	575	10	600	—	ECN1611DAA-E13	—	ECN1618DAA-E13	ECN1618DAA-E13R5	AN16DN0DB
2	—	—	120	—	ECN1621AAA-E13	—	ECN1628AAA-E13	ECN1628AAA-E13R5	AN16GN0AB
	200	10	208	—	ECN1621EAA-E13	—	ECN1628EAA-E13	ECN1628EAA-E13R5	AN16GN0EB
	230	15	240	—	ECN1621BAA-E13	—	ECN1628BAA-E13	ECN1628BAA-E13R5	AN16GN0BB
	460	25	480	—	ECN1621CAA-E13	—	ECN1628CAA-E13	ECN1628CAA-E13R5	AN16GN0CB
	575	25	600	—	ECN1621DAA-E13	—	ECN1628DAA-E13	ECN1628DAA-E13R5	AN16GN0DB

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Fuse clips are for Class R fuses only. For H and J fuses, see modifications in **Tab 15**.

^② To order Type 12 enclosures with safety door interlock add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN16—Special Enclosure Combination Non-Reversing Starter—Fusible/Non-Fusible Disconnect, continued

2

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Fuse Clip Amperes ^①	Type 1	Type 4X	Type 12	Component Starter (Open)	
					General Purpose	Watertight and Dust-Tight Stainless Steel ^②	Dust-Tight Industrial ^③	External Reset Catalog Number	Internal Reset Catalog Number
OverSize Enclosure—without Control Transformer—Fusible									
0	—	—	120	30 A	ECN1601AAB-E3	ECN1604AAB-E3	ECN1608AAB-E3	ECN1608AAB-E3R5	AN16BN0AC
	200	3	208		ECN1601EAB-E3	ECN1604EAB-E3	ECN1608EAB-E3	ECN1608EAB-E3R5	AN16BN0EC
	230	3	240		ECN1601BAB-E3	ECN1604BAB-E3	ECN1608BAB-E3	ECN1608BAB-E3R5	AN16BN0BC
	460	5	480		ECN1601CAC-E3	ECN1604CAC-E3	ECN1608CAC-E3	ECN1608CAC-E3R5	AN16BN0CC
	575	5	600		ECN1601DAC-E3	ECN1604DAC-E3	ECN1608DAC-E3	ECN1608DAC-E3R5	AN16BN0DC
1	—	—	120	30 A	ECN1611AAB-E3	ECN1614AAB-E3	ECN1618AAB-E3	ECN1618AAB-E3R5	AN16DN0AB
	200	7-1/2	208		ECN1611EAB-E3	ECN1614EAB-E3	ECN1618EAB-E3	ECN1618EAB-E3R5	AN16DN0EB
	230	7-1/2	240		ECN1611BAB-E3	ECN1614BAB-E3	ECN1618BAB-E3	ECN1618BAB-E3R5	AN16DN0BB
	460	10	480		ECN1611CAC-E3	ECN1614CAC-E3	ECN1618CAC-E3	ECN1618CAC-E3R5	AN16DN0CB
	575	10	600		ECN1611DAC-E3	ECN1614DAC-E3	ECN1618DAC-E3	ECN1618DAC-E3R5	AN16DN0DB
2	—	—	120	60 A	ECN1621AAD-E3	ECN1624AAD-E3	ECN1628AAD-E3	ECN1628AAD-E3R5	AN16GN0AB
	200	10	208		ECN1621EAD-E3	ECN1624EAD-E3	ECN1628EAD-E3	ECN1628EAD-E3R5	AN16GN0EB
	230	15	240		ECN1621BAD-E3	ECN1624BAD-E3	ECN1628BAD-E3	ECN1628BAD-E3R5	AN16GN0BB
	460	25	480		ECN1621CAE-E3	ECN1624CAE-E3	ECN1628CAE-E3	ECN1628CAE-E3R5	AN16GN0CB
	575	25	600		ECN1621DAE-E3	ECN1624DAE-E3	ECN1628DAE-E3	ECN1628DAE-E3R5	AN16GN0DB
OverSize Enclosure—without Control Transformer—Non-Fusible									
0	—	—	120	—	ECN1601AAA-E3	ECN1604AAA-E3	ECN1608AAA-E3	ECN1608AAA-E3R5	AN16BN0AC
	200	3	208	ECN1601EAA-E3	ECN1604EAA-E3	ECN1608EAA-E3	ECN1608EAA-E3R5	AN16BN0EC	
	230	3	240	ECN1601BAA-E3	ECN1604BAA-E3	ECN1608BAA-E3	ECN1608BAA-E3R5	AN16BN0BC	
	460	5	480	ECN1601CAA-E3	ECN1604CAA-E3	ECN1608CAA-E3	ECN1608CAA-E3R5	AN16BN0CC	
	575	5	600	ECN1601DAA-E3	ECN1604DAA-E3	ECN1608DAA-E3	ECN1608DAA-E3R5	AN16BN0DC	
1	—	—	120	—	ECN1611AAA-E3	ECN1614AAA-E3	ECN1618AAA-E3	ECN1618AAA-E3R5	AN16DN0AB
	200	7-1/2	208	ECN1611EAA-E3	ECN1614EAA-E3	ECN1618EAA-E3	ECN1618EAA-E3R5	AN16DN0EB	
	230	7-1/2	240	ECN1611BAA-E3	ECN1614BAA-E3	ECN1618BAA-E3	ECN1618BAA-E3R5	AN16DN0BB	
	460	10	480	ECN1611CAA-E3	ECN1614CAA-E3	ECN1618CAA-E3	ECN1618CAA-E3R5	AN16DN0CB	
	575	10	600	ECN1611DAA-E3	ECN1614DAA-E3	ECN1618DAA-E3	ECN1618DAA-E3R5	AN16DN0DB	
2	—	—	120	—	ECN1621AAA-E3	ECN1624AAA-E3	ECN1628AAA-E3	ECN1628AAA-E3R5	AN16GN0AB
	200	10	208	ECN1621EAA-E3	ECN1624EAA-E3	ECN1628EAA-E3	ECN1628EAA-E3R5	AN16GN0EB	
	230	15	240	ECN1621BAA-E3	ECN1624BAA-E3	ECN1628BAA-E3	ECN1628BAA-E3R5	AN16GN0BB	
	460	25	480	ECN1621CAA-E3	ECN1624CAA-E3	ECN1628CAA-E3	ECN1628CAA-E3R5	AN16GN0CB	
	575	25	600	ECN1621DAA-E3	ECN1624DAA-E3	ECN1628DAA-E3	ECN1628DAA-E3R5	AN16GN0DB	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① Fuse clips are for Class R fuses only. For H and J fuses, see modifications in **Tab 13**.

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN1604AAB-E3. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ To order Type 12 enclosures with safety door interlock add modification **E11**.

Class ECN17—Combination Reversing Starter—Fusible Disconnect

NEMA Size	Motor Voltage	Maximum hp Rating		Fuse Clip Amperes	Type 1	Type 3R	Type 4X	Type 12	Component
		Dual Element Fuses	Magnet Coil Voltage		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ①	Dust-Tight Industrial ②③	Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30 A	ECN1701AAB	ECN1702AAB	ECN1704AAB	ECN1708AAB	AN56BN0AC
	200	3	208		ECN1701EAB	ECN1702EAB	ECN1704EAB	ECN1708EAB	AN56BN0EC
	230	3	240		ECN1701BAB	ECN1702BAB	ECN1704BAB	ECN1708BAB	AN56BN0BC
	460	5	480		ECN1701CAC	ECN1702CAC	ECN1704CAC	ECN1708CAC	AN56BN0CC
	575	5	600		ECN1701DAC	ECN1702DAC	ECN1704DAC	ECN1708DAC	AN56BN0DC
1	—	—	120	30 A	ECN1711AAB	ECN1712AAB	ECN1714AAB	ECN1718AAB	AN56DN0AB
	200	7-1/2	208		ECN1711EAB	ECN1712EAB	ECN1714EAB	ECN1718EAB	AN56DN0EB
	230	7-1/2	240		ECN1711BAB	ECN1712BAB	ECN1714BAB	ECN1718BAB	AN56DN0BB
	460	10	480		ECN1711CAC	ECN1712CAC	ECN1714CAC	ECN1718CAC	AN56DN0CB
	575	10	600		ECN1711DAC	ECN1712DAC	ECN1714DAC	ECN1718DAC	AN56DN0DB
2	—	—	120	60 A	ECN1721AAD	ECN1722AAD	ECN1724AAD	ECN1728AAD	AN56GN0AB
	200	10	208		ECN1721EAD	ECN1722EAD	ECN1724EAD	ECN1728EAD	AN56GN0EB
	230	15	240		ECN1721BAD	ECN1722BAD	ECN1724BAD	ECN1728BAD	AN56GN0BB
	460	25	480		ECN1721CAE	ECN1722CAE	ECN1724CAE	ECN1728CAE	AN56GN0CB
	575	25	600		ECN1721DAE	ECN1722DAE	ECN1724DAE	ECN1728DAE	AN56GN0DB
3	—	—	120	100 A	ECN1731AAF	ECN1732AAF	ECN1734AAF	ECN1738AAF	AN56KN0A
	200	25	208		ECN1731EAF	ECN1732EAF	ECN1734EAF	ECN1738EAF	AN56KN0E
	230	30	240		ECN1731BAF	ECN1732BAF	ECN1734BAF	ECN1738BAF	AN56KN0B
	460	50	480		ECN1731CAG	ECN1732CAG	ECN1734CAG	ECN1738CAG	AN56KN0C
	575	50	600		ECN1731DAG	ECN1732DAG	ECN1734DAG	ECN1738DAG	AN56KN0D
4	—	—	120	200 A	ECN1741AAH	ECN1742AAH	ECN1744AAH	ECN1748AAH	AN56NN0A
	200	40	208		ECN1741EAH	ECN1742EAH	ECN1744EAH	ECN1748EAH	AN56NN0E
	230	50	240		ECN1741BAH	ECN1742BAH	ECN1744BAH	ECN1748BAH	AN56NN0B
	460	100	480		ECN1741CAJ	ECN1742CAJ	ECN1744CAJ	ECN1748CAJ	AN56NN0C
	575	100	600		ECN1741DAJ	ECN1742DAJ	ECN1744DAJ	ECN1748DAJ	AN56NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1704AAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN17—Combination Reversing Starter—Fusible Disconnect, continued

2

NEMA Size	Motor Voltage	Maximum hp Rating		Fuse Clip Amperes	Type 1	Type 3R	Type 4X	Type 12	Component
		Dual Element Fuses	Magnet Coil Voltage		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ①	Dust-Tight Industrial ②③	Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	—	—	120	400 A	ECN1751AAK	ECN1752AAK	ECN1754AAK	ECN1758AAK	AN56SN0AB
	200	75	208		ECN1751EAK	ECN1752EAK	ECN1754EAK	ECN1758EAK	AN56SN0EB
	230	100	240		ECN1751BAK	ECN1752BAK	ECN1754BAK	ECN1758BAK	AN56SN0BB
	460	200	480		ECN1751CAL	ECN1752CAL	ECN1754CAL	ECN1758CAL	AN56SN0CB
	575	200	600		ECN1751DAL	ECN1752DAL	ECN1754DAL	ECN1758DAL	AN56SN0DB
6	—	—	120	600 A	ECN1761AAM	ECN1762AAM ④	ECN1763AAM	ECN1768AAM	AN56TN0AB
	200	150	208		ECN1761EAM	ECN1762EAM ④	ECN1763EAM	ECN1768EAM	AN56TN0EB
	230	200	240		ECN1761BAM	ECN1762BAM ④	ECN1763BAM	ECN1768BAM	AN56TN0BB
	460	400	480		ECN1761CAN	ECN1762CAN ④	ECN1763CAN	ECN1768CAN	AN56TN0CB
	575	400	600		ECN1761DAN	ECN1762DAN ④	ECN1763DAN	ECN1768DAN	AN56TN0DB
7	—	—	120	⑤	ECN1771AAU	ECN1772AAU ④	ECN1773AAU	ECN1778AAU	AN56UN0AB
	230	300	240		ECN1771BAU	ECN1772BAU ④	ECN1773BAU	ECN1778BAU	AN56UN0BB
	460	600	480		ECN1771CAU	ECN1772CAU ④	ECN1773CAU	ECN1778CAU	AN56UN0CB
	575	600	600		ECN1771DAU	ECN1772DAU ④	ECN1773DAU	ECN1778DAU	AN56UN0DB
8	—	—	120	⑤	ECN1781AAU	ECN1782AAU ④	ECN1783AAU	ECN1788AAU	AN56VN0AB
	230	450	240		ECN1781BAU	ECN1782BAU ④	ECN1783BAU	ECN1788BAU	AN56VN0BB
	460	900	480		ECN1781CAU	ECN1782CAU ④	ECN1783CAU	ECN1788CAU	AN56VN0CB
	575	900	600		ECN1781DAU	ECN1782DAU ④	ECN1783DAU	ECN1788DAU	AN56VN0DB
9	—	—	120	⑤	ECN1791AAU	ECN1792AAU ④	ECN1793AAU	ECN1798AAU	AN56WN0A
	230	800	240		ECN1791BAU	ECN1792BAU ④	ECN1793BAU	ECN1798BAU	AN56WN0B
	460	1000 ⑥	480		ECN1791CAU	ECN1792CAU ④	ECN1793CAU	ECN1798CAU	AN56WN0C
	575	1000	600		ECN1791DAU	ECN1792DAU ④	ECN1793DAU	ECN1798DAU	AN56WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1754AAK. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

④ Type 4 (painted steel) sizes 6–9.

⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

⑥ For 1250 and 1600 hp ratings at 460 V, consult Eaton.

Class ECN17—Combination Reversing Starter—Non-Fusible Disconnect

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Disconnect Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	30 A	ECN1701AAA	ECN1702AAA	ECN1704AAA	ECN1708AAA	AN56BN0AC
	200	3	208		ECN1701EAA	ECN1702EAA	ECN1704EAA	ECN1708EAA	AN56BN0EC
	230	3	240		ECN1701BAA	ECN1702BAA	ECN1704BAA	ECN1708BAA	AN56BN0BC
	460	5	480		ECN1701CAA	ECN1702CAA	ECN1704CAA	ECN1708CAA	AN56BN0CC
	575	5	600		ECN1701DAA	ECN1702DAA	ECN1704DAA	ECN1708DAA	AN56BN0DC
1	—	—	120	30 A	ECN1711AAA	ECN1712AAA	ECN1714AAA	ECN1718AAA	AN56DN0AB
	200	7-1/2	208		ECN1711EAA	ECN1712EAA	ECN1714EAA	ECN1718EAA	AN56DN0EB
	230	7-1/2	240		ECN1711BAA	ECN1712BAA	ECN1714BAA	ECN1718BAA	AN56DN0BB
	460	10	480		ECN1711CAA	ECN1712CAA	ECN1714CAA	ECN1718CAA	AN56DN0CB
	575	10	600		ECN1711DAA	ECN1712DAA	ECN1714DAA	ECN1718DAA	AN56DN0DB
2	—	—	120	60 A	ECN1721AAA	ECN1722AAA	ECN1724AAA	ECN1728AAA	AN56GN0AB
	200	10	208		ECN1721EAA	ECN1722EAA	ECN1724EAA	ECN1728EAA	AN56GN0EB
	230	15	240		ECN1721BAA	ECN1722BAA	ECN1724BAA	ECN1728BAA	AN56GN0BB
	460	25	480		ECN1721CAA	ECN1722CAA	ECN1724CAA	ECN1728CAA	AN56GN0CB
	575	25	600		ECN1721DAA	ECN1722DAA	ECN1724DAA	ECN1728DAA	AN56GN0DB
3	—	—	120	100 A	ECN1731AAA	ECN1732AAA	ECN1734AAA	ECN1738AAA	AN56KN0A
	200	25	208		ECN1731EAA	ECN1732EAA	ECN1734EAA	ECN1738EAA	AN56KN0E
	230	30	240		ECN1731BAA	ECN1732BAA	ECN1734BAA	ECN1738BAA	AN56KN0B
	460	50	480		ECN1731CAA	ECN1732CAA	ECN1734CAA	ECN1738CAA	AN56KN0C
	575	50	600		ECN1731DAA	ECN1732DAA	ECN1734DAA	ECN1738DAA	AN56KN0D
4	—	—	120	200 A	ECN1741AAA	ECN1742AAA	ECN1744AAA	ECN1748AAA	AN56NN0A
	200	40	208		ECN1741EAA	ECN1742EAA	ECN1744EAA	ECN1748EAA	AN56NN0E
	230	50	240		ECN1741BAA	ECN1742BAA	ECN1744BAA	ECN1748BAA	AN56NN0B
	460	100	480		ECN1741CAA	ECN1742CAA	ECN1744CAA	ECN1748CAA	AN56NN0C
	575	100	600		ECN1741DAA	ECN1742DAA	ECN1744DAA	ECN1748DAA	AN56NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1704AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN17—Combination Reversing Starter—Non-Fusible Disconnect, continued

2

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Disconnect Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^① Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{②③} Catalog Number	Component Starter (Open) Catalog Number
5	—	—	120	400 A	ECN1751AAA	ECN1752AAA	ECN1754AAA	ECN1758AAA	AN56SN0AB
	200	75	208		ECN1751EAA	ECN1752EAA	ECN1754EAA	ECN1758EAA	AN56SN0EB
	230	100	240		ECN1751BAA	ECN1752BAA	ECN1754BAA	ECN1758BAA	AN56SN0BB
	460	200	480		ECN1751CAA	ECN1752CAA	ECN1754CAA	ECN1758CAA	AN56SN0CB
	575	200	600		ECN1751DAA	ECN1752DAA	ECN1754DAA	ECN1758DAA	AN56SN0DB
6	—	—	120	600 A	ECN1761AAA	ECN1762AAA	ECN1763AAA ^④	ECN1768AAA	AN56TN0AB
	200	150	208		ECN1761EAA	ECN1762EAA	ECN1763EAA ^④	ECN1768EAA	AN56TN0EB
	230	200	240		ECN1761BAA	ECN1762BAA	ECN1763BAA ^④	ECN1768BAA	AN56TN0BB
	460	400	480		ECN1761CAA	ECN1762CAA	ECN1763CAA ^④	ECN1768CAA	AN56TN0CB
	575	400	600		ECN1761DAA	ECN1762DAA	ECN1763DAA ^④	ECN1768DAA	AN56TN0DB
7	—	—	120	^⑤	ECN1771AAA	ECN1772AAA	ECN1773AAA ^④	ECN1778AAA	AN56UN0AB
	230	300	240		ECN1771BAA	ECN1772BAA	ECN1773BAA ^④	ECN1778BAA	AN56UN0BB
	460	600	480		ECN1771CAA	ECN1772CAA	ECN1773CAA ^④	ECN1778CAA	AN56UN0CB
	575	600	600		ECN1771DAA	ECN1772DAA	ECN1773DAA ^④	ECN1778DAA	AN56UN0DB
8	—	—	120	^⑤	ECN1781AAA	ECN1782AAA	ECN1783AAA ^④	ECN1788AAA	AN56VN0AB
	230	450	240		ECN1781BAA	ECN1782BAA	ECN1783BAA ^④	ECN1788BAA	AN56VN0BB
	460	900	480		ECN1781CAA	ECN1782CAA	ECN1783CAA ^④	ECN1788CAA	AN56VN0CB
	575	900	600		ECN1781DAA	ECN1782DAA	ECN1783DAA ^④	ECN1788DAA	AN56VN0DB
9	—	—	120	^⑤	ECN1791AAA	ECN1792AAA	ECN1793AAA ^④	ECN1798AAA	AN56WN0A
	230	800	240		ECN1791BAA	ECN1792BAA	ECN1793BAA ^④	ECN1798BAA	AN56WN0B
	460	1000 ^⑥	480		ECN1791CAA	ECN1792CAA	ECN1793CAA ^④	ECN1798CAA	AN56WN0C
	575	1000	600		ECN1791DAA	ECN1792DAA	ECN1793DAA ^④	ECN1798DAA	AN56WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1754AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
- ④ Type 4 (painted steel) sizes 6–9.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
- ⑥ For 1250 and 1600 hp ratings at 460 V, consult Eaton.

Class ECN18—Combination Non-Reversing Starter—Fusible Disconnect with CPT ①

NEMA Size	Primary Voltage ②	Maximum hp Rating	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ③ Catalog Number	Type 12 Dust-Tight Industrial External Reset ④⑤ Catalog Number	Component Starter (Open) Catalog Number
00	208	1-1/2	120	30 A ⑥	ECN18A1EAB	ECN18A2EAB	ECN18A4EAB	ECN18A8EAB	AN16AN0EC
	240	1-1/2			ECN18A1BAB	ECN18A2BAB	ECN18A4BAB	ECN18A8BAB	AN16AN0BC
	480	2			ECN18A1CAC	ECN18A2CAC	ECN18A4CAC	ECN18A8CAC	AN16AN0CC
	600	2			ECN18A1DAC	ECN18A2DAC	ECN18A4DAC	ECN18A8DAC	AN16AN0DC
0	208	3	120	30 A ⑥	ECN1801EAB	ECN1802EAB	ECN1804EAB	ECN1808EAB	AN16BN0EC
	240	3			ECN1801BAB	ECN1802BAB	ECN1804BAB	ECN1808BAB	AN16BN0BC
	480	5			ECN1801CAC	ECN1802CAC	ECN1804CAC	ECN1808CAC	AN16BN0CC
	600	5			ECN1801DAC	ECN1802DAC	ECN1804DAC	ECN1808DAC	AN16BN0DC
1	208	7-1/2	120	30 A ⑥	ECN1811EAB	ECN1812EAB	ECN1814EAB	ECN1818EAB	AN16DN0EB
	240	7-1/2			ECN1811BAB	ECN1812BAB	ECN1814BAB	ECN1818BAB	AN16DN0BB
	480	10			ECN1811CAC	ECN1812CAC	ECN1814CAC	ECN1818CAC	AN16DN0CB
	600	10			ECN1811DAC	ECN1812DAC	ECN1814DAC	ECN1818DAC	AN16DN0DB
2	208	10	120	60 A ⑥	ECN1821EAD	ECN1822EAD	ECN1824EAD	ECN1828EAD	AN16GN0EB
	240	15			ECN1821BAD	ECN1822BAD	ECN1824BAD	ECN1828BAD	AN16GN0BB
	480	25			ECN1821CAE	ECN1822CAE	ECN1824CAE	ECN1828CAE	AN16GN0CB
	600	25			ECN1821DAE	ECN1822DAE	ECN1824DAE	ECN1828DAE	AN16GN0DB
3	208	25	120	100 A	ECN1831EAF	ECN1832EAF	ECN1834EAF	ECN1838EAF	AN16KN0E
	240	30			ECN1831BAF	ECN1832BAF	ECN1834BAF	ECN1838BAF	AN16KN0B
	480	50			ECN1831CAG	ECN1832CAG	ECN1834CAG	ECN1838CAG	AN16KN0C
	600	50			ECN1831DAG	ECN1832DAG	ECN1834DAG	ECN1838DAG	AN16KN0D
4	208	40	120	200 A	ECN1841EAH	ECN1842EAH	ECN1844EAH	ECN1848EAH	AN16NN0E
	240	50			ECN1841BAH	ECN1842BAH	ECN1844BAH	ECN1848BAH	AN16NN0B
	480	100			ECN1841CAJ	ECN1842CAJ	ECN1844CAJ	ECN1848CAJ	AN16NN0C
	600	100			ECN1841DAJ	ECN1842DAJ	ECN1844DAJ	ECN1848DAJ	AN16NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① 100,000 rms short-circuit rating.

② Other control power transformer primary and/or secondary voltages, see **Page V10-T2-4**.

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1804EAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

⑥ Fuse clips are for Class R fuses. For H and J fuses, see modifications in **Tab 15**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

2

Class ECN18—Combination Non-Reversing Starter—Fusible Disconnect with CPT, continued ^①

NEMA Size	Primary Voltage ^②	Maximum hp Rating	Magnet Coil Voltage	Fuse Clip Amps	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^③	Dust-Tight Industrial External Reset ^{④⑤}	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	208	75	120	400 A	ECN1851EAK	ECN1852EAK	ECN1854EAK	ECN1858EAK	AN16SN0EB
	240	100			ECN1851BAK	ECN1852BAK	ECN1854BAK	ECN1858BAK	AN16SN0BB
	480	200			ECN1851CAL	ECN1852CAL	ECN1854CAL	ECN1858CAL	AN16SN0CB
	600	200			ECN1851DAL	ECN1852DAL	ECN1854DAL	ECN1858DAL	AN16SN0DB
6	208	150	120	600 A	ECN1861EAM	ECN1862EAM	ECN1863EAM ^⑥	ECN1868EAM	AN16TN0EB
	240	200			ECN1861BAM	ECN1862BAM	ECN1863BAM ^⑥	ECN1868BAM	AN16TN0BB
	480	400			ECN1861CAN	ECN1862CAN	ECN1863CAN ^⑥	ECN1868CAN	AN16TN0CB
	600	400			ECN1861DAN	ECN1862DAN	ECN1863DAN ^⑥	ECN1868DAN	AN16TN0DB
7	240	300	120	⑦	ECN1871BAU	ECN1872BAU	ECN1873BAU ^⑥	ECN1878BAU	AN16UN0BB
	480	600			ECN1871CAU	ECN1872CAU	ECN1873CAU ^⑥	ECN1878CAU	AN16UN0CB
	600	600			ECN1871DAU	ECN1872DAU	ECN1873DAU ^⑥	ECN1878DAU	AN16UN0DB
8	240	450	120	⑦	ECN1881BAU	ECN1882BAU	ECN1883BAU ^⑥	ECN1888BAU	AN16VN0BB
	480	900			ECN1881CAU	ECN1882CAU	ECN1883CAU ^⑥	ECN1888CAU	AN16VN0CB
	600	900			ECN1881DAU	ECN1882DAU	ECN1883DAU ^⑥	ECN1888DAU	AN16VN0DB
9	240	800	120	⑦	ECN1891BAU	ECN1892BAU	ECN1893BAU ^⑥	ECN1898BAU	AN16WN0B
	480	1000 ^⑧			ECN1891CAU	ECN1892CAU	ECN1893CAU ^⑥	ECN1898CAU	AN16WN0C
	600	1000			ECN1891DAU	ECN1892DAU	ECN1893DAU ^⑥	ECN1898DAU	AN16WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① 100,000 rms short-circuit rating.

② Other control power transformer primary and/or secondary voltages, see **Page V10-T2-4**.

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN1854EAK. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

⑥ Type 4 (painted steel) sizes 6–9.

⑦ Supply hp, voltage, FLA and whether motor is design E or not when ordering the motor.

⑧ For 1250 and 1600 hp ratings at 460 V, consult Eaton.

Class ECN18—Combination Non-Reversing Starter—Non-Fusible Disconnect with CPT

NEMA Size	Primary Voltage ^①	Maximum hp Rating	Magnet Coil Voltage	Disconnect Switch Rating	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{③④} Catalog Number	Component Starter (Open) Catalog Number
00	208	1-1/2	120	30 A	ECN18A1EAA	ECN18A2EAA	ECN18A4EAA	ECN18A8EAA	AN16AN0EC
	240	1-1/2			ECN18A1BAA	ECN18A2BAA	ECN18A4BAA	ECN18A8BAA	AN16AN0BC
	480	2			ECN18A1CAA	ECN18A2CAA	ECN18A4CAA	ECN18A8CAA	AN16AN0CC
	600	2			ECN18A1DAA	ECN18A2DAA	ECN18A4DAA	ECN18A8DAA	AN16AN0DC
0	208	3	120	30 A	ECN1801EAA	ECN1802EAA	ECN1804EAA	ECN1808EAA	AN16BN0EC
	240	3			ECN1801BAA	ECN1802BAA	ECN1804BAA	ECN1808BAA	AN16BN0BC
	480	5			ECN1801CAA	ECN1802CAA	ECN1804CAA	ECN1808CAA	AN16BN0CC
	600	5			ECN1801DAA	ECN1802DAA	ECN1804DAA	ECN1808DAA	AN16BN0DC
1	208	7-1/2	120	30 A	ECN1811EAA	ECN1812EAA	ECN1814EAA	ECN1818EAA	AN16DN0EB
	240	7-1/2			ECN1811BAA	ECN1812BAA	ECN1814BAA	ECN1818BAA	AN16DN0BB
	480	10			ECN1811CAA	ECN1812CAA	ECN1814CAA	ECN1818CAA	AN16DN0CB
	600	10			ECN1811DAA	ECN1812DAA	ECN1814DAA	ECN1818DAA	AN16DN0DB
2	208	10	120	60 A	ECN1821EAA	ECN1822EAA	ECN1824EAA	ECN1828EAA	AN16GN0EB
	240	15			ECN1821BAA	ECN1822BAA	ECN1824BAA	ECN1828BAA	AN16GN0BB
	480	25			ECN1821CAA	ECN1822CAA	ECN1824CAA	ECN1828CAA	AN16GN0CB
	600	25			ECN1821DAA	ECN1822DAA	ECN1824DAA	ECN1828DAA	AN16GN0DB
3	208	25	120	100 A	ECN1831EAA	ECN1832EAA	ECN1834EAA	ECN1838EAA	AN16KN0E
	240	30			ECN1831BAA	ECN1832BAA	ECN1834BAA	ECN1838BAA	AN16KN0B
	480	50			ECN1831CAA	ECN1832CAA	ECN1834CAA	ECN1838CAA	AN16KN0C
	600	50			ECN1831DAA	ECN1832DAA	ECN1834DAA	ECN1838DAA	AN16KN0D
4	208	40	120	200 A	ECN1841EAA	ECN1842EAA	ECN1844EAA	ECN1848EAA	AN16NN0E
	240	50			ECN1841BAA	ECN1842BAA	ECN1844BAA	ECN1848BAA	AN16NN0B
	480	100			ECN1841CAA	ECN1842CAA	ECN1844CAA	ECN1848CAA	AN16NN0C
	600	100			ECN1841DAA	ECN1842DAA	ECN1844DAA	ECN1848DAA	AN16NN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① Other control power transformer primary and/or secondary voltages, see **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1804EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN18—Combination Non-Reversing Starter—Non-Fusible Disconnect with CPT, continued

2

NEMA Size	Primary Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Disconnect Switch Rating	Type 1	Type 3R	Type 4X	Type 12	Component Starter
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset ③④	(Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	208	75	120	400 A	ECN1851EAA	ECN1852EAA	ECN1854EAA	ECN1858EAA	AN16SN0EB
	240	100			ECN1851BAA	ECN1852BAA	ECN1854BAA	ECN1858BAA	AN16SN0BB
	480	200			ECN1851CAA	ECN1852CAA	ECN1854CAA	ECN1858CAA	AN16SN0CB
	600	200			ECN1851DAA	ECN1852DAA	ECN1854DAA	ECN1858DAA	AN16SN0DB
6	208	150	120	600 A	ECN1861EAA	ECN1862EAA	ECN1863EAA ⑤	ECN1868EAA	AN16TN0EB
	240	200			ECN1861BAA	ECN1862BAA	ECN1863BAA ⑤	ECN1868BAA	AN16TN0BB
	480	400			ECN1861CAA	ECN1862CAA	ECN1863CAA ⑤	ECN1868CAA	AN16TN0CB
	600	400			ECN1861DAA	ECN1862DAA	ECN1863DAA ⑤	ECN1868DAA	AN16TN0DB
7	240	300	120	⑥	ECN1871BAA	ECN1872BAA	ECN1873BAA ⑤	ECN1878BAA	AN16UN0BB
	480	600			ECN1871CAA	ECN1872CAA	ECN1873CAA ⑤	ECN1878CAA	AN16UN0CB
	600	600			ECN1871DAA	ECN1872DAA	ECN1873DAA ⑤	ECN1878DAA	AN16UN0DB
8	240	450	120	⑥	ECN1881BAA	ECN1882BAA	ECN1883BAA ⑤	ECN1888BAA	AN16VN0BB
	480	900			ECN1881CAA	ECN1882CAA	ECN1883CAA ⑤	ECN1888CAA	AN16VN0CB
	600	900			ECN1881DAA	ECN1882DAA	ECN1883DAA ⑤	ECN1888DAA	AN16VN0DB
9	240	800	120	⑥	ECN1891BAA	ECN1892BAA	ECN1893BAA ⑤	ECN1898BAA	AN16WN0B
	480	1000 ⑦			ECN1891CAA	ECN1892CAA	ECN1893CAA ⑤	ECN1898CAA	AN16WN0C
	600	1000			ECN1891DAA	ECN1892DAA	ECN1893DAA ⑤	ECN1898DAA	AN16WN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① Other control power transformer primary and/or secondary voltages, see **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN1854EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

⑤ Type 4 (painted steel) sizes 6–9.

⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

⑦ For 1250 and 1600 hp ratings at 460 V, consult Eaton.

Combination Starters—Circuit Breaker

Features

- Three-phase magnetic
- Three-pole non-reversing or reversing
- Standard interchangeable heater OLR
- Optional electronic overload
- 600 V maximum
- 100,000 rms 480 V, 25,000 rms 600 V

Product Selection

Class ECN22—Combination Non-Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)		
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset ③④			
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number		
00	200	1	120	7A	ECN22A1AAC	ECN22A2AAC	ECN22A4AAC	ECN22A8AAC	AN16AN0AC		
		1-1/2		15A	ECN22A1AAD	ECN22A2AAD	ECN22A4AAD	ECN22A8AAD			
	230	1	7A	ECN22A1AAC	ECN22A2AAC	ECN22A4AAC	ECN22A8AAC				
		1-1/2	15A	ECN22A1AAD	ECN22A2AAD	ECN22A4AAD	ECN22A8AAD				
	460	1	3A	ECN22A1AAB	ECN22A2AAB	ECN22A4AAB	ECN22A8AAB				
		2	7A	ECN22A1AAC	ECN22A2AAC	ECN22A4AAC	ECN22A8AAC				
	575	1	3A	ECN22A1AAB	ECN22A2AAB	ECN22A4AAB	ECN22A8AAB				
		2	7A	ECN22A1AAC	ECN22A2AAC	ECN22A4AAC	ECN22A8AAC				
	0	200	1	120	7A	ECN2201AAC	ECN2202AAC	ECN2204AAC		ECN2208AAC	AN16BN0AC
			3		15A	ECN2201AAD	ECN2202AAD	ECN2204AAD		ECN2208AAD	
		230	1	7A	ECN2201AAC	ECN2202AAC	ECN2204AAC	ECN2208AAC			
			3	15A	ECN2201AAD	ECN2202AAD	ECN2204AAD	ECN2208AAD			
460		1	3A	ECN2201AAB	ECN2202AAB	ECN2204AAB	ECN2208AAB				
		3	7A	ECN2201AAC	ECN2202AAC	ECN2204AAC	ECN2208AAC				
575		1	3A	ECN2201AAB	ECN2202AAB	ECN2204AAB	ECN2208AAB				
		3	15A	ECN2201AAD	ECN2202AAD	ECN2204AAD	ECN2208AAD				
		5	7A	ECN2201AAC	ECN2202AAC	ECN2204AAC	ECN2208AAC				

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN2204AAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN22—Combination Non-Reversing Starter—Circuit Breaker, continued

2

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset ③④	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1	200	1	120	7 A	ECN2211AAC	ECN2212AAC	ECN2214AAC	ECN2218AAC	AN16DN0AB
				15 A	ECN2211AAD	ECN2212AAD	ECN2214AAD	ECN2218AAD	
				30 A	ECN2211AAE	ECN2212AAE	ECN2214AAE	ECN2218AAE	
				50 A	ECN2211AAF	ECN2212AAF	ECN2214AAF	ECN2218AAF	
	230	1	3	7 A	ECN2211AAC	ECN2212AAC	ECN2214AAC	ECN2218AAC	
				15 A	ECN2211AAD	ECN2212AAD	ECN2214AAD	ECN2218AAD	
				30 A	ECN2211AAE	ECN2212AAE	ECN2214AAE	ECN2218AAE	
				50 A	ECN2211AAF	ECN2212AAF	ECN2214AAF	ECN2218AAF	
	460	1	3	3 A	ECN2211AAB	ECN2212AAB	ECN2214AAB	ECN2218AAB	
				7 A	ECN2211AAC	ECN2212AAC	ECN2214AAC	ECN2218AAC	
				15 A	ECN2211AAD	ECN2212AAD	ECN2214AAD	ECN2218AAD	
				30 A	ECN2211AAE	ECN2212AAE	ECN2214AAE	ECN2218AAE	
	575	1	3	3 A	ECN2211AAB	ECN2212AAB	ECN2214AAB	ECN2218AAB	
				7 A	ECN2211AAC	ECN2212AAC	ECN2214AAC	ECN2218AAC	
				15 A	ECN2211AAD	ECN2212AAD	ECN2214AAD	ECN2218AAD	
				30 A	ECN2211AAE	ECN2212AAE	ECN2214AAE	ECN2218AAE	
2	200	10	120	50 A	ECN2221AAF	ECN2222AAF	ECN2224AAF	ECN2228AAF	AN16GN0AB
				70 A	ECN2221AAW	ECN2222AAW	ECN2224AAW	ECN2228AAW	
	230	10	50 A	ECN2221AAF	ECN2222AAF	ECN2224AAF	ECN2228AAF		
			70 A	ECN2221AAW	ECN2222AAW	ECN2224AAW	ECN2228AAW		
	460	25	50 A	ECN2221AAF	ECN2222AAF	ECN2224AAF	ECN2228AAF		
			30 A	ECN2221AAE	ECN2222AAE	ECN2224AAE	ECN2228AAE		
	575	15	50 A	ECN2221AAF	ECN2222AAF	ECN2224AAF	ECN2228AAF		
			30 A	ECN2221AAE	ECN2222AAE	ECN2224AAE	ECN2228AAE		
3	200	20	120	100 A	ECN2231AAG	ECN2232AAG	ECN2234AAG	ECN2238AAG	AN16KN0A
				150 A	ECN2231AAX	ECN2232AAX	ECN2234AAX	ECN2238AAX	
	230	25	100 A	ECN2231AAG	ECN2232AAG	ECN2234AAG	ECN2238AAG		
			150 A	ECN2231AAX	ECN2232AAX	ECN2234AAX	ECN2238AAX		
	460	50	100 A	ECN2231AAG	ECN2232AAG	ECN2234AAG	ECN2238AAG		
			150 A	ECN2231AAX	ECN2232AAX	ECN2234AAX	ECN2238AAX		
	575	30	50 A	ECN2231AAF	ECN2232AAF	ECN2234AAF	ECN2238AAF		
			100 A	ECN2231AAG	ECN2232AAG	ECN2234AAG	ECN2238AAG		
4	200	40	120	150 A	ECN2241AAH	ECN2242AAH	ECN2244AAH	ECN2248AAH	AN16NN0A
				200 A	ECN2241AAL	ECN2242AAL	ECN2244AAL	ECN2248AAL	
	230	50	150 A	ECN2241AAH	ECN2242AAH	ECN2244AAH	ECN2248AAH		
			200 A	ECN2241AAL	ECN2242AAL	ECN2244AAL	ECN2248AAL		
460	100	150 A	ECN2241AAH	ECN2242AAH	ECN2244AAH	ECN2248AAH			
		200 A	ECN2241AAL	ECN2242AAL	ECN2244AAL	ECN2248AAL			
575	100	150 A	ECN2241AAH	ECN2242AAH	ECN2244AAH	ECN2248AAH			
		200 A	ECN2241AAL	ECN2242AAL	ECN2244AAL	ECN2248AAL			

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECN2214AAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

Class ECN22—Combination Non-Reversing Starter—Circuit Breaker, continued

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset ③④	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	200	50	120	250 A	ECN2251AAJ	ECN2252AAJ	ECN2254AAJ	ECN2258AAJ	AN16SN0AB
		75		400 A	ECN2251AAK	ECN2252AAK	ECN2254AAK	ECN2258AAK	
	230	60	250 A	ECN2251AAJ	ECN2252AAJ	ECN2254AAJ	ECN2258AAJ		
		100	400 A	ECN2251AAK	ECN2252AAK	ECN2254AAK	ECN2258AAK		
	460	125	250 A	ECN2251AAJ	ECN2252AAJ	ECN2254AAJ	ECN2258AAJ		
		200	400 A	ECN2251AAK	ECN2252AAK	ECN2254AAK	ECN2258AAK		
	575	150	250 A	ECN2251AAJ	ECN2252AAJ	ECN2254AAJ	ECN2258AAJ		
		200	400 A	ECN2251AAK	ECN2252AAK	ECN2254AAK	ECN2258AAK		
6	200	150	120	600 A	ECN2261AAL	ECN2262AAL	ECN2263AAL ⑤	ECN2268AAL	AN16TN0AB
	230	200		ECN2261AAL	ECN2262AAL	ECN2263AAL ⑤	ECN2268AAL		
	460	350		ECN2261AAL	ECN2262AAL	ECN2263AAL ⑤	ECN2268AAL		
		400		1200 A	ECN2261AAP	ECN2262AAP	ECN2263AAP ⑤	ECN2268AAP	
	575	400		600 A	ECN2261AAL	ECN2262AAL	ECN2263AAL ⑤	ECN2268AAL	
7	230	300	120	—	ECN2271AAU	ECN2272AAU	ECN2273AAU ⑤	ECN2278AAU	AN16UN0AB
	460	600		—	ECN2271AAU	ECN2272AAU	ECN2273AAU ⑤	ECN2278AAU	
	575	600		—	ECN2271AAU	ECN2272AAU	ECN2273AAU ⑤	ECN2278AAU	
8	230	450	120	—	ECN2281AAU	ECN2282AAU	ECN2283AAU ⑤	ECN2288AAU	AN16VN0AB
	460	900		—	ECN2281AAU	ECN2282AAU	ECN2283AAU ⑤	ECN2288AAU	
	575	900		—	ECN2281AAU	ECN2282AAU	ECN2283AAU ⑤	ECN2288AAU	
9	230	800	120	—	ECN2291AAU	ECN2292AAU	ECN2293AAU ⑤	ECN2298AAU	AN16WN0A
	460	1600		—	ECN2291AAU	ECN2292AAU	ECN2293AAU ⑤	ECN2298AAU	
	575	1600		—	ECN2291AAU	ECN2292AAU	ECN2293AAU ⑤	ECN2298AAU	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECN2254AAJ. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.

To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

⑤ Type 4 (painted steel) sizes 6–9.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

2

Class ECN22—Special Enclosure Combination Non-Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1	Type 4X	Type 12		Component Starter (Open) Catalog Number		
					General Purpose Catalog Number	Watertight and Dust-Tight Stainless Steel ② Catalog Number	Dust-Tight Industrial ③ External Reset Catalog Number	Internal Reset Catalog Number			
Horizontal Enclosure											
1	200	1	120	7 A	ECN2211AAC-E13	ECN2212AAC-E13	ECN2214AAC-E13	ECN2218AAC-E13	AN16DN0AB		
		3		15 A	ECN2211AAD-E13	ECN2212AAD-E13	ECN2214AAD-E13	ECN2218AAD-E13			
		5		30 A	ECN2211AAE-E13	ECN2212AAE-E13	ECN2214AAE-E13	ECN2218AAE-E13			
		7-1/2		50 A	ECN2211AAF-E13	ECN2212AAF-E13	ECN2214AAF-E13	ECN2218AAF-E13			
	230	1	7 A	ECN2211AAC-E13	ECN2212AAC-E13	ECN2214AAC-E13	ECN2218AAC-E13				
		3	15 A	ECN2211AAD-E13	ECN2212AAD-E13	ECN2214AAD-E13	ECN2218AAD-E13				
		5	30 A	ECN2211AAE-E13	ECN2212AAE-E13	ECN2214AAE-E13	ECN2218AAE-E13				
		7-1/2	50 A	ECN2211AAF-E13	ECN2212AAF-E13	ECN2214AAF-E13	ECN2218AAF-E13				
	460	1	3A	ECN2211AAB-E13	ECN2212AAB-E13	ECN2214AAB-E13	ECN2218AAB-E13				
		3	7 A	ECN2211AAC-E13	ECN2212AAC-E13	ECN2214AAC-E13	ECN2218AAC-E13				
		5	15 A	ECN2211AAD-E13	ECN2212AAD-E13	ECN2214AAD-E13	ECN2218AAD-E13				
		10	30 A	ECN2211AAE-E13	ECN2212AAE-E13	ECN2214AAE-E13	ECN2218AAE-E13				
	575	1	3 A	ECN2211AAB-E13	ECN2212AAB-E13	ECN2214AAB-E13	ECN2218AAB-E13				
		3	7 A	ECN2211AAC-E13	ECN2212AAC-E13	ECN2214AAC-E13	ECN2218AAC-E13				
		5	15 A	ECN2211AAD-E13	ECN2212AAD-E13	ECN2214AAD-E13	ECN2218AAD-E13				
		10	30 A	ECN2211AAE-E13	ECN2212AAE-E13	ECN2214AAE-E13	ECN2218AAE-E13				
	2	200	10	120	50 A	ECN2221AAF-E13	ECN2222AAF-E13	ECN2224AAF-E13		ECN2228AAF-E13	AN16GN0AB
		230	10		ECN2221AAF-E13	ECN2222AAF-E13	ECN2224AAF-E13	ECN2228AAF-E13			
			15		70 A	ECN2221AAW-E13	ECN2222AAW-E13	ECN2224AAW-E13		ECN2228AAW-E13	
		460	25		50 A	ECN2221AAF-E13	ECN2222AAF-E13	ECN2224AAF-E13		ECN2228AAF-E13	
575		15	30 A		ECN2221AAE-E13	ECN2222AAE-E13	ECN2224AAE-E13	ECN2228AAE-E13			
		25	50 A		ECN2221AAF-E13	ECN2222AAF-E13	ECN2224AAF-E13	ECN2228AAF-E13			

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN2212AAC-E13. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ To order Type 12 enclosures with safety door interlock add modification **E11**.

Class ECN22—Special Enclosure Combination Non-Reversing Starter—Circuit Breaker, continued

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1	Type 4X	Type 12		Component Starter (Open)	
					General Purpose	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial ③	External Reset		Internal Reset
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	
Enlarge Enclosure—without Control Transformer										
0	200	1	120	7 A	ECN2201AAC-E3	ECN2202AAC-E3	ECN2204AAC-E3	ECN2208AAC-E3	AN16BN0AC	
				15 A	ECN2201AAD-E3	ECN2202AAD-E3	ECN2204AAD-E3	ECN2208AAD-E3		
		3		7 A	ECN2201AAC-E3	ECN2202AAC-E3	ECN2204AAC-E3	ECN2208AAC-E3		
				15 A	ECN2201AAD-E3	ECN2202AAD-E3	ECN2204AAD-E3	ECN2208AAD-E3		
		460		1	3 A	ECN2201AAB-E3	ECN2202AAB-E3	ECN2204AAB-E3		ECN2208AAB-E3
				3	7 A	ECN2201AAC-E3	ECN2202AAC-E3	ECN2204AAC-E3		ECN2208AAC-E3
	575	1	3 A	ECN2201AAB-E3	ECN2202AAB-E3	ECN2204AAB-E3	ECN2208AAB-E3			
			15 A	ECN2201AAD-E3	ECN2202AAD-E3	ECN2204AAD-E3	ECN2208AAD-E3			
		3	7 A	ECN2201AAC-E3	ECN2202AAC-E3	ECN2204AAC-E3	ECN2208AAC-E3			
			15 A	ECN2201AAD-E3	ECN2202AAD-E3	ECN2204AAD-E3	ECN2208AAD-E3			
		5	7 A	ECN2201AAC-E3	ECN2202AAC-E3	ECN2204AAC-E3	ECN2208AAC-E3			
			15 A	ECN2201AAD-E3	ECN2202AAD-E3	ECN2204AAD-E3	ECN2208AAD-E3			
1	200	1	120	7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3	AN16DN0AB	
				15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3		
		3		30 A	ECN2211AAE-E3	ECN2212AAE-E3	ECN2214AAE-E3	ECN2218AAE-E3		
				50 A	ECN2211AAF-E3	ECN2212AAF-E3	ECN2214AAF-E3	ECN2218AAF-E3		
		7-1/2		7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3		
				15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3		
		230		1	7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3		ECN2218AAC-E3
				3	15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3		ECN2218AAD-E3
		5		30 A	ECN2211AAE-E3	ECN2212AAE-E3	ECN2214AAE-E3	ECN2218AAE-E3		
				50 A	ECN2211AAF-E3	ECN2212AAF-E3	ECN2214AAF-E3	ECN2218AAF-E3		
		7-1/2		7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3		
				15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3		
	460	1	3 A	ECN2211AAB-E3	ECN2212AAB-E3	ECN2214AAB-E3	ECN2218AAB-E3			
			7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3			
		3	15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3			
			30 A	ECN2211AAE-E3	ECN2212AAE-E3	ECN2214AAE-E3	ECN2218AAE-E3			
		5	7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3			
			15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3			
	575	1	3 A	ECN2211AAB-E3	ECN2212AAB-E3	ECN2214AAB-E3	ECN2218AAB-E3			
			7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3			
		3	15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3			
			30 A	ECN2211AAE-E3	ECN2212AAE-E3	ECN2214AAE-E3	ECN2218AAE-E3			
		5	7 A	ECN2211AAC-E3	ECN2212AAC-E3	ECN2214AAC-E3	ECN2218AAC-E3			
			15 A	ECN2211AAD-E3	ECN2212AAD-E3	ECN2214AAD-E3	ECN2218AAD-E3			
2	200	10	120	50 A	ECN2221AAF-E3	ECN2222AAF-E3	ECN2224AAF-E3	ECN2228AAF-E3	AN16GN0AB	
				70 A	ECN2221AAW-E3	ECN2222AAW-E3	ECN2224AAW-E3	ECN2228AAW-E3		
	230	10		50 A	ECN2221AAF-E3	ECN2222AAF-E3	ECN2224AAF-E3	ECN2228AAF-E3		
				70 A	ECN2221AAW-E3	ECN2222AAW-E3	ECN2224AAW-E3	ECN2228AAW-E3		
	15	50 A		ECN2221AAF-E3	ECN2222AAF-E3	ECN2224AAF-E3	ECN2228AAF-E3			
		70 A		ECN2221AAW-E3	ECN2222AAW-E3	ECN2224AAW-E3	ECN2228AAW-E3			
	460	25		50 A	ECN2221AAF-E3	ECN2222AAF-E3	ECN2224AAF-E3	ECN2228AAF-E3		
				70 A	ECN2221AAW-E3	ECN2222AAW-E3	ECN2224AAW-E3	ECN2228AAW-E3		
	575	15		30 A	ECN2221AAE-E3	ECN2222AAE-E3	ECN2224AAE-E3	ECN2228AAE-E3		
				50 A	ECN2221AAF-E3	ECN2222AAF-E3	ECN2224AAF-E3	ECN2228AAF-E3		
	25	30 A		ECN2221AAE-E3	ECN2222AAE-E3	ECN2224AAE-E3	ECN2228AAE-E3			
		50 A		ECN2221AAF-E3	ECN2222AAF-E3	ECN2224AAF-E3	ECN2228AAF-E3			

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN2202AAC-E3. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ To order Type 12 enclosures with safety door interlock add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

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Class ECN23—Combination Reversing Starter—Circuit Breaker ①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)		
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ③	Dust-Tight Industrial External Reset ④⑤			
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number		
00	200	1	120	7 A	ECN23A1AAC	ECN23A2AAC	ECN23A4AAC	ECN23A8AAC	AN56AN0AC		
		1-1/2		15 A	ECN23A1AAD	ECN23A2AAD	ECN23A4AAD	ECN23A8AAD			
	230	1	7 A	ECN23A1AAC	ECN23A2AAC	ECN23A4AAC	ECN23A8AAC				
		1-1/2	15 A	ECN23A1AAD	ECN23A2AAD	ECN23A4AAD	ECN23A8AAD				
	460	1	3 A	ECN23A1AAB	ECN23A2AAB	ECN23A4AAB	ECN23A8AAB				
		2	7 A	ECN23A1AAC	ECN23A2AAC	ECN23A4AAC	ECN23A8AAC				
	575	1	3 A	ECN23A1AAB	ECN23A2AAB	ECN23A4AAB	ECN23A8AAB				
		2	7 A	ECN23A1AAC	ECN23A2AAC	ECN23A4AAC	ECN23A8AAC				
	0	200	1	120	7 A	ECN2301AAC	ECN2302AAC	ECN2304AAC		ECN2308AAC	AN56BN0AC
			3		15 A	ECN2301AAD	ECN2302AAD	ECN2304AAD		ECN2308AAD	
230		1	7 A	ECN2301AAC	ECN2302AAC	ECN2304AAC	ECN2308AAC				
		3	15 A	ECN2301AAD	ECN2302AAD	ECN2304AAD	ECN2308AAD				
460		1	3 A	ECN2301AAB	ECN2302AAB	ECN2304AAB	ECN2308AAB				
		3	7 A	ECN2301AAC	ECN2302AAC	ECN2304AAC	ECN2308AAC				
		5	15 A	ECN2301AAD	ECN2302AAD	ECN2304AAD	ECN2308AAD				
575		1	3 A	ECN2301AAB	ECN2302AAB	ECN2304AAB	ECN2308AAB				
		3	15 A	ECN2301AAD	ECN2302AAD	ECN2304AAD	ECN2308AAD				
		5	7 A	ECN2301AAC	ECN2302AAC	ECN2304AAC	ECN2308AAC				
1		200	1	120	7 A	ECN2311AAC	ECN2312AAC	ECN2314AAC	ECN2318AAC	AN56DN0AB	
			3		15 A	ECN2311AAD	ECN2312AAD	ECN2314AAD	ECN2318AAD		
			5		30 A	ECN2311AAE	ECN2312AAE	ECN2314AAE	ECN2318AAE		
			7-1/2		50 A	ECN2311AAF	ECN2312AAF	ECN2314AAF	ECN2318AAF		
	230	1	7 A	ECN2311AAC	ECN2312AAC	ECN2314AAC	ECN2318AAC				
		3	15 A	ECN2311AAD	ECN2312AAD	ECN2314AAD	ECN2318AAD				
		5	30 A	ECN2311AAE	ECN2312AAE	ECN2314AAE	ECN2318AAE				
		7-1/2	50 A	ECN2311AAF	ECN2312AAF	ECN2314AAF	ECN2318AAF				
	460	1	3 A	ECN2311AAB	ECN2312AAB	ECN2314AAB	ECN2318AAB				
		3	7 A	ECN2311AAC	ECN2312AAC	ECN2314AAC	ECN2318AAC				
		5	15 A	ECN2311AAD	ECN2312AAD	ECN2314AAD	ECN2318AAD				
		10	30 A	ECN2311AAE	ECN2312AAE	ECN2314AAE	ECN2318AAE				
	575	1	3 A	ECN2311AAB	ECN2312AAB	ECN2314AAB	ECN2318AAB				
		3	7 A	ECN2311AAC	ECN2312AAC	ECN2314AAC	ECN2318AAC				
		5	15 A	ECN2311AAD	ECN2312AAD	ECN2314AAD	ECN2318AAD				
		10	30 A	ECN2311AAE	ECN2312AAE	ECN2314AAE	ECN2318AAE				

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① 100,000 rms short-circuit—480 V; 25,000 rms short-circuit—600 V.

② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN2304AAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

Class ECN23—Combination Reversing Starter—Circuit Breaker, continued ①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ③	Dust-Tight Industrial External Reset ④⑤	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
2	200	10	120	50 A	ECN2321AAF	ECN2322AAF	ECN2324AAF	ECN2328AAF	AN56GN0AB
		15			ECN2321AAF	ECN2322AAF	ECN2324AAF	ECN2328AAF	
	460	25	50 A	ECN2321AAW	ECN2322AAW	ECN2324AAW	ECN2328AAW		
		15		ECN2321AAF	ECN2322AAF	ECN2324AAF	ECN2328AAF		
	575	15	30 A	ECN2321AAE	ECN2322AAE	ECN2324AAE	ECN2328AAE		
		25		ECN2321AAF	ECN2322AAF	ECN2324AAF	ECN2328AAF		
3	200	20	120	100 A	ECN2331AAG	ECN2332AAG	ECN2334AAG	ECN2338AAG	AN56KN0A
		25			ECN2331AAX	ECN2332AAX	ECN2334AAX	ECN2338AAX	
	230	25	100 A	ECN2331AAG	ECN2332AAG	ECN2334AAG	ECN2338AAG		
		30		ECN2331AAX	ECN2332AAX	ECN2334AAX	ECN2338AAX		
	460	50	100 A	ECN2331AAG	ECN2332AAG	ECN2334AAG	ECN2338AAG		
		30		ECN2331AAF	ECN2332AAF	ECN2334AAF	ECN2338AAF		
	575	30	100 A	ECN2331AAG	ECN2332AAG	ECN2334AAG	ECN2338AAG		
		50		ECN2331AAF	ECN2332AAF	ECN2334AAF	ECN2338AAF		
4	200	40	120	150 A	ECN2341AAH	ECN2342AAH	ECN2344AAH	ECN2348AAH	AN56NN0A
		50			ECN2341AAH	ECN2342AAH	ECN2344AAH	ECN2348AAH	
	460	100	150 A	ECN2341AAH	ECN2342AAH	ECN2344AAH	ECN2348AAH		
		100		ECN2341AAH	ECN2342AAH	ECN2344AAH	ECN2348AAH		
5	200	50	230	250 A	ECN2351AAJ	ECN2352AAJ	ECN2354AAJ	ECN2358AAJ	AN56SN0AB
		75			ECN2351AAK	ECN2352AAK	ECN2354AAK	ECN2358AAK	
	230	60	250 A	ECN2351AAJ	ECN2352AAJ	ECN2354AAJ	ECN2358AAJ		
		100		ECN2351AAK	ECN2352AAK	ECN2354AAK	ECN2358AAK		
	460	125	250 A	ECN2351AAJ	ECN2352AAJ	ECN2354AAJ	ECN2358AAJ		
		200		ECN2351AAK	ECN2352AAK	ECN2354AAK	ECN2358AAK		
	575	150	250 A	ECN2351AAJ	ECN2352AAJ	ECN2354AAJ	ECN2358AAJ		
		200		ECN2351AAK	ECN2352AAK	ECN2354AAK	ECN2358AAK		

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

① 100,000 rms short-circuit—480 V; 25,000 rms short-circuit—600 V.

② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN2324AAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

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Class ECN23—Combination Reversing Starter—Circuit Breaker, continued ^①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^③	Dust-Tight Industrial External Reset ^{④⑤}	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
6	200	150	120	600 A	ECN2361AAL	ECN2362AAL	ECN2363AAL ^⑥	ECN2368AAL	AN56TN0AB
	230	200			ECN2361AAL	ECN2362AAL	ECN2363AAL ^⑥	ECN2368AAL	
	460	350			ECN2361AAL	ECN2362AAL	ECN2363AAL ^⑥	ECN2368AAL	
		400		1200 A	ECN2361AAP	ECN2362AAP	ECN2363AAP ^⑥	ECN2368AAP	
	575	400		600 A	ECN2361AAL	ECN2362AAL	ECN2363AAL ^⑥	ECN2368AAL	
7	230	300	120	—	ECN2371AAU ^⑦	ECN2372AAU ^⑦	ECN2373AAU ^{⑥⑦}	ECN2378AAU ^⑦	AN56UN0AB
	460	600		—	ECN2371AAU ^⑦	ECN2372AAU ^⑦	ECN2373AAU ^{⑥⑦}	ECN2378AAU ^⑦	
	575	600		—	ECN2371AAU ^⑦	ECN2372AAU ^⑦	ECN2373AAU ^{⑥⑦}	ECN2378AAU ^⑦	
8	230	450	120	—	ECN2381AAU ^⑦	ECN2382AAU ^⑦	ECN2383AAU ^{⑥⑦}	ECN2388AAU ^⑦	AN56VN0AB
	460	900		—	ECN2381AAU ^⑦	ECN2382AAU ^⑦	ECN2383AAU ^{⑥⑦}	ECN2388AAU ^⑦	
	575	900		—	ECN2381AAU ^⑦	ECN2382AAU ^⑦	ECN2383AAU ^{⑥⑦}	ECN2388AAU ^⑦	
9	230	800	120	—	ECN2391AAU ^⑦	ECN2392AAU ^⑦	ECN2393AAU ^{⑥⑦}	ECN2398AAU ^⑦	AN56WN0A
	460	1600		—	ECN2391AAU ^⑦	ECN2392AAU ^⑦	ECN2393AAU ^{⑥⑦}	ECN2398AAU ^⑦	
	575	1600		—	ECN2391AAU ^⑦	ECN2392AAU ^⑦	ECN2393AAU ^{⑥⑦}	ECN2398AAU ^⑦	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① 100,000 rms short-circuit—480 V; 25,000 rms short-circuit—600 V.

^② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

^③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECN2363AAL. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

^⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

^⑥ Type 4 (painted steel) sizes 6–9.

^⑦ Provide FLA to size disconnect properly.

Class ECN24—Combination Non-Reversing Starter—Circuit Breaker with CPT ^①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)		
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^③	Dust-Tight Industrial External Reset ^{④⑤}			
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number		
00	200	1	120	7 A	ECN24A1EAC	ECN24A2EAC	ECN24A4EAC	ECN24A8EAC	AN16AN0AC		
		1-1/2		15 A	ECN24A1EAD	ECN24A2EAD	ECN24A4EAD	ECN24A8EAD			
		230	1	7 A	ECN24A1BAC	ECN24A2BAC	ECN24A4BAC	ECN24A8BAC			
			1-1/2	15 A	ECN24A1BAD	ECN24A2BAD	ECN24A4BAD	ECN24A8BAD			
	460	1		3 A	ECN24A1CAB	ECN24A2CAB	ECN24A4CAB	ECN24A8CAB			
				7 A	ECN24A1CAC	ECN24A2CAC	ECN24A4CAC	ECN24A8CAC			
		575		3 A	ECN24A1DAB	ECN24A2DAB	ECN24A4DAB	ECN24A8DAB			
				7 A	ECN24A1DAC	ECN24A2DAC	ECN24A4DAC	ECN24A8DAC			
	0	200	1	120	7 A	ECN2401EAC	ECN2402EAC	ECN2404EAC		ECN2408EAC	AN16BN0AC
			3		15 A	ECN2401EAD	ECN2402EAD	ECN2404EAD		ECN2408EAD	
			230	1	7 A	ECN2401BAC	ECN2402BAC	ECN2404BAC		ECN2408BAC	
				3	15 A	ECN2401BAD	ECN2402BAD	ECN2404BAD		ECN2408BAD	
460		1		3 A	ECN2401CAB	ECN2402CAB	ECN2404CAB	ECN2408CAB			
				7 A	ECN2401CAC	ECN2402CAC	ECN2404CAC	ECN2408CAC			
		575		3 A	ECN2401DAB	ECN2402DAB	ECN2404DAB	ECN2408DAB			
				7 A	ECN2401DAD	ECN2402DAD	ECN2404DAD	ECN2408DAD			
1		200	1	120	7 A	ECN2411EAC	ECN2412EAC	ECN2414EAC	ECN2418EAC	AN16DN0AB	
			3		15 A	ECN2411EAD	ECN2412EAD	ECN2414EAD	ECN2418EAD		
			230	5	30 A	ECN2411EAE	ECN2412EAE	ECN2414EAE	ECN2418EAE		
				7-1/2	50 A	ECN2411EAF	ECN2412EAF	ECN2414EAF	ECN2418EAF		
	460	1		7 A	ECN2411BAC	ECN2412BAC	ECN2414BAC	ECN2418BAC			
				3	15 A	ECN2411BAD	ECN2412BAD	ECN2414BAD	ECN2418BAD		
		575		5	30 A	ECN2411BAE	ECN2412BAE	ECN2414BAE	ECN2418BAE		
				7-1/2	50 A	ECN2411BAF	ECN2412BAF	ECN2414BAF	ECN2418BAF		
	575	1		3 A	ECN2411CAB	ECN2412CAB	ECN2414CAB	ECN2418CAB			
				3	7 A	ECN2411CAC	ECN2412CAC	ECN2414CAC	ECN2418CAC		
		3		15 A	ECN2411CAD	ECN2412CAD	ECN2414CAD	ECN2418CAD			
				5	30 A	ECN2411CAE	ECN2412CAE	ECN2414CAE	ECN2418CAE		
575	1		3 A	ECN2411DAB	ECN2412DAB	ECN2414DAB	ECN2418DAB				
			3	7 A	ECN2411DAC	ECN2412DAC	ECN2414DAC	ECN2418DAC			
	5		15 A	ECN2411DAD	ECN2412DAD	ECN2414DAD	ECN2418DAD				
			10	30 A	ECN2411DAE	ECN2412DAE	ECN2414DAE	ECN2418DAE			

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① 100,000 rms short-circuit—480 V; 25,000 rms short-circuit—600 V.

^② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

^③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECN24A4EAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code R5.

^⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification E11.

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NEMA Contactors and Starters

Freedom Full Voltage Controls

Class ECN24—Combination Non-Reversing Starter—Circuit Breaker with CPT, continued ^①

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NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)		
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^③	Dust-Tight Industrial External Reset ^{④⑤}			
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number		
2	200	10	120	50 A	ECN2421EAF	ECN2422EAF	ECN2424EAF	ECN2428EAF	AN16GN0AB		
					ECN2421BAF	ECN2422BAF	ECN2424BAF	ECN2428BAF			
					ECN2421BAW	ECN2422BAW	ECN2424BAW	ECN2428BAW			
	460	25	50 A	ECN2421CAF	ECN2422CAF	ECN2424CAF	ECN2428CAF				
				575	15	30 A	ECN2421CAE	ECN2422CAE		ECN2424CAE	ECN2428CAE
							50 A	ECN2421DAF		ECN2422DAF	ECN2424DAF
3	200	20	120	100 A	ECN2431EAG	ECN2432EAG	ECN2434EAG	ECN2438EAG	AN16KN0A		
					ECN2431EAX	ECN2432EAX	ECN2434EAX	ECN2438EAX			
	230	25		ECN2431BAG	ECN2432BAG	ECN2434BAG	ECN2438BAG				
				ECN2431BAX	ECN2432BAX	ECN2434BAX	ECN2438BAX				
	460	50		ECN2431CAG	ECN2432CAG	ECN2434CAG	ECN2438CAG				
				575	30	50 A	ECN2431DAF	ECN2432DAF		ECN2434DAF	ECN2438DAF
	100 A	ECN2431DAG	ECN2432DAG				ECN2434DAG	ECN2438DAG			
		4	200			40	120	150 A		ECN2441EAH	ECN2442EAH
ECN2441BAH	ECN2442BAH								ECN2444BAH	ECN2448BAH	
460	100			ECN2441CAH	ECN2442CAH	ECN2444CAH	ECN2448CAH				
				575	100		ECN2441DAH	ECN2442DAH	ECN2444DAH	ECN2448DAH	
5	200	50	120	250 A	ECN2451EAJ	ECN2452EAJ	ECN2454EAJ	ECN2458EAJ	AN16SN0AB		
					400 A	ECN2451EAK	ECN2452EAK	ECN2454EAK		ECN2458EAK	
	230	60		250 A	ECN2451BAJ	ECN2452BAJ	ECN2454BAJ	ECN2458BAJ			
				400 A	ECN2451BAK	ECN2452BAK	ECN2454BAK	ECN2458BAK			
	460	125		250 A	ECN2451CAJ	ECN2452CAJ	ECN2454CAJ	ECN2458CAJ			
				400 A	ECN2451CAK	ECN2452CAK	ECN2454CAK	ECN2458CAK			
	575	150		250 A	ECN2451DAJ	ECN2452DAJ	ECN2454DAJ	ECN2458DAJ			
				400 A	ECN2451DAK	ECN2452DAK	ECN2454DAK	ECN2458DAK			

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① 100,000 rms short-circuit—480 V; 25,000 rms short-circuit—600 V.

^② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

^③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN2424EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code R5.

^⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification E11.

Class ECN24—Combination Non-Reversing Starter—Circuit Breaker with CPT, continued ^①

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ^③	Dust-Tight Industrial External Reset ^{④⑤}	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
6	200	150	120	600 A	ECN2461EAL	ECN2462EAL	ECN2463EAL ^⑥	ECN2468EAL	AN16TN0AB
	230	200			ECN2461BAL	ECN2462BAL	ECN2463BAL ^⑥	ECN2468BAL	
	460	350			ECN2461CAL	ECN2462CAL	ECN2463CAL ^⑥	ECN2468CAL	
		400		1200 A	ECN2461CAP	ECN2462CAP	ECN2463CAP ^⑥	ECN2468CAP	
	575	400		600 A	ECN2461DAL	ECN2462DAL	ECN2463DAL ^⑥	ECN2468DAL	
7	230	300	120	—	ECN2471BAU ^⑦	ECN2472BAU ^⑦	ECN2473BAU ^{⑥⑦}	ECN2478BAU ^⑦	AN16UN0AB
	460	600		—	ECN2471CAU ^⑦	ECN2472CAU ^⑦	ECN2473CAU ^{⑥⑦}	ECN2478CAU ^⑦	
	575	600		—	ECN2471DAU ^⑦	ECN2472DAU ^⑦	ECN2473DAU ^{⑥⑦}	ECN2478DAU ^⑦	
8	230	450	120	—	ECN2481BAU ^⑦	ECN2482BAU ^⑦	ECN2483BAU ^{⑥⑦}	ECN2488BAU ^⑦	AN16VN0AB
	460	900		—	ECN2481CAU ^⑦	ECN2482CAU ^⑦	ECN2483CAU ^{⑥⑦}	ECN2488CAU ^⑦	
	575	900		—	ECN2481DAU ^⑦	ECN2482DAU ^⑦	ECN2483DAU ^{⑥⑦}	ECN2488DAU ^⑦	
9	230	800	120	—	ECN2491BAU ^⑦	ECN2492BAU ^⑦	ECN2493BAU ^{⑥⑦}	ECN2498BAU ^⑦	AN16WN0A
	460	1600		—	ECN2491CAU ^⑦	ECN2492CAU ^⑦	ECN2493CAU ^{⑥⑦}	ECN2498CAU ^⑦	
	575	1600		—	ECN2491DAU ^⑦	ECN2492DAU ^⑦	ECN2493DAU ^{⑥⑦}	ECN2498DAU ^⑦	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**, or solid-state overload codes on **Page V10-T2-5**.

^① 100,000 rms short-circuit—480 V; 25,000 rms short-circuit—600 V.

^② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

^③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECN2463EAL. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code R5.

^⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification E11.

^⑥ Type 4 (painted steel) sizes 6–9.

^⑦ Provide FLA to size disconnect properly.

2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

Wiring Diagrams

Non-Reversing Starter—Single- and Three-Phase Non-Combination

2

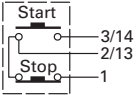
Remote Pilot Devices

Two-Wire Control

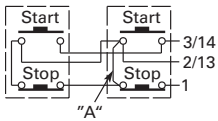


Not for Use with Auto Reset OL Relays

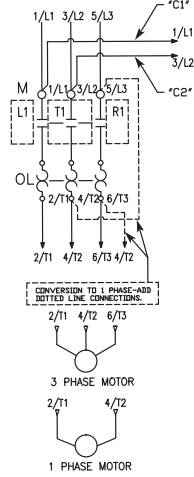
Three-Wire Control



When More than One Pushbutton Station is Used, Omit Connector "A" and Connect per Sketch Below



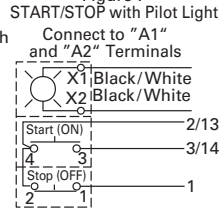
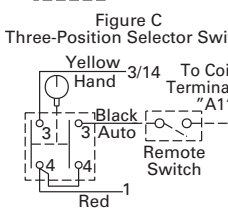
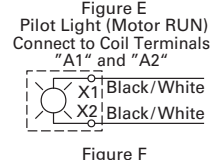
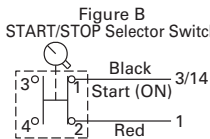
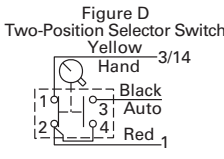
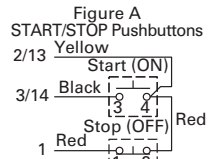
Connections for Non-Reversing Starter



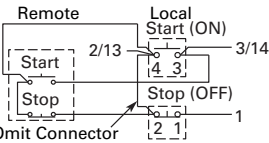
Non-Reversing Starter—Combination

Connections for Control Stations

Local Control



Combined Remote and Local for Figures 1 and 2



Remote Control

Two-Wire Control

Three-Wire Control

When More than One Pushbutton Station is Used

Not for Use with Auto Reset OL Relays

When More than One Pushbutton Station is Used

Connect per Sketch Below

When More than One Pushbutton Station is Used

Connect per Sketch Below

When More than One Pushbutton Station is Used

Connect per Sketch Below

When More than One Pushbutton Station is Used

Connect per Sketch Below

When More than One Pushbutton Station is Used

Connect per Sketch Below

When More than One Pushbutton Station is Used

Connect per Sketch Below

Connections for Starters

Figure 1 Front View Diagram

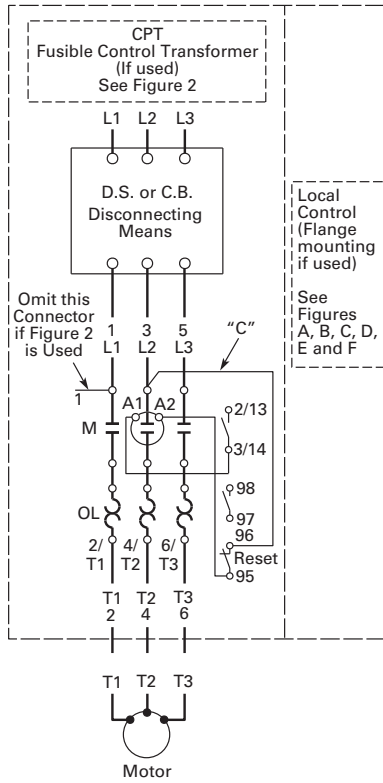
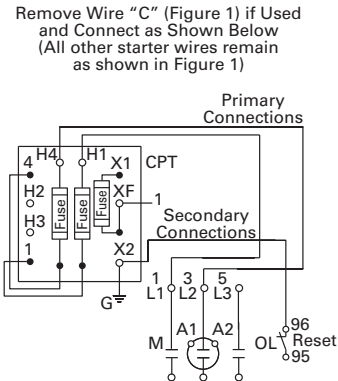
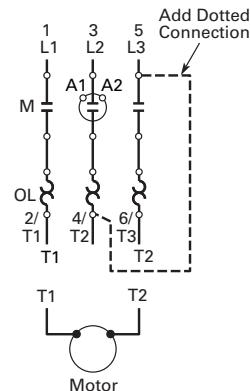


Figure 2 Fusible Control Transformer



Connections for Dual Voltage Rated Transformer—See Transformer Nameplate

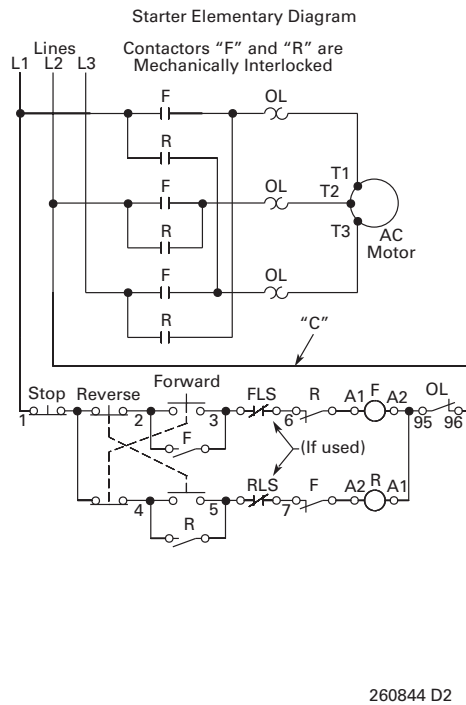
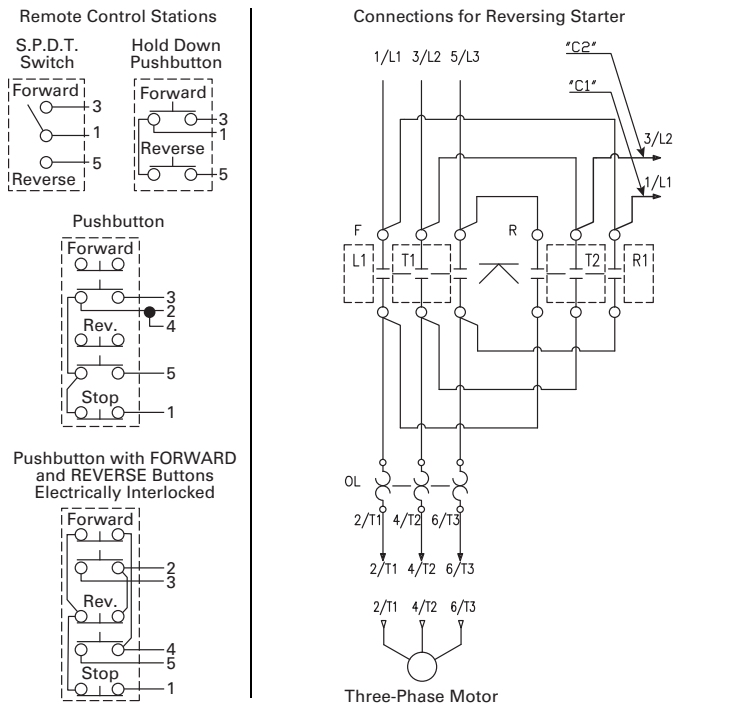
Field Conversion to Single-Phase



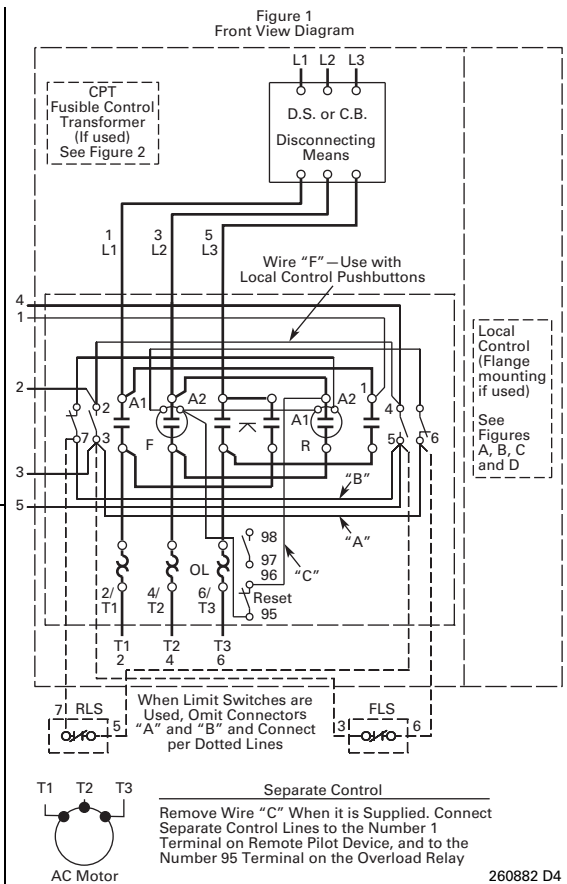
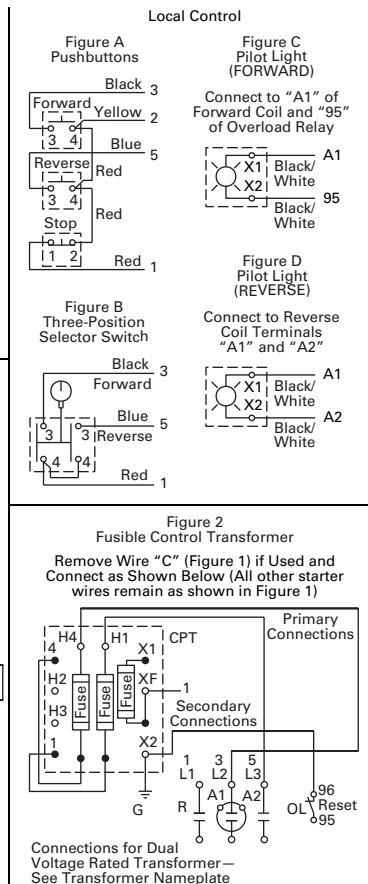
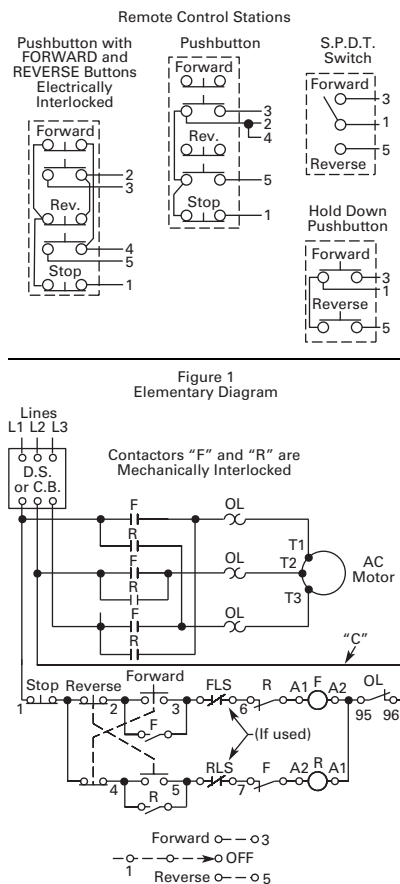
Separate Control
Remove Wire "C" if Supplied and Connect Separate Control Lines to the Number 1 Terminal on the Remote Pilot Device and to the Number 96 Terminal on the Overload Relay

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Reversing Starter—Non-Combination



Reversing Starter—Combination



2.1

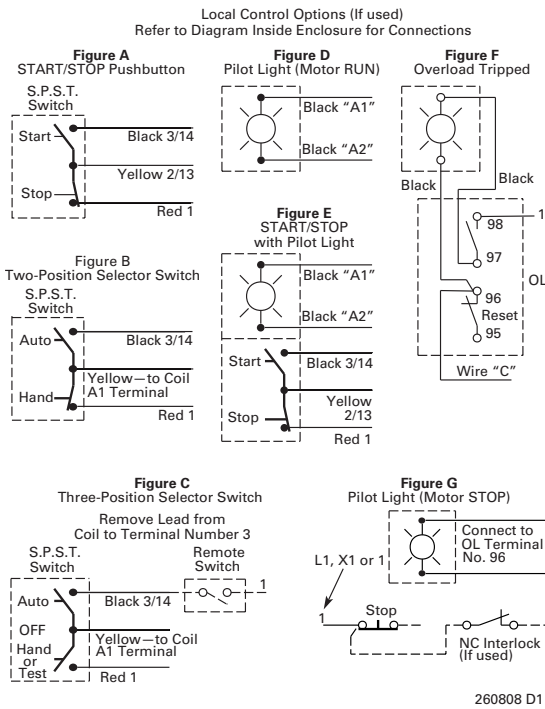
NEMA Contactors and Starters

Freedom Full Voltage Controls

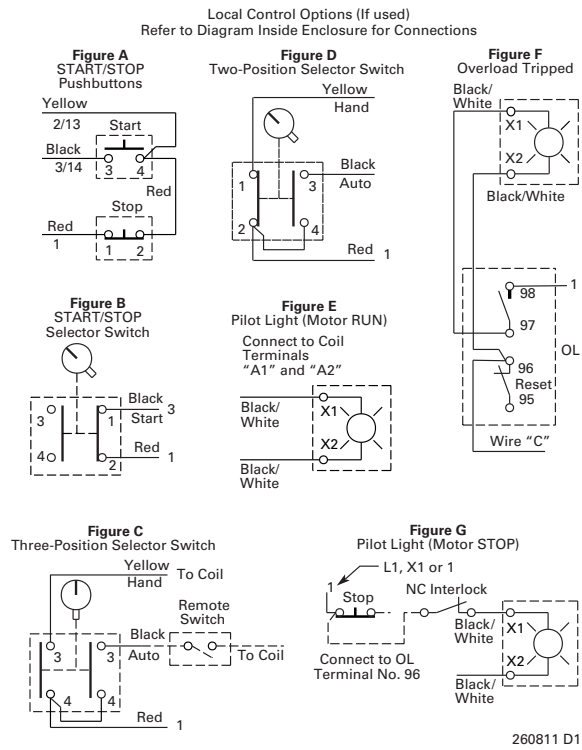
Non-Reversing Cover Control

Type 1 C400G Control Options

2

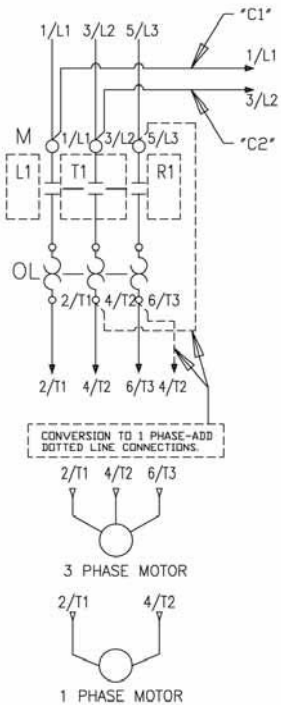


C400T Control Options



Type 1 C600M Control Options

Connections for Non-Reversing Starter



Schematic Symbol Legend

	Normally Open Auxiliary
	Normally Closed Auxiliary
	Normally Open Momentary PB
	Normally Closed Momentary PB
	Contactor Coil
	Red Pilot Light
	Green Pilot Light
	Normally Closed Overload Auxiliary
	Normally Open Overload Auxiliary
	M22-XLED230-T: Used to lower voltage for pilot lights.
	Two-position selector switch (STOP/START, OFF/ON)
	Three-position selector switch (HOA)
	Signifies Location of Side and Top Adder Auxiliary Referenced on Diagram Under Auxiliary Symbol

CAUTION

READ AND FOLLOW INSTRUCTIONS PRIOR TO WIRING OR CONNECTING POWER. THIS PRODUCT CAN BE FACTORY OR FIELD CONFIGURED FOR MULTIPLE CONTROL MODES OR CONTROL VOLTAGES. CHECK NAMEPLATE FOR COIL VOLTAGE.

SEPARATE CONTROL POWER

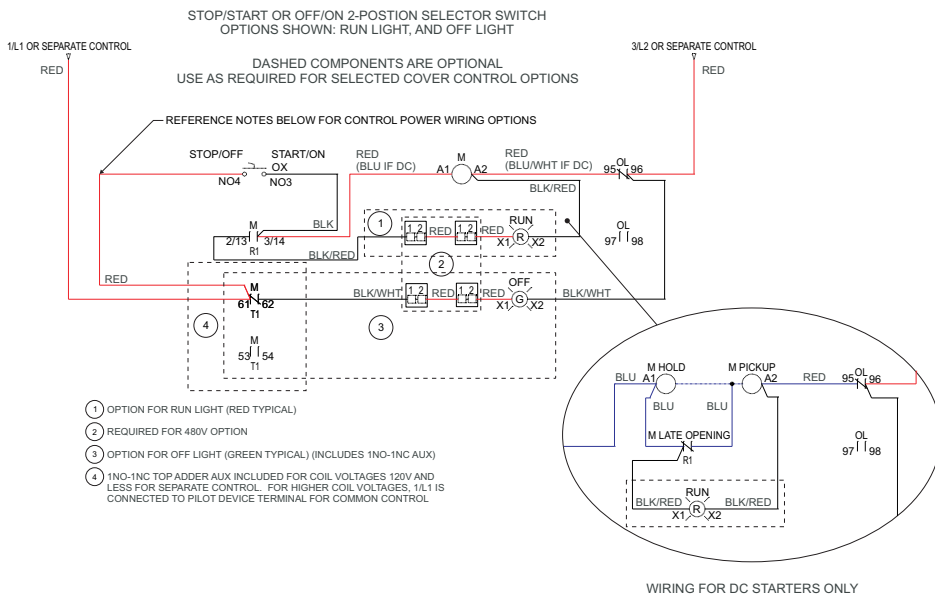
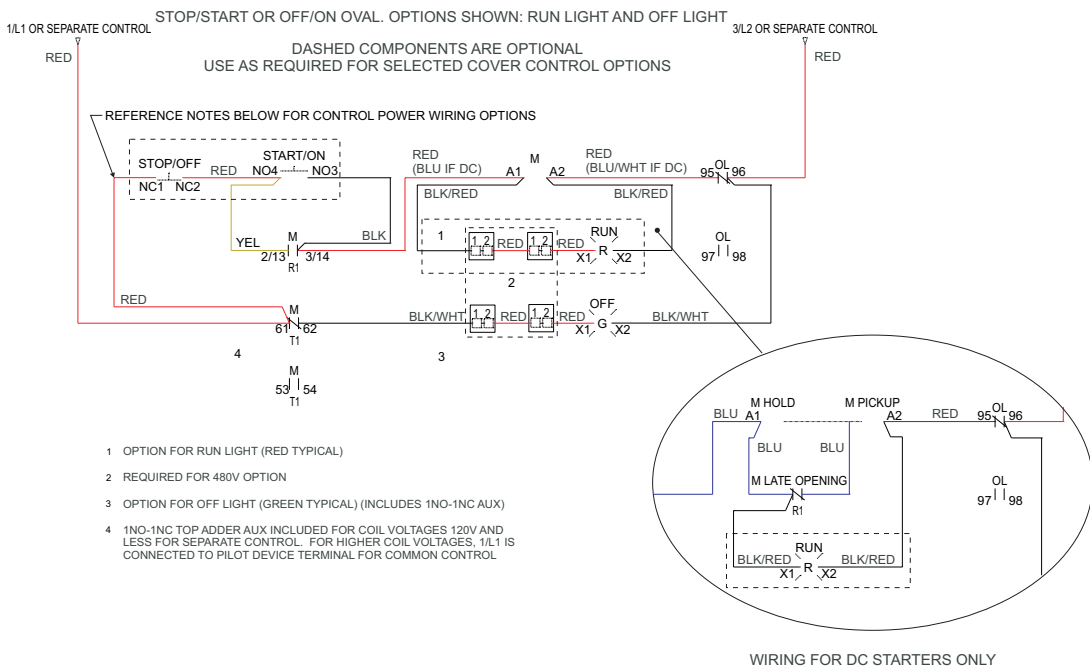
FOR COIL VOLTAGES 120V AND LESS: CONNECT SEPARATE CONTROL LINES TO THE NO. 91 TERMINAL ON THE TOP ADDER AUX. AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

FOR COIL VOLTAGES GREATER THAN 120V: REMOVE WIRE "C2" IF SUPPLIED. IF WIRE "C1" IS TERMINATED ON L1, DISCONNECT FROM L1. CONNECT SEPARATE CONTROL LINES TO THE "C1" WIRE OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

COMMON CONTROL POWER

FOR COIL VOLTAGES 120V AND LESS: ADD WIRE "C2" IF NOT SUPPLIED. ADD CONNECTOR BETWEEN L1 TERMINAL AND THE NO. 61 TERMINAL ON THE TOP ADDER AUX. OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM. FOR COIL VOLTAGES GREATER THAN 120V: ADD WIRE "C1" AND "C2" IF NOT SUPPLIED.

C600M Wiring Kit Diagrams



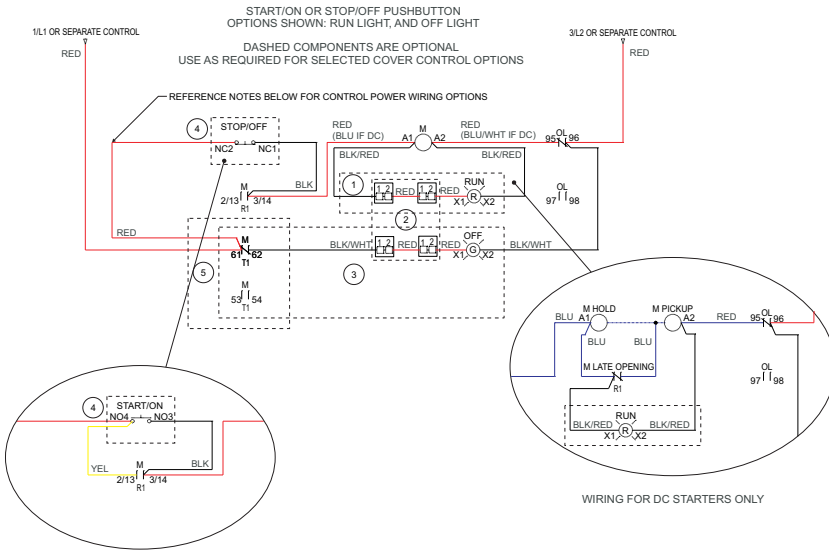
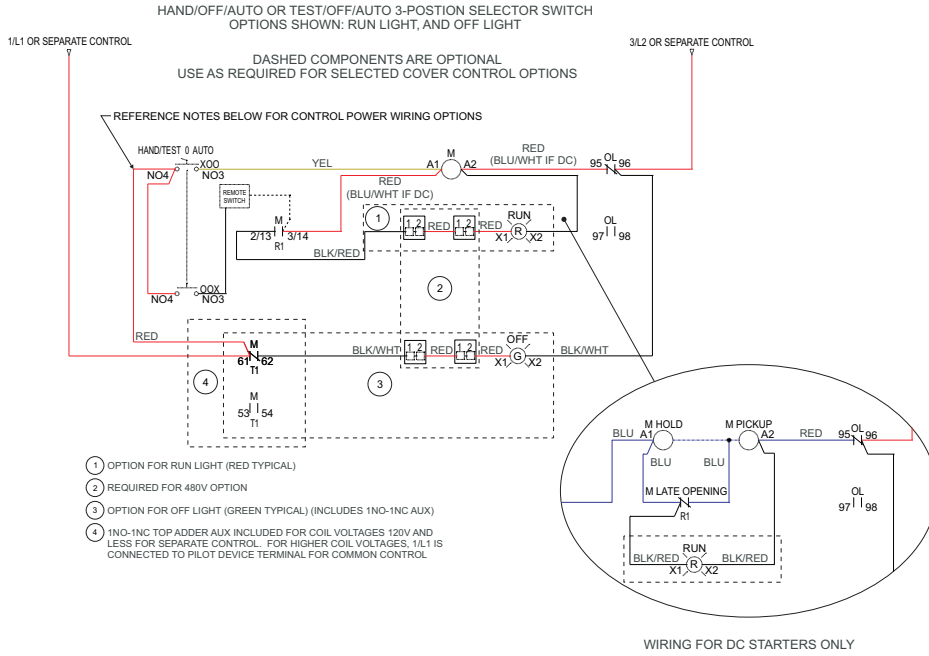
2.1

NEMA Contactors and Starters

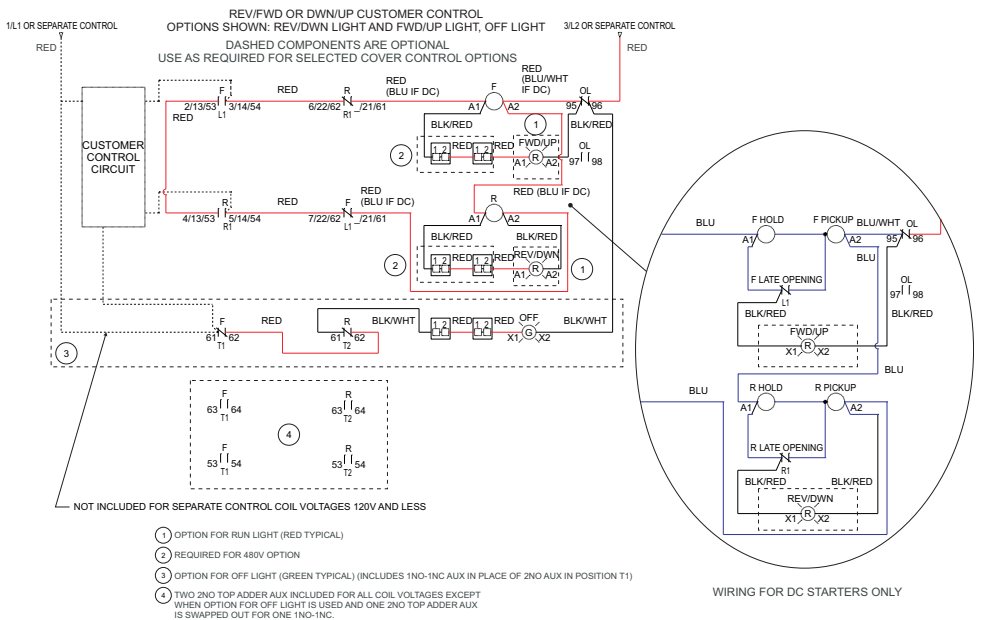
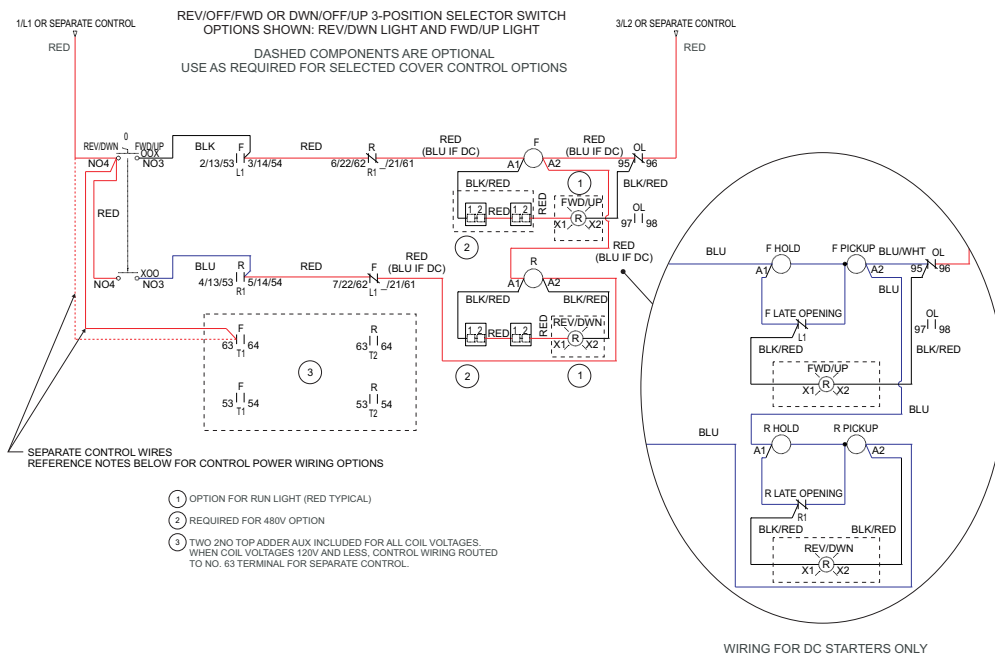
Freedom Full Voltage Controls

C600M Wiring Kit Diagrams, continued

2



C600M Wiring Kit Diagrams, continued



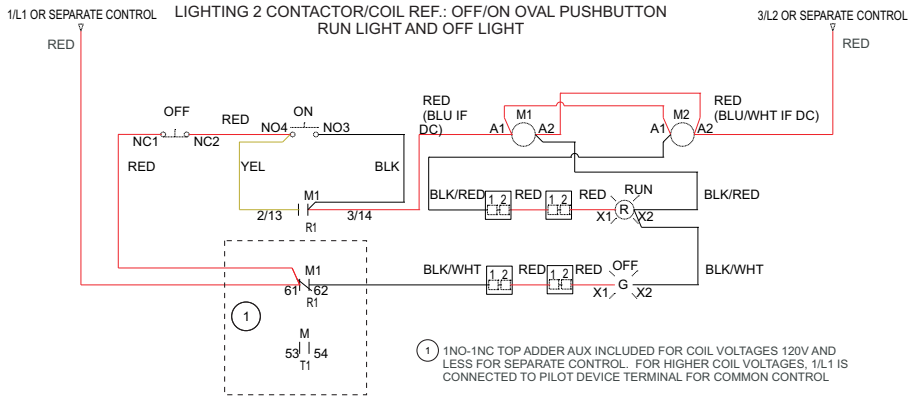
2.1

NEMA Contactors and Starters

Freedom Full Voltage Controls

C600M Wiring Kit Diagrams, continued

2



Reversing Cover Control

Type 1 C400GR Control Options

Local Control Options (If used)
Refer to Diagram Inside Enclosure for Connections

Figure A
Pushbutton
FORWARD/STOP/REVERSE

Add Connector "F"
Between Aux. Contact
Terminals 2 and 4

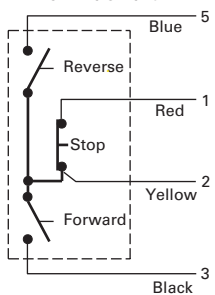


Figure B
Pilot Light (FORWARD)

Connect to Terminal A1 of the
Left Hand Coil and to Terminal
Number 95 of the Overload Relay

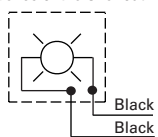
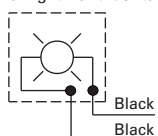


Figure C
Pilot Light (REVERSE)

Connect to Terminals A1 and A2
of the Right Hand Contactor



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C400T Control Options

Local Control Options (If used)
Refer to Diagram Inside Enclosure for Connections

Figure A
Pushbuttons

Connect Wire "F"
per Diagram

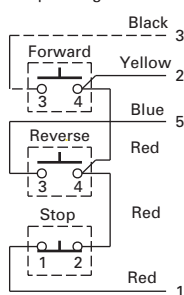


Figure B
Three-Position Selector Switch

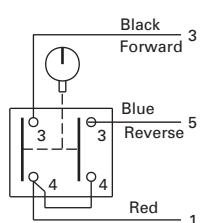


Figure C
Pilot Light (FORWARD)

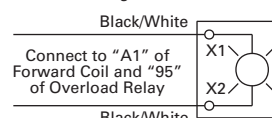
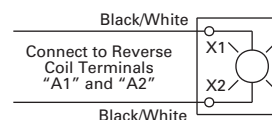


Figure D
Pilot Light (REVERSE)



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A200 Full Voltage Controls

2



Contents

<i>Description</i>	<i>Page</i>
A200 Full Voltage Controls	
Catalog Number Selection	V10-T2-59
Product Selection	
Combination Non-Reversing Starters— Circuit Breaker	V10-T2-60
Combination Non-Reversing Starters— Circuit Breaker with CPT	V10-T2-62

Product Description

Eaton’s A200 Series panels feature A200 family magnetic starters which are 600 V rated devices available in Nema Sizes 00-6.

Features

Sizes 00–4

- Straight-through wiring, up-front, out-front terminals—for ease in installation
- Unique accessory mounting cavities—reduce panel space requirements
- Snap-in accessories—for application flexibility
- Vertical and horizontal Interlocking—capability increases application flexibility
- Ambient compensated overload relays—available as standard, offering superior motor protection in variable motor/controller environments
- Isolated normally open relay contact—available in kit mounting form on Type B overload relay

Sizes 5–9

- Rectified AC/DC coils—available to reduce premature drop-out or “kiss” problems due to inherent low voltage conditions
- Clapper design—armature assembly pivots on needle bearings resulting in quick, smooth opening and closing of the magnet
- Stainless steel kick-out spring—assures quick, positive drop-out time
- Front removable parts—all current carrying parts front removable for easy inspection and maintenance

Standards and Certifications

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- OSHPD Certified (OSP-0015-10)

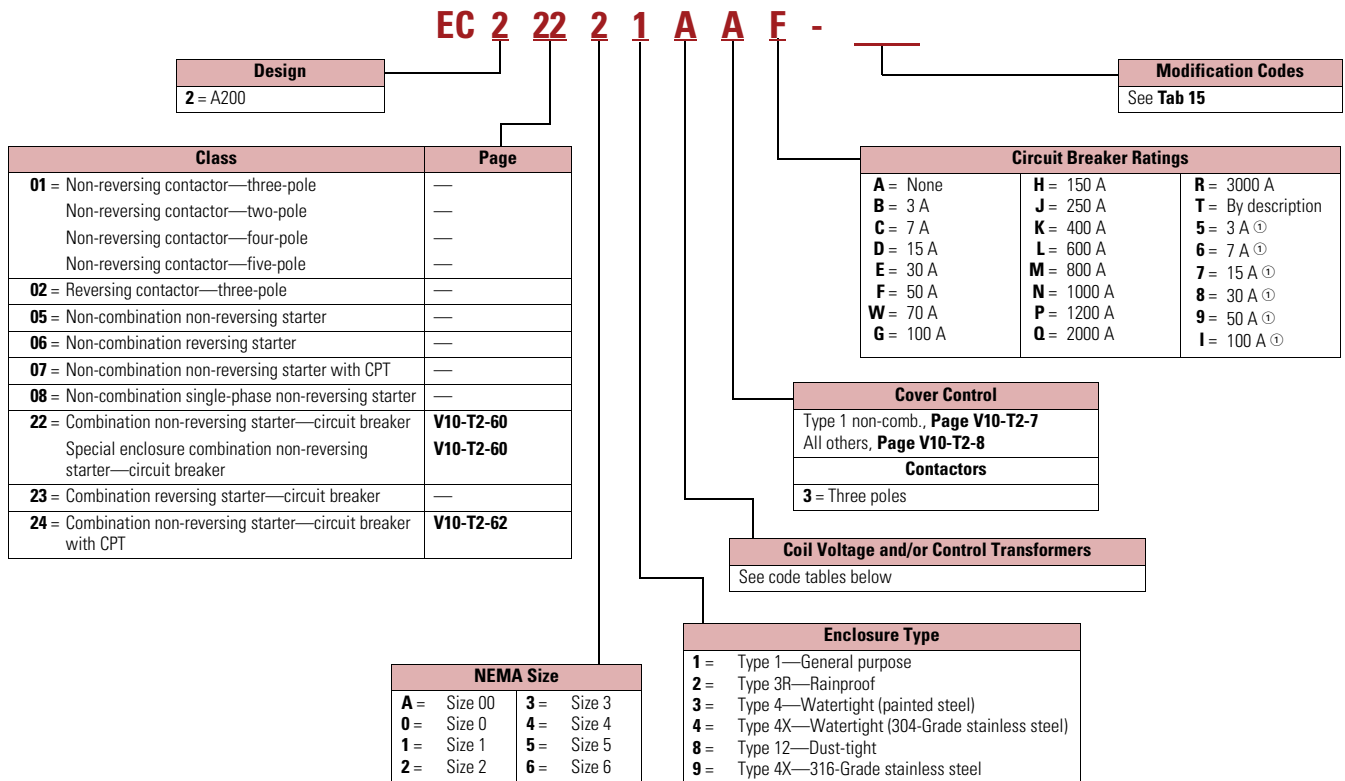
Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

Additional Reference

Other Magnet Coils	V10-T2-4
Cover Control	V10-T2-6
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

Catalog Number Selection

NEMA A200 Line Enclosed Control



Magnetic Coil Codes (System Voltage) ②

Code	Magnet Coil	Code	Magnet Coil	Code	Magnet Coil
A	120/601–10/50	K	240/50	U	24/50
B	240/602–20/50	L	380/50	V	32/50
C	460/604–40/50	M	415/50	W	48/60
D	575/605–50/50	P	12 Vdc	X	104–120/60
E	208/60	Q	24 Vdc	Y	48/50
G	550/50	R	48 Vdc	Z	By description
H	277/60	S	125 Vdc		
J	208–240/60	T	24/60		

Notes

① Use for Sizes 0–3, HMCP 600 V applications only.

② When control power transformer modification codes (**C1–C11**) are used or when starter class includes CPT (that is EC207, 24) see the table at right for system voltage code.

Control Power Transformer Codes (System Voltage)

Code	Primary	Secondary
B	240/480–220/440 wired for 240 V	120/60–110/50
C	240/480–220/440 wired for 480 V	120/60–110/50
D	600/60–550/50	120/60–110/50
E	208/60	120/60
H	277/60	120/60
L	380/50	110/50
M	415/50	110/50
Q	208/60	24
R	240/480–220/440 wired for 240 V	24
S	240/480–220/440 wired for 480 V	24
T	600/60	24
U	277/60	24
V	380/50	24
W	415/50	24
X	240/480/600 wired for 480 V	120
Y	240/480/600 wired for 480 V	24
Z	By description	—

Product Selection

Combination Non-Reversing Starters—Circuit Breaker

2

Class EC222—Combination Non-Reversing Starter—Circuit Breaker ^①

NEMA Size	Motor Voltage	Maximum hp Rating Dual Element Fuses	Magnet Coil Voltage ^②	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) Catalog Number			
					General Purpose Catalog Number	Rainproof Catalog Number	Watertight and Dust-Tight Stainless Steel ^③ Catalog Number	Dust-Tight Industrial External Reset ^{④⑤} Catalog Number				
00	200	1	120	7 A	EC222A1AAC	EC222A2AAC	EC222A4AAC	EC222A8AAC	A200MACAC			
				15 A	EC222A1AAD	EC222A2AAD	EC222A4AAD	EC222A8AAD				
		1-1/2										
		7 A		EC222A1AAC	EC222A2AAC	EC222A4AAC	EC222A8AAC					
	230	1	1-1/2	7 A	EC222A1AAC	EC222A2AAC	EC222A4AAC	EC222A8AAC				
				15 A	EC222A1AAD	EC222A2AAD	EC222A4AAD	EC222A8AAD				
		460		1	3 A	EC222A1AAB	EC222A2AAB	EC222A4AAB		EC222A8AAB		
		2		7 A	EC222A1AAC	EC222A2AAC	EC222A4AAC	EC222A8AAC				
	575	1	2	3 A	EC222A1AAB	EC222A2AAB	EC222A4AAB	EC222A8AAB				
				7 A	EC222A1AAC	EC222A2AAC	EC222A4AAC	EC222A8AAC				
		0		200	1	120	7 A	EC22201AAC		EC22202AAC	EC22204AAC	A200M0CAC
		15 A					EC22201AAD	EC22202AAD		EC22204AAD	EC22208AAD	
3												
7 A	EC22201AAC	EC22202AAC	EC22204AAC		EC22208AAC							
230	1	3	7 A	EC22201AAC	EC22202AAC	EC22204AAC	EC22208AAC					
			15 A	EC22201AAD	EC22202AAD	EC22204AAD	EC22208AAD					
	460		1	3 A	EC22201AAB	EC22202AAB	EC22204AAB	EC22208AAB				
	3		7 A	EC22201AAC	EC22202AAC	EC22204AAC	EC22208AAC					
575	1	5	15 A	EC22201AAD	EC22202AAD	EC22204AAD	EC22208AAD					
			3 A	EC22201AAB	EC22202AAB	EC22204AAB	EC22208AAB					
	3		15 A	EC22201AAD	EC22202AAD	EC22204AAD	EC22208AAD					
	5		7 A	EC22201AAC	EC22202AAC	EC22204AAC	EC22208AAC					
1	200	1	120	7 A	EC22211AAC	EC22212AAC	EC22214AAC	EC22218AAC	A200M1CAC			
				15 A	EC22211AAD	EC22212AAD	EC22214AAD	EC22218AAD				
				3								
				5	30 A	EC22211AAE	EC22212AAE	EC22214AAE		EC22218AAE		
		7-1/2		50 A	EC22211AAF	EC22212AAF	EC22214AAF	EC22218AAF				
		230		1	3	7 A	EC22211AAC	EC22212AAC		EC22214AAC	EC22218AAC	
						15 A	EC22211AAD	EC22212AAD		EC22214AAD	EC22218AAD	
				5		30 A	EC22211AAE	EC22212AAE		EC22214AAE	EC22218AAE	
	7-1/2		50 A	EC22211AAF		EC22212AAF	EC22214AAF	EC22218AAF				
	460	1	5	3 A	EC22211AAB	EC22212AAB	EC22214AAB	EC22218AAB				
				7 A	EC22211AAC	EC22212AAC	EC22214AAC	EC22218AAC				
				15 A	EC22211AAD	EC22212AAD	EC22214AAD	EC22218AAD				
				30 A	EC22211AAE	EC22212AAE	EC22214AAE	EC22218AAE				
		575	1	10	3 A	EC22211AAB	EC22212AAB	EC22214AAB		EC22218AAB		
					7 A	EC22211AAC	EC22212AAC	EC22214AAC		EC22218AAC		
			3		15 A	EC22211AAD	EC22212AAD	EC22214AAD		EC22218AAD		
			5		30 A	EC22211AAE	EC22212AAE	EC22214AAE		EC22218AAE		
	575	1	10	3 A	EC22211AAB	EC22212AAB	EC22214AAB	EC22218AAB				
				7 A	EC22211AAC	EC22212AAC	EC22214AAC	EC22218AAC				
				15 A	EC22211AAD	EC22212AAD	EC22214AAD	EC22218AAD				
				30 A	EC22211AAE	EC22212AAE	EC22214AAE	EC22218AAE				

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

^① For ambient compensated overload relay with auto-reset, add suffix **D**.

^② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

^③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: EC222A4AAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

^⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

Class EC222—Combination Non-Reversing Starter—Circuit Breaker, continued ^①

NEMA Size	Motor Voltage	Maximum hp Rating Dual Element Fuses	Magnet Coil Voltage ^②	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^③ Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{④⑤} Catalog Number	Component Starter (Open) Catalog Number			
2	200	10	120	50 A	EC22221AAF	EC22222AAF	EC22224AAF	EC22228AAF	A200M2CAC			
		10			EC22221AAF	EC22222AAF	EC22224AAF	EC22228AAF				
	15	70 A		EC22221AAW	EC22222AAW	EC22224AAW	EC22228AAW					
	25			EC22221AAF	EC22222AAF	EC22224AAF	EC22228AAF					
	15	30 A		EC22221AAE	EC22222AAE	EC22224AAE	EC22228AAE					
	25			EC22221AAF	EC22222AAF	EC22224AAF	EC22228AAF					
3	200	20	120	100 A	EC22231AAG	EC22232AAG	EC22234AAG	EC22238AAG	A200M3CAC			
		25			EC22231AAX	EC22232AAX	EC22234AAX	EC22238AAX				
	230	25		EC22231AAG	EC22232AAG	EC22234AAG	EC22238AAG					
		30		EC22231AAX	EC22232AAX	EC22234AAX	EC22238AAX					
	460	50		EC22231AAG	EC22232AAG	EC22234AAG	EC22238AAG					
		575		30	50 A	EC22231AAF	EC22232AAF	EC22234AAF		EC22238AAF		
	50			100 A	EC22231AAG	EC22232AAG	EC22234AAG	EC22238AAG				
	4	200		40	120	150 A	EC22241AAH	EC22242AAH		EC22244AAH	EC22248AAH	A200M4CAC
50			EC22241AAH	EC22242AAH			EC22244AAH	EC22248AAH				
460		100	EC22241AAH	EC22242AAH		EC22244AAH	EC22248AAH					
		100	EC22241AAH	EC22242AAH		EC22244AAH	EC22248AAH					
5	200	50	120	250 A	EC22251AAJ	EC22252AAJ	EC22254AAJ	EC22258AAJ	A200M5CAC			
		75			EC22251AAK	EC22252AAK	EC22254AAK	EC22258AAK				
	230	60		250 A	EC22251AAJ	EC22252AAJ	EC22254AAJ	EC22258AAJ				
		100		400 A	EC22251AAK	EC22252AAK	EC22254AAK	EC22258AAK				
	460	125		250 A	EC22251AAJ	EC22252AAJ	EC22254AAJ	EC22258AAJ				
		200		400 A	EC22251AAK	EC22252AAK	EC22254AAK	EC22258AAK				
	575	150		250 A	EC22251AAJ	EC22252AAJ	EC22254AAJ	EC22258AAJ				
		200		400 A	EC22251AAK	EC22252AAK	EC22254AAK	EC22258AAK				
	6	200		150	120	600 A	EC22261AAL	EC22262AAL		EC22263AAL ^⑥	EC22268AAL	A200M6CAC
				200			EC22261AAL	EC22262AAL		EC22263AAL ^⑥	EC22268AAL	
350		EC22261AAL	EC22262AAL	EC22263AAL ^⑥			EC22268AAL					
400		1200 A	EC22261AAP	EC22262AAP		EC22263AAP ^⑥	EC22268AAP					
400		600 A	EC22261AAL	EC22262AAL		EC22263AAL ^⑥	EC22268AAL					

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

- ① For ambient compensated overload relay with auto-reset, add suffix **D**.
- ② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.
- ③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: EC2222**4**AAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
- ⑥ Type 4 (painted steel) sizes 6–9.

2.2

NEMA Contactors and Starters

A200 Full Voltage Controls

Combination Non-Reversing Starters—Circuit Breaker with CPT

2

Class EC224—Combination Non-Reversing Starter—Circuit Breaker with CPT ①

NEMA Size	Motor Voltage	Maximum hp Rating Dual Element Fuses	Magnet Coil Voltage ②	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ③ Catalog Number	Type 12 Dust-Tight Industrial External Reset ④⑤ Catalog Number	Component Starter (Open) Catalog Number		
00	200	1	120	7 A	EC224A1EAC	EC224A2EAC	EC224A4EAC	EC224A8EAC	A200MACAC		
		1-1/2		15 A	EC224A1EAD	EC224A2EAD	EC224A4EAD	EC224A8EAD			
	230	1	7 A	EC224A1BAC	EC224A2BAC	EC224A4BAC	EC224A8BAC				
		1-1/2	15 A	EC224A1BAD	EC224A2BAD	EC224A4BAD	EC224A8BAD				
	460	1	3 A	EC224A1CAB	EC224A2CAB	EC224A4CAB	EC224A8CAB				
		2	7 A	EC224A1CAC	EC224A2CAC	EC224A4CAC	EC224A8CAC				
	575	1	3 A	EC224A1DAB	EC224A2DAB	EC224A4DAB	EC224A8DAB				
		2	7 A	EC224A1DAC	EC224A2DAC	EC224A4DAC	EC224A8DAC				
	0	200	1	120	7 A	EC22401EAC	EC22402EAC	EC22404EAC		EC22408EAC	A200M0CAC
			3		15 A	EC22401EAD	EC22402EAD	EC22404EAD		EC22408EAD	
		230	1	7 A	EC22401BAC	EC22402BAC	EC22404BAC	EC22408BAC			
			3	15 A	EC22401BAD	EC22402BAD	EC22404BAD	EC22408BAD			
		460	1	3 A	EC22401CAB	EC22402CAB	EC22404CAB	EC22408CAB			
			3	7 A	EC22401CAC	EC22402CAC	EC22404CAC	EC22408CAC			
575		1	3 A	EC22401DAB	EC22402DAB	EC22404DAB	EC22408DAB				
		3	15 A	EC22401DAD	EC22402DAD	EC22404DAD	EC22408DAD				
			5	7 A	EC22401DAC	EC22402DAC	EC22404DAC	EC22408DAC			
1		200	1	120	7 A	EC22411EAC	EC22412EAC	EC22414EAC	EC22418EAC	A200M1CAC	
			3		15 A	EC22411EAD	EC22412EAD	EC22414EAD	EC22418EAD		
			5		30 A	EC22411EAE	EC22412EAE	EC22414EAE	EC22418EAE		
			7-1/2		50 A	EC22411EAF	EC22412EAF	EC22414EAF	EC22418EAF		
	230	1	7 A	EC22411BAC	EC22412BAC	EC22414BAC	EC22418BAC				
		3	15 A	EC22411BAD	EC22412BAD	EC22414BAD	EC22418BAD				
		5	30 A	EC22411BAE	EC22412BAE	EC22414BAE	EC22418BAE				
		7-1/2	50 A	EC22411BAF	EC22412BAF	EC22414BAF	EC22418BAF				
	460	1	3 A	EC22411CAB	EC22412CAB	EC22414CAB	EC22418CAB				
		3	7 A	EC22411CAC	EC22412CAC	EC22414CAC	EC22418CAC				
		5	15 A	EC22411CAD	EC22412CAD	EC22414CAD	EC22418CAD				
		10	30 A	EC22411CAE	EC22412CAE	EC22414CAE	EC22418CAE				
	575	1	3 A	EC22411DAB	EC22412DAB	EC22414DAB	EC22418DAB				
		3	7 A	EC22411DAC	EC22412DAC	EC22414DAC	EC22418DAC				
		5	15 A	EC22411DAD	EC22412DAD	EC22414DAD	EC22418DAD				
		10	30 A	EC22411DAE	EC22412DAE	EC22414DAE	EC22418DAE				

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

① For ambient compensated overload relay with auto-reset, add suffix **D**.

② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: EC224A4EAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

Class EC224—Combination Non-Reversing Starter—Circuit Breaker with CPT, continued ①

NEMA Size	Motor Voltage	Maximum hp Rating Dual Element Fuses	Magnet Coil Voltage ②	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ③ Catalog Number	Type 12 Dust-Tight Industrial External Reset ④⑤ Catalog Number	Component Starter (Open) Catalog Number			
2	200	10	120	50 A	EC22421EAF	EC22422EAF	EC22424EAF	EC22428EAF	A200M2CAC			
		10			EC22421BAF	EC22422BAF	EC22424BAF	EC22428BAF				
	15	70 A		EC22421BAW	EC22422BAW	EC22424BAW	EC22428BAW					
	25			50 A	EC22421CAF	EC22422CAF	EC22424CAF	EC22428CAF				
	460	15		30 A	EC22421CAE	EC22422CAE	EC22424CAE	EC22428CAE				
		25		50 A	EC22421DAF	EC22422DAF	EC22424DAF	EC22428DAF				
3	200	20	120	100 A	EC22431EAG	EC22432EAG	EC22434EAG	EC22438EAG	A200M3CAC			
		25			EC22431EAX	EC22432EAX	EC22434EAX	EC22438EAX				
	230	25		EC22431BAG	EC22432BAG	EC22434BAG	EC22438BAG					
		30		EC22431BAX	EC22432BAX	EC22434BAX	EC22438BAX					
	460	50		EC22431CAG	EC22432CAG	EC22434CAG	EC22438CAG					
		575		30	50 A	EC22431DAF	EC22432DAF	EC22434DAF		EC22438DAF		
	50			100 A	EC22431DAG	EC22432DAG	EC22434DAG	EC22438DAG				
	4	200		40	120	150 A	EC22441EAH	EC22442EAH		EC22444EAH	EC22448EAH	A200M4CAC
50			EC22441BAH	EC22442BAH			EC22444BAH	EC22448BAH				
460		100	EC22441CAH	EC22442CAH		EC22444CAH	EC22448CAH					
		100	EC22441DAH	EC22442DAH		EC22444DAH	EC22448DAH					
5	200	50	120	250 A	EC22451EAJ	EC22452EAJ	EC22454EAJ	EC22458EAJ	A200M5CAC			
		75			400 A	EC22451EAK	EC22452EAK	EC22454EAK		EC22458EAK		
	230	60		250 A	EC22451BAJ	EC22452BAJ	EC22454BAJ	EC22458BAJ				
		100		400 A	EC22451BAK	EC22452BAK	EC22454BAK	EC22458BAK				
	460	125		250 A	EC22451CAJ	EC22452CAJ	EC22454CAJ	EC22458CAJ				
		200		400 A	EC22451CAK	EC22452CAK	EC22454CAK	EC22458CAK				
	575	150		250 A	EC22451DAJ	EC22452DAJ	EC22454DAJ	EC22458DAJ				
		200		400 A	EC22451DAK	EC22452DAK	EC22454DAK	EC22458DAK				
	6	200		150	120	600 A	EC22461EAL	EC22462EAL		EC22463EAL ⑥	EC22468EAL	A200M6CAC
				200			EC22461BAL	EC22462BAL		EC22463BAL ⑥	EC22468BAL	
460		350	EC22461CAL	EC22462CAL		EC22463CAL ⑥	EC22468CAL					
		400	1200 A	EC22461CAP		EC22462CAP	EC22463CAP ⑥	EC22468CAP				
575		400	600 A	EC22461DAL		EC22462DAL	EC22463DAL ⑥	EC22468DAL				

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

- ① For ambient compensated overload relay with auto-reset, add suffix **D**.
- ② For other magnet coil voltages substitute the eighth digit with appropriate digit based on modification table on **Page V10-T2-4**.
- ③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: EC22424EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
- ⑥ Type 4 (painted steel) sizes 6–9.

Freedom Multispeed Starters

2



Contents

Description

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Product Description

Eaton's multispeed panels feature Eaton's Freedom Series starters and contactors with a compact, space-saving design, high strength, impact and temperature resistant insulating materials.

Features

Two-speed starters are designed for starting and controlling both separate (two-winding) and reconnectable (one-winding) motors. Separate winding, wye-wye motors have a separate winding for each speed. Reconnectable, consequent pole motors use the same winding for both speeds. All standard starters are wired for selective control.

Standards and Certifications

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- OSHPD Certified (OSP-0015-10)

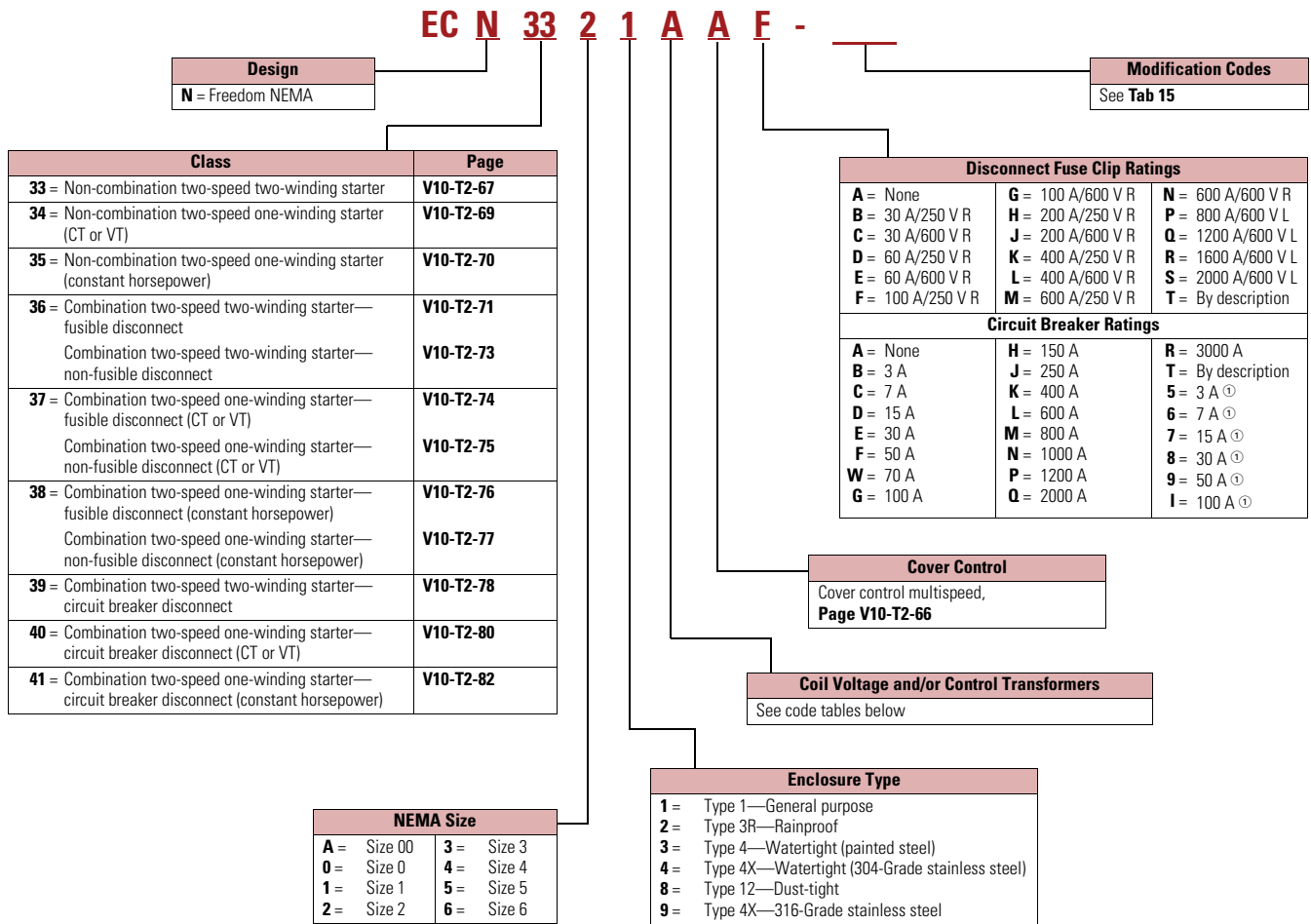
Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

Additional Reference

Other Magnet Coils	V10-T2-4
Cover Control	V10-T2-66
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Catalog Number Selection

NEMA Freedom Multispeed Enclosed Control



Magnetic Coil Codes (System Voltage) ②

Code	Magnet Coil	Code	Magnet Coil	Code	Magnet Coil
A	120/601–10/50	K	240/50	U	24/50
B	240/602–20/50	L	380/50	V	32/50
C	460/604–40/50	M	415/50	W	48/60
D	575/605–50/50	P	12 Vdc	X	104–120/60
E	208/60	Q	24 Vdc	Y	48/50
G	550/50	R	48 Vdc	Z	By description
H	277/60	S	125 Vdc		
J	208–240/60	T	24/60		

Control Power Transformer Codes (System Voltage)

Code	Primary	Secondary
B	240/480–220/440 wired for 240 V	120/60–110/50
C	240/480–220/440 wired for 480 V	120/60–110/50
D	600/60–550/50	120/60–110/50
E	208/60	120/60
H	277/60	120/60
L	380/50	110/50
M	415/50	110/50
Q	208/60	24
R	240/480–220/440 wired for 240 V	24
S	240/480–220/440 wired for 480 V	24
T	600/60	24
U	277/60	24
V	380/50	24
W	415/50	24
X	240/480/600 wired for 480 V	120
Y	240/480/600 wired for 480 V	24
Z	By description	—

Notes

- ① Use for Sizes 0–3, HMCP 600 V applications only.
- ② When control power transformer modification codes (C1–C11) are used or when starter class includes CPT, see the table at right for system voltage code.

Cover Control

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed

To order factory installed pilot devices, change the ninth character of the catalog number to the alpha shown in the table below. Example: to order an **ECN3414CAA** with FAST/OFF/SLOW selector switch and two red pilot lights, change the **A** to **J**, that is, ECN3414C**J**A.

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Product Selection

Multispeed Pilot Devices



Multispeed Pilot Devices

Description	Factory Installed Flange Control			Field Installation Kits	
	Position 9 Alpha	Type 1 Non-Combination ①	All Others ②	Type 1 Non-Combination ① Catalog Number	All Others ② Catalog Number
No cover mounted pilot devices	A	■	■	C400GK0	—
FAST/SLOW/STOP pushbuttons	B	■	■	C400GK9 ③	C400T7
With two red pilot lights	C	■	■	C400GK94 ④	—
With two red/one green pilot lights	D	—	■	—	—
HIGH/LOW/STOP pushbuttons	E	—	■	—	C400T8
With two red pilot lights	F	—	■	—	—
With two red/one green pilot lights	G	—	■	—	—
FAST/OFF/SLOW selector switch	H	—	■	—	C400T17
With two red pilot lights	J	—	■	—	—
With two red/one green pilot lights	K	—	■	—	—
Two red pilot lights	P	■	■	C400GK44 ④	⑤
One green pilot light	Q	■	■	C400GK41 ④	C400T10 ④
Two red/one green pilot lights	R	■	■	—	—
HIGH/OFF/LOW selector switch	V	—	■	—	C400T18
With two red pilot lights	W	—	■	—	—
With two red/one green pilot lights	X	—	■	—	—

Notes

- ① Type 1, NEMA Sizes 00–2 non-combination ONLY.
- ② Type 1, NEMA Sizes 3–7 non-combination PLUS all Type 3R, 4X, 12 non-combination PLUS all combination.
- ③ Uses a FAST/SLOW/OFF pushbutton.
- ④ Add code letter from table below to catalog number for voltage—kits only. Example: C400GK94**B**

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	240 V 60 Hz	B	480 V 60 Hz	C
208V 60 Hz	E	380 V 50 Hz	L	600 V 60 Hz	D

- ⑤ Order quantity two of C400T9 ④.

Non-Combination Starters

Features

- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600 V maximum

Product Selection

Class ECN33—Non-Combination Two-Speed Two-Winding Starter

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	—	120	ECN3301AAA	ECN3302AAA	ECN3304AAA	ECN3308AAA	AN700BN022A
	200	3	2	208	ECN3301EAA	ECN3302EAA	ECN3304EAA	ECN3308EAA	AN700BN022E
	230	3	2	240	ECN3301BAA	ECN3302BAA	ECN3304BAA	ECN3308BAA	AN700BN022B
	460	5	3	480	ECN3301CAA	ECN3302CAA	ECN3304CAA	ECN3308CAA	AN700BN022C
	575	5	3	600	ECN3301DAA	ECN3302DAA	ECN3304DAA	ECN3308DAA	AN700BN022D
1	—	—	—	120	ECN3311AAA	ECN3312AAA	ECN3314AAA	ECN3318AAA	AN700DN022A
	200	7-1/2	5	208	ECN3311EAA	ECN3312EAA	ECN3314EAA	ECN3318EAA	AN700DN022E
	230	7-1/2	5	240	ECN3311BAA	ECN3312BAA	ECN3314BAA	ECN3318BAA	AN700DN022B
	460	10	7-1/2	480	ECN3311CAA	ECN3312CAA	ECN3314CAA	ECN3318CAA	AN700DN022C
	575	10	7-1/2	600	ECN3311DAA	ECN3312DAA	ECN3314DAA	ECN3318DAA	AN700DN022D
2	—	—	—	120	ECN3321AAA	ECN3322AAA	ECN3324AAA	ECN3328AAA	AN700GN022A
	200	10	7-1/2	208	ECN3321EAA	ECN3322EAA	ECN3324EAA	ECN3328EAA	AN700GN022E
	230	15	10	240	ECN3321BAA	ECN3322BAA	ECN3324BAA	ECN3328BAA	AN700GN022B
	460	25	20	480	ECN3321CAA	ECN3322CAA	ECN3324CAA	ECN3328CAA	AN700GN022C
	575	25	20	600	ECN3321DAA	ECN3322DAA	ECN3324DAA	ECN3328DAA	AN700GN022D
3	—	—	—	120	ECN3331AAA	ECN3332AAA	ECN3334AAA	ECN3338AAA	AN700KN022A
	200	25	20	208	ECN3331EAA	ECN3332EAA	ECN3334EAA	ECN3338EAA	AN700KN022E
	230	30	25	240	ECN3331BAA	ECN3332BAA	ECN3334BAA	ECN3338BAA	AN700KN022B
	460	50	40	480	ECN3331CAA	ECN3332CAA	ECN3334CAA	ECN3338CAA	AN700KN022C
	575	50	40	600	ECN3331DAA	ECN3332DAA	ECN3334DAA	ECN3338DAA	AN700KN022D
4	—	—	—	120	ECN3341AAA	ECN3342AAA	ECN3344AAA	ECN3348AAA	AN700NN022A
	200	40	30	208	ECN3341EAA	ECN3342EAA	ECN3344EAA	ECN3348EAA	AN700NN022E
	230	50	40	240	ECN3341BAA	ECN3342BAA	ECN3344BAA	ECN3348BAA	AN700NN022B
	460	100	75	480	ECN3341CAA	ECN3342CAA	ECN3344CAA	ECN3348CAA	AN700NN022C
	575	100	75	600	ECN3341DAA	ECN3342DAA	ECN3344DAA	ECN3348DAA	AN700NN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Constant or variable torque	5	10	25	50	75	150	300
Constant horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3304AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN33—Non-Combination Two-Speed Two-Winding Starter, continued

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component
		Constant or Variable Torque	Constant Horsepower		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	—	—	—	120	ECN3351AAA	ECN3352AAA	ECN3354AAA	ECN3358AAA	AN700SN022A
	200	75	60	208	ECN3351EAA	ECN3352EAA	ECN3354EAA	ECN3358EAA	AN700SN022E
	230	100	75	240	ECN3351BAA	ECN3352BAA	ECN3354BAA	ECN3358BAA	AN700SN022B
	460	200	150	480	ECN3351CAA	ECN3352CAA	ECN3354CAA	ECN3358CAA	AN700SN022C
	575	200	150	600	ECN3351DAA	ECN3352DAA	ECN3354DAA	ECN3358DAA	AN700SN022D
6	200	150	100	208	ECN3361EAA	ECN3362EAA	ECN3363EAA ③	ECN3368EAA	AN700TN022E
	230	200	150	240	ECN3361BAA	ECN3362BAA	ECN3363BAA ③	ECN3368BAA	AN700TN022B
	460	400	300	480	ECN3361CAA	ECN3362CAA	ECN3363CAA ③	ECN3368CAA	AN700TN022C
	575	400	300	600	ECN3361DAA	ECN3362DAA	ECN3363DAA ③	ECN3368DAA	AN700TN022D
7	230	300	225	240	ECN3371BAA	ECN3372BAA	ECN3373BAA ③	ECN3378BAA	AN700UN022B
	460	600	450	480	ECN3371CAA	ECN3372CAA	ECN3373CAA ③	ECN3378CAA	AN700UN022C
	575	600	450	600	ECN3371DAA	ECN3372DAA	ECN3373DAA ③	ECN3378DAA	AN700UN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Constant or variable torque	5	10	25	50	75	150	300
Constant horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3354AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6 and 7.

Class ECN34—Non-Combination Two-Speed One-Winding Starter (CT or VT)

NEMA Size	Motor Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
				General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	ECN3401AAA	ECN3402AAA	ECN3404AAA	ECN3408AAA	AN700BN0218A
	200	3	208	ECN3401EAA	ECN3402EAA	ECN3404EAA	ECN3408EAA	AN700BN0218E
	230	3	240	ECN3401BAA	ECN3402BAA	ECN3404BAA	ECN3408BAA	AN700BN0218B
	460	5	480	ECN3401CAA	ECN3402CAA	ECN3404CAA	ECN3408CAA	AN700BN0218C
	575	5	600	ECN3401DAA	ECN3402DAA	ECN3404DAA	ECN3408DAA	AN700BN0218D
1	—	—	120	ECN3411AAA	ECN3412AAA	ECN3414AAA	ECN3418AAA	AN700DN0218A
	200	7-1/2	208	ECN3411EAA	ECN3412EAA	ECN3414EAA	ECN3418EAA	AN700DN0218E
	230	7-1/2	240	ECN3411BAA	ECN3412BAA	ECN3414BAA	ECN3418BAA	AN700DN0218B
	460	10	480	ECN3411CAA	ECN3412CAA	ECN3414CAA	ECN3418CAA	AN700DN0218C
	575	10	600	ECN3411DAA	ECN3412DAA	ECN3414DAA	ECN3418DAA	AN700DN0218D
2	—	—	120	ECN3421AAA	ECN3422AAA	ECN3424AAA	ECN3428AAA	AN700GN0218A
	200	10	208	ECN3421EAA	ECN3422EAA	ECN3424EAA	ECN3428EAA	AN700GN0218E
	230	15	240	ECN3421BAA	ECN3422BAA	ECN3424BAA	ECN3428BAA	AN700GN0218B
	460	25	480	ECN3421CAA	ECN3422CAA	ECN3424CAA	ECN3428CAA	AN700GN0218C
	575	25	600	ECN3421DAA	ECN3422DAA	ECN3424DAA	ECN3428DAA	AN700GN0218D
3	—	—	120	ECN3431AAA	ECN3432AAA	ECN3434AAA	ECN3438AAA	AN700KN0218A
	200	25	208	ECN3431EAA	ECN3432EAA	ECN3434EAA	ECN3438EAA	AN700KN0218E
	230	30	240	ECN3431BAA	ECN3432BAA	ECN3434BAA	ECN3438BAA	AN700KN0218B
	460	50	480	ECN3431CAA	ECN3432CAA	ECN3434CAA	ECN3438CAA	AN700KN0218C
	575	50	600	ECN3431DAA	ECN3432DAA	ECN3434DAA	ECN3438DAA	AN700KN0218D
4	—	—	120	ECN3441AAA	ECN3442AAA	ECN3444AAA	ECN3448AAA	AN700NN0218A
	200	40	208	ECN3441EAA	ECN3442EAA	ECN3444EAA	ECN3448EAA	AN700NN0218E
	230	50	240	ECN3441BAA	ECN3442BAA	ECN3444BAA	ECN3448BAA	AN700NN0218B
	460	100	480	ECN3441CAA	ECN3442CAA	ECN3444CAA	ECN3448CAA	AN700NN0218C
	575	100	600	ECN3441DAA	ECN3442DAA	ECN3444DAA	ECN3448DAA	AN700NN0218D
5	—	—	120	ECN3451AAA	ECN3452AAA	ECN3454AAA	ECN3458AAA	AN700SN0218A
	200	75	208	ECN3451EAA	ECN3452EAA	ECN3454EAA	ECN3458EAA	AN700SN0218E
	230	100	240	ECN3451BAA	ECN3452BAA	ECN3454BAA	ECN3458BAA	AN700SN0218B
	460	200	480	ECN3451CAA	ECN3452CAA	ECN3454CAA	ECN3458CAA	AN700SN0218C
	575	200	600	ECN3451DAA	ECN3452DAA	ECN3454DAA	ECN3458DAA	AN700SN0218D
6	200	150	208	ECN3461EAA	ECN3462EAA	ECN3463EAA ③	ECN3468EAA	AN700TN0218E
	230	200	240	ECN3461BAA	ECN3462BAA	ECN3463BAA ③	ECN3468BAA	AN700TN0218B
	460	400	480	ECN3461CAA	ECN3462CAA	ECN3463CAA ③	ECN3468CAA	AN700TN0218C
	575	400	600	ECN3461DAA	ECN3462DAA	ECN3463DAA ③	ECN3468DAA	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Horsepower	5	10	25	50	75	150	300

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3404AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

2.3

NEMA Contactors and Starters

Freedom Multispeed Starters

2

Class ECN35—Non-Combination Two-Speed One-Winding Starter (Constant Horsepower)

NEMA Size	Motor Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) Catalog Number
				General Purpose Catalog Number	Rainproof Catalog Number	Watertight and Dust-Tight Stainless Steel ② Catalog Number	Dust-Tight Industrial External Reset Catalog Number	
0	—	—	120	ECN3501AAA	ECN3502AAA	ECN3504AAA	ECN3508AAA	AN700BN0218A
	200	2	208	ECN3501EAA	ECN3502EAA	ECN3504EAA	ECN3508EAA	AN700BN0218E
	230	2	240	ECN3501BAA	ECN3502BAA	ECN3504BAA	ECN3508BAA	AN700BN0218B
	460	3	480	ECN3501CAA	ECN3502CAA	ECN3504CAA	ECN3508CAA	AN700BN0218C
	575	3	600	ECN3501DAA	ECN3502DAA	ECN3504DAA	ECN3508DAA	AN700BN0218D
1	—	—	120	ECN3511AAA	ECN3512AAA	ECN3514AAA	ECN3518AAA	AN700DN0218A
	200	5	208	ECN3511EAA	ECN3512EAA	ECN3514EAA	ECN3518EAA	AN700DN0218E
	230	5	240	ECN3511BAA	ECN3512BAA	ECN3514BAA	ECN3518BAA	AN700DN0218B
	460	7-1/2	480	ECN3511CAA	ECN3512CAA	ECN3514CAA	ECN3518CAA	AN700DN0218C
	575	7-1/2	600	ECN3511DAA	ECN3512DAA	ECN3514DAA	ECN3518DAA	AN700DN0218D
2	—	—	120	ECN3521AAA	ECN3522AAA	ECN3524AAA	ECN3528AAA	AN700GN0218A
	200	7-1/2	208	ECN3521EAA	ECN3522EAA	ECN3524EAA	ECN3528EAA	AN700GN0218E
	230	10	240	ECN3521BAA	ECN3522BAA	ECN3524BAA	ECN3528BAA	AN700GN0218B
	460	20	480	ECN3521CAA	ECN3522CAA	ECN3524CAA	ECN3528CAA	AN700GN0218C
	575	20	600	ECN3521DAA	ECN3522DAA	ECN3524DAA	ECN3528DAA	AN700GN0218D
3	—	—	120	ECN3531AAA	ECN3532AAA	ECN3534AAA	ECN3538AAA	AN700KN0218A
	200	20	208	ECN3531EAA	ECN3532EAA	ECN3534EAA	ECN3538EAA	AN700KN0218E
	230	25	240	ECN3531BAA	ECN3532BAA	ECN3534BAA	ECN3538BAA	AN700KN0218B
	460	40	480	ECN3531CAA	ECN3532CAA	ECN3534CAA	ECN3538CAA	AN700KN0218C
	575	40	600	ECN3531DAA	ECN3532DAA	ECN3534DAA	ECN3538DAA	AN700KN0218D
4	—	—	120	ECN3541AAA	ECN3542AAA	ECN3544AAA	ECN3548AAA	AN700NN0218A
	200	30	208	ECN3541EAA	ECN3542EAA	ECN3544EAA	ECN3548EAA	AN700NN0218E
	230	40	240	ECN3541BAA	ECN3542BAA	ECN3544BAA	ECN3548BAA	AN700NN0218B
	460	75	480	ECN3541CAA	ECN3542CAA	ECN3544CAA	ECN3548CAA	AN700NN0218C
	575	75	600	ECN3541DAA	ECN3542DAA	ECN3544DAA	ECN3548DAA	AN700NN0218D
5	—	—	120	ECN3551AAA	ECN3552AAA	ECN3554AAA	ECN3558AAA	AN700SN0218A
	200	60	208	ECN3551EAA	ECN3552EAA	ECN3554EAA	ECN3558EAA	AN700SN0218E
	230	75	240	ECN3551BAA	ECN3552BAA	ECN3554BAA	ECN3558BAA	AN700SN0218B
	460	150	480	ECN3551CAA	ECN3552CAA	ECN3554CAA	ECN3558CAA	AN700SN0218C
	575	150	600	ECN3551DAA	ECN3552DAA	ECN3554DAA	ECN3558DAA	AN700SN0218D
6	200	100	208	ECN3561EAA	ECN3562EAA	ECN3563EAA ③	ECN3568EAA	AN700TN0218E
	230	150	240	ECN3561BAA	ECN3562BAA	ECN3563BAA ③	ECN3568BAA	AN700TN0218B
	460	300	480	ECN3561CAA	ECN3562CAA	ECN3563CAA ③	ECN3568CAA	AN700TN0218C
	575	300	600	ECN3561DAA	ECN3562DAA	ECN3563DAA ③	ECN3568DAA	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3504AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

Combination Starters

Features

- Choice of fusible/non-fusible combination with disconnect switch or combination HMCP or magnetic trip circuit breaker
- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600 V maximum

Product Selection

Class ECN36—Combination Two-Speed Two-Winding Starter—Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Fuse Clip Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset Catalog Number	Component Starter (Open) Catalog Number
		Constant or Variable Torque	Constant Horsepower							
0	—	—	—	120	30 A	ECN3601AAB	ECN3602AAB	ECN3604AAB	ECN3608AAB	AN700BN022A
	200	3	2	208		ECN3601EAB	ECN3602EAB	ECN3604EAB	ECN3608EAB	AN700BN022E
	230			240		ECN3601BAB	ECN3602BAB	ECN3604BAB	ECN3608BAB	AN700BN022B
	460	5	3	480		ECN3601CAC	ECN3602CAC	ECN3604CAC	ECN3608CAC	AN700BN022C
	575			600		ECN3601DAC	ECN3602DAC	ECN3604DAC	ECN3608DAC	AN700BN022D
1	—	—	—	120	30 A	ECN3611AAB	ECN3612AAB	ECN3614AAB	ECN3618AAB	AN700DN022A
	200	7-1/2	5	208		ECN3611EAB	ECN3612EAB	ECN3614EAB	ECN3618EAB	AN700DN022E
	230			240		ECN3611BAB	ECN3612BAB	ECN3614BAB	ECN3618BAB	AN700DN022B
	460	10	7-1/2	480		ECN3611CAC	ECN3612CAC	ECN3614CAC	ECN3618CAC	AN700DN022C
	575			600		ECN3611DAC	ECN3612DAC	ECN3614DAC	ECN3618DAC	AN700DN022D
2	—	—	—	120	60 A	ECN3621AAD	ECN3622AAD	ECN3624AAD	ECN3628AAD	AN700GN022A
	200	10	7-1/2	208		ECN3621EAD	ECN3622EAD	ECN3624EAD	ECN3628EAD	AN700GN022E
	230	15	10	240		ECN3621BAD	ECN3622BAD	ECN3624BAD	ECN3628BAD	AN700GN022B
	460	25	20	480		ECN3621CAE	ECN3622CAE	ECN3624CAE	ECN3628CAE	AN700GN022C
	575			600		ECN3621DAE	ECN3622DAE	ECN3624DAE	ECN3628DAE	AN700GN022D
3	—	—	—	120	100 A	ECN3631AAF	ECN3632AAF	ECN3634AAF	ECN3638AAF	AN700KN022A
	200	25	20	208		ECN3631EAF	ECN3632EAF	ECN3634EAF	ECN3638EAF	AN700KN022E
	230	30	25	240		ECN3631BAF	ECN3632BAF	ECN3634BAF	ECN3638BAF	AN700KN022B
	460	50	40	480		ECN3631CAG	ECN3632CAG	ECN3634CAG	ECN3638CAG	AN700KN022C
	575			600		ECN3631DAG	ECN3632DAG	ECN3634DAG	ECN3638DAG	AN700KN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Constant or variable torque	5	10	25	50	75	150	300
Constant horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN360**4**AAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECN36—Combination Two-Speed Two-Winding Starter—Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Fuse Clip Amperes	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	
						Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	—	—	—	120	200 A	ECN3641AAH	ECN3642AAH	ECN3644AAH	ECN3648AAH	AN700NN022A
	200	40	30	208		ECN3641EAH	ECN3642EAH	ECN3644EAH	ECN3648EAH	AN700NN022E
	230	50	40	240		ECN3641BAH	ECN3642BAH	ECN3644BAH	ECN3648BAH	AN700NN022B
	460	100	75	480		ECN3641CAJ	ECN3642CAJ	ECN3644CAJ	ECN3648CAJ	AN700NN022C
	575	100	75	600		ECN3641DAJ	ECN3642DAJ	ECN3644DAJ	ECN3648DAJ	AN700NN022D
5	—	—	—	120	400 A	ECN3651AAK	ECN3652AAK	ECN3654AAK	ECN3658AAK	AN700SN022A
	200	75	60	208		ECN3651EAK	ECN3652EAK	ECN3654EAK	ECN3658EAK	AN700SN022E
	230	100	75	240		ECN3651BAK	ECN3652BAK	ECN3654BAK	ECN3658BAK	AN700SN022B
	460	200	150	480		ECN3651CAL	ECN3652CAL	ECN3654CAL	ECN3658CAL	AN700SN022C
	575	200	150	600		ECN3651DAL	ECN3652DAL	ECN3654DAL	ECN3658DAL	AN700SN022D
6	200	150	100	208	600 A	ECN3661EAM	ECN3662EAM	ECN3663EAM ③	ECN3668EAM	AN700TN022E
	230	200	150	240		ECN3661BAM	ECN3662BAM	ECN3663BAM ③	ECN3668BAM	AN700TN022B
	460	400	300	480		ECN3661CAN	ECN3662CAN	ECN3663CAN ③	ECN3668CAN	AN700TN022C
	575	400	300	600		ECN3661DAN	ECN3662DAN	ECN3663DAN ③	ECN3668DAN	AN700TN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Constant or variable torque	5	10	25	50	75	150	300
Constant horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3644AAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

Class ECN36—Combination Two-Speed Two-Winding Starter—Non-Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Fuse Clip Amperes	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	
						Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	—	120	30 A	ECN3601AAA	ECN3602AAA	ECN3604AAA	ECN3608AAA	AN700BN022A
	200	3	2	208		ECN3601EAA	ECN3602EAA	ECN3604EAA	ECN3608EAA	AN700BN022E
	230	3	2	240		ECN3601BAA	ECN3602BAA	ECN3604BAA	ECN3608BAA	AN700BN022B
	460	5	3	480		ECN3601CAA	ECN3602CAA	ECN3604CAA	ECN3608CAA	AN700BN022C
	575	5	3	600		ECN3601DAA	ECN3602DAA	ECN3604DAA	ECN3608DAA	AN700BN022D
1	—	—	—	120	30 A	ECN3611AAA	ECN3612AAA	ECN3614AAA	ECN3618AAA	AN700DN022A
	200	7-1/2	5	208		ECN3611EAA	ECN3612EAA	ECN3614EAA	ECN3618EAA	AN700DN022E
	230	7-1/2	5	240		ECN3611BAA	ECN3612BAA	ECN3614BAA	ECN3618BAA	AN700DN022B
	460	10	7-1/2	480		ECN3611CAA	ECN3612CAA	ECN3614CAA	ECN3618CAA	AN700DN022C
	575	10	7-1/2	600		ECN3611DAA	ECN3612DAA	ECN3614DAA	ECN3618DAA	AN700DN022D
2	—	—	—	120	60 A	ECN3621AAA	ECN3622AAA	ECN3624AAA	ECN3628AAA	AN700GN022A
	200	10	7-1/2	208		ECN3621EAA	ECN3622EAA	ECN3624EAA	ECN3628EAA	AN700GN022E
	230	15	10	240		ECN3621BAA	ECN3622BAA	ECN3624BAA	ECN3628BAA	AN700GN022B
	460	25	20	480		ECN3621CAA	ECN3622CAA	ECN3624CAA	ECN3628CAA	AN700GN022C
	575	25	20	600		ECN3621DAA	ECN3622DAA	ECN3624DAA	ECN3628DAA	AN700GN022D
3	—	—	—	120	100 A	ECN3631AAA	ECN3632AAA	ECN3634AAA	ECN3638AAA	AN700KN022A
	200	25	20	208		ECN3631EAA	ECN3632EAA	ECN3634EAA	ECN3638EAA	AN700KN022E
	230	30	25	240		ECN3631BAA	ECN3632BAA	ECN3634BAA	ECN3638BAA	AN700KN022B
	460	50	40	480		ECN3631CAA	ECN3632CAA	ECN3634CAA	ECN3638CAA	AN700KN022C
	575	50	40	600		ECN3631DAA	ECN3632DAA	ECN3634DAA	ECN3638DAA	AN700KN022D
4	—	—	—	120	200 A	ECN3641AAA	ECN3642AAA	ECN3644AAA	ECN3648AAA	AN700NN022A
	200	40	30	208		ECN3641EAA	ECN3642EAA	ECN3644EAA	ECN3648EAA	AN700NN022E
	230	50	40	240		ECN3641BAA	ECN3642BAA	ECN3644BAA	ECN3648BAA	AN700NN022B
	460	100	75	480		ECN3641CAA	ECN3642CAA	ECN3644CAA	ECN3648CAA	AN700NN022C
	575	100	75	600		ECN3641DAA	ECN3642DAA	ECN3644DAA	ECN3648DAA	AN700NN022D
5	—	—	—	120	400 A	ECN3651AAA	ECN3652AAA	ECN3654AAA	ECN3658AAA	AN700SN022A
	200	75	60	208		ECN3651EAA	ECN3652EAA	ECN3654EAA	ECN3658EAA	AN700SN022E
	230	100	75	240		ECN3651BAA	ECN3652BAA	ECN3654BAA	ECN3658BAA	AN700SN022B
	460	200	150	480		ECN3651CAA	ECN3652CAA	ECN3654CAA	ECN3658CAA	AN700SN022C
	575	200	150	600		ECN3651DAA	ECN3652DAA	ECN3654DAA	ECN3658DAA	AN700SN022D
6	200	150	100	208	600 A	ECN3661EAA	ECN3662EAA	ECN3663EAA ③	ECN3668EAA	AN700TN022E
	230	200	150	240		ECN3661BAA	ECN3662BAA	ECN3663BAA ③	ECN3668BAA	AN700TN022B
	460	400	300	480		ECN3661CAA	ECN3662CAA	ECN3663CAA ③	ECN3668CAA	AN700TN022C
	575	400	300	600		ECN3661DAA	ECN3662DAA	ECN3663DAA ③	ECN3668DAA	AN700TN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Constant or variable torque	5	10	25	50	75	150	300
Constant horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3604AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

Class ECN37—Combination Two-Speed One-Winding Starter (CT or VT)—Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Fuse Clip Amperes	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30 A	ECN3701AAB	ECN3702AAB	ECN3704AAB	ECN3708AAB	AN700BN0218A
	200	3	208		ECN3701EAB	ECN3702EAB	ECN3704EAB	ECN3708EAB	AN700BN0218E
	230	3	240		ECN3701BAB	ECN3702BAB	ECN3704BAB	ECN3708BAB	AN700BN0218B
	460	5	480		ECN3701CAC	ECN3702CAC	ECN3704CAC	ECN3708CAC	AN700BN0218C
	575	5	600		ECN3701DAC	ECN3702DAC	ECN3704DAC	ECN3708DAC	AN700BN0218D
1	—	—	120	30 A	ECN3711AAB	ECN3712AAB	ECN3714AAB	ECN3718AAB	AN700DN0218A
	200	7-1/2	208		ECN3711EAB	ECN3712EAB	ECN3714EAB	ECN3718EAB	AN700DN0218E
	230	7-1/2	240		ECN3711BAB	ECN3712BAB	ECN3714BAB	ECN3718BAB	AN700DN0218B
	460	10	480		ECN3711CAC	ECN3712CAC	ECN3714CAC	ECN3718CAC	AN700DN0218C
	575	10	600		ECN3711DAC	ECN3712DAC	ECN3714DAC	ECN3718DAC	AN700DN0218D
2	—	—	120	60 A	ECN3721AAD	ECN3722AAD	ECN3724AAD	ECN3728AAD	AN700GN0218A
	200	10	208		ECN3721EAD	ECN3722EAD	ECN3724EAD	ECN3728EAD	AN700GN0218E
	230	15	240		ECN3721BAD	ECN3722BAD	ECN3724BAD	ECN3728BAD	AN700GN0218B
	460	25	480		ECN3721CAE	ECN3722CAE	ECN3724CAE	ECN3728CAE	AN700GN0218C
	575	25	600		ECN3721DAE	ECN3722DAE	ECN3724DAE	ECN3728DAE	AN700GN0218D
3	—	—	120	100 A	ECN3731AAF	ECN3732AAF	ECN3734AAF	ECN3738AAF	AN700KN0218A
	200	25	208		ECN3731EAF	ECN3732EAF	ECN3734EAF	ECN3738EAF	AN700KN0218E
	230	30	240		ECN3731BAF	ECN3732BAF	ECN3734BAF	ECN3738BAF	AN700KN0218B
	460	50	480		ECN3731CAG	ECN3732CAG	ECN3734CAG	ECN3738CAG	AN700KN0218C
	575	50	600		ECN3731DAG	ECN3732DAG	ECN3734DAG	ECN3738DAG	AN700KN0218D
4	—	—	120	200 A	ECN3741AAH	ECN3742AAH	ECN3744AAH	ECN3748AAH	AN700NN0218A
	200	40	208		ECN3741EAH	ECN3742EAH	ECN3744EAH	ECN3748EAH	AN700NN0218E
	230	50	240		ECN3741BAH	ECN3742BAH	ECN3744BAH	ECN3748BAH	AN700NN0218B
	460	100	480		ECN3741CAJ	ECN3742CAJ	ECN3744CAJ	ECN3748CAJ	AN700NN0218C
	575	100	600		ECN3741DAJ	ECN3742DAJ	ECN3744DAJ	ECN3748DAJ	AN700NN0218D
5	—	—	120	400 A	ECN3751AAK	ECN3752AAK	ECN3754AAK	ECN3758AAK	AN700SN0218A
	200	75	208		ECN3751EAK	ECN3752EAK	ECN3754EAK	ECN3758EAK	AN700SN0218E
	230	100	240		ECN3751BAK	ECN3752BAK	ECN3754BAK	ECN3758BAK	AN700SN0218B
	460	200	480		ECN3751CAL	ECN3752CAL	ECN3754CAL	ECN3758CAL	AN700SN0218C
	575	200	600		ECN3751DAL	ECN3752DAL	ECN3754DAL	ECN3758DAL	AN700SN0218D
6	200	150	208	600 A	ECN3761EAM	ECN3762EAM	ECN3763EAM ③	ECN3768EAM	AN700TN0218E
	230	200	240		ECN3761BAM	ECN3762BAM	ECN3763BAM ③	ECN3768BAM	AN700TN0218B
	460	400	480		ECN3761CAN	ECN3762CAN	ECN3763CAN ③	ECN3768CAN	AN700TN0218C
	575	400	600		ECN3761DAN	ECN3762DAN	ECN3763DAN ③	ECN3768DAN	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Horsepower	5	10	25	50	75	150	300

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3704AAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

Class ECN37—Combination Two-Speed One-Winding Starter (CT or VT)—Non-Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Disconnect Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	30 A	ECN3701AAA	ECN3702AAA	ECN3704AAA	ECN3708AAA	AN700BN0218A
	200	3	208		ECN3701EAA	ECN3702EAA	ECN3704EAA	ECN3708EAA	AN700BN0218E
	230	3	240		ECN3701BAA	ECN3702BAA	ECN3704BAA	ECN3708BAA	AN700BN0218B
	460	5	480		ECN3701CAA	ECN3702CAA	ECN3704CAA	ECN3708CAA	AN700BN0218C
	575	5	600		ECN3701DAA	ECN3702DAA	ECN3704DAA	ECN3708DAA	AN700BN0218D
1	—	—	120	30 A	ECN3711AAA	ECN3712AAA	ECN3714AAA	ECN3718AAA	AN700DN0218A
	200	7-1/2	208		ECN3711EAA	ECN3712EAA	ECN3714EAA	ECN3718EAA	AN700DN0218E
	230	7-1/2	240		ECN3711BAA	ECN3712BAA	ECN3714BAA	ECN3718BAA	AN700DN0218B
	460	10	480		ECN3711CAA	ECN3712CAA	ECN3714CAA	ECN3718CAA	AN700DN0218C
	575	10	600		ECN3711DAA	ECN3712DAA	ECN3714DAA	ECN3718DAA	AN700DN0218D
2	—	—	120	60 A	ECN3721AAA	ECN3722AAA	ECN3724AAA	ECN3728AAA	AN700GN0218A
	200	10	208		ECN3721EAA	ECN3722EAA	ECN3724EAA	ECN3728EAA	AN700GN0218E
	230	15	240		ECN3721BAA	ECN3722BAA	ECN3724BAA	ECN3728BAA	AN700GN0218B
	460	25	480		ECN3721CAA	ECN3722CAA	ECN3724CAA	ECN3728CAA	AN700GN0218C
	575	25	600		ECN3721DAA	ECN3722DAA	ECN3724DAA	ECN3728DAA	AN700GN0218D
3	—	—	120	100 A	ECN3731AAA	ECN3732AAA	ECN3734AAA	ECN3738AAA	AN700KN0218A
	200	25	208		ECN3731EAA	ECN3732EAA	ECN3734EAA	ECN3738EAA	AN700KN0218E
	230	30	240		ECN3731BAA	ECN3732BAA	ECN3734BAA	ECN3738BAA	AN700KN0218B
	460	50	480		ECN3731CAA	ECN3732CAA	ECN3734CAA	ECN3738CAA	AN700KN0218C
	575	50	600		ECN3731DAA	ECN3732DAA	ECN3734DAA	ECN3738DAA	AN700KN0218D
4	—	—	120	200 A	ECN3741AAA	ECN3742AAA	ECN3744AAA	ECN3748AAA	AN700NN0218A
	200	40	208		ECN3741EAA	ECN3742EAA	ECN3744EAA	ECN3748EAA	AN700NN0218E
	230	50	240		ECN3741BAA	ECN3742BAA	ECN3744BAA	ECN3748BAA	AN700NN0218B
	460	100	480		ECN3741CAA	ECN3742CAA	ECN3744CAA	ECN3748CAA	AN700NN0218C
	575	100	600		ECN3741DAA	ECN3742DAA	ECN3744DAA	ECN3748DAA	AN700NN0218D
5	—	—	120	400 A	ECN3751AAA	ECN3752AAA	ECN3754AAA	ECN3758AAA	AN700SN0218A
	200	75	208		ECN3751EAA	ECN3752EAA	ECN3754EAA	ECN3758EAA	AN700SN0218E
	230	100	240		ECN3751BAA	ECN3752BAA	ECN3754BAA	ECN3758BAA	AN700SN0218B
	460	200	480		ECN3751CAA	ECN3752CAA	ECN3754CAA	ECN3758CAA	AN700SN0218C
	575	200	600		ECN3751DAA	ECN3752DAA	ECN3754DAA	ECN3758DAA	AN700SN0218D
6	200	150	208	600 A	ECN3761EAA	ECN3762EAA	ENC3763EAA ③	ECN3768EAA	AN700TN0218E
	230	200	240		ECN3761BAA	ECN3762BAA	ENC3763BAA ③	ECN3768BAA	AN700TN0218B
	460	400	480		ECN3761CAA	ECN3762CAA	ENC3763CAA ③	ECN3768CAA	AN700TN0218C
	575	400	600		ECN3761DAA	ECN3762DAA	ENC3763DAA ③	ECN3768DAA	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Horsepower	5	10	25	50	75	150	300

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3704AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

Class ECN38—Combination Two-Speed One-Winding Starter (Constant Horsepower)—Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Fuse Clip Amperes	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
					General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30 A	ECN3801AAB	ECN3802AAB	ECN3804AAB	ECN3808AAB	AN700BN0218A
	200	2	208		ECN3801EAB	ECN3802EAB	ECN3804EAB	ECN3808EAB	AN700BN0218E
	230	2	240		ECN3801BAB	ECN3802BAB	ECN3804BAB	ECN3808BAB	AN700BN0218B
	460	3	480		ECN3801CAC	ECN3802CAC	ECN3804CAC	ECN3808CAC	AN700BN0218C
	575	3	600		ECN3801DAC	ECN3802DAC	ECN3804DAC	ECN3808DAC	AN700BN0218D
1	—	—	120	30 A	ECN3811AAB	ECN3812AAB	ECN3814AAB	ECN3818AAB	AN700DN0218A
	200	5	208		ECN3811EAB	ECN3812EAB	ECN3814EAB	ECN3818EAB	AN700DN0218E
	230	5	240		ECN3811BAB	ECN3812BAB	ECN3814BAB	ECN3818BAB	AN700DN0218B
	460	7-1/2	480		ECN3811CAC	ECN3812CAC	ECN3814CAC	ECN3818CAC	AN700DN0218C
	575	7-1/2	600		ECN3811DAC	ECN3812DAC	ECN3814DAC	ECN3818DAC	AN700DN0218D
2	—	—	120	60 A	ECN3821AAD	ECN3822AAD	ECN3824AAD	ECN3828AAD	AN700GN0218A
	200	7-1/2	208		ECN3821EAD	ECN3822EAD	ECN3824EAD	ECN3828EAD	AN700GN0218E
	230	10	240		ECN3821BAD	ECN3822BAD	ECN3824BAD	ECN3828BAD	AN700GN0218B
	460	20	480		ECN3821CAE	ECN3822CAE	ECN3824CAE	ECN3828CAE	AN700GN0218C
	575	20	600		ECN3821DAE	ECN3822DAE	ECN3824DAE	ECN3828DAE	AN700GN0218D
3	—	—	120	100 A	ECN3831AAF	ECN3832AAF	ECN3834AAF	ECN3838AAF	AN700KN0218A
	200	20	208		ECN3831EAF	ECN3832EAF	ECN3834EAF	ECN3838EAF	AN700KN0218E
	230	25	240		ECN3831BAF	ECN3832BAF	ECN3834BAF	ECN3838BAF	AN700KN0218B
	460	40	480		ECN3831CAF	ECN3832CAF	ECN3834CAF	ECN3838CAF	AN700KN0218C
	575	40	600		ECN3831DAF	ECN3832DAF	ECN3834DAF	ECN3838DAF	AN700KN0218D
4	—	—	120	200 A	ECN3841AAH	ECN3842AAH	ECN3844AAH	ECN3848AAH	AN700NN0218A
	200	30	208		ECN3841EAH	ECN3842EAH	ECN3844EAH	ECN3848EAH	AN700NN0218E
	230	40	240		ECN3841BAH	ECN3842BAH	ECN3844BAH	ECN3848BAH	AN700NN0218B
	460	75	480		ECN3841CAJ	ECN3842CAJ	ECN3844CAJ	ECN3848CAJ	AN700NN0218C
	575	75	600		ECN3841DAJ	ECN3842DAJ	ECN3844DAJ	ECN3848DAJ	AN700NN0218D
5	—	—	120	400 A	ECN3851AAK	ECN3852AAK	ECN3854AAK	ECN3858AAK	AN700SN0218A
	200	60	208		ECN3851EAK	ECN3852EAK	ECN3854EAK	ECN3858EAK	AN700SN0218E
	230	75	240		ECN3851BAK	ECN3852BAK	ECN3854BAK	ECN3858BAK	AN700SN0218B
	460	150	480		ECN3851CAL	ECN3852CAL	ECN3854CAL	ECN3858CAL	AN700SN0218C
	575	150	600		ECN3851DAL	ECN3852DAL	ECN3854DAL	ECN3858DAL	AN700SN0218D
6	200	100	208	600 A	ECN3861EAM	ECN3862EAM	ECN3863EAM ③	ECN3868EAM	AN700TN0218E
	230	150	240		ECN3861BAM	ECN3862BAM	ECN3863BAM ③	ECN3868BAM	AN700TN0218B
	460	300	480		ECN3861CAN	ECN3862CAN	ECN3863CAN ③	ECN3868CAN	AN700TN0218C
	575	300	600		ECN3861DAN	ECN3862DAN	ECN3863DAN ③	ECN3868DAN	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3804AAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

Class ECN38—Combination Two-Speed One-Winding Starter (Constant Horsepower)—Non-Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating	Magnet Coil Voltage	Disconnect Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	30 A	ECN3801AAA	ECN3802AAA	ECN3804AAA	ECN3808AAA	AN700BN0218A
	200	2	208		ECN3801EAA	ECN3802EAA	ECN3804EAA	ECN3808EAA	AN700BN0218E
	230	2	240		ECN3801BAA	ECN3802BAA	ECN3804BAA	ECN3808BAA	AN700BN0218B
	460	3	480		ECN3801CAA	ECN3802CAA	ECN3804CAA	ECN3808CAA	AN700BN0218C
	575	3	600		ECN3801DAA	ECN3802DAA	ECN3804DAA	ECN3808DAA	AN700BN0218D
1	—	—	120	30 A	ECN3811AAA	ECN3812AAA	ECN3814AAA	ECN3818AAA	AN700DN0218A
	200	5	208		ECN3811EAA	ECN3812EAA	ECN3814EAA	ECN3818EAA	AN700DN0218E
	230	5	240		ECN3811BAA	ECN3812BAA	ECN3814BAA	ECN3818BAA	AN700DN0218B
	460	7-1/2	480		ECN3811CAA	ECN3812CAA	ECN3814CAA	ECN3818CAA	AN700DN0218C
	575	7-1/2	600		ECN3811DAA	ECN3812DAA	ECN3814DAA	ECN3818DAA	AN700DN0218D
2	—	—	120	60 A	ECN3821AAA	ECN3822AAA	ECN3824AAA	ECN3828AAA	AN700GN0218A
	200	7-1/2	208		ECN3821EAA	ECN3822EAA	ECN3824EAA	ECN3828EAA	AN700GN0218E
	230	10	240		ECN3821BAA	ECN3822BAA	ECN3824BAA	ECN3828BAA	AN700GN0218B
	460	20	480		ECN3821CAA	ECN3822CAA	ECN3824CAA	ECN3828CAA	AN700GN0218C
	575	20	600		ECN3821DAA	ECN3822DAA	ECN3824DAA	ECN3828DAA	AN700GN0218D
3	—	—	120	100 A	ECN3831AAA	ECN3832AAA	ECN3834AAA	ECN3838AAA	AN700KN0218A
	200	20	208		ECN3831EAA	ECN3832EAA	ECN3834EAA	ECN3838EAA	AN700KN0218E
	230	25	240		ECN3831BAA	ECN3832BAA	ECN3834BAA	ECN3838BAA	AN700KN0218B
	460	40	480		ECN3831CAA	ECN3832CAA	ECN3834CAA	ECN3838CAA	AN700KN0218C
	575	40	600		ECN3831DAA	ECN3832DAA	ECN3834DAA	ECN3838DAA	AN700KN0218D
4	—	—	120	200 A	ECN3841AAA	ECN3842AAA	ECN3844AAA	ECN3848AAA	AN700NN0218A
	200	30	208		ECN3841EAA	ECN3842EAA	ECN3844EAA	ECN3848EAA	AN700NN0218E
	230	40	240		ECN3841BAA	ECN3842BAA	ECN3844BAA	ECN3848BAA	AN700NN0218B
	460	75	480		ECN3841CAA	ECN3842CAA	ECN3844CAA	ECN3848CAA	AN700NN0218C
	575	75	600		ECN3841DAA	ECN3842DAA	ECN3844DAA	ECN3848DAA	AN700NN0218D
5	—	—	120	400 A	ECN3851AAA	ECN3852AAA	ECN3854AAA	ECN3858AAA	AN700SN0218A
	200	60	208		ECN3851EAA	ECN3852EAA	ECN3854EAA	ECN3858EAA	AN700SN0218E
	230	75	240		ECN3851BAA	ECN3852BAA	ECN3854BAA	ECN3858BAA	AN700SN0218B
	460	150	480		ECN3851CAA	ECN3852CAA	ECN3854CAA	ECN3858CAA	AN700SN0218C
	575	150	600		ECN3851DAA	ECN3852DAA	ECN3854DAA	ECN3858DAA	AN700SN0218D
6	200	100	208	600 A	ECN3861EAA	ECN3862EAA	ECN3863EAA ③	ECN3868EAA	AN700TN0218E
	230	150	240		ECN3861BAA	ECN3862BAA	ECN3863BAA ③	ECN3868BAA	AN700TN0218B
	460	300	480		ECN3861CAA	ECN3862CAA	ECN3863CAA ③	ECN3868CAA	AN700TN0218C
	575	300	600		ECN3861DAA	ECN3862DAA	ECN3863DAA ③	ECN3868DAA	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

① Maximum horsepower rating of starters for 380 V 50 Hz applications.

NEMA Size	0	1	2	3	4	5	6
Horsepower	3	7-1/2	20	40	60	100	200

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3804AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Type 4 (painted steel) sizes 6.

2.3

NEMA Contactors and Starters

Freedom Multispeed Starters

Class ECN39—Combination Two-Speed Two-Winding Starter—Circuit Breaker

2

NEMA Size	Motor Voltage	Maximum hp Rating		Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight and Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	200	1	1	208	7 A	ECN3901EAC	ECN3902EAC	ECN3904EAC	ECN3908EAC	AN700BN022E
		3	2		15 A	ECN3901EAD	ECN3902EAD	ECN3904EAD	ECN3908EAD	
	230	1	1	240	7 A	ECN3901BAC	ECN3902BAC	ECN3904BAC	ECN3908BAC	AN700BN022B
		3	2		15 A	ECN3901BAD	ECN3902BAD	ECN3904BAD	ECN3908BAD	
	460	3/4	3/4	480	3 A	ECN3901CAB	ECN3902CAB	ECN3904CAB	ECN3908CAB	AN700BN022C
		2	2		7 A	ECN3901CAC	ECN3902CAC	ECN3904CAC	ECN3908CAC	
		5	3		15 A	ECN3901CAD	ECN3902CAD	ECN3904CAD	ECN3908CAD	
	575	1	1	600	3 A	ECN3901DA5	ECN3902DA5	ECN3904DA5	ECN3908DA5	AN700BN022D
		3	3		7 A	ECN3901DA6	ECN3902DA6	ECN3904DA6	ECN3908DA6	
5		—	15 A		ECN3901DA7	ECN3902DA7	ECN3904DA7	ECN3908DA7		
1	200	1	1	208	7 A	ECN3911EAC	ECN3912EAC	ECN3914EAC	ECN3918EAC	AN700DN022E
		2	2		15 A	ECN3911EAD	ECN3912EAD	ECN3914EAD	ECN3918EAD	
		7-1/2	5		30 A	ECN3911EAE	ECN3912EAE	ECN3914EAE	ECN3918EAE	
	230	1	1	240	7 A	ECN3911BAC	ECN3912BAC	ECN3914BAC	ECN3918BAC	AN700DN022B
		2	2		15 A	ECN3911BAD	ECN3912BAD	ECN3914BAD	ECN3918BAD	
		7-1/2	5		30 A	ECN3911BAE	ECN3912BAE	ECN3914BAE	ECN3918BAE	
	460	3/4	3/4	480	3 A	ECN3911CAB	ECN3912CAB	ECN3914CAB	ECN3918CAB	AN700DN022C
		2	2		7 A	ECN3911CAC	ECN3912CAC	ECN3914CAC	ECN3918CAC	
		5	5		15 A	ECN3911CAD	ECN3912CAD	ECN3914CAD	ECN3918CAD	
		10	7-1/2		30 A	ECN3911CAE	ECN3912CAE	ECN3914CAE	ECN3918CAE	
	575	1	1	600	3 A	ECN3911DA5	ECN3912DA5	ECN3914DA5	ECN3918DA5	AN700DN022D
		3	3		7 A	ECN3911DA6	ECN3912DA6	ECN3914DA6	ECN3918DA6	
		7-1/2	7-1/2		15 A	ECN3911DA7	ECN3912DA7	ECN3914DA7	ECN3918DA7	
		10	—		30 A	ECN3911DA8	ECN3912DA8	ECN3914DA8	ECN3918DA8	
	2	200	10	7-1/2	208	50 A	ECN3921EAF	ECN3922EAF	ECN3924EAF	ECN3928EAF
230		15	10	240		ECN3921BAF	ECN3922BAF	ECN3924BAF	ECN3928BAF	AN700GN022B
460		25	20	480		ECN3921CAF	ECN3922CAF	ECN3924CAF	ECN3928CAF	AN700GN022C
575		25	20	600		ECN3921DA9	ECN3922DA9	ECN3924DA9	ECN3928DA9	AN700GN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

- ① Starters with 120 V coil (for separate control) are available. To order, substitute the letter **A** for the eighth character of the listed catalog number.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3904EAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
- ④ Type 12 enclosure is without safety door interlock.

Class ECN39—Combination Two-Speed Two-Winding Starter—Circuit Breaker, continued

NEMA Size	Motor Voltage	Maximum hp Rating		Magnet Coil Voltage ①	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset ③④	
						Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
3	200	25	20	208	100 A	ECN3931EAG	ECN3932EAG	ECN3934EAG	ECN3938EAG	AN700KN022E
	230	30	25	240		ECN3931BAG	ECN3932BAG	ECN3934BAG	ECN3938BAG	AN700KN022B
	460	50	40	480		ECN3931CAG	ECN3932CAG	ECN3934CAG	ECN3938CAG	AN700KN022C
	575	50	40	600		ECN3931DAI	ECN3932DAI	ECN3934DAI	ECN3938DAI	AN700KN022D
4	200	40	30	208	150 A	ECN3941EAH	ECN3942EAH	ECN3944EAH	ECN3948EAH	AN700NN022E
	230	50	40	240		ECN3941BAH	ECN3942BAH	ECN3944BAH	ECN3948BAH	AN700NN022B
	460	100	75	480		ECN3941CAH	ECN3942CAH	ECN3944CAH	ECN3948CAH	AN700NN022C
	575	100	75	600		ECN3941DAH	ECN3942DAH	ECN3944DAH	ECN3948DAH	AN700NN022D
5	200	60	60	208	250 A	ECN3951EAJ	ECN3952EAJ	ECN3954EAJ	ECN3958EAJ	AN700SN022E
		75	—		400 A	ECN3951EAK	ECN3952EAK	ECN3954EAK	ECN3958EAK	
	230	75	75	240	250 A	ECN3951BAJ	ECN3952BAJ	ECN3954BAJ	ECN3958BAJ	AN700SN022B
		100	—		400 A	ECN3951BAK	ECN3952BAK	ECN3954BAK	ECN3958BAK	
	460	150	150	480	250 A	ECN3951CAJ	ECN3952CAJ	ECN3954CAJ	ECN3958CAJ	AN700SN022C
		200	—		400 A	ECN3951CAK	ECN3952CAK	ECN3954CAK	ECN3958CAK	
575	200	150	600	250 A	ECN3951DAJ	ECN3952DAJ	ECN3954DAJ	ECN3958DAJ	AN700SN022D	
6	200	150	100	208	⑤	ECN3961EAU	ECN3962EAU	ECN3963EAU ⑥	ECN3968EAU	AN700TN022E
	230	200	150	240		ECN3961BAU	ECN3962BAU	ECN3963BAU ⑥	ECN3968BAU	AN700TN022B
	460	400	300	480		ECN3961CAU	ECN3962CAU	ECN3963CAU ⑥	ECN3968CAU	AN700TN022C
	575	400	300	600		ECN3961DAU	ECN3962DAU	ECN3963DAU ⑥	ECN3968DAU	AN700TN022D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed).

For heater pack selection, see **Tab 15**.

- ① Starters with 120 V coil (for separate control) are available. To order, substitute the letter **A** for the eight character of the listed catalog number.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN3934EAG. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
- ④ Type 12 enclosure is without safety door interlock.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
- ⑥ Type 4 (painted steel) size 6.

Class ECN40—Combination Two-Speed One-Winding Starter (CT or VT)—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight and Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)			
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number			
0	200	1	208	7 A	ECN4001EAC	ECN4002EAC	ECN4004EAC	ECN4008EAC	AN700BN0218E			
				15 A	ECN4001EAD	ECN4002EAD	ECN4004EAD	ECN4008EAD				
	230	1	240	7 A	ECN4001BAC	ECN4002BAC	ECN4004BAC	ECN4008BAC	AN700BN0218B			
				15 A	ECN4001BAD	ECN4002BAD	ECN4004BAD	ECN4008BAD				
	460	3/4	480	3 A	ECN4001CAB	ECN4002CAB	ECN4004CAB	ECN4008CAB	AN700BN0218C			
				7 A	ECN4001CAC	ECN4002CAC	ECN4004CAC	ECN4008CAC				
				15 A	ECN4001CAD	ECN4002CAD	ECN4004CAD	ECN4008CAD				
	575	1	600	3 A	ECN4001DA5	ECN4002DA5	ECN4004DA5	ECN4008DA5	AN700BN0218D			
				7 A	ECN4001DA6	ECN4002DA6	ECN4004DA6	ECN4008DA6				
				15 A	ECN4001DA7	ECN4002DA7	ECN4004DA7	ECN4008DA7				
	1	200	1	208	7 A	ECN4011EAC	ECN4012EAC	ECN4014EAC	ECN4018EAC	AN700DN0218E		
					15 A	ECN4011EAD	ECN4012EAD	ECN4014EAD	ECN4018EAD			
30 A					ECN4011EAE	ECN4012EAE	ECN4014EAE	ECN4018EAE				
230		1	240	7 A	ECN4011BAC	ECN4012BAC	ECN4014BAC	ECN4018BAC	AN700DN0218B			
				15 A	ECN4011BAD	ECN4012BAD	ECN4014BAD	ECN4018BAD				
				30 A	ECN4011BAE	ECN4012BAE	ECN4014BAE	ECN4018BAE				
460		3/4	480	3 A	ECN4011CAB	ECN4012CAB	ECN4014CAB	ECN4018CAB	AN700DN0218C			
				7 A	ECN4011CAC	ECN4012CAC	ECN4014CAC	ECN4018CAC				
				15 A	ECN4011CAD	ECN4012CAD	ECN4014CAD	ECN4018CAD				
				30 A	ECN4011CAE	ECN4012CAE	ECN4014CAE	ECN4018CAE				
575		1	600	3 A	ECN4011DA5	ECN4012DA5	ECN4014DA5	ECN4018DA5	AN700DN0218D			
				7 A	ECN4011DA6	ECN4012DA6	ECN4014DA6	ECN4018DA6				
	15 A			ECN4011DA7	ECN4012DA7	ECN4014DA7	ECN4018DA7					
	30 A			ECN4011DA8	ECN4012DA8	ECN4014DA8	ECN4018DA8					
2	200	10	208	50 A	ECN4021EAF	ECN4022EAF	ECN4024EAF	ECN4028EAF	AN700GN0218E			
				230	15	240	ECN4021BAF	ECN4022BAF		ECN4024BAF	ECN4028BAF	AN700GN0218B
				460	25	480	ECN4021CAF	ECN4022CAF		ECN4024CAF	ECN4028CAF	AN700GN0218C
				575	25	600	ECN4021DA9	ECN4022DA9		ECN4024DA9	ECN4028DA9	AN700GN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

- ① Starters with 120 V coil (for separate control) are available. To order, substitute the letter **A** for the eight character of the listed catalog number.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4004EAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
- ④ Type 12 enclosure is without safety door interlock.

Class ECN40—Combination Two-Speed One-Winding Starter (CT or VT)—Circuit Breaker, continued

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight and Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
3	200	25	208	100 A	ECN4031EAG	ECN4032EAG	ECN4034EAG	ECN4038EAG	AN700KN0218E
	230	30	240		ECN4031BAG	ECN4032BAG	ECN4034BAG	ECN4038BAG	AN700KN0218B
	460	50	480		ECN4031CAG	ECN4032CAG	ECN4034CAG	ECN4038CAG	AN700KN0218C
	575		600		ECN4031DAI	ECN4032DAI	ECN4034DAI	ECN4038DAI	AN700KN0218D
4	200	40	208	150 A	ECN4041EAH	ECN4042EAH	ECN4044EAH	ECN4048EAH	AN700NN0218E
	230	50	240		ECN4041BAH	ECN4042BAH	ECN4044BAH	ECN4048BAH	AN700NN0218B
	460	100	480		ECN4041CAH	ECN4042CAH	ECN4044CAH	ECN4048CAH	AN700NN0218C
	575		600		ECN4041DAH	ECN4042DAH	ECN4044DAH	ECN4048DAH	AN700NN0218D
5	200	60	208	250 A	ECN4051EAJ	ECN4052EAJ	ECN4054EAJ	ECN4058EAJ	AN700SN0218E
		75		400 A	ECN4051EAK	ECN4052EAK	ECN4054EAK	ECN4058EAK	
	230	75	240	250 A	ECN4051BAJ	ECN4052BAJ	ECN4054BAJ	ECN4058BAJ	AN700SN0218B
		100		400 A	ECN4051BAK	ECN4052BAK	ECN4054BAK	ECN4058BAK	
	460	150	480	250 A	ECN4051CAJ	ECN4052CAJ	ECN4054CAJ	ECN4058CAJ	AN700SN0218C
		200		400 A	ECN4051CAK	ECN4052CAK	ECN4054CAK	ECN4058CAK	
575	200	600	250 A	ECN4051DAJ	ECN4052DAJ	ECN4054DAJ	ECN4058DAJ	AN700SN0218D	
6	200	150	208	⑥	ECN4061EAU	ECN4062EAU	ECN4063EAU ⑥	ECN4068EAU	AN700TN0218E
	230	200	240		ECN4061BAU	ECN4062BAU	ECN4063BAU ⑥	ECN4068BAU	AN700TN0218B
	460	400	480		ECN4061CAU	ECN4062CAU	ECN4063CAU ⑥	ECN4068CAU	AN700TN0218C
	575		600		ECN4061DAU	ECN4062DAU	ECN4063DAU ⑥	ECN4068DAU	AN700TN0218D

Notes

- Starters do not include heater packs.** Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.
- ① Starters with 120 V coil (for separate control) are available. To order, substitute the letter **A** for the eight character of the listed catalog number.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4034EAG. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
- ④ Type 12 enclosure is without safety door interlock.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
- ⑥ Type 4 (painted steel) size 6.

Class ECN41—Combination Two-Speed One-Winding Starter (Constant Horsepower)—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating		Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open)	
		Constant Horsepower	Magnet Coil Voltage ①		General Purpose	Rainproof	Watertight and Dust-Tight Stainless Steel ②	Dust-Tight Industrial External Reset ③④		
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	
0	200	1	208	7 A	ECN4101EAC	ECN4102EAC	ECN4104EAC	ECN4108EAC	AN700BN0218E	
		2		15 A	ECN4101EAD	ECN4102EAD	ECN4104EAD	ECN4108EAD		
	230	1	240	7 A	ECN4101BAC	ECN4102BAC	ECN4104BAC	ECN4108BAC	AN700BN0218B	
		2		15 A	ECN4101BAD	ECN4102BAD	ECN4104BAD	ECN4108BAD		
	460	3/4	480	3 A	ECN4101CAB	ECN4102CAB	ECN4104CAB	ECN4108CAB	AN700BN0218C	
		2		7 A	ECN4101CAC	ECN4102CAC	ECN4104CAC	ECN4108CAC		
		3		15 A	ECN4101CAD	ECN4102CAD	ECN4104CAD	ECN4108CAD		
	575	1	600	3 A	ECN4101DA5	ECN4102DA5	ECN4104DA5	ECN4108DA5	AN700BN0218D	
		3		7 A	ECN4101DA6	ECN4102DA6	ECN4104DA6	ECN4108DA6		
	1	200	1	208	7 A	ECN4111EAC	ECN4112EAC	ECN4114EAC	ECN4118EAC	AN700DN0218E
			2		5 A	ECN4111EAD	ECN4112EAD	ECN4114EAD	ECN4118EAD	
			5		30 A	ECN4111EAE	ECN4112EAE	ECN4114EAE	ECN4118EAE	
230		1	240	7 A	ECN4111BAC	ECN4112BAC	ECN4114BAC	ECN4118BAC	AN700DN0218B	
		2		15 A	ECN4111BAD	ECN4112BAD	ECN4114BAD	ECN4118BAD		
		5		30 A	ECN4111BAE	ECN4112BAE	ECN4114BAE	ECN4118BAE		
460		3/4	480	3 A	ECN4111CAB	ECN4112CAB	ECN4114CAB	ECN4118CAB	AN700DN0218C	
		2		7 A	ECN4111CAC	ECN4112CAC	ECN4114CAC	ECN4118CAC		
		5		15 A	ECN4111CAD	ECN4112CAD	ECN4114CAD	ECN4118CAD		
		7-1/2		30 A	ECN4111CAE	ECN4112CAE	ECN4114CAE	ECN4118CAE		
575		1	600	3 A	ECN4111DA5	ECN4112DA5	ECN4114DA5	ECN4118DA5	AN700DN0218D	
		3		7 A	ECN4111DA6	ECN4112DA6	ECN4114DA6	ECN4118DA6		
		7-1/2		15 A	ECN4111DA7	ECN4112DA7	ECN4114DA7	ECN4118DA7		
2		200	7-1/2	208	50 A	ECN4121EAF	ECN4122EAF	ECN4124EAF	ECN4128EAF	AN700GN0218E
		230	10	240		ECN4121BAF	ECN4122BAF	ECN4124BAF	ECN4128BAF	AN700GN0218B
		460	20	480		ECN4121CAF	ECN4122CAF	ECN4124CAF	ECN4128CAF	AN700GN0218C
		575	20	600		ECN4121DA9	ECN4122DA9	ECN4124DA9	ECN4128DA9	AN700GN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

- ① Starters with 120 V coil (for separate control) are available. To order, substitute the letter **A** for the eight character of the listed catalog number.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4104EAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
- ④ Type 12 enclosure is without safety door interlock.

Class ECN41—Combination Two-Speed One-Winding Starter (Constant Horsepower)—Circuit Breaker, continued

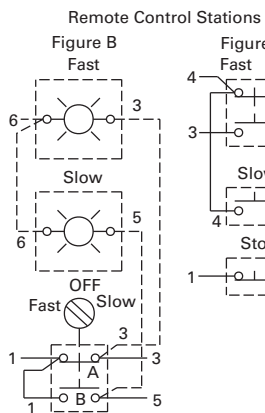
NEMA Size	Motor Voltage	Maximum hp Rating Constant Horsepower	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight and Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
3	200	20	208	100 A	ECN4131EAG	ECN4132EAG	ECN4134EAG	ECN4138EAG	AN700KN0218E
	230	25	240		ECN4131BAG	ECN4132BAG	ECN4134BAG	ECN4138BAG	AN700KN0218B
	460	40	480		ECN4131CAG	ECN4132CAG	ECN4134CAG	ECN4138CAG	AN700KN0218C
	575	40	600		ECN4131DAI	ECN4132DAI	ECN4134DAI	ECN4138DAI	AN700KN0218D
4	200	30	208	150 A	ECN4141EAH	ECN4142EAH	ECN4144EAH	ECN4148EAH	AN700NN0218E
	230	40	240		ECN4141BAH	ECN4142BAH	ECN4144BAH	ECN4148BAH	AN700NN0218B
	460	75	480		ECN4141CAH	ECN4142CAH	ECN4144CAH	ECN4148CAH	AN700NN0218C
	575	75	600		ECN4141DAH	ECN4142DAH	ECN4144DAH	ECN4148DAH	AN700NN0218D
5	200	60	208	250 A	ECN4151EAJ	ECN4152EAJ	ECN4154EAJ	ECN4158EAJ	AN700SN0218E
	230	75	240		ECN4151BAJ	ECN4152BAJ	ECN4154BAJ	ECN4158BAJ	AN700SN0218B
	460	150	480		ECN4151CAJ	ECN4152CAJ	ECN4154CAJ	ECN4158CAJ	AN700SN0218C
	575	150	600		ECN4151DAJ	ECN4152DAJ	ECN4154DAJ	ECN4158DAJ	AN700SN0218D
6	200	100	208	⑤	ECN4161EAU	ECN4162EAU	ECN4163EAU ⑥	ECN4168EAU	AN700TN0218E
	230	150	240		ECN4161BAU	ECN4162BAU	ECN4163BAU ⑥	ECN4168BAU	AN700TN0218B
	460	300	480		ECN4161CAU	ECN4162CAU	ECN4163CAU ⑥	ECN4168CAU	AN700TN0218C
	575	300	600		ECN4161DAU	ECN4162DAU	ECN4163DAU ⑥	ECN4168DAU	AN700TN0218D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each speed). For heater pack selection, see **Tab 15**.

- ① Starters with 120 V coil (for separate control) are available. To order, substitute the letter **A** for the eight character of the listed catalog number.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4134EAG. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
- ④ Type 12 enclosure is without safety door interlock.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
- ⑥ Type 4 (painted steel) size 6.

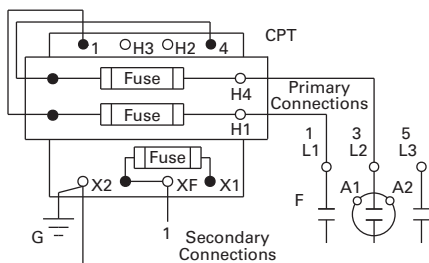
Two-Speed One-Winding



Contact	Position		
	Fast	OFF	Slow
A	X		
B			X

X = Contact Closed

Figure 2
Control Circuit Transformer (If used)
Remove Wire "C" if Supplied and Connect as Shown Below
(All other wiring remains as shown in Figure 1)



Connections for Dual Voltage Rated Transformer—See Transformer Nameplate

Starter Elementary Diagram

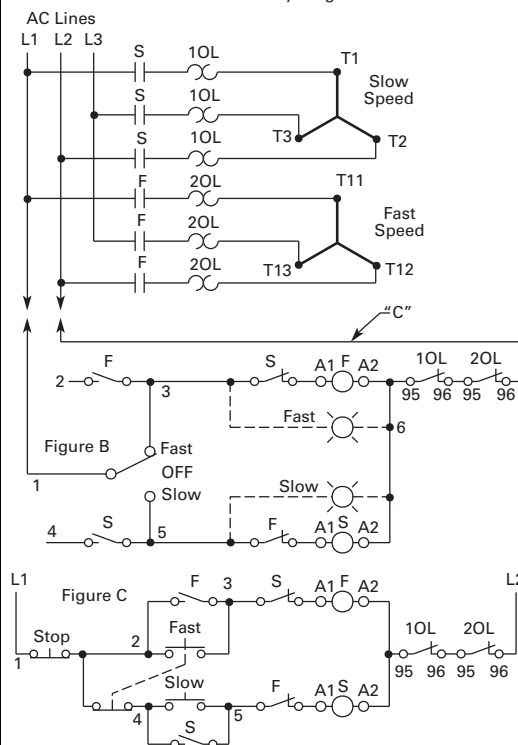
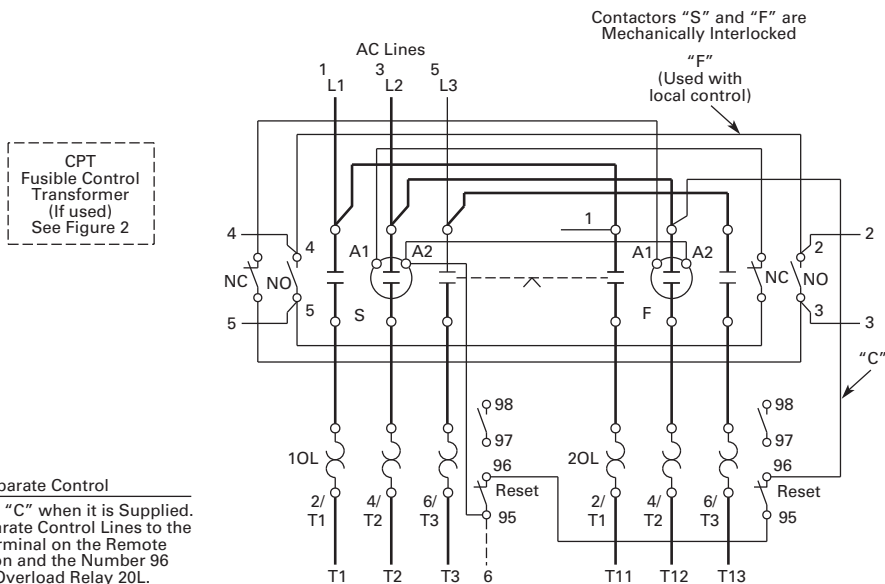
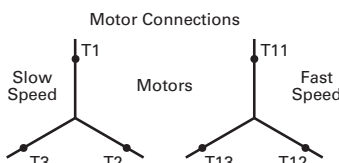


Figure 1
Front View of Panel



Separate Control
Remove Wire "C" when it is Supplied. Connect Separate Control Lines to the Number 1 Terminal on the Remote Control Station and the Number 96 Terminal on Overload Relay 20L.



260815 D3

2.3

NEMA Contactors and Starters

Freedom Multispeed Starters

Multispeed Cover Control

2

Two-Speed Two-Winding C400GK Control Options

Figure A
Three-Position Selector Switch
(Two-wire control)

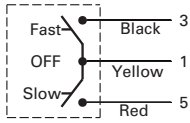
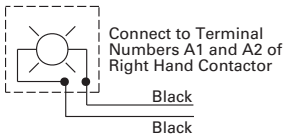
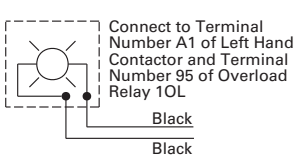


Figure B
Pilot Light
(FAST)



Pilot Light
(SLOW)



260817 D1

Two-Speed One-Winding CH C400GK Control Options

Figure A
Three-Position Selector Switch
(Two-wire control)

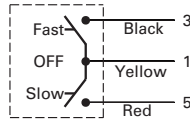


Figure B
Pilot Light
(FAST)

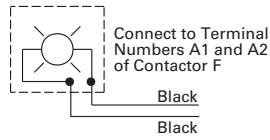
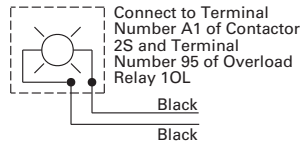


Figure C
Pilot Light
(SLOW)



260894 D1

Two-Speed One-Winding CT, VT C400GK Control Options

Figure A
Three-Position Selector Switch
(Two-wire control)

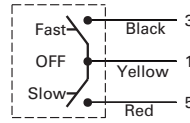


Figure B
Pilot Light
(FAST)

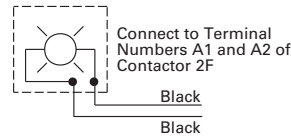
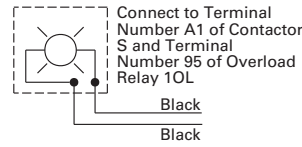


Figure C
Pilot Light
(SLOW)



260893 D1

Two-Speed One-Winding CH C400T Control Options

Figure A
Pushbuttons

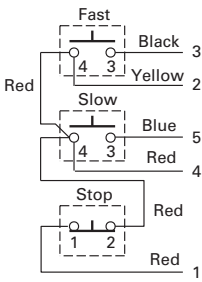


Figure C
Pushbuttons

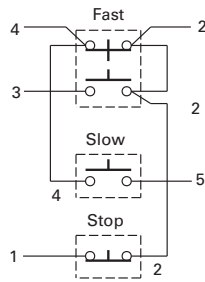
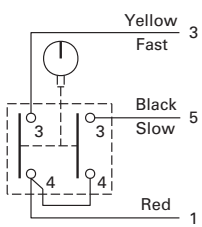
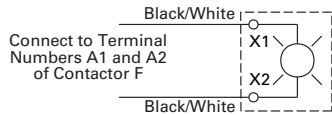


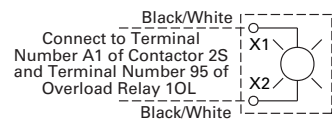
Figure B
Three-Position Selector Switch



Pilot Light
(FAST)



Pilot Light
(SLOW)



260896 D1

Two-Speed One-Winding CT, VT C400T Control Options

Two-Speed Two-Winding C400T Control Options

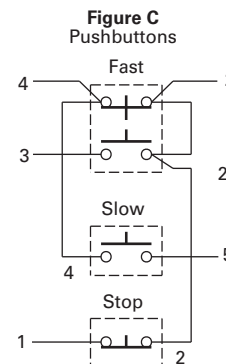
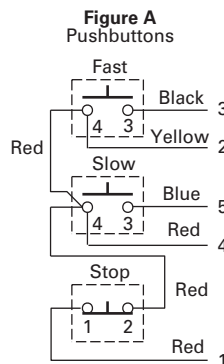
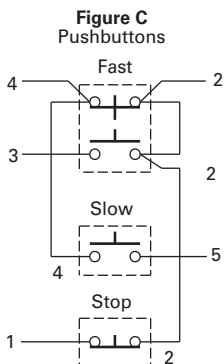
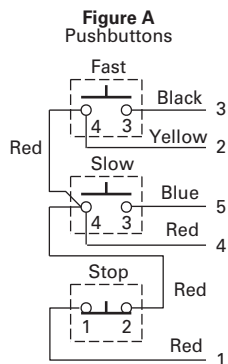
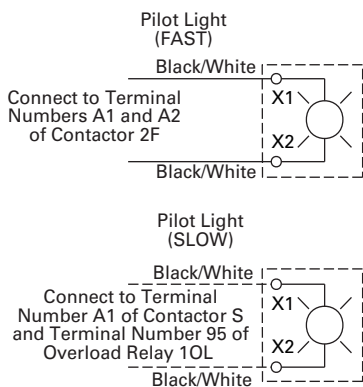
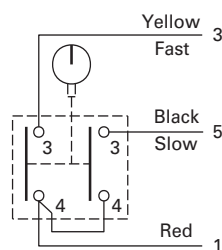
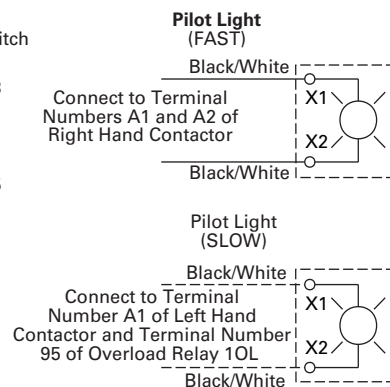
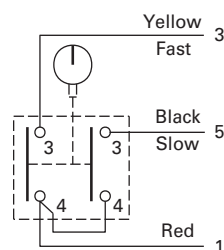


Figure B
Three-Position Selector Switch



260895 D1

Figure B
Three-Position Selector Switch



260816 D1

ECX Enclosed Control



3.1 XTIEC Power Control

Non-Metallic Enclosure—Contactors and Starters

Product Description	V10-T3-2
Features and Benefits	V10-T3-2
Standards and Certifications	V10-T3-2
Catalog Number Selection	V10-T3-3
Cover Control Options	V10-T3-3
Product Selection	V10-T3-4

Metallic Enclosure—Contactors and Starters

Product Description	V10-T3-8
Features and Benefits	V10-T3-8
Standards and Certifications	V10-T3-8
Catalog Number Selection	V10-T3-9
Cover Control	V10-T3-11
Product Selection	V10-T3-14
Wiring Diagrams	V10-T3-35

Combination Motor Controllers

Product Description	V10-T3-43
Features and Benefits	V10-T3-43
Standards and Certifications	V10-T3-43
Additional Reference	V10-T3-43
Catalog Number Selection	V10-T3-44
Cover Control	V10-T3-45
Product Selection	V10-T3-46

3.1

IEC Contactors and Starters

XT IEC Power Control

3

IEC Non-Metallic Enclosure—Contactors and Starters



Non-Metallic Enclosure—Contactors and Starters

Product Description

XT non-metallic 4X starters are the latest addition to our broad line of pre-engineered solutions that make it easy to get an enclosed starter fast! These sturdy, uncomplicated starters are economical, but built to last. Components are all housed in a dust-tight, rain-tight, oil-tight, water-tight and corrosion resistant polycarbonate insulated enclosure. In most cases, **XT** non-metallic 4X starters are available from stock for next day delivery.

Reliable Protection

Each starter features an Eaton **XT** IEC thermal overload relay. Fourteen overload sizes are available to complete the starter, providing adjustable

settings for 0.1 to 32 full load amps. Because of its direct mount design, the **XT** relay and resulting starter command a very small footprint.

Clever, Convenient Design to 25 hp

Six different base models (single- and three-phase) are available, ranging from fractional to 25 hp units (at 575 V). This allows you to closely match the starter to your application.

Each starter is equipped with a telescopic base-mount for the pilot device contact blocks. This eliminates all wiring between the cover and starter base, making commissioning and troubleshooting a snap.

Additional Reference

Cover Control	V10-T3-3
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

Contents

Description	Page
Non-Metallic Enclosure—Contactors and Starters	
Catalog Number Selection	V10-T3-3
Cover Control Options	V10-T3-3
Product Selection	V10-T3-4
Metallic Enclosure—Contactors and Starters	V10-T3-8
Combination Motor Controllers	V10-T3-43

Features and Benefits

- Single- and three-phase enclosed starters to 25 hp (at 575 V)
- Rugged IP65 polycarbonate enclosure equivalent to NEMA 1, 12, 13, 3R and 4X environmental protection
- All starters feature the modern **XT** contactor family from Eaton in your choice of control voltage from 24 Vac to 600 Vac
- Class 10 motor protection is provided by adjustable bimetal overload relays
- Standard starters feature START/STOP double pushbuttons and a RESET selected from our rugged M22 pilot device line
- Other control options include OFF–ON or HAND–0–AUTO selector switches, with or without pilot light
- All starters use electrical operators to energize and de-energize the starter, providing longer component lifespan and the option for two-wire control
- 5 hp starters are only six inches high; 25 hp starters are less than 10 inches high

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed/CSA/IEC

Product Configuration Overview

Starter sizes (mm)

- To 5 hp (at 575 V): 160 x 100 x 145 (L x W x D)
- To 20 hp (at 575 V): 200 x 120 x 160 (L x W x D)
- To 25 hp (at 575 V): 240 x 160 x 160 (L x W x D)

Phases

- Available in single- and three-phase

Contactors

- From miniature to 32 amps

Voltages

- 50 Hz: 110 V, 23 V, 415 V
- 60 Hz: 24 V, 120 V, 208 V, 240 V, 480 V, 600 V

Pilot devices

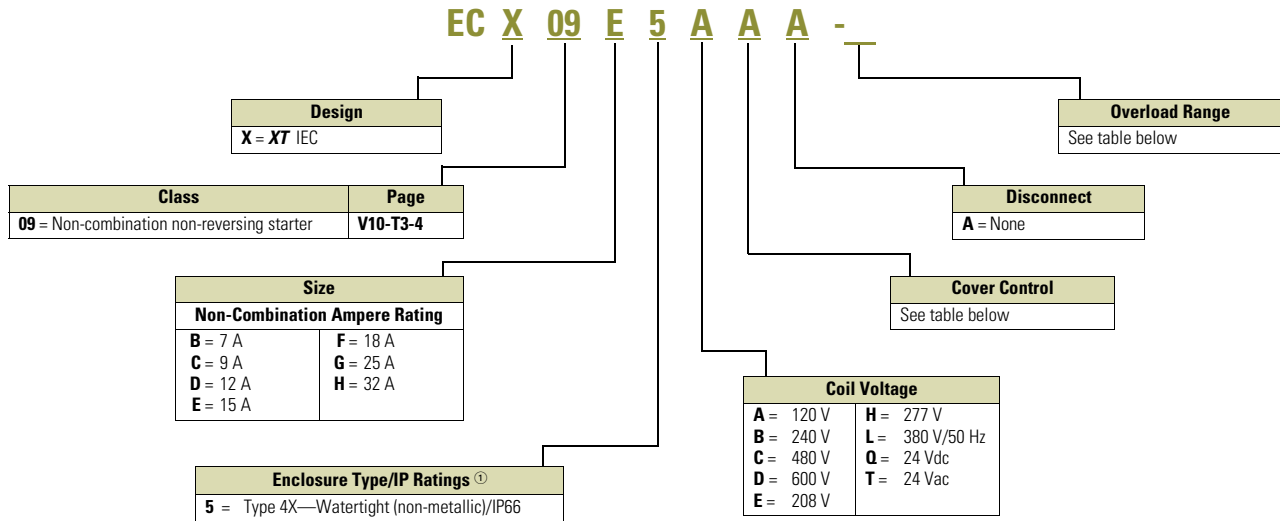
- START/STOP double-pushbutton
- ON–OFF selector switch
- HAND–0–AUTO selector switch

Illumination options

- Red light 85–264 Vac
- Red light 12–30 Vac/Vdc
- Without illumination

Catalog Number Selection

XT IEC Line Non-Metallic Enclosed Control



XTOB Overload Relays for Enclosed XT

FLA Ratings	Size B–E 7–15 A	Size F–H 18–32 A	FLA Ratings	Size B–E 7–15 A	Size F–H 18–32 A
0.1–0.16	A	A	4–6	I	I
0.16–0.24	B	B	6–10	J	J
0.24–0.4	C	C	9–12	K	—
0.4–0.6	D	D	10–16	—	L
0.6–1	E	E	12–16	L	—
1–1.6	F	F	16–24	—	M
1.6–2.4	G	G	24–32	—	N
2.4–4	H	H			

XTOE Electronic Overload Relays for Enclosed XT

FLA Ratings	Size B–E 7–15 A	Size F–H 18–32 A
0.33–1.65	R63/A	R63/A
1–5	R63/B	R63/B
4–20	R63/C	R63/C
9–45	—	R63/D

Cover Control Options



Cover Control Options

Description	Position 9 Control Code
No cover mounted pilot devices	A
START/STOP pushbuttons	B
With red RUN pilot light	C
HAND/OFF/AUTO selector switch	H
With red RUN pilot light	J
ON/OFF selector switch	S
With red RUN pilot light	T

Note

⊙ See **Tab 1** for enclosure type/IP rating cross-reference.

3.1

IEC Contactors and Starters

XT IEC Power Control

Product Selection

CI-K Basic Enclosures

CI-K Basic Enclosures ①②

Dimensions in Inches (mm)



3

Width	Height	External Depth	Internal Depth	Internal Mounting Type	Pkg. Qty.	Catalog Number
3.94 (100.0)	6.30 (160.0)	3.94 (100.0)	2.87 (73.0)	With mounting rail	1	CI-K2X-100-TS-NA ③
			3.11 (79.0)	With mounting plate		CI-K2X-100-M-NA ③
		5.71 (145.0)	4.65 (118.0)	With mounting rail	CI-K2X-145-TS-NA ③	
			4.88 (124.0)	With mounting plate	CI-K2X-145-M-NA ③	
4.72 (120.0)	7.87 (200.0)	4.92 (125.0)	3.66 (93.0)	With mounting rail	1	CI-K3X-125-TS-NA ④
			3.86 (98.0)	With mounting plate		CI-K3X-125-M-NA ④
		6.30 (160.0)	5.04 (128.0)	With mounting rail	CI-K3X-160-TS-NA ④	
			5.24 (133.0)	With mounting plate	CI-K3X-160-M-NA ④	
6.30 (160.0)	9.45 (240.0)	6.30 (160.0)	5.04 (128.0)	With mounting rail	1	CI-K4X-160-TS-NA ④
			5.24 (133.0)	With mounting plate		CI-K4X-160-M-NA ④
7.87 (200.0)	11.02 (280.0)	6.30 (160.0)	5.04 (128.0)	With mounting rail	1	CI-K5X-160-TS-NA ④
			5.24 (133.0)	With mounting plate		CI-K5X-160-M-NA ④

Class ECX09—Non-Metallic Non-Combination Non-Reversing Contactor ONLY

Amps	Maximum hp ⑤		Coil Voltage at 60 Hz ⑦	Type 4X/IP66 Catalog Number	Component Catalog Number
	Motor Voltage ⑥	Single-Phase			
Size B					
7	115	1/4	—	120	ECX09B5AAA XTCE007B10A
	208	3/4	1-1/2	208	ECX09B5EAA XTCE007B10E
	230	1	2	240	ECX09B5BAA XTCE007B10B
	380	—	3	380/50 Hz	ECX09B5LAA XTCE007B10L
	460	—	3	480	ECX09B5CAA XTCE007B10C
	575	—	5	600	ECX09B5DAA XTCE007B10D
Size C					
9	115	1/2	—	120	ECX09C5AAA XTCE009B10A
	208	1	2	208	ECX09C5EAA XTCE009B10E
	230	1-1/2	3	240	ECX09C5BAA XTCE009B10B
	380	—	5	380/50 Hz	ECX09C5LAA XTCE009B10L
	460	—	5	480	ECX09C5CAA XTCE009B10C
	575	—	7-1/2	600	ECX09C5DAA XTCE009B10D
Size D					
12	115	1/2	—	120	ECX09D5AAA XTCE012B10A
	208	1-1/2	3	208	ECX09D5EAA XTCE012B10E
	230	2	3	240	ECX09D5BAA XTCE012B10B
	380	—	5	380/50 Hz	ECX09D5LAA XTCE012B10L
	460	—	7-1/2	480	ECX09D5CAA XTCE012B10C
	575	—	10	600	ECX09D5DAA XTCE012B10D
Size E					
15	115	3/4	—	120	ECX09E5AAA XTCE015B10A
	208	2	3	208	ECX09E5EAA XTCE015B10E
	230	2	3	240	ECX09E5BAA XTCE015B10B
	380	—	5	380/50 Hz	ECX09E5LAA XTCE015B10L
	460	—	7-1/2	480	ECX09E5CAA XTCE015B10C
	575	—	10	600	ECX09E5DAA XTCE015B10D

Notes

- ① Enclosure base RAL 9005, black/enclosure top only RAL 7035. Light gray.
- ② Degree of protection—IEC: IP65; UL/CSA: Type 1, 3R, 4X, 12, 13—indoor and outdoor use.
- ③ CI-K2X_: 4 x 1/2 inch knockouts.
- ④ CI-K3X_, CI-K4X_, CI-K5X_: Smooth overall with sharp corners.
- ⑤ 1 hp = 0.746 kW.
- ⑥ Contact factory for other voltage options.
- ⑦ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.

Class ECX09—Non-Metallic Non-Combination Non-Reversing Contactor ONLY, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 4X/IP66 Catalog Number	Component Catalog Number	
	Motor Voltage ^②	Single-Phase				Three-Phase
Size F						
18	115	2	—	120	ECX09F5AAA	XTCE018C10A
	208	2	5	208	ECX09F5EAA	XTCE018C10E
	230	3	5	240	ECX09F5BAA	XTCE018C10B
	380	—	7-1/2	380/50 Hz	ECX09F5LAA	XTCE018C10L
	460	—	10	480	ECX09F5CAA	XTCE018C10C
	575	—	15	600	ECX09F5DAA	XTCE018C10D
Size G						
25	115	2	—	120	ECX09G5AAA	XTCE025C10A
	208	3	7-1/2	208	ECX09G5EAA	XTCE025C10E
	230	5	7-1/2	240	ECX09G5BAA	XTCE025C10B
	380	—	10	380/50 Hz	ECX09G5LAA	XTCE025C10L
	460	—	15	480	ECX09G5CAA	XTCE025C10C
	575	—	20	600	ECX09G5DAA	XTCE025C10D
Size H						
32	115	3	—	120	ECX09H5AAA	XTCE032C10A
	208	5	10	208	ECX09H5EAA	XTCE032C10E
	230	5	10	240	ECX09H5BAA	XTCE032C10B
	380	—	15	380/50 Hz	ECX09H5LAA	XTCE032C10L
	460	—	20	480	ECX09H5CAA	XTCE032C10C
	575	—	25	600	ECX09H5DAA	XTCE032C10D

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.

3.1

IEC Contactors and Starters

XT IEC Power Control

Class ECX09—Non-Metallic Non-Combination Non-Reversing Starter

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 4X/IP66	Component
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④
Size B					
7	115	1/4	—	120	ECX09B5AAA- XTAE007B10A
	208	3/4	1-1/2	208	ECX09B5EAA- XTAE007B10E
	230	1	2	240	ECX09B5BAA- XTAE007B10B
	380	—	3	380/50 Hz	ECX09B5LAA- XTAE007B10L
	460	—	3	480	ECX09B5CAA- XTAE007B10C
	575	—	5	600	ECX09B5DAA- XTAE007B10D
Size C					
9	115	1/2	—	120	ECX09C5AAA- XTAE009B10A
	208	1	2	208	ECX09C5EAA- XTAE009B10E
	230	1-1/2	3	240	ECX09C5BAA- XTAE009B10B
	380	—	5	380/50 Hz	ECX09C5LAA- XTAE009B10L
	460	—	5	480	ECX09C5CAA- XTAE009B10C
	575	—	7-1/2	600	ECX09C5DAA- XTAE009B10D
Size D					
12	115	1/2	—	120	ECX09D5AAA- XTAE012B10A
	208	1-1/2	3	208	ECX09D5EAA- XTAE012B10E
	230	2	3	240	ECX09D5BAA- XTAE012B10B
	380	—	5	380/50 Hz	ECX09D5LAA- XTAE012B10L
	460	—	7-1/2	480	ECX09D5CAA- XTAE012B10C
	575	—	10	600	ECX09D5DAA- XTAE012B10D
Size E					
15	115	3/4	—	120	ECX09E5AAA- XTAE015B10A
	208	2	3	208	ECX09E5EAA- XTAE015B10E
	230	2	3	240	ECX09E5BAA- XTAE015B10B
	380	—	5	380/50 Hz	ECX09E5LAA- XTAE015B10L
	460	—	7-1/2	480	ECX09E5CAA- XTAE015B10C
	575	—	10	600	ECX09E5DAA- XTAE015B10D

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" or "XTOE" overload amperage range as per motor FLA, see **Page V10-T3-3**.
- ⑤ For complete component Catalog Number, see **Volume 5—Motor Control and Protection, CA08100005E, Tab 27**.

Class ECX09—Non-Metallic Non-Combination Non-Reversing Starter, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 4X/IP66 Catalog Number ^④	Component Catalog Number ^⑤
	Motor Voltage ^②	Single-Phase			
Size F					
18	115	2	—	120	ECX09F5AAA-_ XTAE018C10A_
	208	2	5	208	ECX09F5EAA-_ XTAE018C10E_
	230	3	5	240	ECX09F5BAA-_ XTAE018C10B_
	380	—	7-1/2	380/50 Hz	ECX09F5LAA-_ XTAE018C10L_
	460	—	10	480	ECX09F5CAA-_ XTAE018C10C_
	575	—	15	600	ECX09F5DAA-_ XTAE018C10D_
Size G					
25	115	2	—	120	ECX09G5AAA-_ XTAE025C10A_
	208	3	7-1/2	208	ECX09G5EAA-_ XTAE025C10E_
	230	5	7-1/2	240	ECX09G5BAA-_ XTAE025C10B_
	380	—	10	380/50 Hz	ECX09G5LAA-_ XTAE025C10L_
	460	—	15	480	ECX09G5CAA-_ XTAE025C10C_
	575	—	20	600	ECX09G5DAA-_ XTAE025C10D_
Size H					
32	115	3	—	120	ECX09H5AAA-_ XTAE032C10A_
	208	5	10	208	ECX09H5EAA-_ XTAE032C10E_
	230	5	10	240	ECX09H5BAA-_ XTAE032C10B_
	380	—	15	380/50 Hz	ECX09H5LAA-_ XTAE032C10L_
	460	—	20	480	ECX09H5CAA-_ XTAE032C10C_
	575	—	25	600	ECX09H5DAA-_ XTAE032C10D_

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" or "XTOE" overload amperage range as per motor FLA, see **Page V10-T3-3**.
- ⑤ For complete component Catalog Number, see **Volume 5—Motor Control and Protection, CA08100005E, Tab 27**.

IEC Metallic Enclosure—Contactors and Starters



3

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Metallic Enclosure—Contactors and Starters

Product Description

Eaton's **XT** line includes IEC contactors, starters and combination motor controllers (CMCs). Designed to meet international standards, the enclosed control **XT** line (ECX), carries UL and cUL certifications.

Features and Benefits

- AC control from 12 V to 600 V 50/60 Hz
- DC control from 24 V to 220 V
- Available with screw or spring cage terminals
- Reversing or non-reversing contactors and starters
- AC-3 contactor ratings to 1000 A and AC-1 contactor ratings to 2000 A
- Non-reversing starters to 650 A
- Panel or DIN rail mounting to 65 A
- IP20 finger and back-of-hand proof
- Large ambient temperature range, -25 °C to +50 °C [-13 °F to +122 °F]

- AC and DC controlled contactors in the same compact frame
- Low power consumption DC coils
- Built-in NO or NC auxiliary contacts to 32 A
- Plug-in accessories for reduced installation time
- Types 1 (IP23), 4 (IP66), 4X (IP66), 12 (IP65) and 3R (IP32)
- Circuit breakers, fused, non-fused and non-combination designs available
- Opaque (standard) or clear covers available on non-metallic Halyester enclosure option

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- Fusible—with Class J fuses
 - UL Listed
 - cUL Listed ①
- Circuit Breaker HMCP/E
 - UL Listed
 - cUL Listed ①

Short-Circuit Ratings

- Fused, non-fused
 - 10K AIC at 600 V
- HMCP
 - 0–10 hp 15K AIC at 600 V
 - 15–125 hp 25K AIC at 600 V
- Non-combination
 - 0–1 hp 1K AIC at 600 V
 - 1.5–50 hp 5K AIC at 600 V
 - 50–200 hp 10K AIC at 600 V

Note

① cUL Listing indicates appropriate CSA standard investigation.

Additional Reference

Dimensions	Tab 14
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

Catalog Number Selection

XT IEC Line Metallic Enclosed Control

EC X 25 E 5 A A A -

Design
X = XT IEC

Modification Codes
See Tab 15

Class	Page
09= Non-combination non-reversing starter	V10-T3-14
10= Non-combination reversing starter	V10-T3-17
11= Non-combination non-reversing starter with CPT	V10-T3-20
19= Combination non-reversing starter—fusible/non-fusible disconnect	V10-T3-23
20= Combination reversing starter—fusible/non-fusible disconnect	V10-T3-26
25= Combination non-reversing starter—circuit breaker	V10-T3-29
26= Combination reversing starter—circuit breaker	V10-T3-32

Overload Range
See table below

Disconnect Fuse Clip Ratings	
A = None	
C = 30 A J	
E = 60 A J	
G = 100 A J	
Circuit Breaker Ratings	
A = None	F = 50 A
B = 3 A	W = 70 A
C = 7 A	G = 100 A
D = 15 A	H = 150 A
E = 30 A	J = 250 A

Size	
Combination (Class 16–74)	Non-Combination (Class 09–11) Ampere Rating (UL 600 V)
IEC Size B–Q	B = 7 A J = 40 A C = 9 A K = 50 A D = 12 A L = 65 A E = 15 A M = 80 A F = 18 A N = 95 A G = 25 A P = 115 A H = 32 A Q = 150 A

Enclosure Type/IP Ratings ①
1 = Type 1—General purpose/IP23
3 = Type 4—Painted steel/IP66
4 = Type 4X—Watertight (304-Grade stainless steel)/IP66
5 = Type 4X—Watertight (non-metallic)/IP66
8 = Type 12—Dust-tight/IP65

Cover Control
Type 1 non-comb. (NEW BOX 1 only) starters see Page V10-T3-11
Type 1 non-comb. starters see Page V10-T3-12
All other starters see Page V10-T3-14

Coil Voltage	
A = 120 V	H = 277 V
B = 240 V	L = 380 V / 50 Hz
C = 480 V	Q = 24 Vdc
D = 600 V	T = 24 Vac
E = 208 V	

XTOB Overload Relays for Enclosed XT

FLA Ratings	Size B–E 7–15 A	Size F–H 18–32 A	Size J–L 40–65 A	Size M–N 80–95 A	Size P–Q 115–150 A
0.1–0.16	A	A	—	—	—
0.16–0.24	B	B	—	—	—
0.24–0.4	C	C	—	—	—
0.4–0.6	D	D	—	—	—
0.6–1	E	E	—	—	—
1–1.6	F	F	—	—	—
1.6–2.4	G	G	—	—	—
2.4–4	H	H	—	—	—
4–6	I	I	—	—	—
6–10	J	J	J	—	—
9–12	K	—	—	—	—
12–16	L ②	L	L	—	—

FLA Ratings	Size B–E 7–15 A	Size F–H 18–32 A	Size J–L 40–65 A	Size M–N 80–95 A	Size P–Q 115–150 A
16–24	—	M	M	—	—
24–32	—	N	—	—	—
24–40	—	—	P	—	—
25–35	—	—	—	S	S
35–50	—	—	—	T	T
40–57	—	—	Q	—	—
50–65	—	—	R	—	—
50–70	—	—	—	U	U
70–100	—	—	—	V	V
95–125	—	—	—	—	W
120–150	—	—	—	—	X

Notes

① See Tab 1 for enclosure type/IP rating cross-reference.

② Size B–E is 10–16 A.

C440 Solid-State Overload Modifications

Reliability and Improved Uptime

- C440 provides the users with peace of mind knowing that their assets are protected with the highest level of motor protection and communication capability in its class
- Extends the life of plant assets with selectable motor protection features such as trip class, phase unbalance and ground fault
- Protects against unnecessary downtime by discovering changes in your system (line/load) with remote monitoring capabilities
- Status LED provides added assurance that valuable assets are protected by indicating the overload operational status

Flexibility

- Improves return on investment by reducing inventory carrying costs with wide FLA adjustment (5:1) and selectable trip class
- Design incorporates built-in ground fault protection thus eliminating the need for separate CTs and modules
- Flexible communication with optional I/O enables easy integration into plant management systems for remote monitoring and control

Monitoring Capabilities

- Individual phase currents RMS
- Average three-phase current RMS
- Thermal memory
- Fault indication (overload, phase loss, phase unbalance, ground fault)

Safety

- IP20 rated terminal blocks
- Available in Eaton's industry leading FlashGard MCCs
- Tested to the highest industry standards such as UL, CSA, CE and IEC
- RoHS compliant

For solid-state overload enclosed control, add R63 or R64 modification code after the base Catalog Number. (Example, ECX09G1AAA-**R63/B**).

Modification	IEC Size	NEMA Size	Full Load Current Adjustment Range (A)	Three-Phase without Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30	Three-Phase with Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30
Solid-state electronic overload relay ^①	B and C	00	0.33–1.65 ^②	R63/A	R64/A
			1–5	R63/B	R64/B
			4–20	R63/C	R64/C
	C and D	0 and 1	0.33–1.65 ^②	R63/A	R64/A
			1–5	R63/B	R64/B
			4–20	R63/C	R64/C
			9–45	R63/D	R64/D
	D	2	9–45	R63/D	R64/D
	D, F and G	3	20–100	R63/E	R64/E
	G	4	28–140	R63/F	R64/F
	N/A	5	60–300	R63/G	R64/G
	N/A	6	120–600	R63/H	R64/H

Notes

- ^① Features:
- Self-powered
 - Phase loss protection
 - Current adjustment knob
 - ±1% repeat accuracy
 - 1NO and 1NC isolated contacts
- ^② Not UL Listed.

Cover Control

Product Selection

Type 1 Non-Combination Cover Control (Box 1 Only)

- Cover control for non-combination starters uses M22 style devices as standard
- Pushbuttons are momentary type
- Field convertible selector switches from momentary to maintained operation and vice versa
- Cover control kits include hardware, M22 pushbuttons, bracket and pre-wired wire harnesses
- See Volume 7, Tab 1, for more details on M22 pushbuttons

Type 1 Non-Combination Cover Control (Box 1 Only)

Box 1 offering includes metallic enclosures with starters up to 32 A.



Description	Factory Installed	Field Installation Kits
	Flange Control Position 9 Cover Control Code	Catalog Number
Non-Reversing		
No cover mounted pilot devices	A	—
STOP/START oval pushbuttons	B	C600M1
With red RUN pilot light	C	C600M101 ^①
With red RUN/green OFF lights	D	C600M102 ^①
OFF/ON oval pushbuttons	E	C600M2
With red RUN pilot light	F	C600M201 ^①
With red RUN/green OFF lights	G	C600M202 ^①
STOP/START selector switch	S	C600M13
With red RUN pilot light	T	C600M131 ^①
With red RUN/green OFF lights	U	C600M132 ^①
OFF/ON selector switch	V	C600M14
With red RUN pilot light	W	C600M141 ^①
With red RUN/green OFF lights	X	C600M142 ^①
HAND/OFF/AUTO selector switch	H	C600M12
With red RUN pilot light	J	C600M121 ^①
With red RUN/green OFF lights	K	C600M122 ^①
Green START pushbutton	L	C600M3
Red STOP pushbutton	Y	C600M7 ^①
Green ON pushbutton	M	C600M4
Red OFF pushbutton	N	C600M5
Red RUN pilot light	P	C600M9 ^①
Green OFF pilot light	Q	C600M10 ^①
Red RUN/green OFF lights	R	C600M11 ^①
TEST/OFF/AUTO selector switch	—	C600M8
Reversing		
UP/STOP/DOWN selector switch	E	C600M27
With 2 red pilot lights	F	C600M271 ^①
REV/STOP/FWD selector switch	H	C600M15
With 2 red pilot lights	J	C600M151 ^①
Two red pilot lights (labeled FWD, REV)	P	C600M28 ^①
Green OFF pilot light	Q	C600M10 ^①

Note

^① Add code letter from the table below to catalog number for voltage. Example: C600M101A.

Rating	Code Letter
85–264 Vac	A
480 Vac	C
12–30 Vac/Vdc	T

3.1

IEC Contactors and Starters

XT IEC Power Control

3

Type 1 Non-Combination Cover Control (Box 2 and Larger Enclosures Only)

- Cover control for combination starters uses 10250T style devices as standard
- Selector switches are maintained with lever operators
- Pushbuttons are momentary type with extended pushbutton
- The kit includes hardware and connecting wires (where possible)
- For factory installed control devices other than shown below, refer to modification codes, **Tab 15**

Type 1 Cover Control



Type 1 Non-Combination Cover Control (Box 2 and Larger Enclosures Only)

Box 2 and Larger Enclosure offering includes metallic enclosures with starters larger than 32 A.

Description	Factory Installed Flange Control ① Position 9 Cover Control Code	Field Installation Kits Catalog Number
Non-Reversing		
No cover mounted pilot devices	A	C400GK0
STOP/START pushbuttons	B	C400GK1
With red RUN pilot light	C	C400GK12 ②
With red RUN/green OFF lights	D	C400GK16 ②
HAND/OFF/AUTO selector switch	H	C400GK3
With red RUN pilot light	J	C400GK32 ②
With red RUN/green OFF lights	K	C400GK36 ②
Red RUN pilot light	P	C400GK42 ②
Green OFF pilot light	Q	C400GK41 ②
Red RUN/green OFF pilot lights	R	C400GK46 ②
Reversing		
No cover mounted pilot devices	A	C400GK0
FOR/REV/STOP pushbuttons	B	C400GR1
With two red pilot lights	C	C400GR14 ②
UP/STOP/DOWN pushbuttons	E	C400GR2
With two red pilot lights	F	C400GR24 ②
Two red pilot lights	P	C400GK44 ②
One green pilot light	Q	C400GK41 ②

Notes

- ① For more available factory installed flange control, see **Page V10-T3-11**.
 ② Add code letter from the table below to catalog number for voltage—kits only. Example: C400GK0B.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	277 V 60 Hz	H	480 V 60 Hz	C
208 V 60 Hz	E	380 V 50 Hz	L	600 V 60 Hz	D
240 V 60 Hz	B				

Type 1 Non-Combination Empty Enclosure (Box 1 Only)

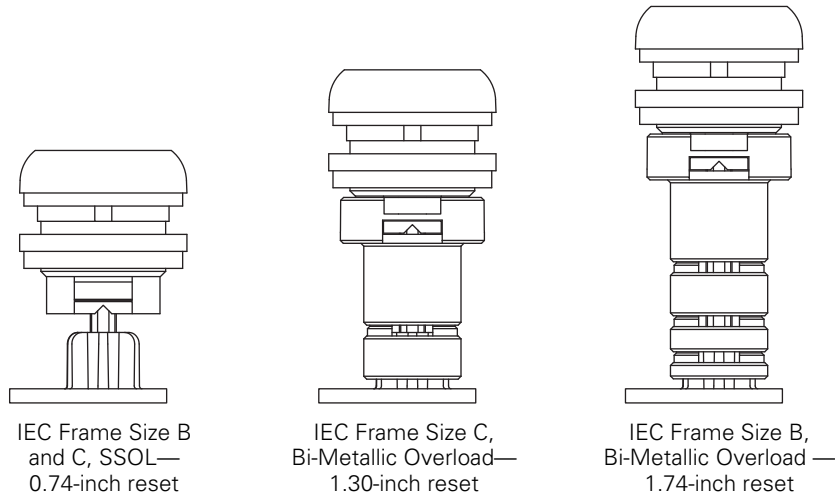
There is a universal empty enclosure for the non-metallic Type 1 Non-Combination Box 1 regardless of the starter or the contactor needed. The only difference is the length of the easily interchangeable reset rod. The reset rod kit provides everything needed to install the correct reset rod, including all the reset rod lengths, a protective shroud, a paddle and a reset button with nut.

Box 1 offering includes metallic enclosures with starters up to 32 A.

Empty Enclosure Stacking Needs	Catalog Number
Empty enclosure	C899001
Reset rod kit	RESET001

The table below shows which reset rod is used with each starter or contactor.

Starter or Contactor	Reset Rod Length
IEC Frame Size B and C, SSOL	0.74-inch reset
IEC Frame Size B, Bi-Metallic Overload	1.74-inch reset
IEC Frame Size C, Bi-Metallic Overload	1.30-inch reset



Product Selection

Non-Combination Starters

Class ECX09—Non-Combination Non-Reversing Starter

3

Amps	Maximum hp ^①			Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑤	Type 12/IP65	Component
	Motor Voltage ^②	Single-Phase	Three-Phase		Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size B								
7	115	1/4	—	120	ECX09B1AAA- ₋	ECX09B4AAA- ₋	ECX09B8AAA- ₋	XTAE007B10A- ₋
	208	3/4	1-1/2	208	ECX09B1EAA- ₋	ECX09B4EAA- ₋	ECX09B8EAA- ₋	XTAE007B10E- ₋
	230	1	2	240	ECX09B1BAA- ₋	ECX09B4BAA- ₋	ECX09B8BAA- ₋	XTAE007B10B- ₋
	380	—	3	380/50 Hz	ECX09B1LAA- ₋	ECX09B4LAA- ₋	ECX09B8LAA- ₋	XTAE007B10L- ₋
	460	—	3	480	ECX09B1CAA- ₋	ECX09B4CAA- ₋	ECX09B8CAA- ₋	XTAE007B10C- ₋
	575	—	5	600	ECX09B1DAA- ₋	ECX09B4DAA- ₋	ECX09B8DAA- ₋	XTAE007B10D- ₋
Size C								
9	115	1/2	—	120	ECX09C1AAA- ₋	ECX09C4AAA- ₋	ECX09C8AAA- ₋	XTAE009B10A- ₋
	208	1	2	208	ECX09C1EAA- ₋	ECX09C4EAA- ₋	ECX09C8EAA- ₋	XTAE009B10E- ₋
	230	1-1/2	3	240	ECX09C1BAA- ₋	ECX09C4BAA- ₋	ECX09C8BAA- ₋	XTAE009B10B- ₋
	380	—	5	380/50 Hz	ECX09C1LAA- ₋	ECX09C4LAA- ₋	ECX09C8LAA- ₋	XTAE009B10L- ₋
	460	—	5	480	ECX09C1CAA- ₋	ECX09C4CAA- ₋	ECX09C8CAA- ₋	XTAE009B10C- ₋
	575	—	7-1/2	600	ECX09C1DAA- ₋	ECX09C4DAA- ₋	ECX09C8DAA- ₋	XTAE009B10D- ₋
Size D								
12	115	1/2	—	120	ECX09D1AAA- ₋	ECX09D4AAA- ₋	ECX09D8AAA- ₋	XTAE012B10A- ₋
	208	1-1/2	3	208	ECX09D1EAA- ₋	ECX09D4EAA- ₋	ECX09D8EAA- ₋	XTAE012B10E- ₋
	230	2	3	240	ECX09D1BAA- ₋	ECX09D4BAA- ₋	ECX09D8BAA- ₋	XTAE012B10B- ₋
	380	—	5	380/50 Hz	ECX09D1LAA- ₋	ECX09D4LAA- ₋	ECX09D8LAA- ₋	XTAE012B10L- ₋
	460	—	7-1/2	480	ECX09D1CAA- ₋	ECX09D4CAA- ₋	ECX09D8CAA- ₋	XTAE012B10C- ₋
	575	—	10	600	ECX09D1DAA- ₋	ECX09D4DAA- ₋	ECX09D8DAA- ₋	XTAE012B10D- ₋
Size E								
15	115	3/4	—	120	ECX09E1AAA- ₋	ECX09E4AAA- ₋	ECX09E8AAA- ₋	XTAE015B10A- ₋
	208	2	3	208	ECX09E1EAA- ₋	ECX09E4EAA- ₋	ECX09E8EAA- ₋	XTAE015B10E- ₋
	230	2	3	240	ECX09E1BAA- ₋	ECX09E4BAA- ₋	ECX09E8BAA- ₋	XTAE015B10B- ₋
	380	—	5	380/50 Hz	ECX09E1LAA- ₋	ECX09E4LAA- ₋	ECX09E8LAA- ₋	XTAE015B10L- ₋
	460	—	7-1/2	480	ECX09E1CAA- ₋	ECX09E4CAA- ₋	ECX09E8CAA- ₋	XTAE015B10C- ₋
	575	—	10	600	ECX09E1DAA- ₋	ECX09E4DAA- ₋	ECX09E8DAA- ₋	XTAE015B10D- ₋
Size F								
18	115	2	—	120	ECX09F1AAA- ₋	ECX09F4AAA- ₋	ECX09F8AAA- ₋	XTAE018C10A- ₋
	208	2	5	208	ECX09F1EAA- ₋	ECX09F4EAA- ₋	ECX09F8EAA- ₋	XTAE018C10E- ₋
	230	3	5	240	ECX09F1BAA- ₋	ECX09F4BAA- ₋	ECX09F8BAA- ₋	XTAE018C10B- ₋
	380	—	7-1/2	380/50 Hz	ECX09F1LAA- ₋	ECX09F4LAA- ₋	ECX09F8LAA- ₋	XTAE018C10L- ₋
	460	—	10	480	ECX09F1CAA- ₋	ECX09F4CAA- ₋	ECX09F8CAA- ₋	XTAE018C10C- ₋
	575	—	15	600	ECX09F1DAA- ₋	ECX09F4DAA- ₋	ECX09F8DAA- ₋	XTAE018C10D- ₋

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX09B4AAA-₋. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX09—Non-Combination Non-Reversing Starter, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④		Catalog Number ^④
Size G								
25	115	2	—	120	ECX09G1AAA- __	ECX09G4AAA- __	ECX09G8AAA- __	XTAE025C10A- __
	208	3	7-1/2	208	ECX09G1EAA- __	ECX09G4EAA- __	ECX09G8EAA- __	XTAE025C10E- __
	230	5	7-1/2	240	ECX09G1BAA- __	ECX09G4BAA- __	ECX09G8BAA- __	XTAE025C10B- __
	380	—	10	380/50 Hz	ECX09G1LAA- __	ECX09G4LAA- __	ECX09G8LAA- __	XTAE025C10L- __
	460	—	15	480	ECX09G1CAA- __	ECX09G4CAA- __	ECX09G8CAA- __	XTAE025C10C- __
	575	—	20	600	ECX09G1DAA- __	ECX09G4DAA- __	ECX09G8DAA- __	XTAE025C10D- __
Size H								
32	115	3	—	120	ECX09H1AAA- __	ECX09H4AAA- __	ECX09H8AAA- __	XTAE032C10A- __
	208	5	10	208	ECX09H1EAA- __	ECX09H4EAA- __	ECX09H8EAA- __	XTAE032C10E- __
	230	5	10	240	ECX09H1BAA- __	ECX09H4BAA- __	ECX09H8BAA- __	XTAE032C10B- __
	380	—	15	380/50 Hz	ECX09H1LAA- __	ECX09H4LAA- __	ECX09H8LAA- __	XTAE032C10L- __
	460	—	20	480	ECX09H1CAA- __	ECX09H4CAA- __	ECX09H8CAA- __	XTAE032C10C- __
	575	—	25	600	ECX09H1DAA- __	ECX09H4DAA- __	ECX09H8DAA- __	XTAE032C10D- __
Size J								
40	115	3	—	120	ECX09J1AAA- __	ECX09J4AAA- __	ECX09J8AAA- __	XTAE040D00A- __
	208	5	10	208	ECX09J1EAA- __	ECX09J4EAA- __	ECX09J8EAA- __	XTAE040D00E- __
	230	7-1/2	15	240	ECX09J1BAA- __	ECX09J4BAA- __	ECX09J8BAA- __	XTAE040D00D- __
	380	—	15	380/50 Hz	ECX09J1LAA- __	ECX09J4LAA- __	ECX09J8LAA- __	XTAE040D00L- __
	460	—	30	480	ECX09J1CAA- __	ECX09J4CAA- __	ECX09J8CAA- __	XTAE040D00C- __
	575	—	40	600	ECX09J1DAA- __	ECX09J4DAA- __	ECX09J8DAA- __	XTAE040D00D- __
Size K								
50	115	3	—	120	ECX09K1AAA- __	ECX09K4AAA- __	ECX09K8AAA- __	XTAE050D00A- __
	208	7-1/2	15	208	ECX09K1EAA- __	ECX09K4EAA- __	ECX09K8EAA- __	XTAE050D00E- __
	230	10	20	240	ECX09K1BAA- __	ECX09K4BAA- __	ECX09K8BAA- __	XTAE050D00B- __
	380	—	20	380/50 Hz	ECX09K1LAA- __	ECX09K4LAA- __	ECX09K8LAA- __	XTAE050D00L- __
	460	—	40	480	ECX09K1CAA- __	ECX09K4CAA- __	ECX09K8CAA- __	XTAE050D00C- __
	575	—	50	600	ECX09K1DAA- __	ECX09K4DAA- __	ECX09K8DAA- __	XTAE050D00D- __
Size L								
65	115	5	—	120	ECX09L1AAA- __	ECX09L4AAA- __	ECX09L8AAA- __	XTAE065D00A- __
	208	10	20	208	ECX09L1EAA- __	ECX09L4EAA- __	ECX09L8EAA- __	XTAE065D00E- __
	230	15	25	240	ECX09L1BAA- __	ECX09L4BAA- __	ECX09L8BAA- __	XTAE065D00B- __
	380	—	30	380/50 Hz	ECX09L1LAA- __	ECX09L4LAA- __	ECX09L8LAA- __	XTAE065D00L- __
	460	—	50	480	ECX09L1CAA- __	ECX09L4CAA- __	ECX09L8CAA- __	XTAE065D00C- __
	575	—	60	600	ECX09L1DAA- __	ECX09L4DAA- __	ECX09L8DAA- __	XTAE065D00D- __

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑥ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX09G4AAA-_{_}. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

3.1

IEC Contactors and Starters

XT IEC Power Control

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Class ECX09—Non-Combination Non-Reversing Starter, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size M								
80	115	7-1/2	—	120	ECX09M1AAA- __	ECX09M4AAA- __	ECX09M8AAA- __	XTAE080F00A- __
	208	15	25	208	ECX09M1EAA- __	ECX09M4EAA- __	ECX09M8EAA- __	XTAE080F00E- __
	230	15	30	240	ECX09M1BAA- __	ECX09M4BAA- __	ECX09M8BAA- __	XTAE080F00B- __
	380	—	50	380/50 Hz	ECX09M1LAA- __	ECX09M4LAA- __	ECX09M8LAA- __	XTAE080F00L- __
	460	—	60	480	ECX09M1CAA- __	ECX09M4CAA- __	ECX09M8CAA- __	XTAE080F00C- __
	575	—	75	600	ECX09M1DAA- __	ECX09M4DAA- __	ECX09M8DAA- __	XTAE080F00D- __
Size N								
95	115	7-1/2	—	120	ECX09N1AAA- __	ECX09N4AAA- __	ECX09N8AAA- __	XTAE095F00A- __
	208	15	25	208	ECX09N1EAA- __	ECX09N4EAA- __	ECX09N8EAA- __	XTAE095F00E- __
	230	15	40	240	ECX09N1BAA- __	ECX09N4BAA- __	ECX09N8BAA- __	XTAE095F00B- __
	380	—	60	380/50 Hz	ECX09N1LAA- __	ECX09N4LAA- __	ECX09N8LAA- __	XTAE095F00L- __
	460	—	75	480	ECX09N1CAA- __	ECX09N4CAA- __	ECX09N8CAA- __	XTAE095F00C- __
	575	—	100	600	ECX09N1DAA- __	ECX09N4DAA- __	ECX09N8DAA- __	XTAE095F00D- __
Size P								
115	115	10	—	120	ECX09P1AAA- __	ECX09P4AAA- __	ECX09P8AAA- __	XTAE115G00A- __
	208	25	40	208	ECX09P1EAA- __	ECX09P4EAA- __	ECX09P8EAA- __	XTAE115G00E- __
	230	25	50	240	ECX09P1BAA- __	ECX09P4BAA- __	ECX09P8BAA- __	XTAE115G00B- __
	380	—	60	380/50 Hz	ECX09P1LAA- __	ECX09P4LAA- __	ECX09P8LAA- __	XTAE115G00L- __
	460	—	100	480	ECX09P1CAA- __	ECX09P4CAA- __	ECX09P8CAA- __	XTAE115G00C- __
	575	—	125	600	ECX09P1DAA- __	ECX09P4DAA- __	ECX09P8DAA- __	XTAE115G00D- __
Size Q								
150	115	15	—	120	ECX09Q1AAA- __	ECX09Q4AAA- __	ECX09Q8AAA- __	XTAE150G00A- __
	208	25	40	208	ECX09Q1EAA- __	ECX09Q4EAA- __	ECX09Q8EAA- __	XTAE150G00E- __
	230	30	60	240	ECX09Q1BAA- __	ECX09Q4BAA- __	ECX09Q8BAA- __	XTAE150G00B- __
	380	—	60	380/50 Hz	ECX09Q1LAA- __	ECX09Q4LAA- __	ECX09Q8LAA- __	XTAE150G00L- __
	460	—	125	480	ECX09Q1CAA- __	ECX09Q4CAA- __	ECX09Q8CAA- __	XTAE150G00C- __
	575	—	150	600	ECX09Q1DAA- __	ECX09Q4DAA- __	ECX09Q8DAA- __	XTAE150G00D- __

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑥ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX09M4AAA-_{_}. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX10—Non-Combination Reversing Starter

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④		Catalog Number ^④
Size B								
7	115	1/4	—	120	ECX10B1AAA- ₋	ECX10B4AAA- ₋	ECX10B8AAA- ₋	XTAR007B10A- ₋
	208	3/4	1-1/2	208	ECX10B1EAA- ₋	ECX10B4EAA- ₋	ECX10B8EAA- ₋	XTAR007B10E- ₋
	230	1	2	240	ECX10B1BAA- ₋	ECX10B4BAA- ₋	ECX10B8BAA- ₋	XTAR007B10B- ₋
	380	—	3	380/50 Hz	ECX10B1LAA- ₋	ECX10B4LAA- ₋	ECX10B8LAA- ₋	XTAR007B10L- ₋
	460	—	3	480	ECX10B1CAA- ₋	ECX10B4CAA- ₋	ECX10B8CAA- ₋	XTAR007B10C- ₋
	575	—	5	600	ECX10B1DAA- ₋	ECX10B4DAA- ₋	ECX10B8DAA- ₋	XTAR007B10D- ₋
Size C								
9	115	1/2	—	120	ECX10C1AAA- ₋	ECX10C4AAA- ₋	ECX10C8AAA- ₋	XTAR009B10A- ₋
	208	1	2	208	ECX10C1EAA- ₋	ECX10C4EAA- ₋	ECX10C8EAA- ₋	XTAR009B10E- ₋
	230	1-1/2	3	240	ECX10C1BAA- ₋	ECX10C4BAA- ₋	ECX10C8BAA- ₋	XTAR009B10B- ₋
	380	—	5	380/50 Hz	ECX10C1LAA- ₋	ECX10C4LAA- ₋	ECX10C8LAA- ₋	XTAR009B10L- ₋
	460	—	5	480	ECX10C1CAA- ₋	ECX10C4CAA- ₋	ECX10C8CAA- ₋	XTAR009B10C- ₋
	575	—	7-1/2	600	ECX10C1DAA- ₋	ECX10C4DAA- ₋	ECX10C8DAA- ₋	XTAR009B10D- ₋
Size D								
12	115	1/2	—	120	ECX10D1AAA- ₋	ECX10D4AAA- ₋	ECX10D8AAA- ₋	XTAR012B10A- ₋
	208	1-1/2	3	208	ECX10D1EAA- ₋	ECX10D4EAA- ₋	ECX10D8EAA- ₋	XTAR012B10E- ₋
	230	2	3	240	ECX10D1BAA- ₋	ECX10D4BAA- ₋	ECX10D8BAA- ₋	XTAR012B10B- ₋
	380	—	5	380/50 Hz	ECX10D1LAA- ₋	ECX10D4LAA- ₋	ECX10D8LAA- ₋	XTAR012B10L- ₋
	460	—	7-1/2	480	ECX10D1CAA- ₋	ECX10D4CAA- ₋	ECX10D8CAA- ₋	XTAR012B10C- ₋
	575	—	10	600	ECX10D1DAA- ₋	ECX10D4DAA- ₋	ECX10D8DAA- ₋	XTAR012B10D- ₋
Size E								
15	115	3/4	—	120	ECX10E1AAA- ₋	ECX10E4AAA- ₋	ECX10E8AAA- ₋	XTAR015B10A- ₋
	208	2	3	208	ECX10E1EAA- ₋	ECX10E4EAA- ₋	ECX10E8EAA- ₋	XTAR015B10E- ₋
	230	2	3	240	ECX10E1BAA- ₋	ECX10E4BAA- ₋	ECX10E8BAA- ₋	XTAR015B10B- ₋
	380	—	5	380/50 Hz	ECX10E1LAA- ₋	ECX10E4LAA- ₋	ECX10E8LAA- ₋	XTAR015B10L- ₋
	460	—	7-1/2	480	ECX10E1CAA- ₋	ECX10E4CAA- ₋	ECX10E8CAA- ₋	XTAR015B10C- ₋
	575	—	10	600	ECX10E1DAA- ₋	ECX10E4DAA- ₋	ECX10E8DAA- ₋	XTAR015B10D- ₋
Size F								
18	115	2	—	120	ECX10F1AAA- ₋	ECX10F4AAA- ₋	ECX10F8AAA- ₋	XTAR018C10A- ₋
	208	2	5	208	ECX10F1EAA- ₋	ECX10F4EAA- ₋	ECX10F8EAA- ₋	XTAR018C10E- ₋
	230	3	5	240	ECX10F1BAA- ₋	ECX10F4BAA- ₋	ECX10F8BAA- ₋	XTAR018C10B- ₋
	380	—	7-1/2	380/50 Hz	ECX10F1LAA- ₋	ECX10F4LAA- ₋	ECX10F8LAA- ₋	XTAR018C10L- ₋
	460	—	10	480	ECX10F1CAA- ₋	ECX10F4CAA- ₋	ECX10F8CAA- ₋	XTAR018C10C- ₋
	575	—	15	600	ECX10F1DAA- ₋	ECX10F4DAA- ₋	ECX10F8DAA- ₋	XTAR018C10D- ₋

Notes

① 1 hp = 0.746 kW.

② Contact factory for other voltage options.

③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.

④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.

⑥ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECX10B4AAA-₋. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

3.1

IEC Contactors and Starters

XT IEC Power Control

3

Class ECX10—Non-Combination Reversing Starter, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size G								
25	115	2	—	120	ECX10G1AAA-	ECX10G4AAA-	ECX10G8AAA-	XTAR025C10A
	208	3	7-1/2	208	ECX10G1EAA-	ECX10G4EAA-	ECX10G8EAA-	XTAR025C10E
	230	5	7-1/2	240	ECX10G1BAA-	ECX10G4BAA-	ECX10G8BAA-	XTAR025C10B
	380	—	10	380/50 Hz	ECX10G1LAA-	ECX10G4LAA-	ECX10G8LAA-	XTAR025C10L
	460	—	15	480	ECX10G1CAA-	ECX10G4CAA-	ECX10G8CAA-	XTAR025C10C
	575	—	20	600	ECX10G1DAA-	ECX10G4DAA-	ECX10G8DAA-	XTAR025C10D
	Size H							
32	115	3	—	120	ECX10H1AAA-	ECX10H4AAA-	ECX10H8AAA-	XTAR032C10A
	208	5	10	208	ECX10H1EAA-	ECX10H4EAA-	ECX10H8EAA-	XTAR032C10E
	230	5	10	240	ECX10H1BAA-	ECX10H4BAA-	ECX10H8BAA-	XTAR032C10B
	380	—	15	380/50 Hz	ECX10H1LAA-	ECX10H4LAA-	ECX10H8LAA-	XTAR032C10L
	460	—	20	480	ECX10H1CAA-	ECX10H4CAA-	ECX10H8CAA-	XTAR032C10C
	575	—	25	600	ECX10H1DAA-	ECX10H4DAA-	ECX10H8DAA-	XTAR032C10D
	Size J							
40	115	3	—	120	ECX10J1AAA-	ECX10J4AAA-	ECX10J8AAA-	XTAR040D00A
	208	5	10	208	ECX10J1EAA-	ECX10J4EAA-	ECX10J8EAA-	XTAR040D00E
	230	7-1/2	15	240	ECX10J1BAA-	ECX10J4BAA-	ECX10J8BAA-	XTAR040D00B
	380	—	15	380/50 Hz	ECX10J1LAA-	ECX10J4LAA-	ECX10J8LAA-	XTAR040D00L
	460	—	30	480	ECX10J1CAA-	ECX10J4CAA-	ECX10J8CAA-	XTAR040D00C
	575	—	40	600	ECX10J1DAA-	ECX10J4DAA-	ECX10J8DAA-	XTAR040D00D
	Size K							
50	115	3	—	120	ECX10K1AAA-	ECX10K4AAA-	ECX10K8AAA-	XTAR050D00A
	208	7-1/2	15	208	ECX10K1EAA-	ECX10K4EAA-	ECX10K8EAA-	XTAR050D00E
	230	10	20	240	ECX10K1BAA-	ECX10K4BAA-	ECX10K8BAA-	XTAR050D00B
	380	—	20	380/50 Hz	ECX10K1LAA-	ECX10K4LAA-	ECX10K8LAA-	XTAR050D00L
	460	—	40	480	ECX10K1CAA-	ECX10K4CAA-	ECX10K8CAA-	XTAR050D00C
	575	—	50	600	ECX10K1DAA-	ECX10K4DAA-	ECX10K8DAA-	XTAR050D00D
	Size L							
65	115	5	—	120	ECX10L1AAA-	ECX10L4AAA-	ECX10L8AAA-	XTAR065D00A
	208	10	20	208	ECX10L1EAA-	ECX10L4EAA-	ECX10L8EAA-	XTAR065D00E
	230	15	25	240	ECX10L1BAA-	ECX10L4BAA-	ECX10L8BAA-	XTAR065D00B
	380	—	30	380/50 Hz	ECX10L1LAA-	ECX10L4LAA-	ECX10L8LAA-	XTAR065D00L
	460	—	50	480	ECX10L1CAA-	ECX10L4CAA-	ECX10L8CAA-	XTAR065D00C
	575	—	60	600	ECX10L1DAA-	ECX10L4DAA-	ECX10L8DAA-	XTAR065D00D

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑥ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX10G4AAA-_. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX10—Non-Combination Reversing Starter, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size M								
80	115	7-1/2	—	120	ECX10M1AAA- __	ECX10M4AAA- __	ECX10M8AAA- __	XTAR080F00A- __
	208	15	25	208	ECX10M1EAA- __	ECX10M4EAA- __	ECX10M8EAA- __	XTAR080F00E- __
	230	15	30	240	ECX10M1BAA- __	ECX10M4BAA- __	ECX10M8BAA- __	XTAR080F00B- __
	380	—	50	380/50 Hz	ECX10M1LAA- __	ECX10M4LAA- __	ECX10M8LAA- __	XTAR080F00L- __
	460	—	60	480	ECX10M1CAA- __	ECX10M4CAA- __	ECX10M8CAA- __	XTAR080F00C- __
	575	—	75	600	ECX10M1DAA- __	ECX10M4DAA- __	ECX10M8DAA- __	XTAR080F00D- __
Size N								
95	115	7-1/2	—	120	ECX10N1AAA- __	ECX10N4AAA- __	ECX10N8AAA- __	XTAR095F00A- __
	208	15	25	208	ECX10N1EAA- __	ECX10N4EAA- __	ECX10N8EAA- __	XTAR095F00E- __
	230	15	40	240	ECX10N1BAA- __	ECX10N4BAA- __	ECX10N8BAA- __	XTAR095F00B- __
	380	—	60	380/50 Hz	ECX10N1LAA- __	ECX10N4LAA- __	ECX10N8LAA- __	XTAR095F00L- __
	460	—	75	480	ECX10N1CAA- __	ECX10N4CAA- __	ECX10N8CAA- __	XTAR095F00C- __
	575	—	100	600	ECX10N1DAA- __	ECX10N4DAA- __	ECX10N8DAA- __	XTAR095F00D- __
Size P								
115	115	10	—	120	ECX10P1AAA- __	ECX10P4AAA- __	ECX10P8AAA- __	XTAR115G00A- __
	208	25	40	208	ECX10P1EAA- __	ECX10P4EAA- __	ECX10P8EAA- __	XTAR115G00E- __
	230	25	50	240	ECX10P1BAA- __	ECX10P4BAA- __	ECX10P8BAA- __	XTAR115G00B- __
	380	—	60	380/50 Hz	ECX10P1LAA- __	ECX10P4LAA- __	ECX10P8LAA- __	XTAR115G00L- __
	460	—	100	480	ECX10P1CAA- __	ECX10P4CAA- __	ECX10P8CAA- __	XTAR115G00C- __
	575	—	125	600	ECX10P1DAA- __	ECX10P4DAA- __	ECX10P8DAA- __	XTAR115G00D- __
Size Q								
150	115	15	—	120	ECX10Q1AAA- __	ECX10Q4AAA- __	ECX10Q8AAA- __	XTAR150G00A- __
	208	25	40	208	ECX10Q1EAA- __	ECX10Q4EAA- __	ECX10Q8EAA- __	XTAR150G00E- __
	230	30	60	240	ECX10Q1BAA- __	ECX10Q4BAA- __	ECX10Q8BAA- __	XTAR150G00B- __
	380	—	60	380/50 Hz	ECX10Q1LAA- __	ECX10Q4LAA- __	ECX10Q8LAA- __	XTAR150G00L- __
	460	—	125	480	ECX10Q1CAA- __	ECX10Q4CAA- __	ECX10Q8CAA- __	XTAR150G00C- __
	575	—	150	600	ECX10Q1DAA- __	ECX10Q4DAA- __	ECX10Q8DAA- __	XTAR150G00D- __

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX10M4AAA-_{_}. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

3.1

IEC Contactors and Starters

X7 IEC Power Control

3

Class ECX11—Non-Combination Non-Reversing Starter with CPT

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size B								
7	115	1/4	—	120	ECX11B1AAA-	ECX11B4AAA-	ECX11B8AAA-	XTAE007B10A
	208	3/4	1-1/2	120	ECX11B1AAA-	ECX11B4AAA-	ECX11B8AAA-	XTAE007B10A
	230	1	2	120	ECX11B1AAA-	ECX11B4AAA-	ECX11B8AAA-	XTAE007B10A
	380	—	3	110	ECX11B1AAA-	ECX11B4AAA-	ECX11B8AAA-	XTAE007B10A
	460	—	3	120	ECX11B1AAA-	ECX11B4AAA-	ECX11B8AAA-	XTAE007B10A
	575	—	5	120	ECX11B1AAA-	ECX11B4AAA-	ECX11B8AAA-	XTAE007B10A
Size C								
9	115	1/2	—	120	ECX11C1AAA-	ECX11C4AAA-	ECX11C8AAA-	XTAE009B10A
	208	1	2	120	ECX11C1AAA-	ECX11C4AAA-	ECX11C8AAA-	XTAE009B10A
	230	1-1/2	3	120	ECX11C1AAA-	ECX11C4AAA-	ECX11C8AAA-	XTAE009B10A
	380	—	5	110	ECX11C1AAA-	ECX11C4AAA-	ECX11C8AAA-	XTAE009B10A
	460	—	5	120	ECX11C1AAA-	ECX11C4AAA-	ECX11C8AAA-	XTAE009B10A
	575	—	7-1/2	120	ECX11C1AAA-	ECX11C4AAA-	ECX11C8AAA-	XTAE009B10A
Size D								
12	115	1/2	—	120	ECX11D1AAA-	ECX11D4AAA-	ECX11D8AAA-	XTAE012B10A
	208	1-1/2	3	120	ECX11D1AAA-	ECX11D4AAA-	ECX11D8AAA-	XTAE012B10A
	230	2	3	120	ECX11D1AAA-	ECX11D4AAA-	ECX11D8AAA-	XTAE012B10A
	380	—	5	110	ECX11D1AAA-	ECX11D4AAA-	ECX11D8AAA-	XTAE012B10A
	460	—	7-1/2	120	ECX11D1AAA-	ECX11D4AAA-	ECX11D8AAA-	XTAE012B10A
	575	—	10	120	ECX11D1AAA-	ECX11D4AAA-	ECX11D8AAA-	XTAE012B10A
Size E								
15	115	3/4	—	120	ECX11E1AAA-	ECX11E4AAA-	ECX11E8AAA-	XTAE015B10A
	208	2	3	120	ECX11E1AAA-	ECX11E4AAA-	ECX11E8AAA-	XTAE015B10A
	230	2	3	120	ECX11E1AAA-	ECX11E4AAA-	ECX11E8AAA-	XTAE015B10A
	380	—	5	110	ECX11E1AAA-	ECX11E4AAA-	ECX11E8AAA-	XTAE015B10A
	460	—	7-1/2	120	ECX11E1AAA-	ECX11E4AAA-	ECX11E8AAA-	XTAE015B10A
	575	—	10	120	ECX11E1AAA-	ECX11E4AAA-	ECX11E8AAA-	XTAE015B10A
Size F								
18	115	2	—	120	ECX11F1AAA-	ECX11F4AAA-	ECX11F8AAA-	XTAE018C10A
	208	2	5	120	ECX11F1AAA-	ECX11F4AAA-	ECX11F8AAA-	XTAE018C10A
	230	3	5	120	ECX11F1AAA-	ECX11F4AAA-	ECX11F8AAA-	XTAE018C10A
	380	—	7-1/2	110	ECX11F1AAA-	ECX11F4AAA-	ECX11F8AAA-	XTAE018C10A
	460	—	10	120	ECX11F1AAA-	ECX11F4AAA-	ECX11F8AAA-	XTAE018C10A
	575	—	15	120	ECX11F1AAA-	ECX11F4AAA-	ECX11F8AAA-	XTAE018C10A

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑥ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX11B4AAA-_. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX11—Non-Combination Non-Reversing Starter with CPT, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑤	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size G								
25	115	2	—	120	ECX11G1AAA-	ECX11G4AAA-	ECX11G8AAA-	XTAE025C10A-
	208	3	7-1/2	120	ECX11G1AAA-	ECX11G4AAA-	ECX11G8AAA-	XTAE025C10A-
	230	5	7-1/2	120	ECX11G1AAA-	ECX11G4AAA-	ECX11G8AAA-	XTAE025C10A-
	380	—	10	110	ECX11G1AAA-	ECX11G4AAA-	ECX11G8AAA-	XTAE025C10A-
	460	—	15	120	ECX11G1AAA-	ECX11G4AAA-	ECX11G8AAA-	XTAE025C10A-
	575	—	20	120	ECX11G1AAA-	ECX11G4AAA-	ECX11G8AAA-	XTAE025C10A-
Size H								
32	115	3	—	120	ECX11H1AAA-	ECX11H4AAA-	ECX11H8AAA-	XTAE032C10A-
	208	5	10	120	ECX11H1AAA-	ECX11H4AAA-	ECX11H8AAA-	XTAE032C10A-
	230	5	10	120	ECX11H1AAA-	ECX11H4AAA-	ECX11H8AAA-	XTAE032C10A-
	380	—	15	110	ECX11H1AAA-	ECX11H4AAA-	ECX11H8AAA-	XTAE032C10A-
	460	—	20	120	ECX11H1AAA-	ECX11H4AAA-	ECX11H8AAA-	XTAE032C10A-
	575	—	25	120	ECX11H1AAA-	ECX11H4AAA-	ECX11H8AAA-	XTAE032C10A-
Size J								
40	115	3	—	120	ECX11J1AAA-	ECX11J4AAA-	ECX11J8AAA-	XTAE040D00A-
	208	5	10	120	ECX11J1AAA-	ECX11J4AAA-	ECX11J8AAA-	XTAE040D00A-
	230	7-1/2	15	120	ECX11J1AAA-	ECX11J4AAA-	ECX11J8AAA-	XTAE040D00A-
	380	—	15	110	ECX11J1AAA-	ECX11J4AAA-	ECX11J8AAA-	XTAE040D00A-
	460	—	30	120	ECX11J1AAA-	ECX11J4AAA-	ECX11J8AAA-	XTAE040D00A-
	575	—	40	120	ECX11J1AAA-	ECX11J4AAA-	ECX11J8AAA-	XTAE040D00A-
Size K								
50	115	3	—	120	ECX11K1AAA-	ECX11K4AAA-	ECX11K8AAA-	XTAE050D00A-
	208	7-1/2	15	120	ECX11K1AAA-	ECX11K4AAA-	ECX11K8AAA-	XTAE050D00A-
	230	10	20	120	ECX11K1AAA-	ECX11K4AAA-	ECX11K8AAA-	XTAE050D00A-
	380	—	20	110	ECX11K1AAA-	ECX11K4AAA-	ECX11K8AAA-	XTAE050D00A-
	460	—	40	120	ECX11K1AAA-	ECX11K4AAA-	ECX11K8AAA-	XTAE050D00A-
	575	—	50	120	ECX11K1AAA-	ECX11K4AAA-	ECX11K8AAA-	XTAE050D00A-
Size L								
65	115	5	—	120	ECX11L1AAA-	ECX11L4AAA-	ECX11L8AAA-	XTAE065D00A-
	208	10	20	120	ECX11L1AAA-	ECX11L4AAA-	ECX11L8AAA-	XTAE065D00A-
	230	15	25	120	ECX11L1AAA-	ECX11L4AAA-	ECX11L8AAA-	XTAE065D00A-
	380	—	30	110	ECX11L1AAA-	ECX11L4AAA-	ECX11L8AAA-	XTAE065D00A-
	460	—	50	120	ECX11L1AAA-	ECX11L4AAA-	ECX11L8AAA-	XTAE065D00A-
	575	—	60	120	ECX11L1AAA-	ECX11L4AAA-	ECX11L8AAA-	XTAE065D00A-

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX11G4AAA-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

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IEC Contactors and Starters

XT IEC Power Control

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Class ECX11—Non-Combination Non-Reversing Starter with CPT, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Type 1/IP23	Type 4X/IP66 ^⑥	Type 12/IP65	Component	
	Motor Voltage ^②	Single-Phase		Three-Phase	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④	Catalog Number ^④
Size M								
80	115	7-1/2	—	120	ECX11M1AAA- ₋	ECX11M4AAA- ₋	ECX11M8AAA- ₋	XTAE080F00A- ₋
	208	15	25	120	ECX11M1AAA- ₋	ECX11M4AAA- ₋	ECX11M8AAA- ₋	XTAE080F00A- ₋
	230	15	30	120	ECX11M1AAA- ₋	ECX11M4AAA- ₋	ECX11M8AAA- ₋	XTAE080F00A- ₋
	380	—	50	110	ECX11M1AAA- ₋	ECX11M4AAA- ₋	ECX11M8AAA- ₋	XTAE080F00A- ₋
	460	—	60	120	ECX11M1AAA- ₋	ECX11M4AAA- ₋	ECX11M8AAA- ₋	XTAE080F00A- ₋
	575	—	75	120	ECX11M1AAA- ₋	ECX11M4AAA- ₋	ECX11M8AAA- ₋	XTAE080F00A- ₋
Size N								
95	115	7-1/2	—	120	ECX11N1AAA- ₋	ECX11N4AAA- ₋	ECX11N8AAA- ₋	XTAE095F00A- ₋
	208	15	25	120	ECX11N1AAA- ₋	ECX11N4AAA- ₋	ECX11N8AAA- ₋	XTAE095F00A- ₋
	230	15	40	120	ECX11N1AAA- ₋	ECX11N4AAA- ₋	ECX11N8AAA- ₋	XTAE095F00A- ₋
	380	—	60	110	ECX11N1AAA- ₋	ECX11N4AAA- ₋	ECX11N8AAA- ₋	XTAE095F00A- ₋
	460	—	75	120	ECX11N1AAA- ₋	ECX11N4AAA- ₋	ECX11N8AAA- ₋	XTAE095F00A- ₋
	575	—	100	120	ECX11N1AAA- ₋	ECX11N4AAA- ₋	ECX11N8AAA- ₋	XTAE095F00A- ₋
Size P								
115	115	10	—	120	ECX11P1AAA- ₋	ECX11P4AAA- ₋	ECX11P8AAA- ₋	XTAE115G00A- ₋
	208	25	40	120	ECX11P1AAA- ₋	ECX11P4AAA- ₋	ECX11P8AAA- ₋	XTAE115G00A- ₋
	230	25	50	120	ECX11P1AAA- ₋	ECX11P4AAA- ₋	ECX11P8AAA- ₋	XTAE115G00A- ₋
	380	—	60	110	ECX11P1AAA- ₋	ECX11P4AAA- ₋	ECX11P8AAA- ₋	XTAE115G00A- ₋
	460	—	100	120	ECX11P1AAA- ₋	ECX11P4AAA- ₋	ECX11P8AAA- ₋	XTAE115G00A- ₋
	575	—	125	120	ECX11P1AAA- ₋	ECX11P4AAA- ₋	ECX11P8AAA- ₋	XTAE115G00A- ₋
Size Q								
150	115	15	—	120	ECX11Q1AAA- ₋	ECX11Q4AAA- ₋	ECX11Q8AAA- ₋	XTAE150G00A- ₋
	208	25	40	120	ECX11Q1AAA- ₋	ECX11Q4AAA- ₋	ECX11Q8AAA- ₋	XTAE150G00A- ₋
	230	30	60	120	ECX11Q1AAA- ₋	ECX11Q4AAA- ₋	ECX11Q8AAA- ₋	XTAE150G00A- ₋
	380	—	60	110	ECX11Q1AAA- ₋	ECX11Q4AAA- ₋	ECX11Q8AAA- ₋	XTAE150G00A- ₋
	460	—	125	120	ECX11Q1AAA- ₋	ECX11Q4AAA- ₋	ECX11Q8AAA- ₋	XTAE150G00A- ₋
	575	—	150	120	ECX11Q1AAA- ₋	ECX11Q4AAA- ₋	ECX11Q8AAA- ₋	XTAE150G00A- ₋

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑥ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX11M4AAA-₋. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Combination Starters

Class ECX19—Combination Non-Reversing Starter—Fusible/Non-Fusible Disconnect

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Fuse Clips	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component Catalog Number ^④
	Motor Voltage ^②	Single-Phase						
Size B								
7	—	—	—	30 A	ECX19B1AAA_-	ECX19B4AAA_-	ECX19B8AAA_-	XTAE007B10A_
	115	1/4	—	120	ECX19B1AAC_-	ECX19B4AAC_-	ECX19B8AAC_-	XTAE007B10A_
	208	3/4	1-1/2	208	ECX19B1EAC_-	ECX19B4EAC_-	ECX19B8EAC_-	XTAE007B10E_
	230	1	2	240	ECX19B1BAC_-	ECX19B4BAC_-	ECX19B8BAC_-	XTAE007B10B_
	380	—	3	380/50 Hz	ECX19B1LAC_-	ECX19B4LAC_-	ECX19B8LAC_-	XTAE007B10L_
	460	—	3	480	ECX19B1CAC_-	ECX19B4CAC_-	ECX19B8CAC_-	XTAE007B10C_
	575	—	5	600	ECX19B1DAC_-	ECX19B4DAC_-	ECX19B8DAC_-	XTAE007B10D_
Size C								
9	—	—	—	30 A	ECX19C1AAA_-	ECX19C4AAA_-	ECX19C8AAA_-	XTAE009B10A_
	115	1/2	—	120	ECX19C1AAC_-	ECX19C4AAC_-	ECX19C8AAC_-	XTAE009B10A_
	208	1	2	208	ECX19C1EAC_-	ECX19C4EAC_-	ECX19C8EAC_-	XTAE009B10E_
	230	1-1/2	3	240	ECX19C1BAC_-	ECX19C4BAC_-	ECX19C8BAC_-	XTAE009B10B_
	380	—	5	380/50 Hz	ECX19C1LAC_-	ECX19C4LAC_-	ECX19C8LAC_-	XTAE009B10L_
	460	—	5	480	ECX19C1CAC_-	ECX19C4CAC_-	ECX19C8CAC_-	XTAE009B10C_
	575	—	7-1/2	600	ECX19C1DAC_-	ECX19C4DAC_-	ECX19C8DAC_-	XTAE009B10D_
Size D								
12	—	—	—	30 A	ECX19D1AAA_-	ECX19D4AAA_-	ECX19D8AAA_-	XTAE012B10A_
	115	1/2	—	120	ECX19D1AAC_-	ECX19D4AAC_-	ECX19D8AAC_-	XTAE012B10A_
	208	1-1/2	3	208	ECX19D1EAC_-	ECX19D4EAC_-	ECX19D8EAC_-	XTAE012B10E_
	230	2	3	240	ECX19D1BAC_-	ECX19D4BAC_-	ECX19D8BAC_-	XTAE012B10B_
	380	—	5	380/50 Hz	ECX19D1LAC_-	ECX19D4LAC_-	ECX19D8LAC_-	XTAE012B10L_
	460	—	7-1/2	480	ECX19D1CAC_-	ECX19D4CAC_-	ECX19D8CAC_-	XTAE012B10C_
	575	—	10	600	ECX19D1DAC_-	ECX19D4DAC_-	ECX19D8DAC_-	XTAE012B10D_
Size E								
15	—	—	—	30 A	ECX19E1AAA_-	ECX19E4AAA_-	ECX19E8AAA_-	XTAE015B10A_
	115	3/4	—	120	ECX19E1AAC_-	ECX19E4AAC_-	ECX19E8AAC_-	XTAE015B10A_
	208	2	3	208	ECX19E1EAC_-	ECX19E4EAC_-	ECX19E8EAC_-	XTAE015B10E_
	230	2	3	240	ECX19E1BAC_-	ECX19E4BAC_-	ECX19E8BAC_-	XTAE015B10B_
	380	—	5	380/50 Hz	ECX19E1LAC_-	ECX19E4LAC_-	ECX19E8LAC_-	XTAE015B10L_
	460	—	7-1/2	480	ECX19E1CAC_-	ECX19E4CAC_-	ECX19E8CAC_-	XTAE015B10C_
	575	—	10	600	ECX19E1DAC_-	ECX19E4DAC_-	ECX19E8DAC_-	XTAE015B10D_

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX19B4AAA_- . To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

3.1

IEC Contactors and Starters

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Class ECX19—Combination Non-Reversing Starter—Fusible/Non-Fusible Disconnect, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Fuse Clips	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size F									
18	—	—	—	30 A	ECX19F1AAA_	ECX19F4AAA_	ECX19F8AAA_	XTAE018C10A_	
	115	2	—	120	ECX19F1AAC_	ECX19F4AAC_	ECX19F8AAC_	XTAE018C10A_	
	208	2	5	208	ECX19F1EAC_	ECX19F4EAC_	ECX19F8EAC_	XTAE018C10E_	
	230	3	5	240	ECX19F1BAC_	ECX19F4BAC_	ECX19F8BAC_	XTAE018C10B_	
	380	—	7-1/2	380/50 Hz	ECX19F1LAC_	ECX19F4LAC_	ECX19F8LAC_	XTAE018C10L_	
	460	—	10	480	ECX19F1CAC_	ECX19F4CAC_	ECX19F8CAC_	XTAE018C10C_	
	575	—	15	600	ECX19F1DAC_	ECX19F4DAC_	ECX19F8DAC_	XTAE018C10D_	
Size G									
25	—	—	—	30 A	ECX19G1AAA_	ECX19G4AAA_	ECX19G8AAA_	XTAE025C10A_	
	115	2	—	120	ECX19G1AAC_	ECX19G4AAC_	ECX19G8AAC_	XTAE025C10A_	
	208	3	7-1/2	208	ECX19G1EAC_	ECX19G4EAC_	ECX19G8EAC_	XTAE025C10E_	
	230	5	7-1/2	240	ECX19G1BAC_	ECX19G4BAC_	ECX19G8BAC_	XTAE025C10B_	
	380	—	10	380/50 Hz	ECX19G1LAC_	ECX19G4LAC_	ECX19G8LAC_	XTAE025C10L_	
	460	—	15	480	ECX19G1CAC_	ECX19G4CAC_	ECX19G8CAC_	XTAE025C10C_	
	575	—	20	600	ECX19G1DAC_	ECX19G4DAC_	ECX19G8DAC_	XTAE025C10D_	
Size H									
32	—	—	—	60 A	ECX19H1AAA_	ECX19H4AAA_	ECX19H8AAA_	XTAE032C10A_	
	115	3	—	120	ECX19H1AAE_	ECX19H4AAE_	ECX19H8AAE_	XTAE032C10A_	
	208	5	10	208	ECX19H1EAE_	ECX19H4EAE_	ECX19H8EAE_	XTAE032C10E_	
	230	5	10	240	ECX19H1BAE_	ECX19H4BAE_	ECX19H8BAE_	XTAE032C10B_	
	380	—	15	380/50 Hz	ECX19H1LAE_	ECX19H4LAE_	ECX19H8LAE_	XTAE032C10L_	
	460	—	20	480	ECX19H1CAE_	ECX19H4CAE_	ECX19H8CAE_	XTAE032C10C_	
	575	—	25	600	ECX19H1DAE_	ECX19H4DAE_	ECX19H8DAE_	XTAE032C10D_	
Size J									
40	—	—	—	60 A	ECX19J1AAA_	ECX19J4AAA_	ECX19J8AAA_	XTAE040D00A_	
	115	3	—	120	ECX19J1AAE_	ECX19J4AAE_	ECX19J8AAE_	XTAE040D00A_	
	208	5	10	208	ECX19J1EAE_	ECX19J4EAE_	ECX19J8EAE_	XTAE040D00E_	
	230	7-1/2	15	240	ECX19J1BAE_	ECX19J4BAE_	ECX19J8BAE_	XTAE040D00B_	
	380	—	15	380/50 Hz	ECX19J1LAE_	ECX19J4LAE_	ECX19J8LAE_	XTAE040D00L_	
	460	—	30	480	ECX19J1CAE_	ECX19J4CAE_	ECX19J8CAE_	XTAE040D00C_	
	575	—	40	600	ECX19J1DAE_	ECX19J4DAE_	ECX19J8DAE_	XTAE040D00D_	
Size K									
50	—	—	—	100 A	ECX19K1AAA_	ECX19K4AAA_	ECX19K8AAA_	XTAE050D00A_	
	115	3	—	120	ECX19K1AAE_	ECX19K4AAE_	ECX19K8AAE_	XTAE050D00A_	
	208	7-1/2	15	208	ECX19K1EAE_	ECX19K4EAE_	ECX19K8EAE_	XTAE050D00E_	
	230	10	20	240	ECX19K1BAE_	ECX19K4BAE_	ECX19K8BAE_	XTAE050D00B_	
	380	—	20	380/50 Hz	ECX19K1LAE_	ECX19K4LAE_	ECX19K8LAE_	XTAE050D00L_	
	460	—	40	480	ECX19K1CAE_	ECX19K4CAE_	ECX19K8CAE_	XTAE050D00C_	
	575	—	50	600	ECX19K1DAE_	ECX19K4DAE_	ECX19K8DAE_	XTAE050D00D_	

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX19F4AAA_-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX19—Combination Non-Reversing Starter—Fusible/Non-Fusible Disconnect, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^②	Fuse Clips	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component Catalog Number ^④
	Motor Voltage ^②	Single-Phase						
Size L								
65	—	—	—	100 A	ECX19L1AAA_-	ECX19L4AAA_-	ECX19L8AAA_-	XTAE065D00A_-
	115	5	—	120	ECX19L1AAG_-	ECX19L4AAG_-	ECX19L8AAG_-	XTAE065D00A_-
	208	10	20	208	ECX19L1EAG_-	ECX19L4EAG_-	ECX19L8EAG_-	XTAE065D00E_-
	230	15	25	240	ECX19L1BAG_-	ECX19L4BAG_-	ECX19L8BAG_-	XTAE065D00B_-
	380	—	30	380/50 Hz	ECX19L1LAG_-	ECX19L4LAG_-	ECX19L8LAG_-	XTAE065D00L_-
	460	—	50	480	ECX19L1CAG_-	ECX19L4CAG_-	ECX19L8CAG_-	XTAE065D00C_-
	575	—	60	600	ECX19L1DAG_-	ECX19L4DAG_-	ECX19L8DAG_-	XTAE065D00D_-
Size M								
80	—	—	—	100 A	ECX19M1AAA_-	ECX19M4AAA_-	ECX19M8AAA_-	XTAE080F00A_-
	115	7-1/2	—	120	ECX19M1AAG_-	ECX19M4AAG_-	ECX19M8AAG_-	XTAE080F00A_-
	208	15	25	208	ECX19M1EAG_-	ECX19M4EAG_-	ECX19M8EAG_-	XTAE080F00E_-
	230	15	30	240	ECX19M1BAG_-	ECX19M4BAG_-	ECX19M8BAG_-	XTAE080F00B_-
	380	—	50	380/50 Hz	ECX19M1LAG_-	ECX19M4LAG_-	ECX19M8LAG_-	XTAE080F00L_-
	460	—	60	480	ECX19M1CAG_-	ECX19M4CAG_-	ECX19M8CAG_-	XTAE080F00C_-
	575	—	75	600	ECX19M1DAG_-	ECX19M4DAG_-	ECX19M8DAG_-	XTAE080F00D_-
Size N ^⑥								
95	—	—	—	⑥	ECX19N1AAA_-	ECX19N4AAA_-	ECX19N8AAA_-	XTAE095F00A_-
	115	7-1/2	—	120	ECX19N1AAG_-	ECX19N4AAG_-	ECX19N8AAG_-	XTAE095F00A_-
	208	15	25	208	ECX19N1EAG_-	ECX19N4EAG_-	ECX19N8EAG_-	XTAE095F00E_-
	230	15	40	240	ECX19N1BAG_-	ECX19N4BAG_-	ECX19N8BAG_-	XTAE095F00B_-
	380	—	60	380/50 Hz	ECX19N1LAG_-	ECX19N4LAG_-	ECX19N8LAG_-	XTAE095F00L_-
	460	—	75	480	ECX19N1CAG_-	ECX19N4CAG_-	ECX19N8CAG_-	XTAE095F00C_-
	575	—	100	600	ECX19N1DAG_-	ECX19N4DAG_-	ECX19N8DAG_-	XTAE095F00D_-
Size P ^⑥								
105	—	—	—	⑥	ECX19P1AAA_-	ECX19P4AAA_-	ECX19P8AAA_-	XTAE115G00A_-
	115	10	—	120	ECX19P1AAG_-	ECX19P4AAG_-	ECX19P8AAG_-	XTAE115G00A_-
	208	25	30	208	ECX19P1EAG_-	ECX19P4EAG_-	ECX19P8EAG_-	XTAE115G00E_-
	230	25	40	240	ECX19P1BAG_-	ECX19P4BAG_-	ECX19P8BAG_-	XTAE115G00B_-
	380	—	60	380/50 Hz	ECX19P1LAG_-	ECX19P4LAG_-	ECX19P8LAG_-	XTAE115G00L_-
	460	—	75	480	ECX19P1CAG_-	ECX19P4CAG_-	ECX19P8CAG_-	XTAE115G00C_-
	575	—	100	600	ECX19P1DAG_-	ECX19P4DAG_-	ECX19P8DAG_-	XTAE115G00D_-

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX19L4AAA_- . To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
 ⑥ Non-fused disconnect only.

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IEC Contactors and Starters

XT IEC Power Control

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Class ECX20—Combination Reversing Starter—Fusible/Non-Fusible Disconnect

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Fuse Clips	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size B									
7	—	—	—	30 A	ECX20B1AAA_	ECX20B4AAA_	ECX20B8AAA_	XTAR007B10A_	
	115	1/4	—	120	ECX20B1AAC_	ECX20B4AAC_	ECX20B8AAC_	XTAR007B10A_	
	208	3/4	1-1/2	208	ECX20B1EAC_	ECX20B4EAC_	ECX20B8EAC_	XTAR007B10E_	
	230	1	2	240	ECX20B1BAC_	ECX20B4BAC_	ECX20B8BAC_	XTAR007B10B_	
	380	—	3	380/50 Hz	ECX20B1LAC_	ECX20B4LAC_	ECX20B8LAC_	XTAR007B10L_	
	460	—	3	480	ECX20B1CAC_	ECX20B4CAC_	ECX20B8CAC_	XTAR007B10C_	
	575	—	5	600	ECX20B1DAC_	ECX20B4DAC_	ECX20B8DAC_	XTAR007B10D_	
Size C									
9	—	—	—	30 A	ECX20C1AAA_	ECX20C4AAA_	ECX20C8AAA_	XTAR009B10A_	
	115	1/2	—	120	ECX20C1AAC_	ECX20C4AAC_	ECX20C8AAC_	XTAR009B10A_	
	208	1	2	208	ECX20C1EAC_	ECX20C4EAC_	ECX20C8EAC_	XTAR009B10E_	
	230	1-1/2	3	240	ECX20C1BAC_	ECX20C4BAC_	ECX20C8BAC_	XTAR009B10B_	
	380	—	5	380/50 Hz	ECX20C1LAC_	ECX20C4LAC_	ECX20C8LAC_	XTAR009B10L_	
	460	—	5	480	ECX20C1CAC_	ECX20C4CAC_	ECX20C8CAC_	XTAR009B10C_	
	575	—	7-1/2	600	ECX20C1DAC_	ECX20C4DAC_	ECX20C8DAC_	XTAR009B10D_	
Size D									
12	—	—	—	30 A	ECX20D1AAA_	ECX20D4AAA_	ECX20D8AAA_	XTAR012B10A_	
	115	1/2	—	120	ECX20D1AAC_	ECX20D4AAC_	ECX20D8AAC_	XTAR012B10A_	
	208	1-1/2	3	208	ECX20D1EAC_	ECX20D4EAC_	ECX20D8EAC_	XTAR012B10E_	
	230	2	3	240	ECX20D1BAC_	ECX20D4BAC_	ECX20D8BAC_	XTAR012B10B_	
	380	—	5	380/50 Hz	ECX20D1LAC_	ECX20D4LAC_	ECX20D8LAC_	XTAR012B10L_	
	460	—	7-1/2	480	ECX20D1CAC_	ECX20D4CAC_	ECX20D8CAC_	XTAR012B10C_	
	575	—	10	600	ECX20D1DAC_	ECX20D4DAC_	ECX20D8DAC_	XTAR012B10D_	
Size E									
15	—	—	—	30 A	ECX20E1AAA_	ECX20E4AAA_	ECX20E8AAA_	XTAR015B10A_	
	115	3/4	—	120	ECX20E1AAC_	ECX20E4AAC_	ECX20E8AAC_	XTAR015B10A_	
	208	2	3	208	ECX20E1EAC_	ECX20E4EAC_	ECX20E8EAC_	XTAR015B10E_	
	230	2	3	240	ECX20E1BAC_	ECX20E4BAC_	ECX20E8BAC_	XTAR015B10B_	
	380	—	5	380/50 Hz	ECX20E1LAC_	ECX20E4LAC_	ECX20E8LAC_	XTAR015B10L_	
	460	—	7-1/2	480	ECX20E1CAC_	ECX20E4CAC_	ECX20E8CAC_	XTAR015B10C_	
	575	—	10	600	ECX20E1DAC_	ECX20E4DAC_	ECX20E8DAC_	XTAR015B10D_	

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECX20B4AAA_-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX20—Combination Reversing Starter—Fusible/Non-Fusible Disconnect, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Fuse Clips	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size F									
18	—	—	—	30 A	ECX20F1AAA_-	ECX20F4AAA_-	ECX20F8AAA_-	XTAR018C10A_	
	115	2	—	120	ECX20F1AAC_-	ECX20F4AAC_-	ECX20F8AAC_-	XTAR018C10A_	
	208	2	5	208	ECX20F1EAC_-	ECX20F4EAC_-	ECX20F8EAC_-	XTAR018C10E_	
	230	3	5	240	ECX20F1BAC_-	ECX20F4BAC_-	ECX20F8BAC_-	XTAR018C10B_	
	380	—	7-1/2	380/50 Hz	ECX20F1LAC_-	ECX20F4LAC_-	ECX20F8LAC_-	XTAR018C10L_	
	460	—	10	480	ECX20F1CAC_-	ECX20F4CAC_-	ECX20F8CAC_-	XTAR018C10C_	
	575	—	15	600	ECX20F1DAC_-	ECX20F4DAC_-	ECX20F8DAC_-	XTAR018C10D_	
Size G									
25	—	—	—	30 A	ECX20G1AAA_-	ECX20G4AAA_-	ECX20G8AAA_-	XTAR025C10A_	
	115	2	—	120	ECX20G1AAC_-	ECX20G4AAC_-	ECX20G8AAC_-	XTAR025C10A_	
	208	3	7-1/2	208	ECX20G1EAC_-	ECX20G4EAC_-	ECX20G8EAC_-	XTAR025C10E_	
	230	5	7-1/2	240	ECX20G1BAC_-	ECX20G4BAC_-	ECX20G8BAC_-	XTAR025C10B_	
	380	—	10	380/50 Hz	ECX20G1LAC_-	ECX20G4LAC_-	ECX20G8LAC_-	XTAR025C10L_	
	460	—	15	480	ECX20G1CAC_-	ECX20G4CAC_-	ECX20G8CAC_-	XTAR025C10C_	
	575	—	20	600	ECX20G1DAC_-	ECX20G4DAC_-	ECX20G8DAC_-	XTAR025C10D_	
Size H									
32	—	—	—	60 A	ECX20H1AAA_-	ECX20H4AAA_-	ECX20H8AAA_-	XTAR032C10A_	
	115	3	—	120	ECX20H1AAE_-	ECX20H4AAE_-	ECX20H8AAE_-	XTAR032C10A_	
	208	5	10	208	ECX20H1EAE_-	ECX20H4EAE_-	ECX20H8EAE_-	XTAR032C10E_	
	230	5	10	240	ECX20H1BAE_-	ECX20H4BAE_-	ECX20H8BAE_-	XTAR032C10B_	
	380	—	15	380/50 Hz	ECX20H1LAE_-	ECX20H4LAE_-	ECX20H8LAE_-	XTAR032C10L_	
	460	—	20	480	ECX20H1CAE_-	ECX20H4CAE_-	ECX20H8CAE_-	XTAR032C10C_	
	575	—	25	600	ECX20H1DAE_-	ECX20H4DAE_-	ECX20H8DAE_-	XTAR032C10D_	
Size J									
40	—	—	—	60 A	ECX20J1AAA_-	ECX20J4AAA_-	ECX20J8AAA_-	XTAR040D00A_	
	115	3	—	120	ECX20J1AAE_-	ECX20J4AAE_-	ECX20J8AAE_-	XTAR040D00A_	
	208	5	10	208	ECX20J1EAE_-	ECX20J4EAE_-	ECX20J8EAE_-	XTAR040D00E_	
	230	7-1/2	15	240	ECX20J1BAE_-	ECX20J4BAE_-	ECX20J8BAE_-	XTAR040D00B_	
	380	—	15	380/50 Hz	ECX20J1LAE_-	ECX20J4LAE_-	ECX20J8LAE_-	XTAR040D00L_	
	460	—	30	480	ECX20J1CAE_-	ECX20J4CAE_-	ECX20J8CAE_-	XTAR040D00C_	
	575	—	40	600	ECX20J1DAE_-	ECX20J4DAE_-	ECX20J8DAE_-	XTAR040D00D_	
Size K									
50	—	—	—	100 A	ECX20K1AAA_-	ECX20K4AAA_-	ECX20K8AAA_-	XTAR050D00A_	
	115	3	—	120	ECX20K1AAG_-	ECX20K4AAG_-	ECX20K8AAG_-	XTAR050D00A_	
	208	7-1/2	15	208	ECX20K1EAG_-	ECX20K4EAG_-	ECX20K8EAG_-	XTAR050D00E_	
	230	10	20	240	ECX20K1BAG_-	ECX20K4BAG_-	ECX20K8BAG_-	XTAR050D00B_	
	380	—	20	380/50 Hz	ECX20K1LAG_-	ECX20K4LAG_-	ECX20K8LAG_-	XTAR050D00L_	
	460	—	40	480	ECX20K1CAG_-	ECX20K4CAG_-	ECX20K8CAG_-	XTAR050D00C_	
	575	—	50	600	ECX20K1DAG_-	ECX20K4DAG_-	ECX20K8DAG_-	XTAR050D00D_	

Notes

① 1 hp = 0.746 kW.

② Contact factory for other voltage options.

③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.

④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.

⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECX20F4AAA_-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.

To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

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IEC Contactors and Starters

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Class ECX20—Combination Reversing Starter—Fusible/Non-Fusible Disconnect, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Fuse Clips	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size L									
65	—	—	—	100 A	ECX20L1AAA_	ECX20L4AAA_	ECX20L8AAA_	XTAR065D00A_	
	115	5	—	120	ECX20L1AAG_	ECX20L4AAG_	ECX20L8AAG_	XTAR065D00A_	
	208	10	20	208	ECX20L1EAG_	ECX20L4EAG_	ECX20L8EAG_	XTAR065D00E_	
	230	15	25	240	ECX20L1BAG_	ECX20L4BAG_	ECX20L8BAG_	XTAR065D00B_	
	380	—	30	380/50 Hz	ECX20L1LAG_	ECX20L4LAG_	ECX20L8LAG_	XTAR065D00L_	
	460	—	50	480	ECX20L1CAG_	ECX20L4CAG_	ECX20L8CAG_	XTAR065D00C_	
	575	—	60	600	ECX20L1DAG_	ECX20L4DAG_	ECX20L8DAG_	XTAR065D00D_	
Size M									
80	—	—	—	100 A	ECX20M1AAA_	ECX20M4AAA_	ECX20M8AAA_	XTAR080F00A_	
	115	7-1/2	—	120	ECX20M1AAG_	ECX20M4AAG_	ECX20M8AAG_	XTAR080F00A_	
	208	15	25	208	ECX20M1EAG_	ECX20M4EAG_	ECX20M8EAG_	XTAR080F00E_	
	230	15	30	240	ECX20M1BAG_	ECX20M4BAG_	ECX20M8BAG_	XTAR080F00B_	
	380	—	50	380/50 Hz	ECX20M1LAG_	ECX20M4LAG_	ECX20M8LAG_	XTAR080F00L_	
	460	—	60	480	ECX20M1CAG_	ECX20M4CAG_	ECX20M8CAG_	XTAR080F00C_	
	575	—	75	600	ECX20M1DAG_	ECX20M4DAG_	ECX20M8DAG_	XTAR080F00D_	
Size N ^⑥									
95	—	—	—	⑥	ECX20N1AAA_	ECX20N4AAA_	ECX20N8AAA_	XTAR095F00A_	
	115	7-1/2	—	120	ECX20N1AAA_	ECX20N4AAA_	ECX20N8AAA_	XTAR095F00A_	
	208	15	25	208	ECX20N1EAA_	ECX20N4EAA_	ECX20N8EAA_	XTAR095F00E_	
	230	15	40	240	ECX20N1BAA_	ECX20N4BAA_	ECX20N8BAA_	XTAR095F00B_	
	380	—	60	380/50 Hz	ECX20N1LAA_	ECX20N4LAA_	ECX20N8LAA_	XTAR095F00L_	
	460	—	75	480	ECX20N1CAA_	ECX20N4CAA_	ECX20N8CAA_	XTAR095F00C_	
	575	—	100	600	ECX20N1DAA_	ECX20N4DAA_	ECX20N8DAA_	XTAR095F00D_	
Size P ^⑥									
105	—	—	—	⑥	ECX20P1AAA_	ECX20P4AAA_	ECX20P8AAA_	XTAR115G00A_	
	115	10	—	120	ECX20P1AAA_	ECX20P4AAA_	ECX20P8AAA_	XTAR115G00A_	
	208	25	30	208	ECX20P1EAA_	ECX20P4EAA_	ECX20P8EAA_	XTAR115G00E_	
	230	25	40	240	ECX20P1BAA_	ECX20P4BAA_	ECX20P8BAA_	XTAR115G00B_	
	380	—	60	380/50 Hz	ECX20P1LAA_	ECX20P4LAA_	ECX20P8LAA_	XTAR115G00L_	
	460	—	75	480	ECX20P1CAA_	ECX20P4CAA_	ECX20P8CAA_	XTAR115G00C_	
	575	—	100	600	ECX20P1DAA_	ECX20P4DAA_	ECX20P8DAA_	XTAR115G00D_	

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECX20L4AAA_-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ⑥ Non-fused disconnect only.

Class ECX25—Combination Non-Reversing Starter—Circuit Breaker

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Circuit Breaker	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component Catalog Number ^④	
	Motor Voltage ^②	Single-Phase							Three-Phase
Size B									
7	115	1/4	—	120	7 A	ECX25B1AAC_-	ECX25B4AAC_-	ECX25B8AAC_-	XTAE007B10A_
	208	3/4	1-1/2	208		ECX25B1EAC_-	ECX25B4EAC_-	ECX25B8EAC_-	XTAE007B10E_
	230	1	2	240		ECX25B1BAC_-	ECX25B4BAC_-	ECX25B8BAC_-	XTAE007B10B_
	380	—	3	380/50 Hz		ECX25B1LAC_-	ECX25B4LAC_-	ECX25B8LAC_-	XTAE007B10L_
	460	—	3	480		ECX25B1CAC_-	ECX25B4CAC_-	ECX25B8CAC_-	XTAE007B10C_
	575	—	5	600		ECX25B1DAC_-	ECX25B4DAC_-	ECX25B8DAC_-	XTAE007B10D_
Size C									
9	115	1/2	—	120	15 A	ECX25C1AAD_-	ECX25C4AAD_-	ECX25C8AAD_-	XTAE009B10A_
	208	1	2	208		ECX25C1EAD_-	ECX25C4EAD_-	ECX25C8EAD_-	XTAE009B10E_
	230	1-1/2	3	240		ECX25C1BAD_-	ECX25C4BAD_-	ECX25C8BAD_-	XTAE009B10B_
	380	—	5	380/50 Hz		ECX25C1LAD_-	ECX25C4LAD_-	ECX25C8LAD_-	XTAE009B10L_
	460	—	5	480		ECX25C1CAD_-	ECX25C4CAD_-	ECX25C8CAD_-	XTAE009B10C_
	575	—	7-1/2	600		ECX25C1DAD_-	ECX25C4DAD_-	ECX25C8DAD_-	XTAE009B10D_
Size D									
12	115	1/2	—	120	15 A	ECX25D1AAD_-	ECX25D4AAD_-	ECX25D8AAD_-	XTAE012B10A_
	208	1-1/2	3	208		ECX25D1EAD_-	ECX25D4EAD_-	ECX25D8EAD_-	XTAE012B10E_
	230	2	3	240		ECX25D1BAD_-	ECX25D4BAD_-	ECX25D8BAD_-	XTAE012B10B_
	380	—	5	380/50 Hz		ECX25D1LAD_-	ECX25D4LAD_-	ECX25D8LAD_-	XTAE012B10L_
	460	—	7-1/2	480		ECX25D1CAD_-	ECX25D4CAD_-	ECX25D8CAD_-	XTAE012B10C_
	575	—	10	600		ECX25D1DAD_-	ECX25D4DAD_-	ECX25D8DAD_-	XTAE012B10D_
Size E									
15	115	3/4	—	120	30 A	ECX25E1AAE_-	ECX25E4AAE_-	ECX25E8AAE_-	XTAE015B10A_
	208	2	3	208		ECX25E1EAE_-	ECX25E4EAE_-	ECX25E8EAE_-	XTAE015B10E_
	230	2	3	240		ECX25E1BAE_-	ECX25E4BAE_-	ECX25E8BAE_-	XTAE015B10B_
	380	—	5	380/50 Hz		ECX25E1LAE_-	ECX25E4LAE_-	ECX25E8LAE_-	XTAE015B10L_
	460	—	7-1/2	480		ECX25E1CAE_-	ECX25E4CAE_-	ECX25E8CAE_-	XTAE015B10C_
	575	—	10	600		ECX25E1DAE_-	ECX25E4DAE_-	ECX25E8DAE_-	XTAE015B10D_
Size F									
18	115	2	—	120	30 A	ECX25F1AAE_-	ECX25F4AAE_-	ECX25F8AAE_-	XTAE018C10A_
	208	2	5	208		ECX25F1EAE_-	ECX25F4EAE_-	ECX25F8EAE_-	XTAE018C10E_
	230	3	5	240		ECX25F1BAE_-	ECX25F4BAE_-	ECX25F8BAE_-	XTAE018C10B_
	380	—	7-1/2	380/50 Hz		ECX25F1LAE_-	ECX25F4LAE_-	ECX25F8LAE_-	XTAE018C10L_
	460	—	10	480		ECX25F1CAE_-	ECX25F4CAE_-	ECX25F8CAE_-	XTAE018C10C_
	575	—	15	600		ECX25F1DAE_-	ECX25F4DAE_-	ECX25F8DAE_-	XTAE018C10D_

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX25B4AAA_- . To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

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IEC Contactors and Starters

XT IEC Power Control

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Class ECX25—Combination Non-Reversing Starter—Circuit Breaker, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Circuit Breaker	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size G									
25	115	2	—	120	50 A	ECX25G1AAF_	ECX25G4AAF_	ECX25G8AAF_	XTAE025C10A_
	208	3	7-1/2	208		ECX25G1EAF_	ECX25G4EAF_	ECX25G8EAF_	XTAE025C10E_
	230	5	7-1/2	240		ECX25G1BAF_	ECX25G4BAF_	ECX25G8BAF_	XTAE025C10B_
	380	—	10	380/50 Hz		ECX25G1LAF_	ECX25G4LAF_	ECX25G8LAF_	XTAE025C10L_
	460	—	15	480		ECX25G1CAF_	ECX25G4CAF_	ECX25G8CAF_	XTAE025C10C_
	575	—	20	600		ECX25G1DAF_	ECX25G4DAF_	ECX25G8DAF_	XTAE025C10D_
	Size H								
32	115	3	—	120	50 A	ECX25H1AAF_	ECX25H4AAF_	ECX25H8AAF_	XTAE032C10A_
	208	5	10	208		ECX25H1EAF_	ECX25H4EAF_	ECX25H8EAF_	XTAE032C10E_
	230	5	10	240		ECX25H1BAF_	ECX25H4BAF_	ECX25H8BAF_	XTAE032C10B_
	380	—	15	380/50 Hz		ECX25H1LAF_	ECX25H4LAF_	ECX25H8LAF_	XTAE032C10L_
	460	—	20	480		ECX25H1CAF_	ECX25H4CAF_	ECX25H8CAF_	XTAE032C10C_
	575	—	25	600		ECX25H1DAF_	ECX25H4DAF_	ECX25H8DAF_	XTAE032C10D_
	Size J								
40	115	3	—	120	50 A	ECX25J1AAF_	ECX25J4AAF_	ECX25J8AAF_	XTAE040D00A_
	208	5	10	208		ECX25J1EAF_	ECX25J4EAF_	ECX25J8EAF_	XTAE040D00E_
	230	7-1/2	15	240		ECX25J1BAF_	ECX25J4BAF_	ECX25J8BAF_	XTAE040D00B_
	380	—	15	380/50 Hz		ECX25J1LAF_	ECX25J4LAF_	ECX25J8LAF_	XTAE040D00L_
	460	—	30	480		ECX25J1CAF_	ECX25J4CAF_	ECX25J8CAF_	XTAE040D00C_
	575	—	40	600		ECX25J1DAF_	ECX25J4DAF_	ECX25J8DAF_	XTAE040D00D_
	Size K								
50	115	3	—	120	70 A	ECX25K1AAW_	ECX25K4AAW_	ECX25K8AAW_	XTAE050D00A_
	208	7-1/2	15	208		ECX25K1EAW_	ECX25K4EAW_	ECX25K8EAW_	XTAE050D00E_
	230	10	20	240		ECX25K1BAW_	ECX25K4BAW_	ECX25K8BAW_	XTAE050D00B_
	380	—	20	380/50 Hz		ECX25K1LAW_	ECX25K4LAW_	ECX25K8LAW_	XTAE050D00L_
	460	—	40	480		ECX25K1CAW_	ECX25K4CAW_	ECX25K8CAW_	XTAE050D00C_
	575	—	50	600		ECX25K1DAW_	ECX25K4DAW_	ECX25K8DAW_	XTAE050D00D_
	Size L								
65	115	5	—	120	70 A	ECX25L1AAW_	ECX25L4AAW_	ECX25L8AAW_	XTAE065D00A_
	208	10	20	208		ECX25L1EAW_	ECX25L4EAW_	ECX25L8EAW_	XTAE065D00E_
	230	15	25	240		ECX25L1BAW_	ECX25L4BAW_	ECX25L8BAW_	XTAE065D00B_
	380	—	30	380/50 Hz		ECX25L1LAW_	ECX25L4LAW_	ECX25L8LAW_	XTAE065D00L_
	460	—	50	480		ECX25L1CAW_	ECX25L4CAW_	ECX25L8CAW_	XTAE065D00C_
	575	—	60	600		ECX25L1DAW_	ECX25L4DAW_	ECX25L8DAW_	XTAE065D00D_

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX25G4AAA-_. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX25—Combination Non-Reversing Starter—Circuit Breaker, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Circuit Breaker	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component Catalog Number ^④	
	Motor Voltage ^②	Single-Phase							Three-Phase
Size M									
80	115	7-1/2	—	120	100 A	ECX25M1AAG_-	ECX25M4AAG_-	ECX25M8AAG_-	XTAE080F00A_
	208	15	25	208		ECX25M1EAG_-	ECX25M4EAG_-	ECX25M8EAG_-	XTAE080F00E_
	230	15	30	240		ECX25M1BAG_-	ECX25M4BAG_-	ECX25M8BAG_-	XTAE080F00B_
	380	—	50	380/50 Hz		ECX25M1LAG_-	ECX25M4LAG_-	ECX25M8LAG_-	XTAE080F00L_
	460	—	60	480		ECX25M1CAG_-	ECX25M4CAG_-	ECX25M8CAG_-	XTAE080F00C_
	575	—	75	600		ECX25M1DAG_-	ECX25M4DAG_-	ECX25M8DAG_-	XTAE080F00D_
Size N									
95	115	7-1/2	—	120	100 A	ECX25N1AAG_-	ECX25N4AAG_-	ECX25N8AAG_-	XTAE095F00A_
	208	15	25	208		ECX25N1EAG_-	ECX25N4EAG_-	ECX25N8EAG_-	XTAE095F00E_
	230	15	40	240		ECX25N1BAG_-	ECX25N4BAG_-	ECX25N8BAG_-	XTAE095F00B_
	380	—	60	380/50 Hz		ECX25N1LAG_-	ECX25N4LAG_-	ECX25N8LAG_-	XTAE095F00L_
	460	—	75	480		ECX25N1CAG_-	ECX25N4CAG_-	ECX25N8CAG_-	XTAE095F00C_
	575	—	100	600		ECX25N1DAG_-	ECX25N4DAG_-	ECX25N8DAG_-	XTAE095F00D_
Size P									
115	115	10	—	120	150 A	ECX25P1AAH_-	ECX25P4AAH_-	ECX25P8AAH_-	XTAE115G00A_
	208	25	40	208		ECX25P1EAH_-	ECX25P4EAH_-	ECX25P8EAH_-	XTAE115G00E_
	230	25	50	240		ECX25P1BAH_-	ECX25P4BAH_-	ECX25P8BAH_-	XTAE115G00B_
	380	—	60	380/50 Hz		ECX25P1LAH_-	ECX25P4LAH_-	ECX25P8LAH_-	XTAE115G00L_
	460	—	100	480		ECX25P1CAH_-	ECX25P4CAH_-	ECX25P8CAH_-	XTAE115G00C_
	575	—	125	600		ECX25P1DAH_-	ECX25P4DAH_-	ECX25P8DAH_-	XTAE115G00D_
Size Q									
125	115	15	—	120	150 A	ECX25Q1AAH_-	ECX25Q4AAH_-	ECX25Q8AAH_-	XTAE150G00A_
	208	25	40	208		ECX25Q1EAH_-	ECX25Q4EAH_-	ECX25Q8EAH_-	XTAE150G00E_
	230	25	50	240		ECX25Q1BAH_-	ECX25Q4BAH_-	ECX25Q8BAH_-	XTAE150G00B_
	380	—	75	380/50 Hz		ECX25Q1LAH_-	ECX25Q4LAH_-	ECX25Q8LAH_-	XTAE150G00L_
	460	—	100	480		ECX25Q1CAH_-	ECX25Q4CAH_-	ECX25Q8CAH_-	XTAE150G00C_
	575	—	125	600		ECX25Q1DAH_-	ECX25Q4DAH_-	ECX25Q8DAH_-	XTAE150G00D_

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX25M4AAA_-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

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Class ECX26—Combination Reversing Starter—Circuit Breaker

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Circuit Breaker	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size B									
7	115	1/4	—	120	7 A	ECX26B1AAC_-	ECX26B4AAC_-	ECX26B8AAC_-	XTAR007B10A_
	208	3/4	1-1/2	208		ECX26B1EAC_-	ECX26B4EAC_-	ECX26B8EAC_-	XTAR007B10E_
	230	1	2	240		ECX26B1BAC_-	ECX26B4BAC_-	ECX26B8BAC_-	XTAR007B10B_
	380	—	3	380/50 Hz		ECX26B1LAC_-	ECX26B4LAC_-	ECX26B8LAC_-	XTAR007B10L_
	460	—	3	480		ECX26B1CAC_-	ECX26B4CAC_-	ECX26B8CAC_-	XTAR007B10C_
	575	—	5	600		ECX26B1DAC_-	ECX26B4DAC_-	ECX26B8DAC_-	XTAR007B10D_
Size C									
9	115	1/2	—	120	15 A	ECX26C1AAD_-	ECX26C4AAD_-	ECX26C8AAD_-	XTAR009B10A_
	208	1	2	208		ECX26C1EAD_-	ECX26C4EAD_-	ECX26C8EAD_-	XTAR009B10E_
	230	1-1/2	3	240		ECX26C1BAD_-	ECX26C4BAD_-	ECX26C8BAD_-	XTAR009B10B_
	380	—	5	380/50 Hz		ECX26C1LAD_-	ECX26C4LAD_-	ECX26C8LAD_-	XTAR009B10L_
	460	—	5	480		ECX26C1CAD_-	ECX26C4CAD_-	ECX26C8CAD_-	XTAR009B10C_
	575	—	7-1/2	600		ECX26C1DAD_-	ECX26C4DAD_-	ECX26C8DAD_-	XTAR009B10D_
Size D									
12	115	1/2	—	120	15 A	ECX26D1AAD_-	ECX26D4AAD_-	ECX26D8AAD_-	XTAR012B10A_
	208	1-1/2	3	208		ECX26D1EAD_-	ECX26D4EAD_-	ECX26D8EAD_-	XTAR012B10E_
	230	2	3	240		ECX26D1BAD_-	ECX26D4BAD_-	ECX26D8BAD_-	XTAR012B10B_
	380	—	5	380/50 Hz		ECX26D1LAD_-	ECX26D4LAD_-	ECX26D8LAD_-	XTAR012B10L_
	460	—	7-1/2	480		ECX26D1CAD_-	ECX26D4CAD_-	ECX26D8CAD_-	XTAR012B10C_
	575	—	10	600		ECX26D1DAD_-	ECX26D4DAD_-	ECX26D8DAD_-	XTAR012B10D_
Size E									
15	115	3/4	—	120	30 A	ECX26E1AAE_-	ECX26E4AAE_-	ECX26E8AAE_-	XTAR015B10A_
	208	2	3	208		ECX26E1EAE_-	ECX26E4EAE_-	ECX26E8EAE_-	XTAR015B10E_
	230	2	3	240		ECX26E1BAE_-	ECX26E4BAE_-	ECX26E8BAE_-	XTAR015B10B_
	380	—	5	380/50 Hz		ECX26E1LAE_-	ECX26E4LAE_-	ECX26E8LAE_-	XTAR015B10L_
	460	—	7-1/2	480		ECX26E1CAE_-	ECX26E4CAE_-	ECX26E8CAE_-	XTAR015B10C_
	575	—	10	600		ECX26E1DAE_-	ECX26E4DAE_-	ECX26E8DAE_-	XTAR015B10D_
Size F									
18	115	2	—	120	30 A	ECX26F1AAE_-	ECX26F4AAE_-	ECX26F8AAE_-	XTAR018C10A_
	208	2	5	208		ECX26F1EAE_-	ECX26F4EAE_-	ECX26F8EAE_-	XTAR018C10E_
	230	3	5	240		ECX26F1BAE_-	ECX26F4BAE_-	ECX26F8BAE_-	XTAR018C10B_
	380	—	7-1/2	380/50 Hz		ECX26F1LAE_-	ECX26F4LAE_-	ECX26F8LAE_-	XTAR018C10L_
	460	—	10	480		ECX26F1CAE_-	ECX26F4CAE_-	ECX26F8CAE_-	XTAR018C10C_
	575	—	15	600		ECX26F1DAE_-	ECX26F4DAE_-	ECX26F8DAE_-	XTAR018C10D_

Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX26B4AAA_- . To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECX26—Combination Reversing Starter—Circuit Breaker, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Circuit Breaker	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component Catalog Number ^④	
	Motor Voltage ^②	Single-Phase							Three-Phase
Size G									
25	115	2	—	120	50 A	ECX26G1AAF_-	ECX26G4AAF_-	ECX26G8AAF_-	XTAR025C10A_
	208	3	7-1/2	208		ECX26G1EAF_-	ECX26G4EAF_-	ECX26G8EAF_-	XTAR025C10E_
	230	5	7-1/2	240		ECX26G1BAF_-	ECX26G4BAF_-	ECX26G8BAF_-	XTAR025C10B_
	380	—	10	380/50 Hz		ECX26G1LAF_-	ECX26G4LAF_-	ECX26G8LAF_-	XTAR025C10L_
	460	—	15	480		ECX26G1CAF_-	ECX26G4CAF_-	ECX26G8CAF_-	XTAR025C10C_
	575	—	20	600		ECX26G1DAF_-	ECX26G4DAF_-	ECX26G8DAF_-	XTAR025C10D_
Size H									
32	115	3	—	120	50 A	ECX26H1AAF_-	ECX26H4AAF_-	ECX26H8AAF_-	XTAR032C10A_
	208	5	10	208		ECX26H1EAF_-	ECX26H4EAF_-	ECX26H8EAF_-	XTAR032C10E_
	230	5	10	240		ECX26H1BAF_-	ECX26H4BAF_-	ECX26H8BAF_-	XTAR032C10B_
	380	—	15	380/50 Hz		ECX26H1LAF_-	ECX26H4LAF_-	ECX26H8LAF_-	XTAR032C10L_
	460	—	20	480		ECX26H1CAF_-	ECX26H4CAF_-	ECX26H8CAF_-	XTAR032C10C_
	575	—	25	600		ECX26H1DAF_-	ECX26H4DAF_-	ECX26H8DAF_-	XTAR032C10D_
Size J									
40	115	3	—	120	50 A	ECX26J1AAF_-	ECX26J4AAF_-	ECX26J8AAF_-	XTAR040D00A_
	208	5	10	208		ECX26J1EAF_-	ECX26J4EAF_-	ECX26J8EAF_-	XTAR040D00E_
	230	7-1/2	15	240		ECX26J1BAF_-	ECX26J4BAF_-	ECX26J8BAF_-	XTAR040D00B_
	380	—	15	380/50 Hz		ECX26J1LAF_-	ECX26J4LAF_-	ECX26J8LAF_-	XTAR040D00L_
	460	—	30	480		ECX26J1CAF_-	ECX26J4CAF_-	ECX26J8CAF_-	XTAR040D00C_
	575	—	40	600		ECX26J1DAF_-	ECX26J4DAF_-	ECX26J8DAF_-	XTAR040D00D_
Size K									
50	115	3	—	120	70 A	ECX26K1AAW_-	ECX26K4AAW_-	ECX26K8AAW_-	XTAR050D00A_
	208	7-1/2	15	208		ECX26K1EAW_-	ECX26K4EAW_-	ECX26K8EAW_-	XTAR050D00E_
	230	10	20	240		ECX26K1BAW_-	ECX26K4BAW_-	ECX26K8BAW_-	XTAR050D00B_
	380	—	20	380/50 Hz		ECX26K1LAW_-	ECX26K4LAW_-	ECX26K8LAW_-	XTAR050D00L_
	460	—	40	480		ECX26K1CAW_-	ECX26K4CAW_-	ECX26K8CAW_-	XTAR050D00C_
	575	—	50	600		ECX26K1DAW_-	ECX26K4DAW_-	ECX26K8DAW_-	XTAR050D00D_
Size L									
65	115	5	—	120	100 A	ECX26L1AAW_-	ECX26L4AAW_-	ECX26L8AAW_-	XTAR065D00A_
	208	10	20	208		ECX26L1EAW_-	ECX26L4EAW_-	ECX26L8EAW_-	XTAR065D00E_
	230	15	25	240		ECX26L1BAW_-	ECX26L4BAW_-	ECX26L8BAW_-	XTAR065D00B_
	380	—	30	380/50 Hz		ECX26L1LAW_-	ECX26L4LAW_-	ECX26L8LAW_-	XTAR065D00L_
	460	—	50	480		ECX26L1CAW_-	ECX26L4CAW_-	ECX26L8CAW_-	XTAR065D00C_
	575	—	60	600		ECX26L1DAW_-	ECX26L4DAW_-	ECX26L8DAW_-	XTAR065D00D_

Notes

- ① 1 hp = 0.746 kW.
 ② Contact factory for other voltage options.
 ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
 ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
 ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
 Example: ECX26G4AAF_- . To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
 To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

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Class ECX26—Combination Reversing Starter—Circuit Breaker, continued

Amps	Maximum hp ^①		Coil Voltage at 60 Hz ^③	Circuit Breaker	Type 1/IP23 Catalog Number ^④	Type 4X/IP66 ^⑤ Catalog Number ^④	Type 12/IP65 Catalog Number ^④	Component	
	Motor Voltage ^②	Single-Phase						Three-Phase	Catalog Number ^④
Size M									
80	115	7-1/2	—	120	100 A	ECX26M1AAG_-	ECX26M4AAG_-	ECX26M8AAG_-	XTAR080F00A_
	208	15	25	208		ECX26M1EAG_-	ECX26M4EAG_-	ECX26M8EAG_-	XTAR080F00E_
	230	15	30	240		ECX26M1BAG_-	ECX26M4BAG_-	ECX26M8BAG_-	XTAR080F00B_
	380	—	50	380/50 Hz		ECX26M1LAG_-	ECX26M4LAG_-	ECX26M8LAG_-	XTAR080F00L_
	460	—	60	480		ECX26M1CAG_-	ECX26M4CAG_-	ECX26M8CAG_-	XTAR080F00C_
	575	—	75	600		ECX26M1DAG_-	ECX26M4DAG_-	ECX26M8DAG_-	XTAR080F00D_
Size N									
95	115	7-1/2	—	120	100 A	ECX26N1AAG_-	ECX26N4AAG_-	ECX26N8AAG_-	XTAR095F00A_
	208	15	25	208		ECX26N1EAG_-	ECX26N4EAG_-	ECX26N8EAG_-	XTAR095F00E_
	230	15	40	240		ECX26N1BAG_-	ECX26N4BAG_-	ECX26N8BAG_-	XTAR095F00B_
	380	—	60	380/50 Hz		ECX26N1LAG_-	ECX26N4LAG_-	ECX26N8LAG_-	XTAR095F00L_
	460	—	75	480		ECX26N1CAG_-	ECX26N4CAG_-	ECX26N8CAG_-	XTAR095F00C_
	575	—	100	600		ECX26N1DAG_-	ECX26N4DAG_-	ECX26N8DAG_-	XTAR095F00D_
Size P									
115	115	10	—	120	150 A	ECX26P1AAH_-	ECX26P4AAH_-	ECX26P8AAH_-	XTAR115G00A_
	208	25	40	208		ECX26P1EAH_-	ECX26P4EAH_-	ECX26P8EAH_-	XTAR115G00E_
	230	25	50	240		ECX26P1BAH_-	ECX26P4BAH_-	ECX26P8BAH_-	XTAR115G00B_
	380	—	60	380/50 Hz		ECX26P1LAH_-	ECX26P4LAH_-	ECX26P8LAH_-	XTAR115G00L_
	460	—	100	480		ECX26P1CAH_-	ECX26P4CAH_-	ECX26P8CAH_-	XTAR115G00C_
	575	—	125	600		ECX26P1DAH_-	ECX26P4DAH_-	ECX26P8DAH_-	XTAR115G00D_

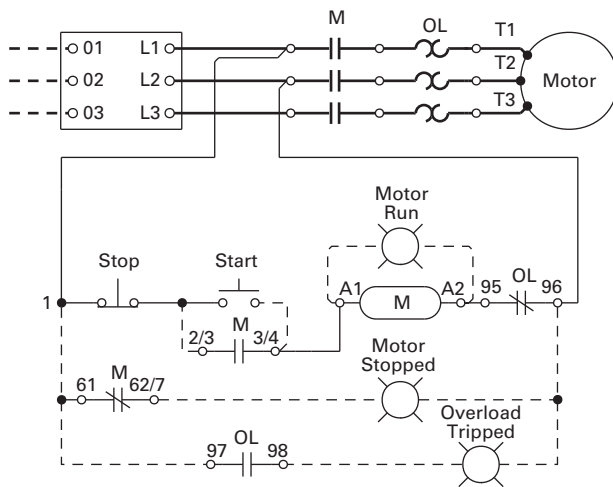
Notes

- ① 1 hp = 0.746 kW.
- ② Contact factory for other voltage options.
- ③ Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ④ Select proper "XTOB" overload amperage range as per motor FLA, see **Page V10-T3-9**.
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECX26M4AAG_-. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

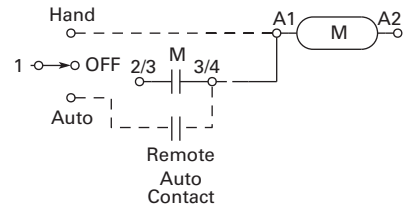
Wiring Diagrams

Typical Wiring Diagram

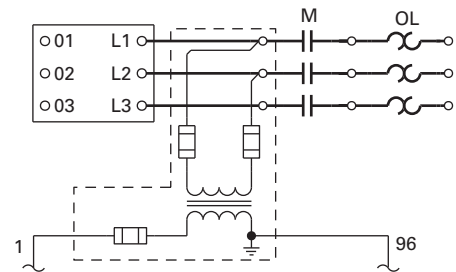
FVNR with Pushbutton Control



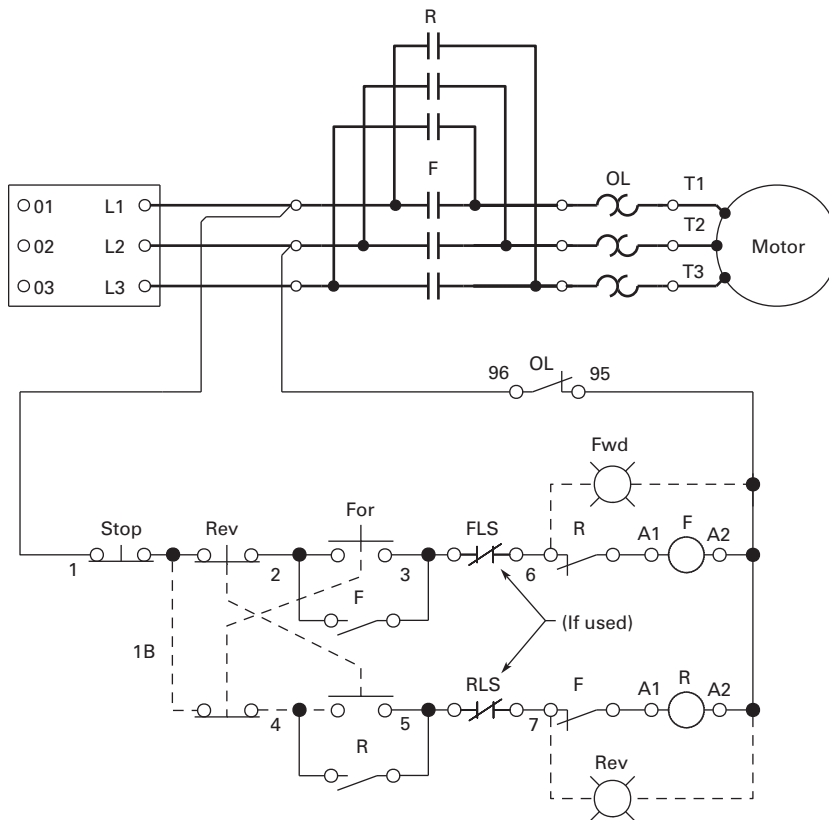
With Three-Position Selector Switch



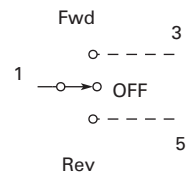
Control Power Transformer Option



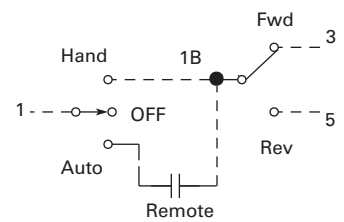
Reversing Combination Starter Wiring



Three-Position Switch



Two- and Three-Position Switch



3.1

IEC Contactors and Starters

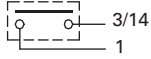
XT IEC Power Control

3

Non-Combination Starters (Non-Reversing)

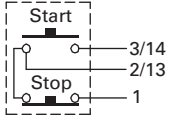
Remote Pilot Devices

Two-Wire Control

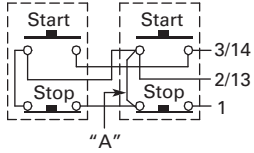


Not for Use with Auto Reset OL Relays

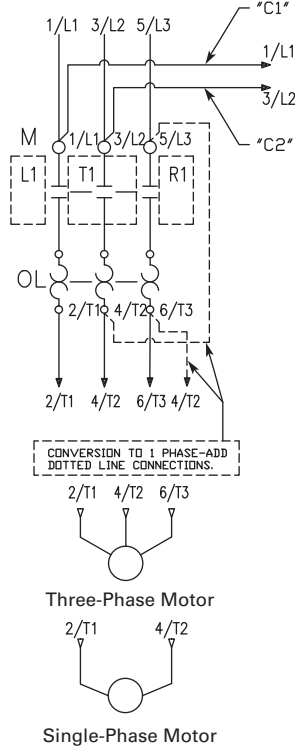
Three-Wire Control



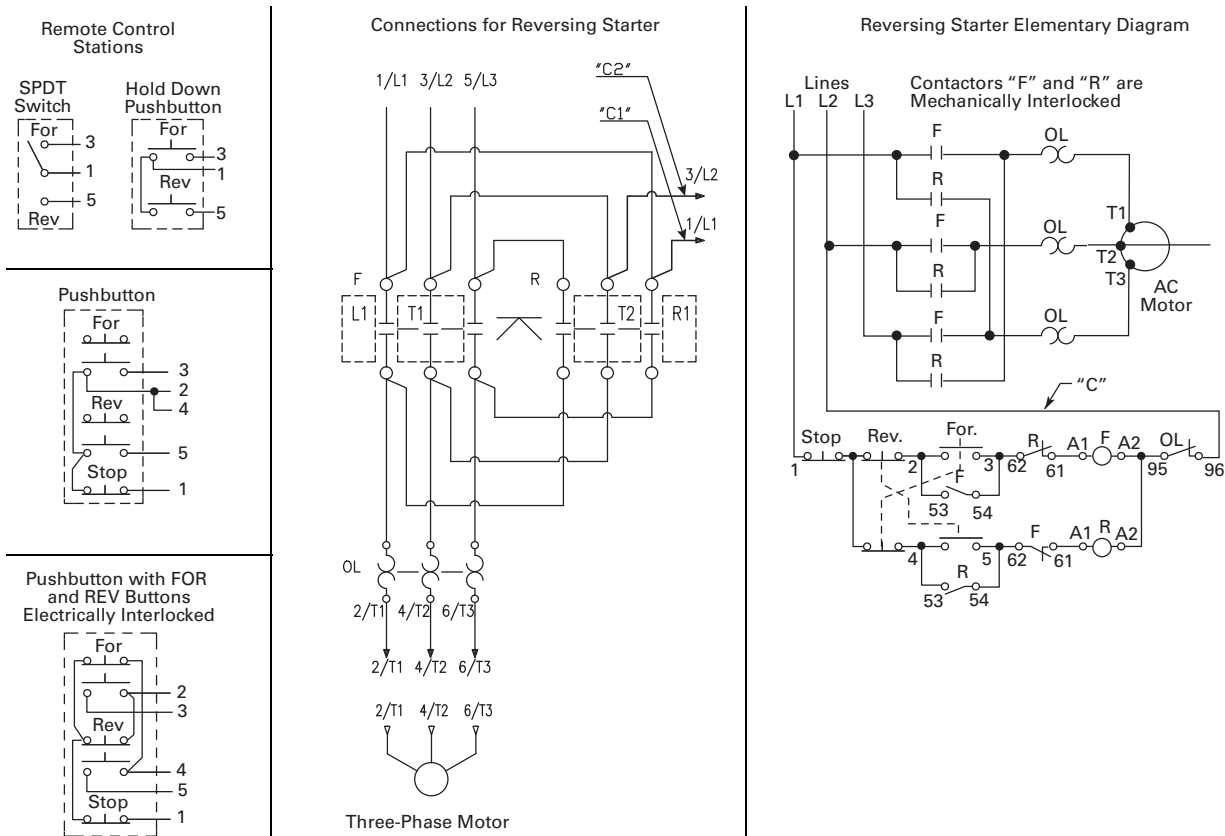
When More than One Pushbutton Station is Used, Omit Connector "A" and Connect per Sketch Below



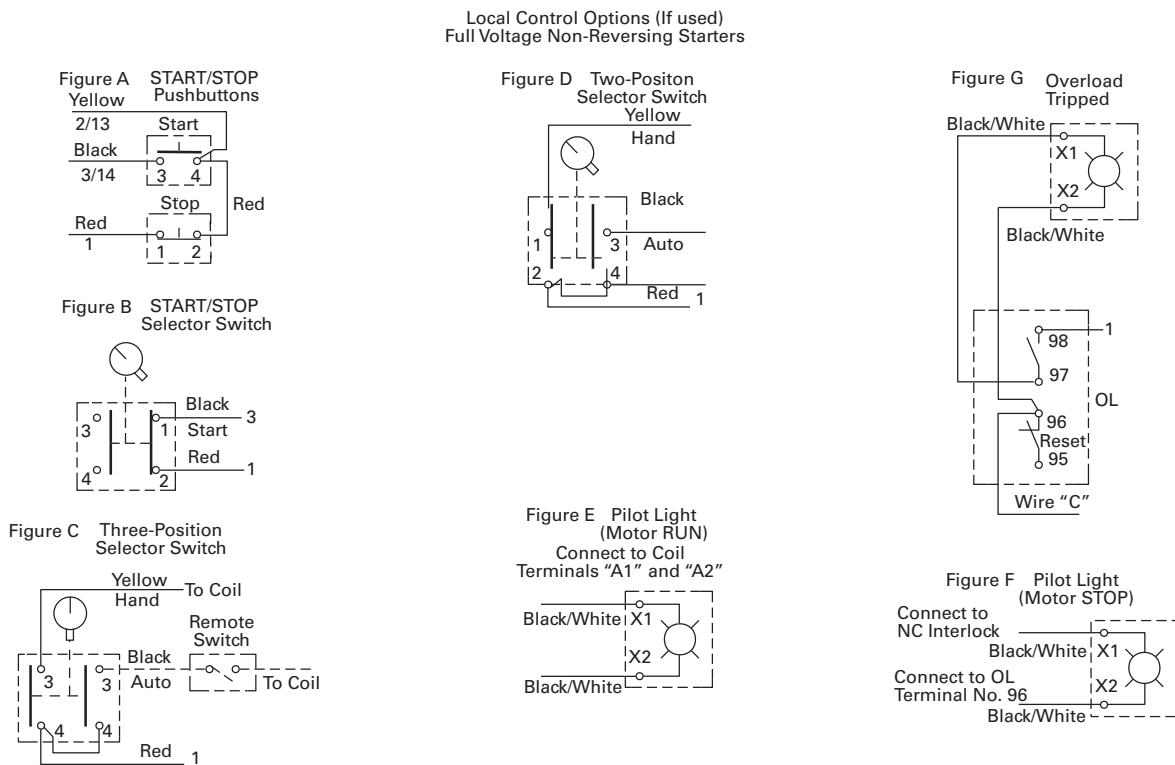
Connections for Non-Reversing Starter



Non-Combination Starters (Reversing)



C400T Control Options



Local Control Options (If used)
Full Voltage Non-Reversing Starters

Figure E Pilot Light (Motor RUN)
Connect to Coil
Terminals "A1" and "A2"

Figure F Pilot Light (Motor STOP)

3.1

IEC Contactors and Starters

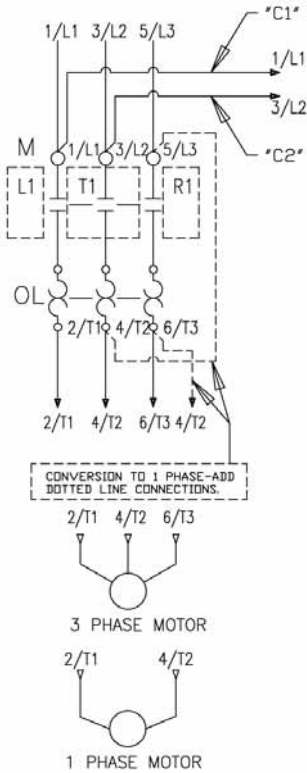
XT IEC Power Control

Non-Reversing Cover Control

Type 1 C600M Control Options (To be used with Box 1 Only)

3

Connections for Non-Reversing Starter



Schematic Symbol Legend

	Normally Open Auxiliary
	Normally Closed Auxiliary
	Normally Open Momentary PB
	Normally Closed Momentary PB
	Contactor Coil
	Red Pilot Light
	Green Pilot Light
	Normally Closed Overload Auxiliary
	Normally Open Overload Auxiliary
	M22-XLED230-T: Used to lower voltage for pilot lights.
	Two-position selector switch (STOP/START, OFF/ON)
	Three-position selector switch (HOA)
	Signifies Location of Side and Top Adder Auxiliary Referenced on Diagram Under Auxiliary Symbol

CAUTION

READ AND FOLLOW INSTRUCTIONS PRIOR TO WIRING OR CONNECTING POWER! THIS PRODUCT CAN BE FACTORY OR FIELD CONFIGURED FOR MULTIPLE CONTROL MODES OR CONTROL VOLTAGES. CHECK NAMEPLATE FOR COIL VOLTAGE.

SEPARATE CONTROL POWER

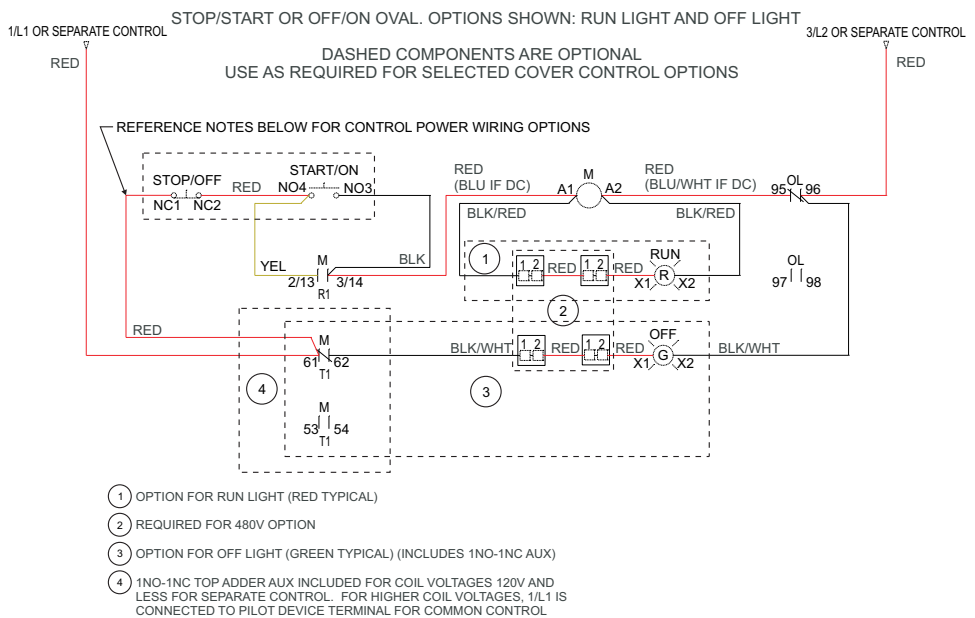
FOR COIL VOLTAGES 120V AND LESS: CONNECT SEPARATE CONTROL LINES TO THE NO. 61 TERMINAL ON THE TOP ADDER AUX. AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

FOR COIL VOLTAGES GREATER THAN 120V: REMOVE WIRE "C2" IF SUPPLIED. IF WIRE "C1" IS TERMINATED ON L1, DISCONNECT FROM L1. CONNECT SEPARATE CONTROL LINES TO THE "C1" WIRE OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

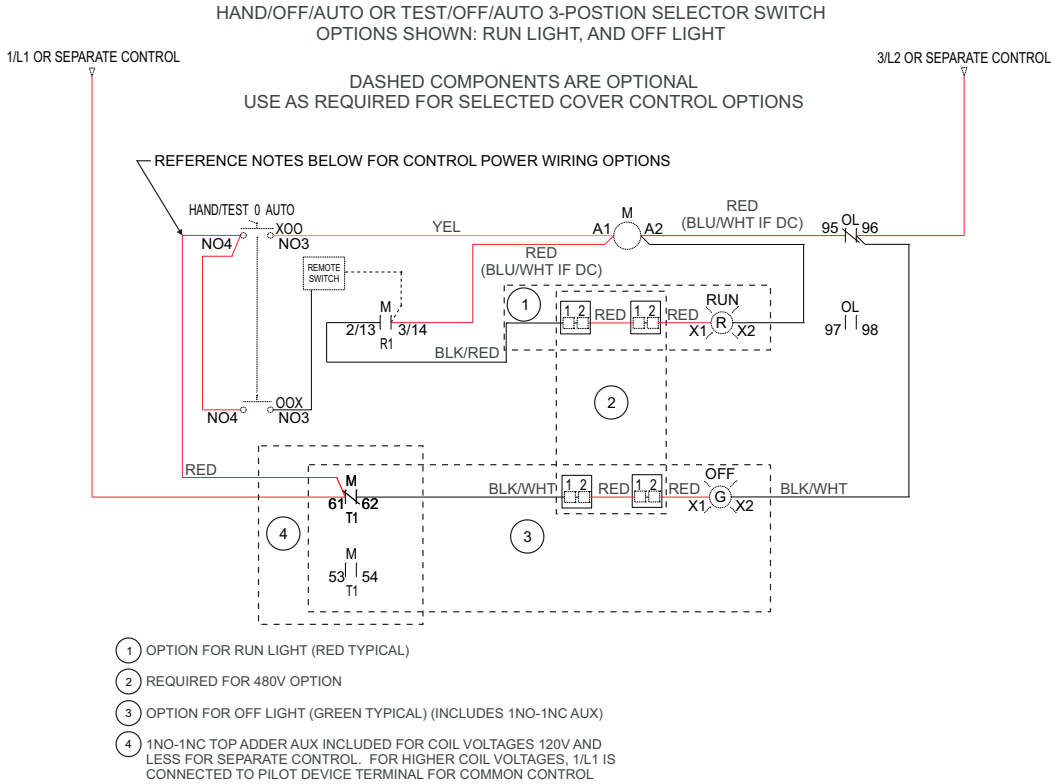
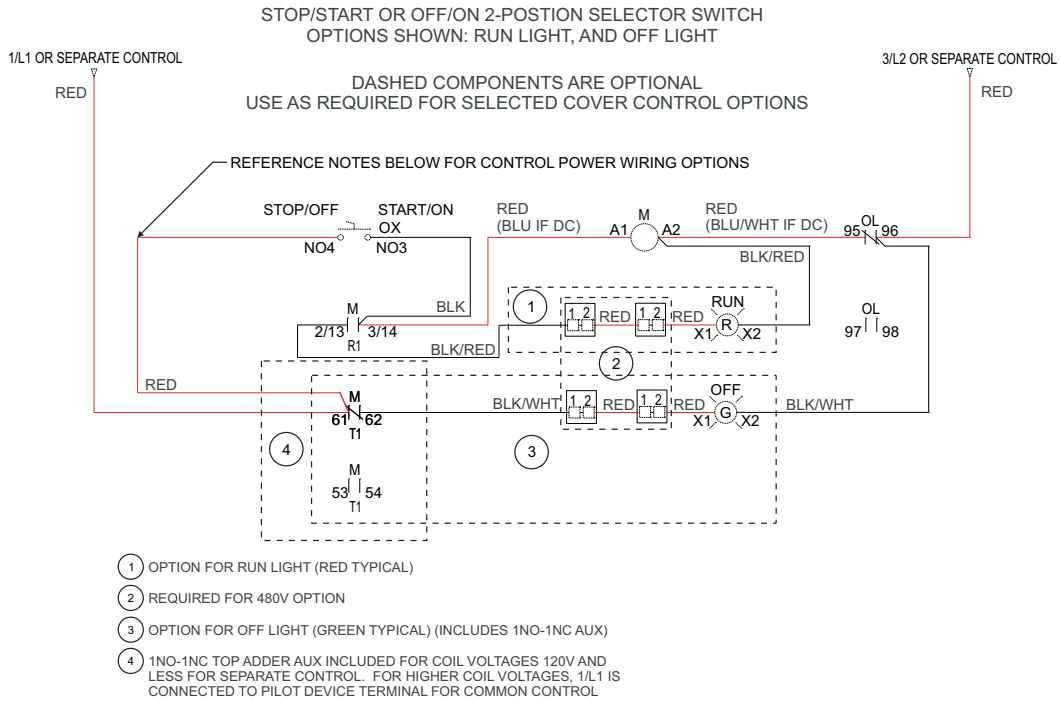
COMMON CONTROL POWER

FOR COIL VOLTAGES 120V AND LESS: ADD WIRE "C2" IF NOT SUPPLIED. ADD CONNECTOR BETWEEN L1 TERMINAL AND THE NO. 61 TERMINAL ON THE TOP ADDER AUX. OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM.

FOR COIL VOLTAGES GREATER THAN 120V: ADD WIRE "C1" AND "C2" IF NOT SUPPLIED.



Type 1 C600M Control Options (To be used with Box 1 Only)



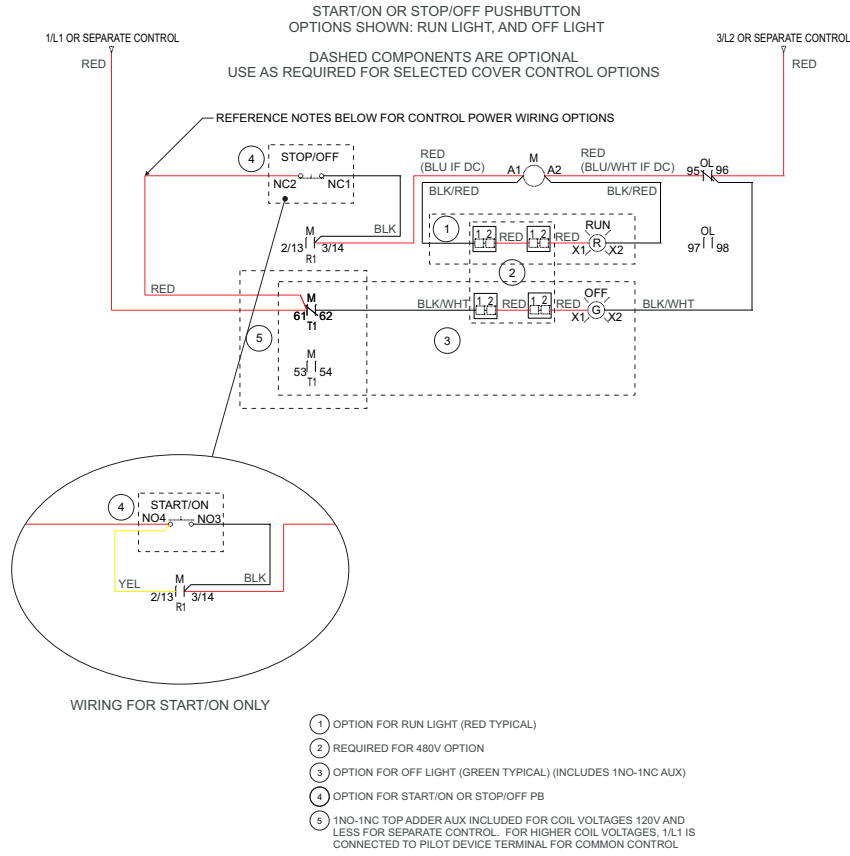
3.1

IEC Contactors and Starters

X7 IEC Power Control

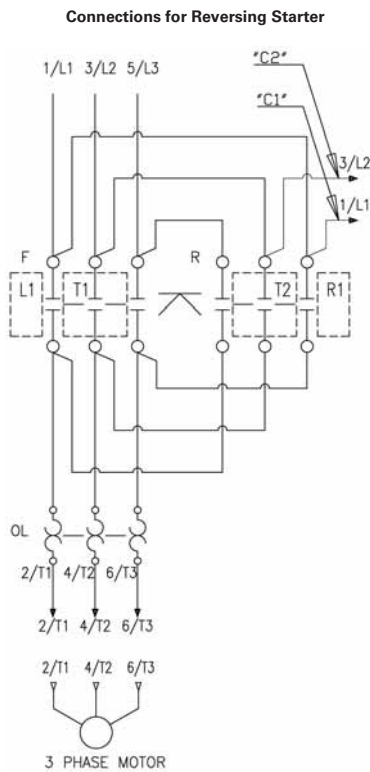
3

Type 1 C600M Control Options (To be used with Box 1 Only)



Reversing Cover Control

Type 1 C600M Control Options (To be used with Box 1 Only)

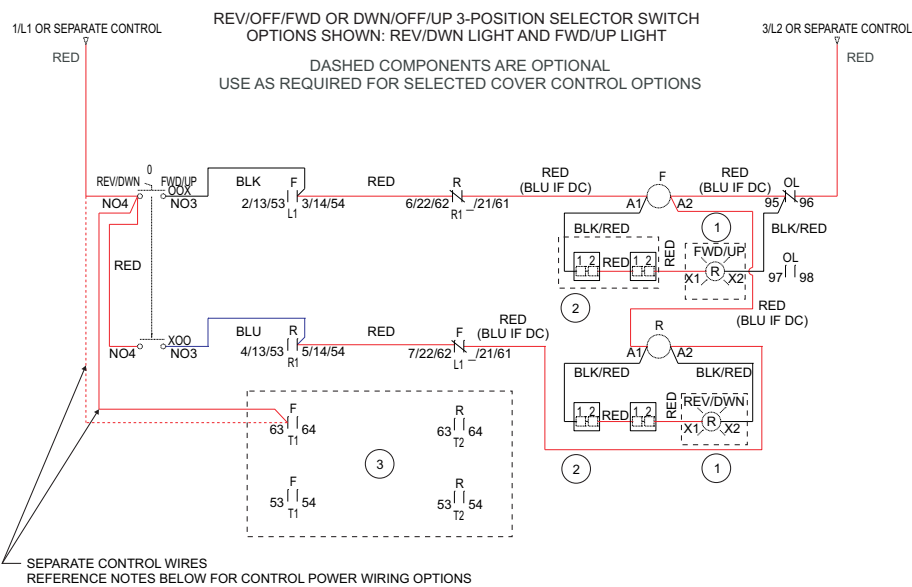


Schematic Symbol Legend	
	Normally Open Auxiliary
	Normally Closed Auxiliary
	Normally Open Momentary PB
	Normally Closed Momentary PB
	Contactor Coil
	Red Pilot Light
	Green Pilot Light
	Normally Closed Overload Auxiliary
	Normally Open Overload Auxiliary
	M22-XLED230-T: Used to lower voltage for pilot lights.
	Two-position selector switch (STOP/START, OFF/ON)
	Three-position selector switch (HOA)
	Signifies Location of Side and Top Adder Auxiliary Referenced on Diagram Under Auxiliary Symbol

CAUTION
 READ AND FOLLOW INSTRUCTIONS PRIOR TO WIRING OR CONNECTING POWER! THIS PRODUCT CAN BE FACTORY OR FIELD CONFIGURED FOR MULTIPLE CONTROL MODES OR CONTROL VOLTAGES. CHECK NAMEPLATE FOR COIL VOLTAGE.

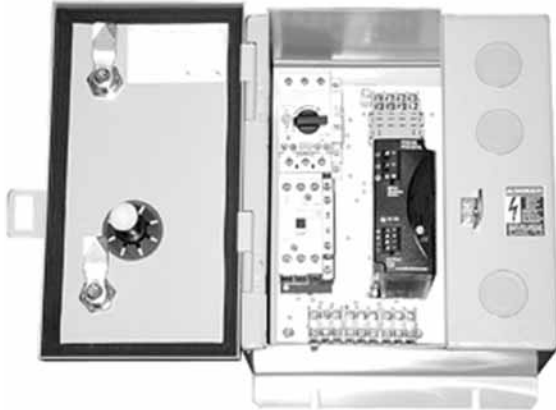
SEPARATE CONTROL POWER
 FOR COIL VOLTAGES 120V AND LESS: CONNECT SEPARATE CONTROL LINES TO THE NO. 63 OR NO. 61 TERMINAL PER DIAGRAM ON THE TOP ADDER AUX. AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.
 FOR COIL VOLTAGES GREATER THAN 120V: REMOVE WIRE "C2" IF SUPPLIED. IF WIRE "C1" IS TERMINATED ON L1, DISCONNECT FROM L1. CONNECT SEPARATE CONTROL LINES TO THE "C1" WIRE OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

COMMON CONTROL POWER
 FOR COIL VOLTAGES 120V AND LESS: ADD WIRE "C2" IF NOT SUPPLIED. ADD CONNECTOR BETWEEN L1 TERMINAL AND THE NO. 61 OR NO. 63 TERMINAL PER DIAGRAM ON THE TOP ADDER AUX. OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM.
 FOR COIL VOLTAGES GREATER THAN 120V: ADD WIRE "C1" AND "C2" IF NOT SUPPLIED.



- ① OPTION FOR RUN LIGHT (RED TYPICAL)
- ② REQUIRED FOR 480V OPTION
- ③ TWO 2NO TOP ADDER AUX INCLUDED FOR ALL COIL VOLTAGES. WHEN COIL VOLTAGES 120V AND LESS, CONTROL WIRING ROUTED TO NO. 63 TERMINAL FOR SEPARATE CONTROL.

Enclosed XT Combination Motor Controller



Contents

<i>Description</i>	<i>Page</i>
Non-Metallic Enclosure—Contactors and Starters . . .	V10-T3-2
Metallic Enclosure—Contactors and Starters	V10-T3-8
Combination Motor Controllers	
Catalog Number Selection	V10-T3-44
Cover Control	V10-T3-45
Product Selection	
Non-Reversing Starters	V10-T3-46
Non-Reversing Starters with CPT	V10-T3-46
Reversing Starters	V10-T3-47

Combination Motor Controllers

Product Description

Eaton's **XT** line includes IEC contactors, starters and combination motor controllers (CMCs). Designed to meet international standards, the enclosed control **XT** line (ECX), carries UL and cUL certifications.

Features and Benefits

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Test trip function
- Motor applications from 0.11 A to 32 A
- Class 10 overload protection
- Built-in heater and magnetic trip elements to protect the motor
- Phase loss sensitivity
- Type 2 coordination
- Ambient compensated up to 55 °C [140 °F]
- Control inputs located at front of starter for easy access and wiring
- Wide range of coils
- DIN rail mount—XTSC...BB_
- Mounting plates—XTSC...BC_, XTSC...D motor controllers
- Adjustment dial for setting motor FLA
- Short-circuit trip at 14 times the maximum setting of the FLA adjustment dial
- UL 508 Type F CMC high fault short-circuit ratings; refer to manual motor protectors in **CA08102001E**
- Non-metallic and metallic enclosures in Types 1 (IP23), 4 (IP66), 4X (IP66) and 12 (IP65)
- Opaque (standard) or clear covers available on non-metallic Halylester enclosure

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)

Short-Circuit Ratings

- 0–12 A / B-frame MMP with B-frame contactor
 - 50K AIC at 600 V
- 13–32A/B-frame MMP with C-frame contactor
 - 18K AIC at 600 V

Additional Reference

Dimensions	Tab 14
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

3.1

IEC Contactors and Starters

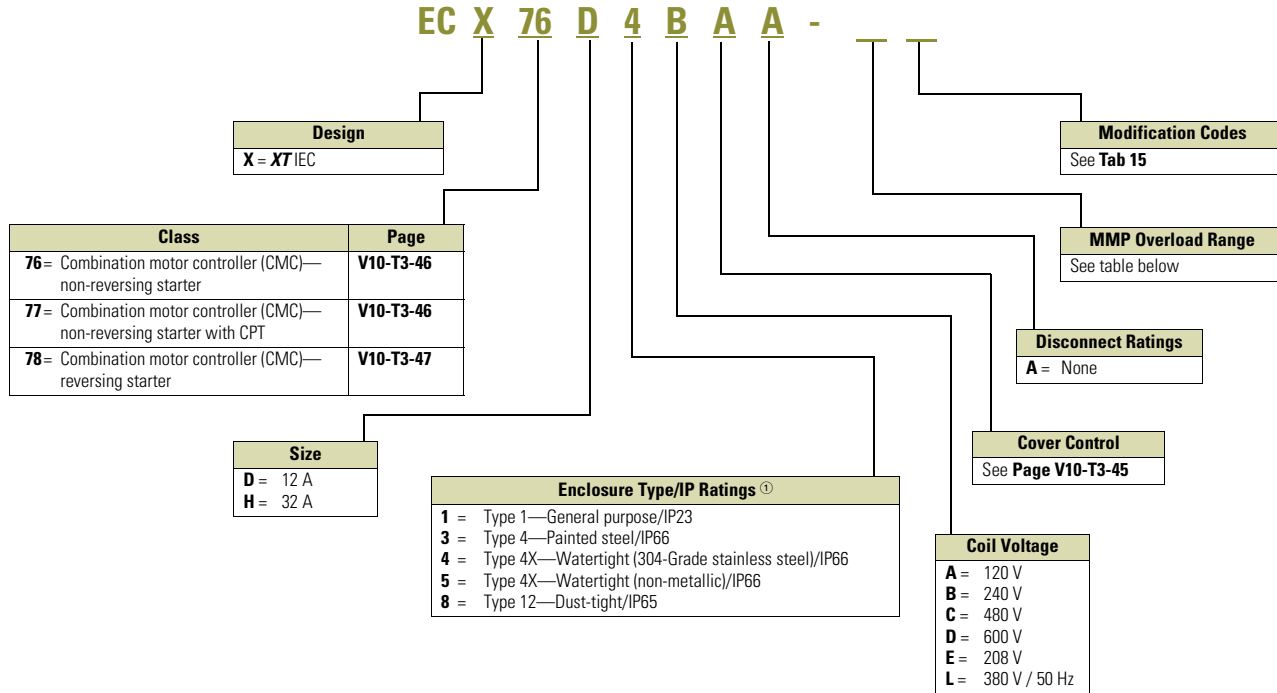
XT IEC Power Control

Catalog Number Selection

Combination Motor Controllers—Enclosed Control

3

EC X 76 D 4 B A A -



XTPR MMP Amperage Ranges

XT MMP Catalog Number	Overload Amp Range	Enclosed Control Suffix Code
Frame B Rotary MMP		
XTPRP16BC1	0.1–0.16	A
XTPRP25BC1	0.16–0.25	B
XTPRP40BC1	0.25–0.4	C
XTPRP63BC1	0.4–0.63	D
XTPR01BC1	0.63–1	E
XTPR1P6BC1	1–1.6	F
XTPR2P5BC1	1.6–2.5	G
XTPR04BC1	2.5–4	H
XTPR6P3BC1	4–6.3	J
XTPR010BC1	6.3–10	K
XTPR012BC1	8–12.0	L
XTPR016BC1	10–16.0	M
XTPR020BC1	16–20	N
XTPR025BC1	20–25	Q
XTPR032BC1	25–32	R

Note

① See Tab 1 for enclosure type/IP rating cross-reference.

Cover Control

- Cover control for combination motor control starters uses the 10250T (30 mm) family
- Selector switches are maintained with lever operators
- Pushbuttons are momentary type with extended pushbutton
- The kit includes hardware and connecting wires (where possible)
- For factory installed control devices other than shown below, refer to modification codes, **Tab 15**

Product Selection**10250T Style Combination Cover Control**

Description	Factory Installed	Field Installation
	Flange Control	Kits
	Position 9 Alpha	Combination Catalog Number
Non-Reversing		
No cover mounted pilot devices	A	—
START/STOP pushbuttons	B	C400T1
With red RUN pilot light	C	—
With red RUN/green OFF lights	D	—
ON/OFF pushbuttons	E	C400T2
With red RUN pilot light	F	—
With red RUN/green OFF lights	G	—
HAND/OFF/AUTO selector switch	H	C400T12
With red RUN pilot light	J	—
With red RUN/green OFF lights	K	—
START pushbutton	L	C400T3
ON pushbutton	M	C400T4
OFF pushbutton	N	C400T5
Red RUN pilot light	P	C400T9 ^①
Green OFF	Q	C400T10 ^①
Red RUN/green OFF pilot lights	R	C400T11 ^①
START/STOP selector switch	S	C400T13
With red RUN pilot light	T	—
With red RUN/green OFF lights	U	—
ON/OFF selector switch	V	C400T14
With red RUN pilot light	W	—
With red RUN/green OFF lights	X	—

Notes

^① Add code letter from the table below to catalog number for voltage—kits only. Example: C400T9**B**.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	240 V 60 Hz	B	480 V 60 Hz	C
208 V 60 Hz	E	380 V 50 Hz	L	600 V 60 Hz	D

^② Order quantity (2) of **C400T10**.

Description	Factory Installed	Field Installation
	Flange Control	Kits
	Position 9 Alpha	Combination Catalog Number
Reversing		
No cover mounted pilot devices	A	—
FOR/REV/STOP pushbuttons	B	C400T6
With two red pilot lights	C	—
With two red/one green pilot lights	D	—
UP/STOP/DOWN pushbuttons	E	—
With two red pilot lights	F	—
FOR/OFF/REV selector switch	H	C400T15
With two red pilot lights	J	—
With two red/one green pilot lights	K	—
Two red pilot lights	P	^②
One green pilot light	Q	C400T10 ^①
Two red/one green pilot lights	R	—
OPEN/OFF/CLOSE selector switch	V	C400T16
With two red pilot lights	W	—
With two red/one green pilot lights	X	—

Product Selection

Non-Reversing Starters

Class ECX76—Combination Motor Controller (CMC)—Non-Reversing Starter

Amps	Maximum hp ^①			Coil Voltage at 60 Hz ^②	Type 1/IP23 General Purpose	Type 4X/IP66 ^{③④} Watertight	Type 4X Non-Metallic/IP66 Watertight ^④	Type 12/IP65 Dust-Tight	Component ^⑤
	Motor Voltage	Single-Phase	Three-Phase		Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Size D									
12	115	1/2	—	120	ECX76D1AAA-	ECX76D4AAA-	ECX76D5AAA-	ECX76D8AAA-	XTPR__BC1
	208	1-1/2	3	208	ECX76D1EAA-	ECX76D4EAA-	ECX76D5EAA-	ECX76D8EAA-	
	230	2	3	240	ECX76D1BAA-	ECX76D4BAA-	ECX76D5BAA-	ECX76D8BAA-	
	380	—	5	380/50 Hz	ECX76D1LAA-	ECX76D4LAA-	ECX76D5LAA-	ECX76D8LAA-	
	460	—	7-1/2	480	ECX76D1CAA-	ECX76D4CAA-	ECX76D5CAA-	ECX76D8CAA-	
	575	—	10	600	ECX76D1DAA-	ECX76D4DAA-	ECX76D5DAA-	ECX76D8DAA-	
Size H									
32	115	3	—	120	ECX76H1AAA-	ECX76H4AAA-	ECX76H5AAA-	ECX76H8AAA-	XTPR__BC1
	208	5	10	208	ECX76H1EAA-	ECX76H4EAA-	ECX76H5EAA-	ECX76H8EAA-	
	230	5	10	240	ECX76H1BAA-	ECX76H4BAA-	ECX76H5BAA-	ECX76H8BAA-	
	380	—	15	380/50 Hz	ECX76H1LAA-	ECX76H4LAA-	ECX76H5LAA-	ECX76H8LAA-	
	460	—	20	480	ECX76H1CAA-	ECX76H4CAA-	ECX76H5CAA-	ECX76H8CAA-	
	575	—	25	600	ECX76H1DAA-	ECX76H4DAA-	ECX76H5DAA-	ECX76H8DAA-	

Non-Reversing Starters with CPT

Class ECX77—Combination Motor Controller (CMC)—Non-Reversing Starter with CPT

Amps	Maximum hp ^①			Coil Voltage at 60 Hz ^②	Type 1/IP23 General Purpose	Type 4X/IP66 ^{③④} Watertight	Type 4X Non-Metallic/IP66 Watertight ^④	Type 12/IP65 Dust-Tight	Component ^⑤
	Motor Voltage	Single-Phase	Three-Phase		Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Size D									
12	115	1/2	—	120	ECX77D1AAA-	ECX77D4AAA-	ECX77D5AAA-	ECX77D8AAA-	XTPR__BC1
	208	1-1/2	3	208	ECX77D1EAA-	ECX77D4EAA-	ECX77D5EAA-	ECX77D8EAA-	
	230	2	3	240	ECX77D1BAA-	ECX77D4BAA-	ECX77D5BAA-	ECX77D8BAA-	
	380	—	5	380/50 Hz	ECX77D1LAA-	ECX77D4LAA-	ECX77D5LAA-	ECX77D8LAA-	
	460	—	7-1/2	480	ECX77D1CAA-	ECX77D4CAA-	ECX77D5CAA-	ECX77D8CAA-	
	575	—	10	600	ECX77D1DAA-	ECX77D4DAA-	ECX77D5DAA-	ECX77D8DAA-	
Size H									
32	115	3	—	120	ECX77H1AAA-	ECX77H4AAA-	ECX77H5AAA-	ECX77H8AAA-	XTPR__BC1
	208	5	10	208	ECX77H1EAA-	ECX77H4EAA-	ECX77H5EAA-	ECX77H8EAA-	
	230	5	10	240	ECX77H1BAA-	ECX77H4BAA-	ECX77H5BAA-	ECX77H8BAA-	
	380	—	15	380/50 Hz	ECX77H1LAA-	ECX77H4LAA-	ECX77H5LAA-	ECX77H8LAA-	
	460	—	20	480	ECX77H1CAA-	ECX77H4CAA-	ECX77H5CAA-	ECX77H8CAA-	
	575	—	25	600	ECX77H1DAA-	ECX77H4DAA-	ECX77H5DAA-	ECX77H8DAA-	

Notes

- ① 1 hp = 0.746 kW.
- ② Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECX76D5AAA-. To order Type 4 painted steel, change that digit to **3**.
- ④ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.
- ⑤ Select proper "XTPR" MMP overload amperage range as per motor FLA, see **Page V10-T3-44**.

Reversing Starters**Class ECX78—Combination Motor Controller (CMC)—Reversing Starter**

Amps	Maximum hp ^①			Coil Voltage at 60 Hz ^②	Type 1/IP23 General Purpose	Type 4X/IP66 ^{③④} Watertight	Type 4X Non-Metallic/IP66 Watertight ^④	Type 12/IP65 Dust-Tight	Component ^⑤
	Motor Voltage	Single-phase	Three-phase		Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Size D									
12	115	1/2	—	120	ECX78D1AAA- __	ECX78D4AAA- __	ECX78D5AAA- __	ECX78D8AAA- __	XTPR- __ -BC1
	208	1-1/2	3	208	ECX78D1EAA- __	ECX78D4EAA- __	ECX78D5EAA- __	ECX78D8EAA- __	
	230	2	3	240	ECX78D1BAA- __	ECX78D4BAA- __	ECX78D5BAA- __	ECX78D8BAA- __	
	380	—	5	380/50 Hz	ECX78D1LAA- __	ECX78D4LAA- __	ECX78D5LAA- __	ECX78D8LAA- __	
	460	—	7-1/2	480	ECX78D1CAA- __	ECX78D4CAA- __	ECX78D5CAA- __	ECX78D8CAA- __	
	575	—	10	600	ECX78D1DAA- __	ECX78D4DAA- __	ECX78D5DAA- __	ECX78D8DAA- __	
Size H									
32	115	3	—	120	ECX78H1AAA- __	ECX78H4AAA- __	ECX78H5AAA- __	ECX78H8AAA- __	XTPR- __ -BC1
	208	5	10	208	ECX78H1EAA- __	ECX78H4EAA- __	ECX78H5EAA- __	ECX78H8EAA- __	
	230	5	10	240	ECX78H1BAA- __	ECX78H4BAA- __	ECX78H5BAA- __	ECX78H8BAA- __	
	380	—	15	380/50 Hz	ECX78H1LAA- __	ECX78H4LAA- __	ECX78H5LAA- __	ECX78H8LAA- __	
	460	—	20	480	ECX78H1CAA- __	ECX78H4CAA- __	ECX78H5CAA- __	ECX78H8CAA- __	
	575	—	25	600	ECX78H1DAA- __	ECX78H4DAA- __	ECX78H5DAA- __	ECX78H8DAA- __	

Notes

- ① 1 hp = 0.746 kW.
- ② Voltage is listed at 60 Hz unless otherwise noted. Other voltages available upon request.
- ③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECX78D5AAA-_{_}. To order Type 4 painted steel, change that digit to **3**.
- ④ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.
- ⑤ Select proper "XTPR" MMP overload amperage range as per motor FLA, see **Page V10-T3-44**.

Electrically Held Lighting Contactors



Mechanically Held Lighting Contactor



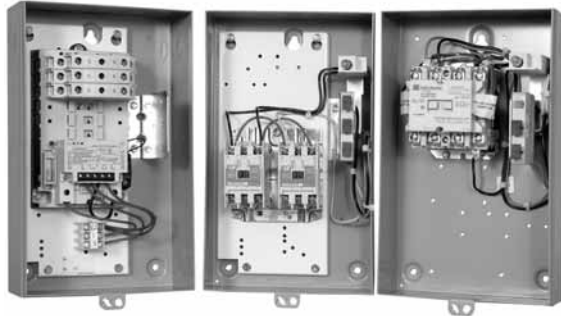
Type 1 Non-Combination Lighting Contactors



4.1 UL Rated AC Contactors

Product Description	V10-T4-2
Application Description	V10-T4-2
Standards and Certifications	V10-T4-2
Additional Reference	V10-T4-2
Catalog Number Selection	V10-T4-3
Enclosures	V10-T4-3
Cover Control	V10-T4-4
Operation	V10-T4-9
Accessories	V10-T4-13
Wiring Diagrams	V10-T4-14

UL Rated AC Contactors



Product Description

Eaton’s lighting contactors are designed to provide a safe, convenient means for local or remote switching of tungsten (incandescent filament) or ballast (fluorescent and mercury arc) lamp loads. They are also suitable for other loads such as low pressure and high pressure sodium lamp loads and other non-motor (resistive) loads. They are not recommended for most sign flashing loads.

These lighting contactors are designed to withstand the large initial inrush currents of tungsten lamp loads without contact welding. They are fully rated and do not require derating.

Application Description

Loads:

Ballast Lamps—Fluorescent, mercury vapor, metal halide sodium vapor, quartz—600 V maximum.

Filament Lamps—Incandescent, infrared, heating—480 V maximum, line to line; 277 V maximum line to neutral.

Resistance Heating—Radiant and convection heating, furnaces and ovens.

Additional Reference

Accessories	V10-T4-13 and Tab 15
Cover Control	V10-T4-4
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Technical Data and Specifications	Tab 17

Contents

<i>Description</i>	<i>Page</i>
UL Rated AC Contactors	
Catalog Number Selection	V10-T4-3
Enclosures	V10-T4-3
Cover Control	V10-T4-4
Product Selection	V10-T4-6
Operation	
Non-Combination Contactors.....	V10-T4-9
Combination Contactors	V10-T4-11
Accessories	V10-T4-13
Wiring Diagrams	V10-T4-14

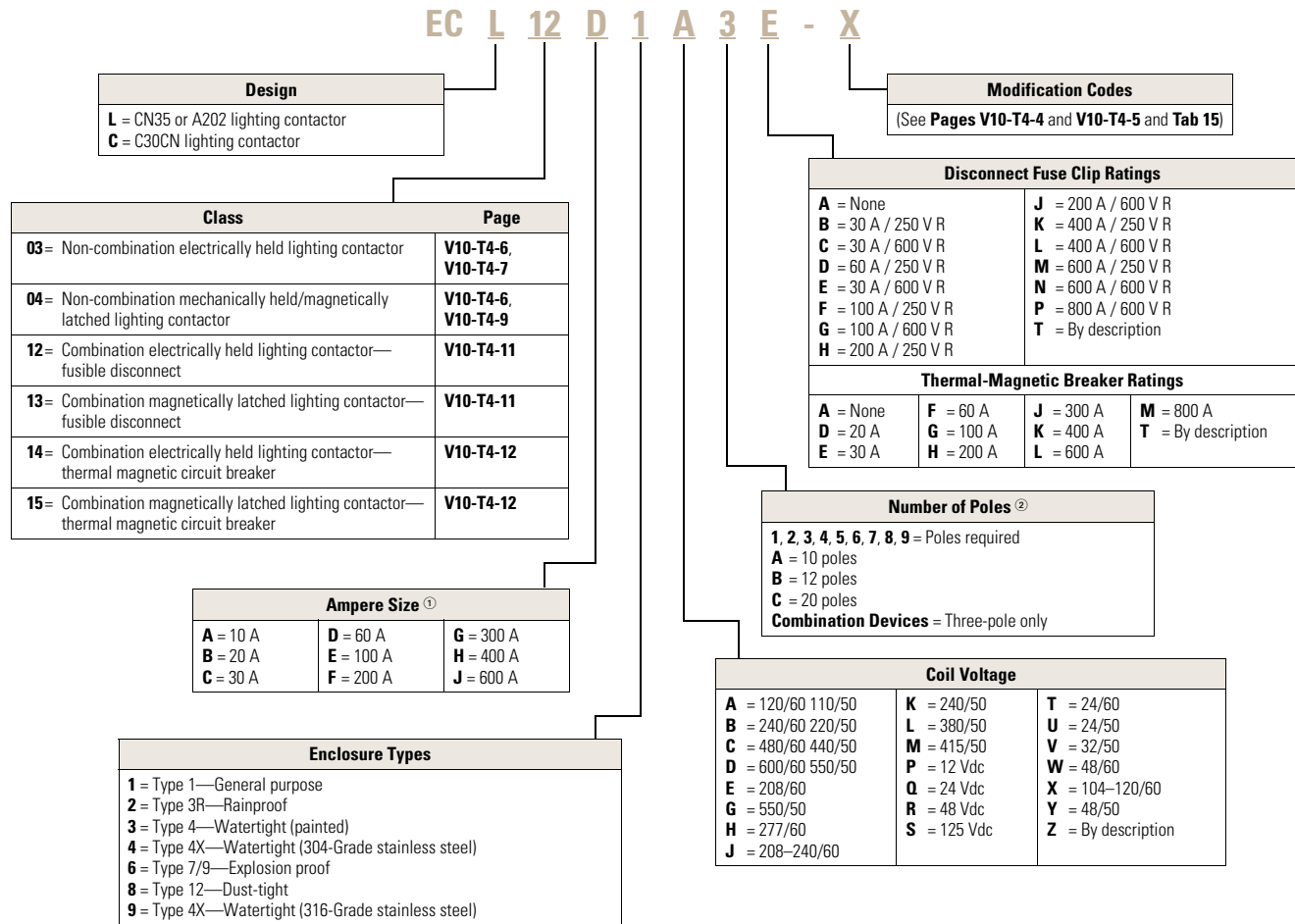
Standards and Certifications

Note: See **Tab 17** for additional information on Standards and Certifications that apply to all Enclosed Control products.

- UL Listed
- cUL Listed
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Catalog Number Selection

Enclosed Lighting Contactors



Enclosures

Lighting contactors are available open or mounted in Type 1, 3R, 4, 4X, 12 or 7/9 enclosures.

Type 1 is for indoor, general purpose for personal protection. Knock-outs are provided in the top and bottom for conduit entry.

Type 3R is for outdoor applications and rated for rain, sleet and external ice buildup. Type 3R enclosures have knockouts in the bottom and provisions for a hub in the top.

Type 4 and 4X are for mounting indoor or outdoor and provide protection from splashing water, hose-directed water and wind-blown dust. Watertight conduit hubs are provided in the top and bottom of Type 4X enclosures. The standard Type 4X enclosures are made of 304-Grade stainless steel, providing corrosion protection. 316-Grade stainless steel construction is available as an upgrade option.

Type 12 enclosures are for indoor mounting and protect from dripping liquids, falling dirt and dust. No knockouts or hubs are provided with Type 12 enclosures.

Type 1, 3R, 4 and 12 enclosures are painted with a polyester urethane powder coat paint meeting UL requirements and the color is ANSI 61 gray. Type 1 enclosures have knockouts for cover controls. All the other types have holes plugged, ready for cover controls. Type 7/9 is also available for explosion proof applications. Please contact the factory for additional details.

Notes

- ① C30CN available in 30 A only.
- ② For normally closed poles see **Tab 15**.

Cover Control

Type 1 Non-Combination Cover Control (Box 1 Only) ^①

Description	Factory Installed Cover Control	Field Installation Kits
	Modification Code Suffix	Catalog Number
ON/OFF pushbutton	P8	C600M2
With red RUN pilot light	P8P23	C600M201_ ^②
With red RUN/green OFF lights	P8P23P25	C600M202_ ^②
HAND/OFF/AUTO selector switch	S3	C600M12
With red RUN pilot light	S3P23	C600M121_ ^②
With red RUN/green OFF lights	S3P23P25	C600M122_ ^②
ON/OFF selector switch	S12	C600M14
With red RUN pilot light	S12P23	C600M141_ ^②
With red RUN/green OFF lights	S12P23P25	C600M142_ ^②
Red RUN pilot light	P23	C600M9_ ^②
Green OFF pilot light	P25	C600M10_ ^②
Red RUN/green OFF lights	P23P25	C600M11_ ^②

Notes

- ① Box 1 offering with cover control includes CN35 lighting contactors 10 A 2–4P, 20 A 2–4P, 30 A 2–3P and 60 A 2–4P.
 ② Add code letter from the table below to catalog number for voltage. Example: C600M101**A**.

Rating	Code Letter
85–264 Vac	A
480 Vac	C
12–30 Vac/Vdc	T

Type 1, 3R, 4X and 12 Cover Control Non-Combination (Non-Box 1) and Combination Cover Control

Description	For Use with Lighting Contactor	Factory Installed Cover Control		Field Installation Kits	
		Type 1, 3R, 4X and 12 Modification Code Suffix	Type 7/9 Modification Code Suffix	Type 1 ^{①②} Catalog Number	Type 3R, 4X and 12 Non-Combination and Type 1, 3R, 4X and 12 Combination ^② Catalog Number
ON/OFF pushbuttons	Electrical three-wire C30CN; CN35; A202	P8	P8	C400GK18	C400T2
With red RUN pilot light		P8P23	P8P23	C400GK19_	—
With red RUN/GREEN off lights		P8P23P25	P8P23P25	C400GK1A_	—
ON/OFF Pushbuttons	Mechanical three-wire C30CN	P8	P8	C400GK4	C400T201
With red RUN pilot light		P8P23	P8P23	C400GK48_	—
With red RUN/GREEN off lights		P8P23P25	P8P23P25	C400GK49_	—
ON/OFF pushbuttons	Electrical and mechanical two-wire C30CN; CN35; A202	P8	P8	C400GK5	C400T14 ^③
With red RUN pilot light		P8P23	P8P23	C400GK52_	—
With red RUN/GREEN off lights		P8P23P25	P8P23P25	C400GK55_	—
Start/stop pushbuttons	Mechanical three-wire C30CN	P7	P7	C400GK7	C400T200
With red RUN pilot light		P7P23	P7P23	C400GK72_	—
With red RUN/GREEN off lights		P7P23P25	P7P23P25	C400GK75_	—
Start/stop pushbuttons	Electrical and mechanical two-wire C30CN	P7	P7	C400GK6	C400T13 ^③
With red RUN pilot light		P7P23	P7P23	C400GK62_	—
With red RUN/GREEN off lights		P7P23P25	P7P23P25	C400GK65_	—
HAND/OFF/AUTO cover control	Electrical and mechanical two-wire C30CN; CN35; A202	S3	S3 ^④	C400GK3	C400T12 ^③
With red RUN pilot light		S3P23	S3P23 ^④	C400GK32_	—
With red RUN/GREEN off lights		S3P23P25	S3P23P25 ^④	C400GK35_	—
Red RUN pilot light	All	P23	P23	C400GK42_	C400T9_
Green OFF pilot light		P25	P25	C400GK41_	C400T10_
Red RUN/green OFF pilot light		P23P25	P23P25	C400GK46_	C400T11_

Notes

- ① For use with non-combination units (box sizes 2–4).
 ② Add code letter from table below to catalog number for voltage in place of _.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
24 V 60 Hz	T	240 V 60 Hz	B	480 V 60 Hz	C
120 V 60 Hz	A	277 V 60 Hz	H	600 V 60 Hz	D
208 V 60 Hz	E	380 V 60 Hz	L		

③ Selector switch.

④ With three-position selector switch, Mod **C20** (two-wire control relay) must be used with magnetically latched contactor (ECL04, ECL13, ECL15).

Product Selection

Two-Wire and Three-Wire Control Wiring Options—Two-Wire Control Standard

Class ECC03—Non-Combination Electrically Held Lighting Contactor—Two or Three-Wire Control

Number of Poles	Type 1 Catalog Number ①	Type 3R Catalog Number ①	Type 4X ② Catalog Number ①	Type 7/9 Catalog Number ①	Type 12 Catalog Number ①	Component Contactor (Open) Catalog Number ①
Continuous Amps — 30						
2	ECC03C1_2A	ECC03C2_2A	ECC03C4_2A	ECC03C6_2A	ECC03C8_2A	C30CNE20_0
3	ECC03C1_3A	ECC03C2_3A	ECC03C4_3A	ECC03C6_3A	ECC03C8_3A	C30CNE30_0
4	ECC03C1_4A	ECC03C2_4A	ECC03C4_4A	ECC03C6_4A	ECC03C8_4A	C30CNE40_0
5	ECC03C1_5A	ECC03C2_5A	ECC03C4_5A	ECC03C6_5A	ECC03C8_5A	C30CNE50_0
6	ECC03C1_6A	ECC03C2_6A	ECC03C4_6A	ECC03C6_6A	ECC03C8_6A	C30CNE60_0
7	ECC03C1_7A	ECC03C2_7A	ECC03C4_7A	ECC03C6_7A	ECC03C8_7A	C30CNE70_0
8	ECC03C1_8A	ECC03C2_8A	ECC03C4_8A	ECC03C6_8A	ECC03C8_8A	C30CNE80_0
9	ECC03C1_9A	ECC03C2_9A	ECC03C4_9A	ECC03C6_9A	ECC03C8_9A	C30CNE90_0
10	ECC03C1_AA	ECC03C2_AA	ECC03C4_AA	ECC03C6_AA	ECC03C8_AA	C30CNE100_0
12	ECC03C1_BA	ECC03C2_BA	ECC03C4_BA	ECC03C6_BA	ECC03C8_BA	C30CNE120_0

Class ECC04—Non-Combination Mechanically Held Lighting Contactor—Two-Wire Control ③

Number of Poles	Type 1 Catalog Number ①	Type 3R Catalog Number ①	Type 4X ② Catalog Number ①	Type 7/9 Catalog Number ①	Type 12 Catalog Number ①	Component Contactor (Open) Catalog Number ①
Continuous Amps — 30						
2	ECC04C1_2A	ECC04C2_2A	ECC04C4_2A	ECC04C6_2A	ECC04C8_2A	C30CNM20_
3	ECC04C1_3A	ECC04C2_3A	ECC04C4_3A	ECC04C6_3A	ECC04C8_3A	C30CNM30_
4	ECC04C1_4A	ECC04C2_4A	ECC04C4_4A	ECC04C6_4A	ECC04C8_4A	C30CNM40_
5	ECC04C1_5A	ECC04C2_5A	ECC04C4_5A	ECC04C6_5A	ECC04C8_5A	C30CNM50_
6	ECC04C1_6A	ECC04C2_6A	ECC04C4_6A	ECC04C6_6A	ECC04C8_6A	C30CNM60_
7	ECC04C1_7A	ECC04C2_7A	ECC04C4_7A	ECC04C6_7A	ECC04C8_7A	C30CNM70_
8	ECC04C1_8A	ECC04C2_8A	ECC04C4_8A	ECC04C6_8A	ECC04C8_8A	C30CNM80_
9	ECC04C1_9A	ECC04C2_9A	ECC04C4_9A	ECC04C6_9A	ECC04C8_9A	C30CNM90_
10	ECC04C1_AA	ECC04C2_AA	ECC04C4_AA	ECC04C6_AA	ECC04C8_AA	C30CNM100_
12	ECC04C1_BA	ECC04C2_BA	ECC04C4_BA	ECC04C6_BA	ECC04C8_BA	C30CNM120_

Notes

① For first open position (coil voltage), use the table below.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECC03C4A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Suffix	Coil Voltage	Suffix	Coil Voltage	Suffix	Coil Voltage
A	120/60 or 110/50	D	600/60 or 550/50	T	24/60
B	240/60 or 220/50	E	208/60	V	28/60 or 24/50
C	480/60 or 440/50	H	277/60 or 240/50	X	347/60

③ Add **C18** modification code for three-wire control.

To get the C30CN lighting contactor with normally closed power poles, see **Tab 15**, for modification codes.

Class ECL03—Non-Combination Electrically Held Lighting Contactor

No. of Poles	Frame Size	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 4X ② Watertight and Dust-Tight Stainless Steel Catalog Number ①	Type 7/9 Hazardous Location Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Component Contactor (Open) Catalog Number ①
Maximum Ampere Rating—10 ③							
2	45 mm	ECL03A1_2A	ECL03A2_2A	ECL03A4_2A	ECL03A6_2A	ECL03A8_2A	CN35AN2_B
3		ECL03A1_3A	ECL03A2_3A	ECL03A4_3A	ECL03A6_3A	ECL03A8_3A	CN35AN3_B
4		ECL03A1_4A	ECL03A2_4A	ECL03A4_4A	ECL03A6_4A	ECL03A8_4A	CN35AN4_B
5		ECL03A1_5A	ECL03A2_5A	ECL03A4_5A	ECL03A6_5A	ECL03A8_5A	—
6		ECL03A1_6A	ECL03A2_6A	ECL03A4_6A	ECL03A6_6A	ECL03A8_6A	—
9		ECL03A1_9A	ECL03A2_9A	ECL03A4_9A	ECL03A6_9A	ECL03A8_9A	—
10		ECL03A1_AA	ECL03A2_AA	ECL03A4_AA	ECL03A6_AA	ECL03A8_AA	—
12		ECL03A1_BA	ECL03A2_BA	ECL03A4_BA	ECL03A6_BA	ECL03A8_BA	—
20		ECL03A1_CA	ECL03A2_CA	ECL03A4_CA	ECL03A6_CA	ECL03A8_CA	—
Maximum Ampere Rating—20 ③							
2	45 mm	ECL03B1_2A	ECL03B2_2A	ECL03B4_2A	ECL03B6_2A	ECL03B8_2A	CN35BN2_B
3		ECL03B1_3A	ECL03B2_3A	ECL03B4_3A	ECL03B6_3A	ECL03B8_3A	CN35BN3_B
4		ECL03B1_4A	ECL03B2_4A	ECL03B4_4A	ECL03B6_4A	ECL03B8_4A	CN35BN4_B
5		ECL03B1_5A	ECL03B2_5A	ECL03B4_5A	ECL03B6_5A	ECL03B8_5A	—
6		ECL03B1_6A	ECL03B2_6A	ECL03B4_6A	ECL03B6_6A	ECL03B8_6A	CN35BN6_B
9		ECL03B1_9A	ECL03B2_9A	ECL03B4_9A	ECL03B6_9A	ECL03B8_9A	CN35BN9_B
10		ECL03B1_AA	ECL03B2_AA	ECL03B4_AA	ECL03B6_AA	ECL03B8_AA	—
12		ECL03B1_BA	ECL03B2_BA	ECL03B4_BA	ECL03B6_BA	ECL03B8_BA	CN35BN12_B
20		ECL03B1_CA	ECL03B2_CA	ECL03B4_CA	ECL03B6_CA	ECL03B8_CA	—
Maximum Ampere Rating—30 ③							
2	45 mm	ECL03C1_2A	ECL03C2_2A	ECL03C4_2A	ECL03C6_2A	ECL03C8_2A	CN35DN2_B
3		ECL03C1_3A	ECL03C2_3A	ECL03C4_3A	ECL03C6_3A	ECL03C8_3A	CN35DN3_B
4		ECL03C1_4A	ECL03C2_4A	ECL03C4_4A	ECL03C6_4A	ECL03C8_4A	CN35DN4_B
5		ECL03C1_5A	ECL03C2_5A	ECL03C4_5A	ECL03C6_5A	ECL03C8_5A	CN35DN5_B
6		ECL03C1_6A	ECL03C2_6A	ECL03C4_6A	ECL03C6_6A	ECL03C8_6A	CN35DN6_B
9		ECL03C1_9A	ECL03C2_9A	ECL03C4_9A	ECL03C6_9A	ECL03C8_9A	CN35DN9_B
10		ECL03C1_AA	ECL03C2_AA	ECL03C4_AA	ECL03C6_AA	ECL03C8_AA	—
12		ECL03C1_BA	ECL03C2_BA	ECL03C4_BA	ECL03C6_BA	ECL03C8_BA	CN35DN12_B
20		ECL03C1_CA	ECL03C2_CA	ECL03C4_CA	ECL03C6_CA	ECL03C8_CA	—
Maximum Ampere Rating—60 ③							
2	65 mm	ECL03D1_2A	ECL03D2_2A	ECL03D4_2A	ECL03D6_2A	ECL03D8_2A	CN35GN2_B
3		ECL03D1_3A	ECL03D2_3A	ECL03D4_3A	ECL03D6_3A	ECL03D8_3A	CN35GN3_B
4		ECL03D1_4A	ECL03D2_4A	ECL03D4_4A	ECL03D6_4A	ECL03D8_4A	CN35GN4_B
5		ECL03D1_5A	ECL03D2_5A	ECL03D4_5A	ECL03D6_5A	ECL03D8_5A	CN35GN5_B
6		ECL03D1_6A	ECL03D2_6A	ECL03D4_6A	ECL03D6_6A	ECL03D8_6A	—
9		ECL03D1_9A	ECL03D2_9A	ECL03D4_9A	ECL03D6_9A	ECL03D8_9A	—
10		ECL03D1_AA	ECL03D2_AA	ECL03D4_AA	ECL03D6_AA	ECL03D8_AA	—
12		ECL03D1_BA	ECL03D2_BA	ECL03D4_BA	ECL03D6_BA	ECL03D8_BA	—

Notes

① For open position (coil voltage), use the table below:

Suffix	Coil Voltage	Suffix	Coil Voltage	Suffix	Coil Voltage
A	120/60 or 110/5	C	480/60 or 440/50	E	208/60
B	240/60 or 220/50	D	600/60 or 550/50	H	277/60

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the seventh digit. Example: ECL03B4A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballast or mercury vapor type applications.

Class ECL03—Non-Combination Electrically Held Lighting Contactor, continued

No. of Poles	Frame Size	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 4X ② Watertight and Dust-Tight Stainless Steel Catalog Number ①	Type 7/9 Hazardous Location Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Component Contactor (Open) Catalog Number ①
Maximum Ampere Rating—100 ③							
2	90 mm	ECL03E1_2A	ECL03E2_2A	ECL03E4_2A	ECL03E6_2A	ECL03E8_2A	CN35KN2_
3		ECL03E1_3A	ECL03E2_3A	ECL03E4_3A	ECL03E6_3A	ECL03E8_3A	CN35KN3_
4		ECL03E1_4A	ECL03E2_4A	ECL03E4_4A	ECL03E6_4A	ECL03E8_4A	—
5		ECL03E1_5A	ECL03E2_5A	ECL03E4_5A	ECL03E6_5A	ECL03E8_5A	—
6		ECL03E1_6A	ECL03E2_6A	ECL03E4_6A	ECL03E6_6A	ECL03E8_6A	—
9		ECL03E1_9A	ECL03E2_9A	ECL03E4_9A	ECL03E6_9A	ECL03E8_9A	—
Maximum Ampere Rating—200 ③							
2	180 mm	ECL03F1_2A	ECL03F2_2A	ECL03F4_2A	ECL03F6_2A	ECL03F8_2A	CN35NN2_
3		ECL03F1_3A	ECL03F2_3A	ECL03F4_3A	ECL03F6_3A	ECL03F8_3A	CN35NN3_
4		ECL03F1_4A	ECL03F2_4A	ECL03F4_4A	ECL03F6_4A	ECL03F8_4A	—
5		ECL03F1_5A	ECL03F2_5A	ECL03F4_5A	ECL03F6_5A	ECL03F8_5A	—
6		ECL03F1_6A	ECL03F2_6A	ECL03F4_6A	ECL03F6_6A	ECL03F8_6A	—
Maximum Ampere Rating—300 ③							
2	180 mm	ECL03G1_2A	ECL03G2_2A	ECL03G4_2A	ECL03G6_2A	ECL03G8_2A	CN35SN2_
3		ECL03G1_3A	ECL03G2_3A	ECL03G4_3A	ECL03G6_3A	ECL03G8_3A	CN35SN3_
4		ECL03G1_4A	ECL03G2_4A	ECL03G4_4A	ECL03G6_4A	ECL03G8_4A	—
5		ECL03G1_5A	ECL03G2_5A	ECL03G4_5A	ECL03G6_5A	ECL03G8_5A	—
6		ECL03G1_6A	ECL03G2_6A	ECL03G4_6A	ECL03G6_6A	ECL03G8_6A	—
Maximum Ampere Rating—400 ③④							
2	220 mm	ECL03H1_2A	ECL03H2_2A	ECL03H4_2A	ECL03H6_2A	ECL03H8_2A	CN35TN2_
3		ECL03H1_3A	ECL03H2_3A	ECL03H4_3A	ECL03H6_3A	ECL03H8_3A	CN35TN3_

Notes

① For open position (coil voltage), use the table below:

Suffix	Coil Voltage	Suffix	Coil Voltage	Suffix	Coil Voltage
A	120/60 or 110/5	C	480/60 or 440/50	E	208/60
B	240/60 or 220/50	D	600/60 or 550/50	H	277/60

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL03E4**2**A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballast or mercury vapor type applications.

④ UL ballast and resistive ratings only.

Operation

A permanent magnet is built into the contactor structure that will maintain the contactor in its energized state indefinitely without using control power. When

energized, a DC current is applied to the latch coil, producing a magnetic field that reinforces the polarity of the permanent magnet, pulling in the contactor. The current to

the coil is disconnected by the coil clearing interlock. In order to drop out the contactor, it is necessary to apply a field through the STOP coil in the reverse

direction to the permanent magnet. This momentarily cancels the magnetic attraction and the contactor drops out.

Non-Combination Contactors

Class ECL04—Non-Combination Magnetically Latched Lighting Contactor

No. of Poles	Type 1 General Purpose Catalog Number ^①	Type 3R Rainproof Catalog Number ^①	Type 4X ^② Watertight and Dust-Tight Stainless Steel Catalog Number ^①	Type 7/9 Hazardous Location Catalog Number ^①	Type 12 Dust-Tight Industrial Catalog Number ^①	Component Contactor (Open) Catalog Number ^①
Maximum Ampere Rating—30 ^③						
2	ECL04C1_2A	ECL04C2_2A	ECL04C4_2A	ECL04C6_2A	ECL04C8_2A	A202K1B_M
3	ECL04C1_3A	ECL04C2_3A	ECL04C4_3A	ECL04C6_3A	ECL04C8_3A	A202K1C_M
4	ECL04C1_4A	ECL04C2_4A	ECL04C4_4A	ECL04C6_4A	ECL04C8_4A	A202K1D_M
5	ECL04C1_5A	ECL04C2_5A	ECL04C4_5A	ECL04C6_5A	ECL04C8_5A	A202K1E_M
6	ECL04C1_6A	ECL04C2_6A	ECL04C4_6A	ECL04C6_6A	ECL04C8_6A	A202K1F_M
8	ECL04C1_8A	ECL04C2_8A	ECL04C4_8A	ECL04C6_8A	ECL04C8_8A	A202K1G_M
9	ECL04C1_9A	ECL04C2_9A	ECL04C4_9A	ECL04C6_9A	ECL04C8_9A	—
10	ECL04C1_AA	ECL04C2_AA	ECL04C4_AA	ECL04C6_AA	ECL04C8_AA	A202K1H_M
12	ECL04C1_BA	ECL04C2_BA	ECL04C4_BA	ECL04C6_BA	ECL04C8_BA	A202K1K_M
20	ECL04C1_CA	ECL04C2_CA	ECL04C4_CA	ECL04C6_CA	ECL04C8_CA	—
Maximum Ampere Rating—60 ^③						
2	ECL04D1_2A	ECL04D2_2A	ECL04D4_2A	ECL04D6_2A	ECL04D8_2A	A202K2B_M
3	ECL04D1_3A	ECL04D2_3A	ECL04D4_3A	ECL04D6_3A	ECL04D8_3A	A202K2C_M
4	ECL04D1_4A	ECL04D2_4A	ECL04D4_4A	ECL04D6_4A	ECL04D8_4A	A202K2D_M
5	ECL04D1_5A	ECL04D2_5A	ECL04D4_5A	ECL04D6_5A	ECL04D8_5A	A202K2E_M
6	ECL04D1_6A	ECL04D2_6A	ECL04D4_6A	ECL04D6_6A	ECL04D8_6A	A202K2F_M
8	ECL04D1_8A	ECL04D2_8A	ECL04D4_8A	ECL04D6_8A	ECL04D8_8A	A202K2G_M
9	ECL04D1_9A	ECL04D2_9A	ECL04D4_9A	ECL04D6_9A	ECL04D8_9A	—
10	ECL04D1_AA	ECL04D2_AA	ECL04D4_AA	ECL04D6_AA	ECL04D8_AA	A202K2H_M
12	ECL04D1_BA	ECL04D2_BA	ECL04D4_BA	ECL04D6_BA	ECL04D8_BA	A202K2K_M
20	ECL04D1_CA	ECL04D2_CA	ECL04D4_CA	ECL04D6_CA	ECL04D8_CA	—

Notes

^① For open position (coil voltage), use the table below:

Enclosed Suffix	Open Suffix	Coil Voltage	Enclosed Suffix	Open Suffix	Coil Voltage
A	A	120/60 or 110/50	D	E	600/60
B	W	240/60 or 220/50	E	B	208/60
C	X	480/60 or 440/50	H	Z	277/60

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL04C4A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ Ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballast or mercury vapor type applications.

Class ECL04—Non-Combination Magnetically Latched Lighting Contactor, continued

No. of Poles	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 4X ② Watertight and Dust-Tight Stainless Steel Catalog Number ①	Type 7/9 Hazardous Location Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Component Contactor (Open) Catalog Number ①
Maximum Ampere Rating—100 ③						
2	ECL04E1_2A	ECL04E2_2A	ECL04E4_2A	ECL04E6_2A	ECL04E8_2A	A202K3B_M
3	ECL04E1_3A	ECL04E2_3A	ECL04E4_3A	ECL04E6_3A	ECL04E8_3A	A202K3C_M
4	ECL04E1_4A	ECL04E2_4A	ECL04E4_4A	ECL04E6_4A	ECL04E8_4A	A202K3D_M
5	ECL04E1_5A	ECL04E2_5A	ECL04E4_5A	ECL04E6_5A	ECL04E8_5A	A202K3E_M
6	ECL04E1_6A	ECL04E2_6A	ECL04E4_6A	ECL04E6_6A	ECL04E8_6A	A202K3F_M
8	ECL04E1_8A	ECL04E2_8A	ECL04E4_8A	ECL04E6_8A	ECL04E8_8A	A202K3G_M
9	ECL04E1_9A	ECL04E2_9A	ECL04E4_9A	ECL04E6_9A	ECL04E8_9A	—
10	ECL04E1_AA	ECL04E2_AA	ECL04E4_AA	ECL04E6_AA	ECL04E8_AA	A202K3H_M
12	ECL04E1_BA	ECL04E2_BA	ECL04E4_BA	ECL04E6_BA	ECL04E8_BA	A202K3K_M
20	ECL04E1_CA	ECL04E2_CA	ECL04E4_CA	ECL04E6_CA	ECL04E8_CA	—
Maximum Ampere Rating—200 ③						
2	ECL04F1_2A	ECL04F2_2A	ECL04F4_2A	ECL04F6_2A	ECL04F8_2A	A202K4B_M
3	ECL04F1_3A	ECL04F2_3A	ECL04F4_3A	ECL04F6_3A	ECL04F8_3A	A202K4C_M
4	ECL04F1_4A	ECL04F2_4A	ECL04F4_4A	ECL04F6_4A	ECL04F8_4A	A202K4D_M
5	ECL04F1_5A	ECL04F2_5A	ECL04F4_5A	ECL04F6_5A	ECL04F8_5A	A202K4E_M
6	ECL04F1_6A	ECL04F2_6A	ECL04F4_6A	ECL04F6_6A	ECL04F8_6A	A202K4F_M
8	ECL04F1_8A	ECL04F2_8A	ECL04F4_8A	ECL04F6_8A	ECL04F8_8A	A202K4G_M
9	ECL04F1_9A	ECL04F2_9A	ECL04F4_9A	ECL04F6_9A	ECL04F8_9A	—
10	ECL04F1_AA	ECL04F2_AA	ECL04F4_AA	ECL04F6_AA	ECL04F8_AA	A202K4H_M
12	ECL04F1_BA	ECL04F2_BA	ECL04F4_BA	ECL04F6_BA	ECL04F8_BA	A202K4K_M
20	ECL04F1_CA	ECL04F2_CA	ECL04F4_CA	ECL04F6_CA	ECL04F8_CA	—
Maximum Ampere Rating—300 ③						
2	ECL04G1_2A	ECL04G2_2A	ECL04G4_2A	ECL04G6_2A	ECL04G8_2A	A202K5B_M A202K5C_M
3	ECL04G1_3A	ECL04G2_3A	ECL04G4_3A	ECL04G6_3A	ECL04G8_3A	A202K5C_M
4	ECL04G1_4A	ECL04G2_4A	ECL04G4_4A	ECL04G6_4A	ECL04G8_4A	—
5	ECL04G1_5A	ECL04G2_5A	ECL04G4_5A	ECL04G6_5A	ECL04G8_5A	—
6	ECL04G1_6A	ECL04G2_6A	ECL04G4_6A	ECL04G6_6A	ECL04G8_6A	—
Maximum Ampere Rating—400 ③						
2	ECL04H1_2A	ECL04H2_2A	ECL04H4_2A	ECL04H6_2A	ECL04H8_2A	A202K6B_M
3	ECL04H1_3A	ECL04H2_3A	ECL04H4_3A	ECL04H6_3A	ECL04H8_3A	A202K6C_M
4	ECL04H1_4A	ECL04H2_4A	ECL04H4_4A	ECL04H6_4A	ECL04H8_4A	—
5	ECL04H1_5A	ECL04H2_5A	ECL04H4_5A	ECL04H6_5A	ECL04H8_5A	—
6	ECL04H1_6A	ECL04H2_6A	ECL04H4_6A	ECL04H6_6A	ECL04H8_6A	—

Notes

① For open position (coil voltage), use the table below:

Enclosed Suffix	Open Suffix	Coil Voltage	Enclosed Suffix	Open Suffix	Coil Voltage
A	A	120/60 or 110/50	D	E	600/60
B	W	240/60 or 220/50	E	B	208/60
C	X	480/60 or 440/50	H	Z	277/60

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL04E6A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballast or mercury vapor type applications.

Combination Contactors

Class ECL12 and ECL13—Combination Lighting Contactor—Fusible Disconnect

Max. Amp Rating ^①	No. of Poles	Fuse Clips Amps/Volts ^②	Type 1 General Purpose Catalog Number ^③	Type 3R Rainproof Catalog Number ^③	Type 4X ^④ Watertight and Dust-Tight SS Catalog Number ^③	Type 7/9 Hazardous Location Catalog Number ^③	Type 12 Dust-Tight Industrial Catalog Number ^③	Component Contactor (Open) Catalog Number ^③
Electrically Held—Class ECL12								
30	3	30/250	ECL12C1_3B	ECL12C2_3B	ECL12C4_3B	ECL12C6_3B	ECL12C8_3B	CN35DN3_B
		30/600	ECL12C1_3C	ECL12C2_3C	ECL12C4_3C	ECL12C6_3C	ECL12C8_3C	—
60		60/250	ECL12D1_3D	ECL12D2_3D	ECL12D4_3D	ECL12D6_3D	ECL12D8_3D	CN35GN3_B
		60/600	ECL12D1_3E	ECL12D2_3E	ECL12D4_3E	ECL12D6_3E	ECL12D8_3E	—
100		100/250	ECL12E1_3F	ECL12E2_3F	ECL12E4_3F	ECL12E6_3F	ECL12E8_3F	CN35KN3_
		100/600	ECL12E1_3G	ECL12E2_3G	ECL12E4_3G	ECL12E6_3G	ECL12E8_3G	—
200		200/250	ECL12F1_3H	ECL12F2_3H	ECL12F4_3H	ECL12F6_3H	ECL12F8_3H	CN35NN3_
		200/600	ECL12F1_3J	ECL12F2_3J	ECL12F4_3J	ECL12F6_3J	ECL12F8_3J	—
300		400/250	ECL12G1_3K	ECL12G2_3K	ECL12G4_3K	ECL12G6_3K	ECL12G8_3K	CN35SN3_
		400/600	ECL12G1_3L	ECL12G2_3L	ECL12G4_3L	ECL12G6_3L	ECL12G8_3L	—
400		400/250	ECL12H1_3K	ECL12H2_3K	ECL12H4_3K	ECL12H6_3K	ECL12H8_3K	CN35TN3_
		400/600	ECL12H1_3L	ECL12H2_3L	ECL12H4_3L	ECL12H6_3L	ECL12H8_3L	—
Magnetically Latched—Class ECL13								
30	3	30/250	ECL13C1_3B	ECL13C2_3B	ECL13C4_3B	ECL13C6_3B	ECL13C8_3B	A202K1C_M
		30/600	ECL13C1_3C	ECL13C2_3C	ECL13C4_3C	ECL13C6_3C	ECL13C8_3C	—
60		60/250	ECL13D1_3D	ECL13D2_3D	ECL13D4_3D	ECL13D6_3D	ECL13D8_3D	A202K2C_M
		60/600	ECL13D1_3E	ECL13D2_3E	ECL13D4_3E	ECL13D6_3E	ECL13D8_3E	—
100		100/250	ECL13E1_3F	ECL13E2_3F	ECL13E4_3F	ECL13E6_3F	ECL13E8_3F	A202K3C_M
		100/600	ECL13E1_3G	ECL13E2_3G	ECL13E4_3G	ECL13E6_3G	ECL13E8_3G	—
200		200/250	ECL13F1_3H	ECL13F2_3H	ECL13F4_3H	ECL13F6_3H	ECL13F8_3H	A202K4C_M
		200/600	ECL13F1_3J	ECL13F2_3J	ECL13F4_3J	ECL13F6_3J	ECL13F8_3J	—

Notes

- ① The listed ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballasts or mercury vapor type applications.
- ② Power fuses are not included.
- ③ The underscore (_) indicates missing code letter for coil selection—see table below. Example: Magnet coils with 120/110 V coils—change the eighth character to **A**. ECL12C1**A**3B.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	240 V 60 Hz	B	480 V 60 Hz	C
208 V 60 Hz	E	277 V 60 Hz	H	600 V 60 Hz	D

- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL12C**4**A3B. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

4.1

Lighting Contactors

UL Rated AC Contactors

Class ECL14 and ECL15—Combination Lighting Contactor—Thermal Magnetic Circuit Breaker

Max. Amp Rating ^①	No. of Poles	Continuous Ampere Rating at 40°C	Type 1 General Purpose Catalog Number ^②	Type 3R Rainproof Catalog Number ^②	Type 4X ^③ Watertight and Dust-Tight SS Catalog Number ^②	Type 7/9 Hazardous Location Catalog Number ^②	Type 12 Dust-Tight Industrial Catalog Number ^②	Component Contactor (Open) Catalog Number ^②
Electrically Held—Class ECL14								
30	3	30	ECL14C1_3E	ECL14C2_3E	ECL14C4_3E	ECL14C6_3E	ECL14C8_3E	CN35DN3_B
60		60	ECL14D1_3F	ECL14D2_3F	ECL14D4_3F	ECL14D6_3F	ECL14D8_3F	CN35GN3_B
100		100	ECL14E1_3G	ECL14E2_3G	ECL14E4_3G	ECL14E6_3G	ECL14E8_3G	CN35KN3_
200		200	ECL14F1_3H	ECL14F2_3H	ECL14F4_3H	ECL14F6_3H	ECL14F8_3H	CN35NN3_
300		300	ECL14G1_3J	ECL14G2_3J	ECL14G4_3J	ECL14G6_3J	ECL14G8_3J	CN35SN3_
400		400	ECL14H1_3K	ECL14H2_3K	ECL14H4_3K	ECL14H6_3K	ECL14H8_3K	CN35TN3_
Magnetically Latched—Class ECL15								
30	3	30	ECL15C1_3E	ECL15C2_3E	ECL15C4_3E	ECL15C6_3E	ECL15C8_3E	A202K1C_M
60		60	ECL15D1_3F	ECL15D2_3F	ECL15D4_3F	ECL15D6_3F	ECL15D8_3F	A202K2C_M
100		100	ECL15E1_3G	ECL15E2_3G	ECL15E4_3G	ECL15E6_3G	ECL15E8_3G	A202K3C_M
200		200	ECL15F1_3H	ECL15F2_3H	ECL15F4_3H	ECL15F6_3H	ECL15F8_3H	A202K4C_M

Notes

- ① The listed ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballasts or mercury vapor type applications.
- ② The underscore (_) indicates missing code letter for coil selection—see table below. Example: Magnet coils with 120/110 V coils—change the eighth character to **A**. ECL14C1**A**3E.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120 V 60 Hz	A	240 V 60 Hz	B	480 V 60 Hz	C
208 V 60 Hz	E	277 V 60 Hz	H	600 V 60 Hz	D

- ③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL14C**4**A3E. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Additional common modifications are available for outside lighting for ballfields, parks, and so on:

- **E7**—Service entrance
- **E5**—Enclosure with pole mounting brackets
- **P70**—Photocell
- **T1–T25**—Timers

See **Tab 15** for details.

Accessories

Auxiliary Contacts

C30CN Electrically Held Contactors—The base C30CN product line can accept up to four auxiliary contacts (2NO/2NC), which are mounted on the top of the unit. The auxiliary contacts, rated A600, are also suitable for use on low-level circuits down to 12 V, 5 mA.

CN35 Electrically Held Contactors—Include a NO maintaining auxiliary contact mounted on the right side of the contactor or integral to the contactor. The 10–60 A devices will accept additional auxiliary contacts on the top (front) and/or sides. The 100–400 A sizes will accept side-mounted auxiliaries only.

Mechanically Held and Magnetically Latched

Holding circuit auxiliary contact, if needed, is not included and should be added separately as an option.

Power Poles for C30CN

The C30CN can be configured with up to 12 poles (30 A maximum per pole). Power poles are available in single or double pole designs and can be mounted to provide either normally open or normally closed operation with a maximum of 12 NO poles or 8 NC and 4 NO poles. Each pole is capable of accepting up to 8 AWG wire.

Two-Wire or Three-Wire Control Module for C30CN

A mechanical latch with a two- or three-wire electronic control module delivers reliable performance and protection from such application abnormalities as line noise, leakage currents from controller outputs, or short repetitive commands burst from faulty controllers. For enclosed control, units come standard with two-wire control.

IMPORTANT: Add the **C18** modification code to get three-wire control with the C30CN contactor.

Mechanically Held Kit for C30CN

A modification kit allows the conversion of an electrically held lighting contactor into a mechanically held contactor.

Coil Kits for C30CN

The C30CN line comes in a wide range of input voltages and with coils from 24 Vac to 600 Vac.

Two-Wire Control Relay for A202

The two-wire control relay is designed to field convert three-wire magnetically latched lighting contactors to operate controls such as photocells and timers. Terminal blocks included for fast wiring installation.

Enclosed Lighting Contactors



Type 1 Two-Wire Control Relay

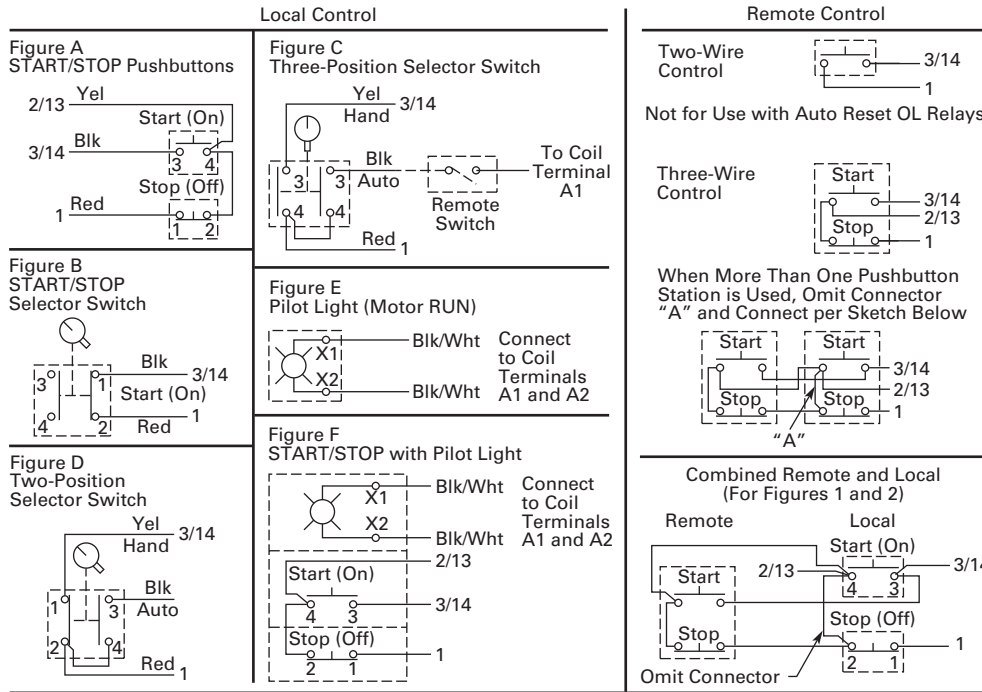
Description	Magnetic Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number
Two-wire control relay	120	ECLC201A	ECLC202A
	208	ECLC201E	ECLC202E
	240	ECLC201B	ECLC202B
	277	ECLC201H	ECLC202H
	480	ECLC201C	ECLC202C

Wiring Diagrams

C30CN

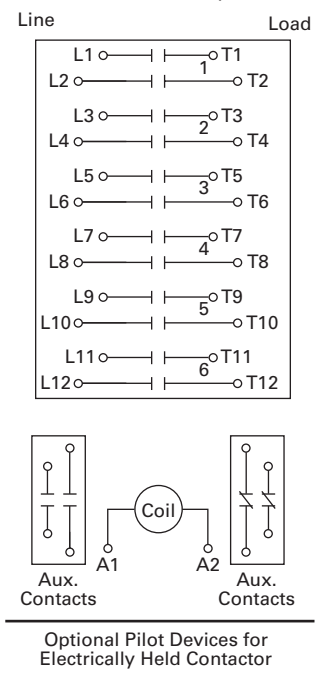
COMBINATION MOTOR CONTROLLER

Connections for Control Stations

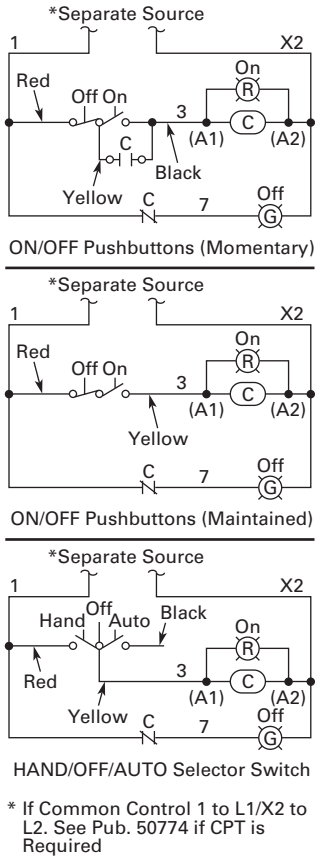
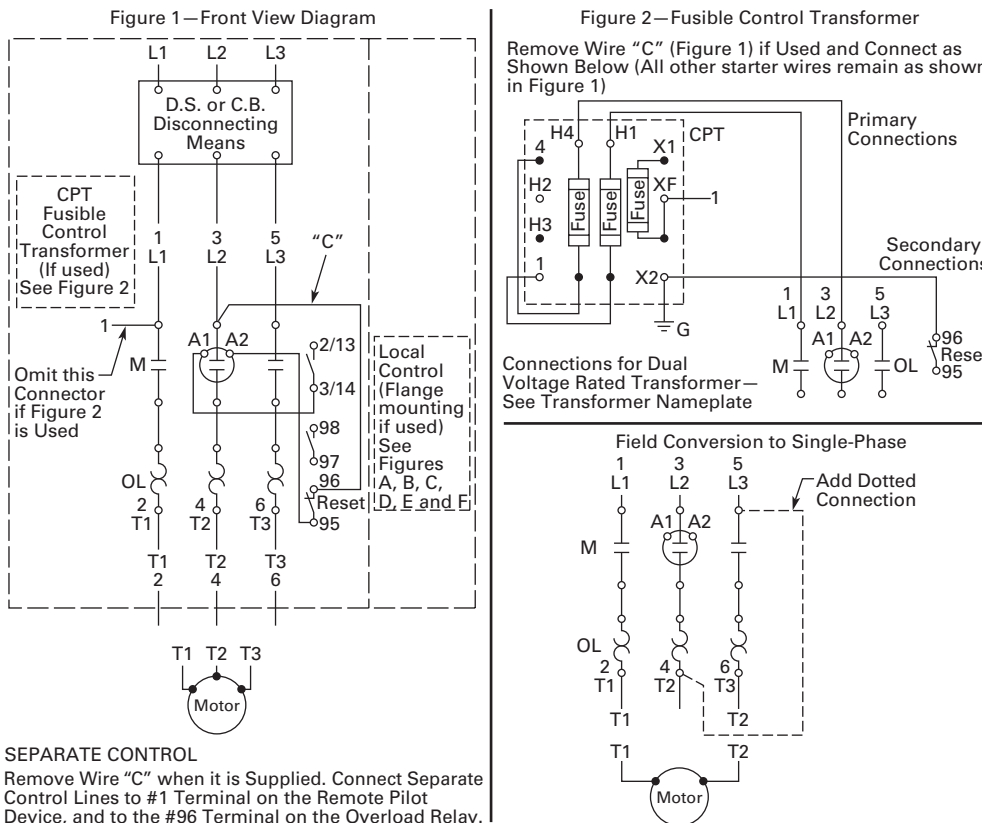


C30CNE WIRING DIAGRAM

C30CNE Electrically Held

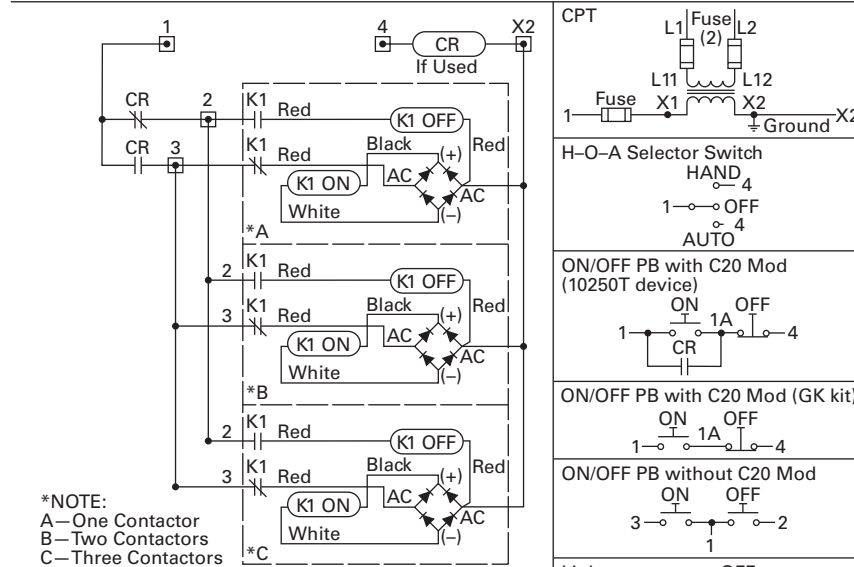


Connections for Starters



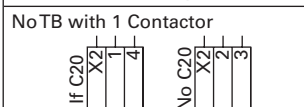
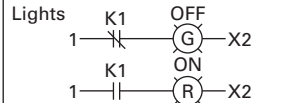
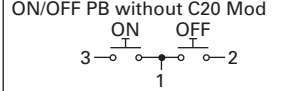
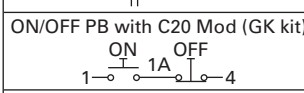
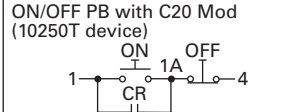
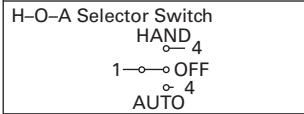
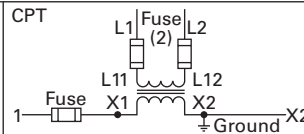
Magnetically Latched

30–200A L04 Contactor 2–12 Pole

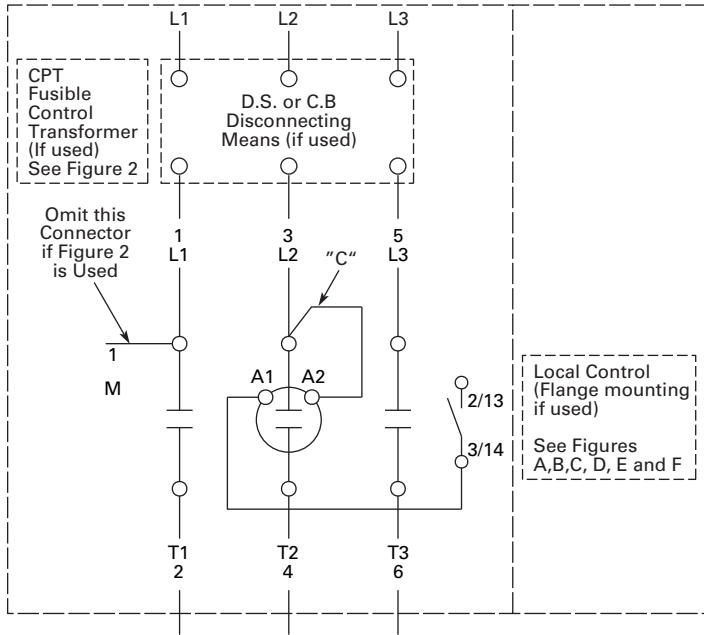


***NOTE:**
 A—One Contactor
 B—Two Contactors
 C—Three Contactors

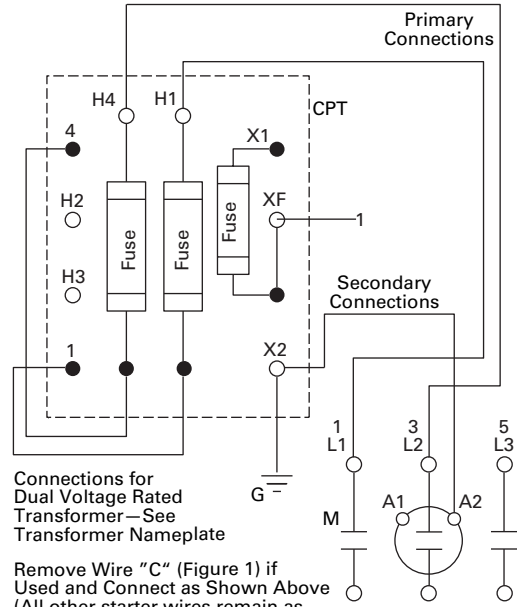
Suitable for Use on a Circuit Capable of Producing Not More Than 5,000 (33–100A) or 10,000 (200A) rms Symmetrical Amperes, 600 Volts Maximum	POWER TERMINATIONS Use 60/75°C Al/Cu Conductors Only		
	Contactor Size	Wire Range (AWG)	Torque (lb-in)
	30A	14–8	18–20
	60A	14–4	45–50
	100A	6–1/0	110–130
	200A	6–300 kcmil	275–375



Electrically Held Contactors—CN35 with C400 Control

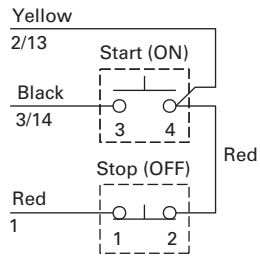


Front View Diagram
Figure 1

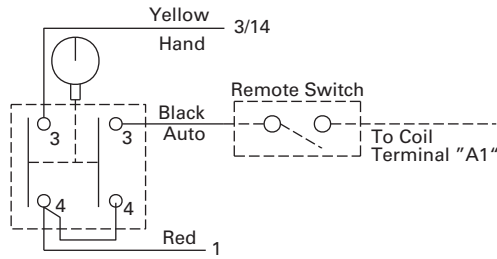


Connections for Dual Voltage Rated Transformer—See Transformer Nameplate
Remove Wire "C" (Figure 1) if Used and Connect as Shown Above (All other starter wires remain as shown in Figure 1)

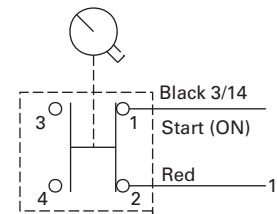
Fusible Control Transformer
Figure 2



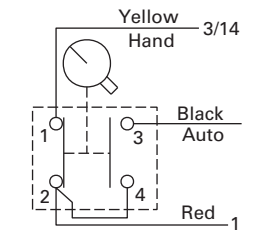
START/STOP Pushbuttons
Figure A



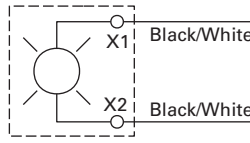
Three-Position Selector Switch
Figure C



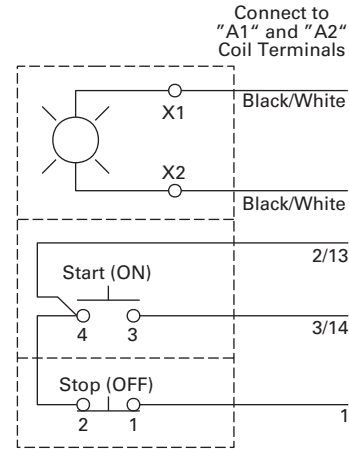
START/STOP Selector Switch
Figure B



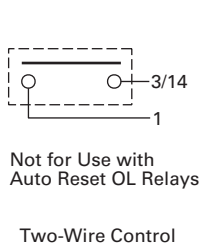
Two-Position Selector Switch
Figure D



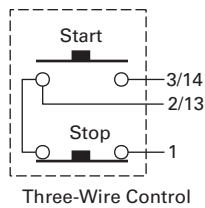
Pilot Light (Motor RUN)
Figure E



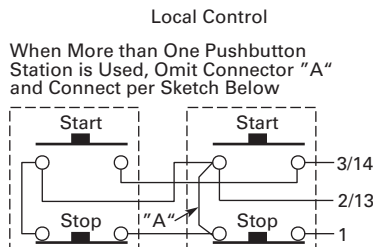
STOP/START with Pilot Light
Figure F



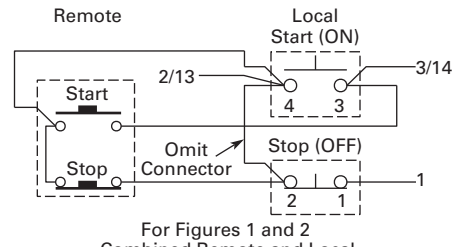
Two-Wire Control



Three-Wire Control



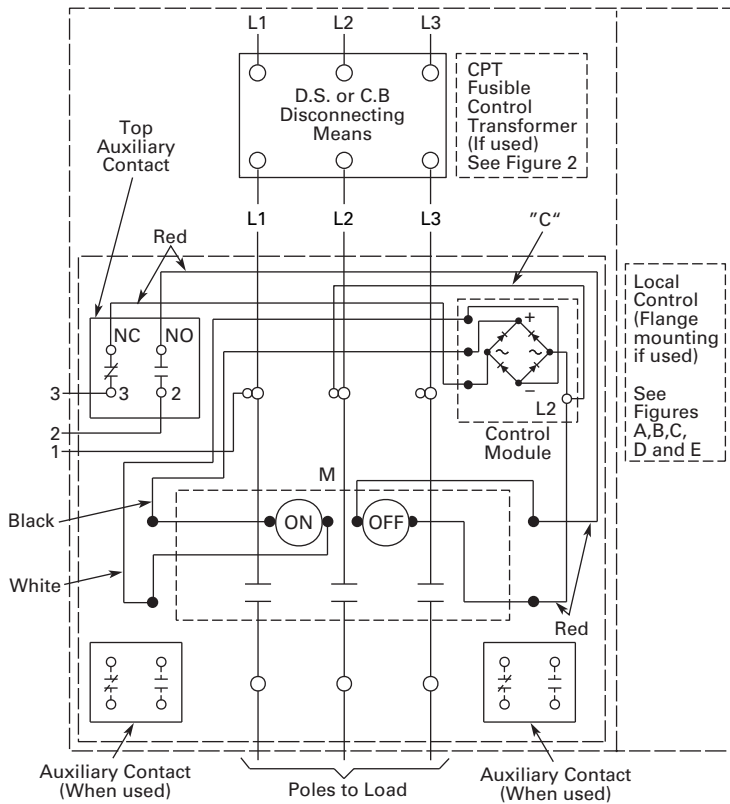
Remote Control



For Figures 1 and 2 Combined Remote and Local

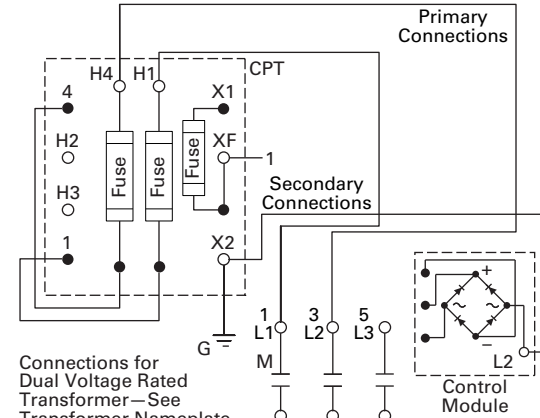
260880 D4

Magnetically Latched Combination Contactors



Front View Diagram
Figure 1

Remove Wire "C" (Figure 1) if Used and Connect as Shown Below (All other starter wires remain as shown in Figure 1)



Connections for Dual Voltage Rated Transformer—See Transformer Nameplate

Fusible Control Transformer
Figure 2

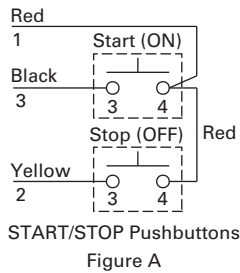
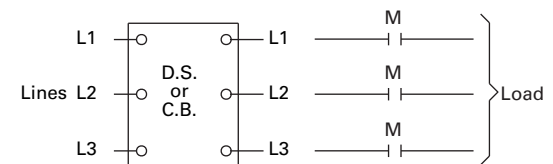


Figure A

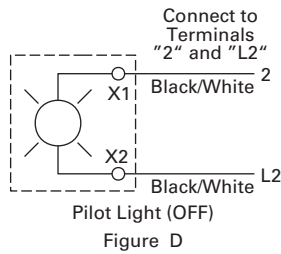
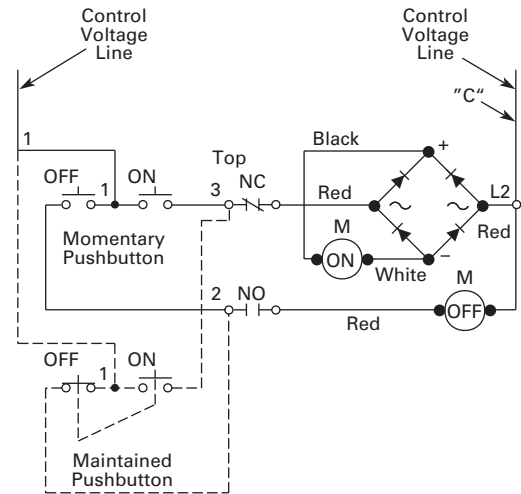


Figure D



Elementary Diagram

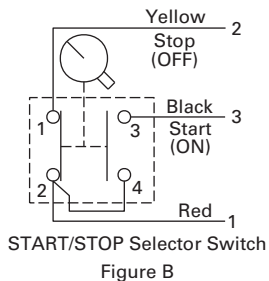


Figure B

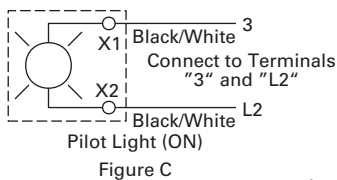


Figure C

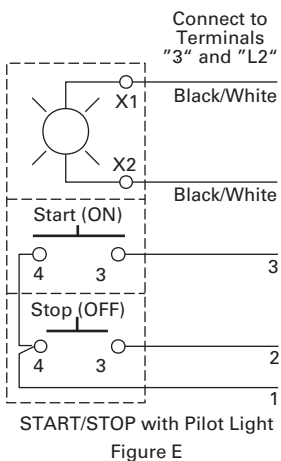
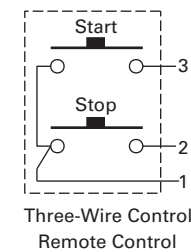


Figure E



Three-Wire Control Remote Control

Local Control

260887 D4

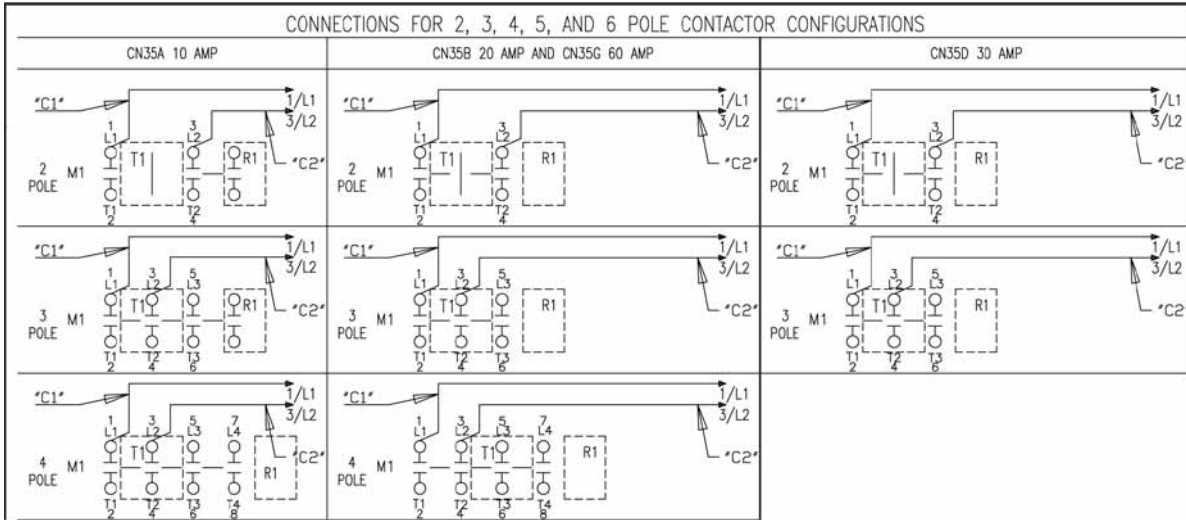
4.1

Lighting Contactors

UL Rated AC Contactors

Electrically Held Non-Combination Contactors—CN35 with C600 Control

4



SCHEMATIC SYMBOL LEGEND

	NORMALLY OPEN AUX.
	NORMALLY CLOSED AUX.
	NORMALLY OPEN MOMENTARY PB
	NORMALLY CLOSED MOMENTARY PB
	CONTACTOR COIL
	RED PILOT LIGHT
	GREEN PILOT LIGHT
	NORMALLY CLOSED OVERLOAD AUX.
	NORMALLY OPEN OVERLOAD AUX.
	M22-XLED230-T; USED TO LOWER VOLTAGE FOR PILOT LIGHTS.
	2-POSITION SELECTOR SWITCH (STOP/START, OFF/ON)
	3 POSITION SELECTOR SWITCH (HOA)
	SIGNIFIES LOCATION OF SIDE AND TOP ADDER AUX. REFERENCED ON DIAGRAM UNDER AUX. SYMBOL

CAUTION

READ AND FOLLOW INSTRUCTIONS PRIOR TO WIRING OR CONNECTING POWER!
THIS PRODUCT CAN BE FACTORY OR FIELD CONFIGURED FOR MULTIPLE CONTROL MODES OR CONTROL VOLTAGES. CHECK NAMEPLATE FOR COIL VOLTAGE.

SEPARATE CONTROL POWER

FOR COIL VOLTAGES 120V AND LESS; CONNECT SEPARATE CONTROL LINES TO THE NO. 61 TERMINAL ON THE TOP ADDER AUX. AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

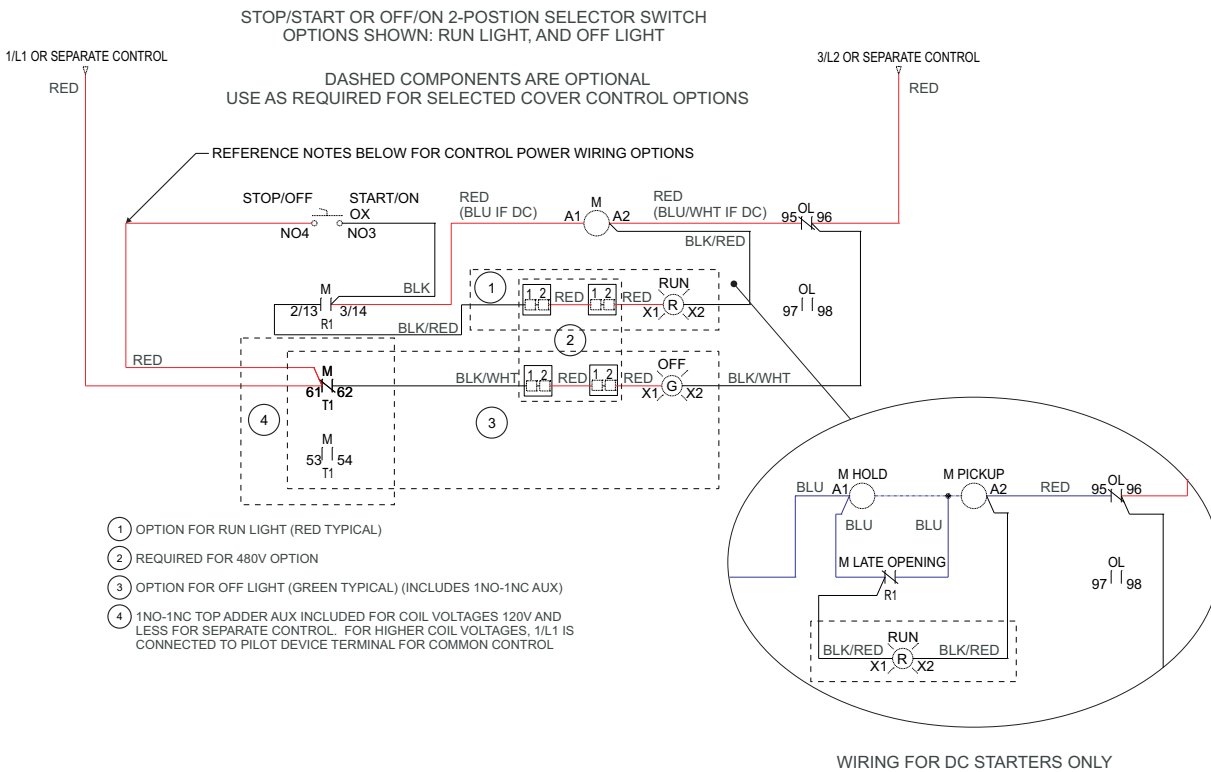
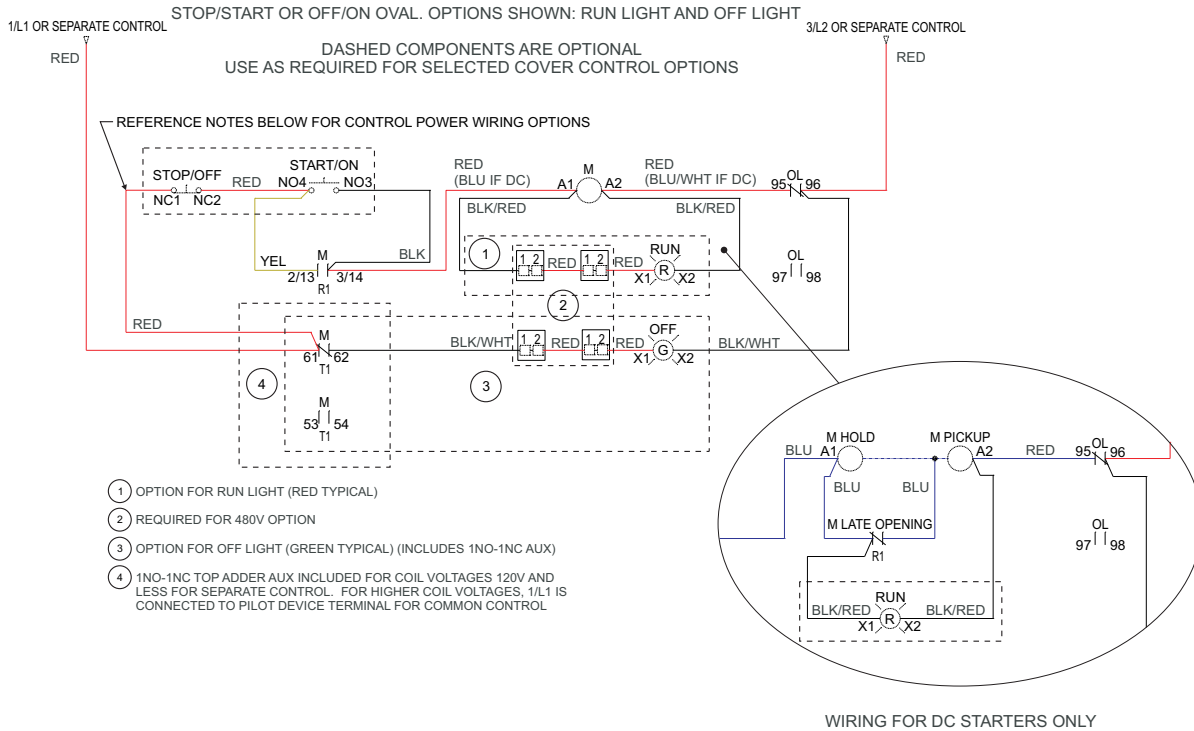
FOR COIL VOLTAGES GREATER THAN 120V; REMOVE WIRE "C2" IF SUPPLIED. IF WIRE "C1" IS TERMINATED ON L1, DISCONNECT FROM L1. CONNECT SEPARATE CONTROL LINES TO THE "C1" WIRE OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM AND TO THE NO. 96 TERMINAL ON THE OVERLOAD RELAY.

COMMON CONTROL POWER

FOR COIL VOLTAGES 120V AND LESS; ADD WIRE "C2" IF NOT SUPPLIED. ADD CONNECTOR BETWEEN L1 TERMINAL AND THE NO. 61 TERMINAL ON THE TOP ADDER AUX. OR APPROPRIATE PILOT DEVICE TERMINAL PER DIAGRAM.

FOR COIL VOLTAGES GREATER THAN 120V; ADD WIRE "C1" AND "C2" IF NOT SUPPLIED.

Electrically Held Non-Combination Contactors—CN35 with C600 Control



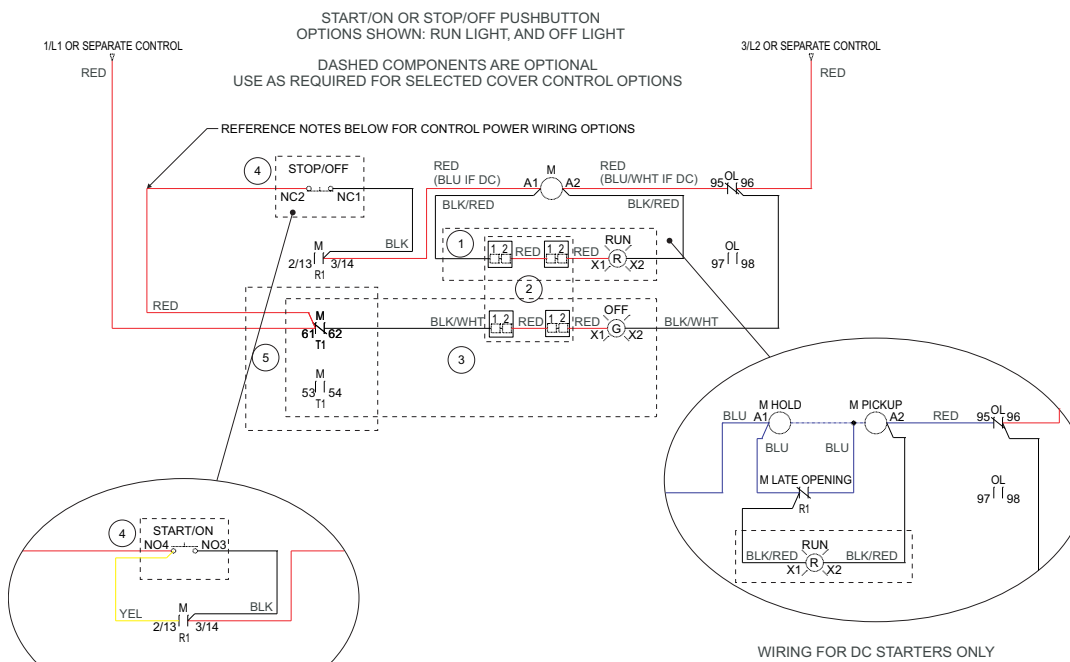
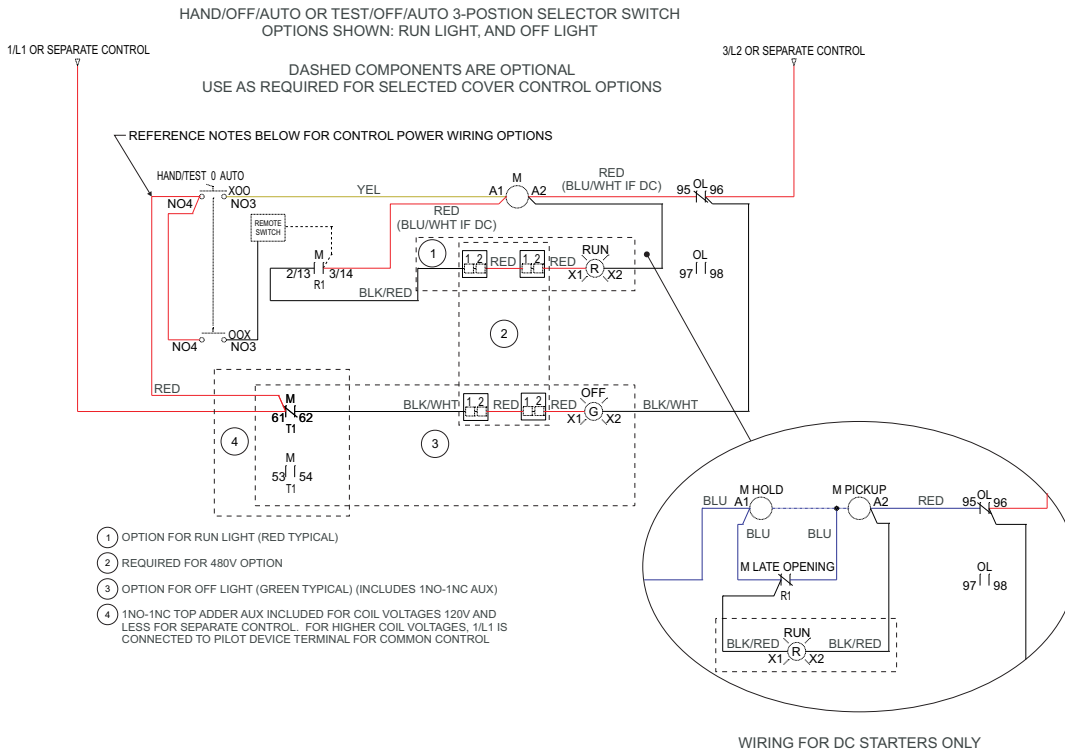
4.1

Lighting Contactors

UL Rated AC Contactors

Electrically Held Non-Combination Contactors—CN35 with C600 Control

4



- ① OPTION FOR RUN LIGHT (RED TYPICAL)
② REQUIRED FOR 480V OPTION
③ OPTION FOR OFF LIGHT (GREEN TYPICAL) (INCLUDES 1NO-1NC AUX)
④ OPTION FOR START/ON OR STOP/OFF PB
⑤ 1NO-1NC TOP ADDER AUX INCLUDED FOR COIL VOLTAGES 120V AND LESS FOR SEPARATE CONTROL. FOR HIGHER COIL VOLTAGES, 1/L1 IS CONNECTED TO PILOT DEVICE TERMINAL FOR COMMON CONTROL

Enclosed S611 with Breaker Disconnect



5.1 S611 Solid-State Soft Starter

Product Description	V10-T5-2
Features and Benefits	V10-T5-2
Options	V10-T5-3
Communications	V10-T5-3
Standards and Certifications	V10-T5-3
Additional Reference	V10-T5-3
Catalog Number Selection	V10-T5-4
Product Selection	
Non-Combination	V10-T5-5
Combination—Disconnect Switch	V10-T5-7
Combination—Circuit Breaker	V10-T5-11
Wiring Diagram	V10-T5-13
Dimensions	V10-T5-14

Enclosed 40 hp /T/ Soft Starter



5.2 S801+/S811+ /T/ Solid-State Soft Starters

Product Description	V10-T5-15
Features and Benefits	V10-T5-15
Options	V10-T5-16
Standards and Certifications	V10-T5-16
Additional Reference	V10-T5-16
Catalog Number Selection	V10-T5-17
Cover Control	V10-T5-18
Product Selection	
Non-Combination	V10-T5-19
Combination—Fusible Disconnect	V10-T5-23
Combination—Circuit Breaker	V10-T5-27
Wiring Diagrams	V10-T5-31
Dimensions	V10-T5-33

Type 3R Fused S801+ /T/ Soft Starter



5.3 Freedom Three-Phase Magnetic Starters

Product Description	V10-T5-34
Features	V10-T5-34
Standards and Certifications	V10-T5-34
Additional Reference	V10-T5-34
Catalog Number Selection	V10-T5-35
Cover Control	V10-T5-36
Product Selection	
Autotransformer	V10-T5-37
Part Winding	V10-T5-45
Wye Delta	V10-T5-51
Part Winding Pump Control	V10-T5-80
Wiring Diagrams	V10-T5-81

Type 12 HMCP Combination /T/ Soft Starter



S611 Solid-State Soft Starter



5

Product Description

Eaton's line of S611 reduced voltage soft starters is multi-functional, easy to install and easy to program. The S611 soft starter includes advanced feature set and user-friendly interface module to enhance system performance and reduce commissioning time. Easy communication interface, as well as metering, monitoring, and diagnostics are possible with this revolutionary soft starter.

Designed to control acceleration and deceleration of three-phase motors up to 600V, current ratings from 26 to 414 amps, and suitable for mounting in a variety of enclosures including NEMA Type 1, 12, 3R, 4, and 4X.

- Intuitive User Interface Module (UI)
- Internal run bypass
- 120 Vac control voltage
- Open architecture for serviceability (PCBs and contactors can be replaced in the field)
- Built-in overload protection
 - Adjustable trip class 5, 10, 20, 30
 - 50–100% FLA adjustment
- Selectable current limit or ramp start
- Adjustable ramp times
 - 0–180 seconds standard
 - Extended ramps available
- Adjustable torque control
- Adjustable kick start control
- Soft stop control
 - 0–60 seconds standard
 - Extended times available
- Built-in low impedance contactor
- Six SCR control in all units
- Selectable phase reversal protection
- User interface module

Features and Benefits

- Mechanical stress on system
 - Reduced wear on belts, gears, chains, clutches, shafts and bearings. You can get up to 2–6 times the life on standard belts by switching to a soft starter
 - Elimination of water-hammer in pumping applications extends component life and helps limit leakage in system
 - Lower shock to product on conveyor lines and material handling gear
 - Able to catch motors and fans on the fly and control their acceleration
- Electrical system improvements
 - Limits the peak inrush current as required by many local codes
 - Helps to eliminate sags on the plant electrical grid when starting large loads, thus avoiding brownout conditions

Contents

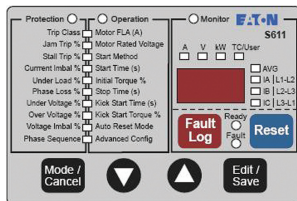
Description	Page
S611 Solid-State Soft Starter	
Options	V10-T5-3
Communications	V10-T5-3
Standards and Certifications	V10-T5-3
Additional Reference	V10-T5-3
Catalog Number Selection	V10-T5-4
Product Selection	
Non-Combination	V10-T5-5
Combination—Disconnect Switch	V10-T5-7
Combination—Circuit Breaker	V10-T5-11
Wiring Diagram	V10-T5-13
Dimensions	V10-T5-14

User Interface Module (UI)

The S611 has an easy to use User Interface Module (UI) that allows the user to configure the device and to read system parameters and values. The UI includes an LED display and keypad to scroll through the various parameters. The UI allows the user to modify control parameters, enable or disable protections, set communication variables, monitor system values such as line voltages and currents and access the fault queue.

The UI can be removed from the S611 and remote mounted. Kits are available to door mount the DIM, enabling users to safely configure, commission, monitor and troubleshoot the system at the electrical panel without opening the enclosure door. Factory assembled units are supplied with door mounted keypad. If door mounted keypad is not needed, consult factory.

User Interface Module (UI)



Options

S611

Description	Modification Code
Pump control option	Standard
Door mounted keypad	Standard
Extended ramp	R1

Pump Control Option

- Designed to reduce “water-hammer” during start-up and stopping sequences
- Stop ramp extended to 120 seconds to help control larger motors and systems with long piping runs

Communications

The S611 has built-in communication capabilities through two communications ports to connect the soft starter to a variety of networks, including Modbus (resident), DeviceNet™, PROFIBUS®, and Ethernet.

The S611 communication parameters can be configured with the UI or through the Fieldbus.

Advanced communication configuration settings provide the system integrator with powerful tools to facilitate system optimization.

Network Communications Reference

Description	Catalog Number
Modbus communication adapter without I/O	C441M
Modbus communication adapter with 120 Vac I/O	C441N
Modbus communication adapter with 24 Vdc I/O	C441P
DeviceNet communication adapter with 120 Vac I/O	C441K
DeviceNet communication adapter with 24 Vdc I/O	C441L
PROFIBUS communication adapter with 120 Vac I/O	C441S
PROFIBUS communication adapter with 24 Vdc I/O	C441Q
EtherNet/IP and Modbus TCP communication adapter with 120 Vac I/O	C441R
EtherNet/IP and Modbus TCP communication adapter with 24 Vdc I/O	C441T
Communication adapter	C440-COM-ADP

Standards and Certifications

See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- IEC 947-4-2
- EN 60947.2 (for motor controller)
- cUL (indicates appropriate CSA Standard investigation)
- ABS Type Approved

Additional Reference

Dimensions	Tab 14
Accessories and Modifications	Tab 15
Technical Data and Specifications	Tab 17

5.1

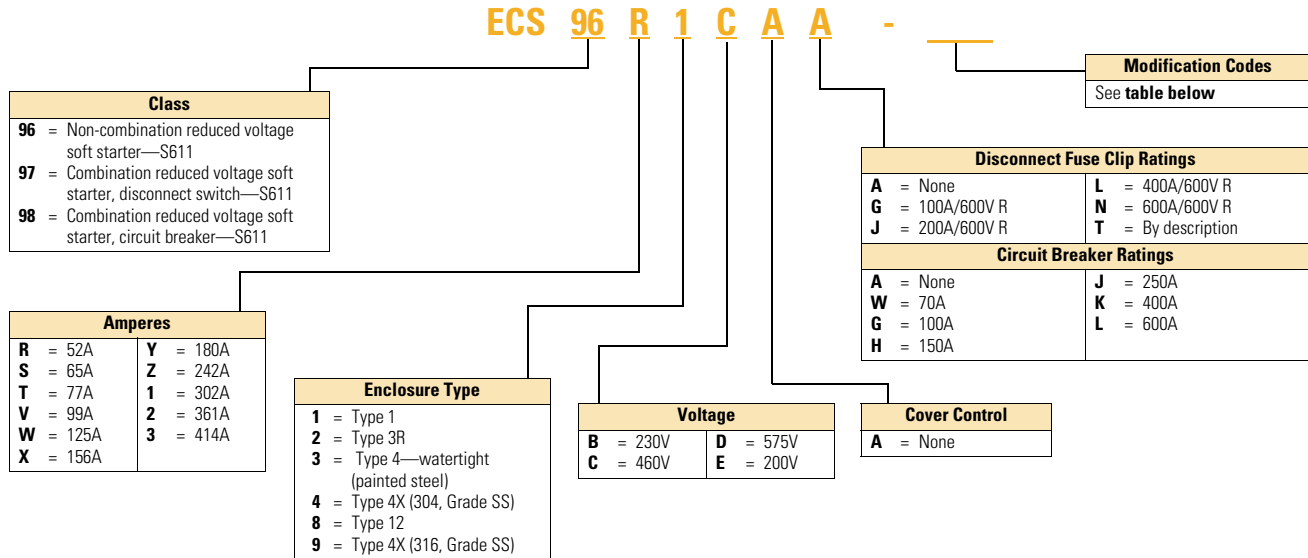
Reduced Voltage Starter

S611 Solid-State Soft Starter

Catalog Number Selection

S611 Solid-State Soft Starters

5



Enclosed S611 Modification Codes

Modification Code	Description
A47	2 N.O. / 2 N.C. auxiliary relay (soft start)
C1	Standard size CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C42	With 50 VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C3	With 100 VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C5	With 200 VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C7	With 300 VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C8	With 400 VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C9	With 1K VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C10	With 2K VA extra capacity CPT, 120V/60 Hz, 110V 50 Hz secondary w/fuses
C12	2-pole 120V coil control relay
C47	Bypass starter with SSOL - S611 ONLY
P7	PB - START/STOP
P23	PL - red RUN
P25	PL - green OFF
S3	HAND-OFF-AUTO selector switch
S44	2-position selector switch
T15	Terminal point per customer specification, wired

Note: Door mounted keypad and pump control algorithm are provided as standard.

Product Selection

Non-Combination

Class ECS96—Non-Combination Reduced Voltage Soft Starter—S611

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame A								
52A	200V	15	120 Vac	ECS96R1EAA	ECS96R2EAA	ECS96R4EAA	ECS96R8EAA	S611A052P3S
	230V	15		ECS96R1BAA	ECS96R2BAA	ECS96R4BAA	ECS96R8BAA	
	460V	40		ECS96R1CAA	ECS96R2CAA	ECS96R4CAA	ECS96R8CAA	
	575V	50		ECS96R1DAA	ECS96R2DAA	ECS96R4DAA	ECS96R8DAA	
65A	200V	20	120 Vac	ECS96S1EAA	ECS96S2EAA	ECS96S4EAA	ECS96S8EAA	S611A065P3S
	230V	20		ECS96S1BAA	ECS96S2BAA	ECS96S4BAA	ECS96S8BAA	
	460V	50		ECS96S1CAA	ECS96S2CAA	ECS96S4CAA	ECS96S8CAA	
	575V	60		ECS96S1DAA	ECS96S2DAA	ECS96S4DAA	ECS96S8DAA	
77A	200V	25	120 Vac	ECS96T1EAA	ECS96T2EAA	ECS96T4EAA	ECS96T8EAA	S611A077P3S
	230V	25		ECS96T1BAA	ECS96T2BAA	ECS96T4BAA	ECS96T8BAA	
	460V	60		ECS96T1CAA	ECS96T2CAA	ECS96T4CAA	ECS96T8CAA	
	575V	75		ECS96T1DAA	ECS96T2DAA	ECS96T4DAA	ECS96T8DAA	
Frame B								
99A	200V	30	120 Vac	ECS96V1EAA	ECS96V2EAA	ECS96V4EAA	ECS96V8EAA	S611B099P3S
	230V	30		ECS96V1BAA	ECS96V2BAA	ECS96V4BAA	ECS96V8BAA	
	460V	75		ECS96V1CAA	ECS96V2CAA	ECS96V4CAA	ECS96V8CAA	
	575V	100		ECS96V1DAA	ECS96V2DAA	ECS96V4DAA	ECS96V8DAA	
125A	200V	40	120 Vac	ECS96W1EAA	ECS96W2EAA	ECS96W4EAA	ECS96W8EAA	S611B125P3S
	230V	40		ECS96W1BAA	ECS96W2BAA	ECS96W4BAA	ECS96W8BAA	
	460V	100		ECS96W1CAA	ECS96W2CAA	ECS96W4CAA	ECS96W8CAA	
	575V	125		ECS96W1DAA	ECS96W2DAA	ECS96W4DAA	ECS96W8DAA	
Frame C								
156A	200V	50	120 Vac	ECS96X1EAA	ECS96X2EAA	ECS96X4EAA	ECS96X8EAA	S611C156P3S
	230V	60		ECS96X1BAA	ECS96X2BAA	ECS96X4BAA	ECS96X8BAA	
	460V	125		ECS96X1CAA	ECS96X2CAA	ECS96X4CAA	ECS96X8CAA	
	575V	150		ECS96X1DAA	ECS96X2DAA	ECS96X4DAA	ECS96X8DAA	
180A	200V	60	120 Vac	ECS96Y1EAA	ECS96Y2EAA	ECS96Y4EAA	ECS96Y8EAA	S611C180P3S
	230V	60		ECS96Y1BAA	ECS96Y2BAA	ECS96Y4BAA	ECS96Y8BAA	
	460V	150		ECS96Y1CAA	ECS96Y2CAA	ECS96Y4CAA	ECS96Y8CAA	
	575V	150		ECS96Y1DAA	ECS96Y2DAA	ECS96Y4DAA	ECS96Y8DAA	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS96R4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

5.1

Reduced Voltage Starter

S611 Solid-State Soft Starter

5

Class ECS96—Non-Combination Reduced Voltage Soft Starter—S611, continued

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame D								
242A	200V	75	120 Vac	ECS96Z1EAA	ECS96Z2EAA	ECS96Z4EAA	ECS96Z8EAA	S611D242P3S
	230V	75		ECS96Z1BAA	ECS96Z2BAA	ECS96Z4BAA	ECS96Z8BAA	
	460V	200		ECS96Z1CAA	ECS96Z2CAA	ECS96Z4CAA	ECS96Z8CAA	
	575V	250		ECS96Z1DAA	ECS96Z2DAA	ECS96Z4DAA	ECS96Z8DAA	
Frame E								
302A	200V	100	120 Vac	ECS9611EAA	ECS9612EAA	ECS9614EAA	ECS9618EAA	S611E302P3S
	230V	100		ECS9611BAA	ECS9612BAA	ECS9614BAA	ECS9618BAA	
	460V	250		ECS9611CAA	ECS9612CAA	ECS9614CAA	ECS9618CAA	
	575V	300		ECS9611DAA	ECS9612DAA	ECS9614DAA	ECS9618DAA	
361A	200V	125	120 Vac	ECS9621EAA	ECS9622EAA	ECS9624EAA	ECS9628EAA	S611E361P3S
	230V	150		ECS9621BAA	ECS9622BAA	ECS9624BAA	ECS9628BAA	
	460V	300		ECS9621CAA	ECS9622CAA	ECS9624CAA	ECS9628CAA	
	575V	350		ECS9621DAA	ECS9622DAA	ECS9624DAA	ECS9628DAA	
Frame F								
414A	200V	150	120 Vac	ECS9631EAA	ECS9632EAA	ECS9634EAA	ECS9638EAA	S611F414P3S
	230V	150		ECS9631BAA	ECS9632BAA	ECS9634BAA	ECS9638BAA	
	460V	350		ECS9631CAA	ECS9632CAA	ECS9634CAA	ECS9638CAA	
	575V	450		ECS9631DAA	ECS9632DAA	ECS9634DAA	ECS9638DAA	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS96Z4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

Combination—Disconnect Switch

Class ECS97—Combination Reduced Voltage Soft Starter—Disconnect Switch (Non-Fusible)—S611

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame A								
52A	200V	15	120 Vac	ECS97R1EAA	ECS97R2EAA	ECS97R4EAA	ECS97R8EAA	S611A052P3S
	230V	15		ECS97R1BAA	ECS97R2BAA	ECS97R4BAA	ECS97R8BAA	
	460V	40		ECS97R1CAA	ECS97R2CAA	ECS97R4CAA	ECS97R8CAA	
	575V	50		ECS97R1DAA	ECS97R2DAA	ECS97R4DAA	ECS97R8DAA	
65A	200V	20	120 Vac	ECS97S1EAA	ECS97S2EAA	ECS97S4EAA	ECS97S8EAA	S611A065P3S
	230V	20		ECS97S1BAA	ECS97S2BAA	ECS97S4BAA	ECS97S8BAA	
	460V	50		ECS97S1CAA	ECS97S2CAA	ECS97S4CAA	ECS97S8CAA	
	575V	60		ECS97S1DAA	ECS97S2DAA	ECS97S4DAA	ECS97S8DAA	
77A	200V	25	120 Vac	ECS97T1EAA	ECS97T2EAA	ECS97T4EAA	ECS97T8EAA	S611A077P3S
	230V	25		ECS97T1BAA	ECS97T2BAA	ECS97T4BAA	ECS97T8BAA	
	460V	60		ECS97T1CAA	ECS97T2CAA	ECS97T4CAA	ECS97T8CAA	
	575V	75		ECS97T1DAA	ECS97T2DAA	ECS97T4DAA	ECS97T8DAA	
Frame B								
99A	200V	30	120 Vac	ECS97V1EAA	ECS97V2EAA	ECS97V4EAA	ECS97V8EAA	S611B099P3S
	230V	30		ECS97V1BAA	ECS97V2BAA	ECS97V4BAA	ECS97V8BAA	
	460V	75		ECS97V1CAA	ECS97V2CAA	ECS97V4CAA	ECS97V8CAA	
	575V	100		ECS97V1DAA	ECS97V2DAA	ECS97V4DAA	ECS97V8DAA	
125A	200V	40	120 Vac	ECS97W1EAA	ECS97W2EAA	ECS97W4EAA	ECS97W8EAA	S611B125P3S
	230V	40		ECS97W1BAA	ECS97W2BAA	ECS97W4BAA	ECS97W8BAA	
	460V	100		ECS97W1CAA	ECS97W2CAA	ECS97W4CAA	ECS97W8CAA	
	575V	125		ECS97W1DAA	ECS97W2DAA	ECS97W4DAA	ECS97W8DAA	
Frame C								
156A	200V	50	120 Vac	ECS97X1EAA	ECS97X2EAA	ECS97X4EAA	ECS97X8EAA	S611C156P3S
	230V	60		ECS97X1BAA	ECS97X2BAA	ECS97X4BAA	ECS97X8BAA	
	460V	125		ECS97X1CAA	ECS97X2CAA	ECS97X4CAA	ECS97X8CAA	
	575V	150		ECS97X1DAA	ECS97X2DAA	ECS97X4DAA	ECS97X8DAA	
180A	200V	60	120 Vac	ECS97Y1EAA	ECS97Y2EAA	ECS97Y4EAA	ECS97Y8EAA	S611C180P3S
	230V	60		ECS97Y1BAA	ECS97Y2BAA	ECS97Y4BAA	ECS97Y8BAA	
	460V	150		ECS97Y1CAA	ECS97Y2CAA	ECS97Y4CAA	ECS97Y8CAA	
	575V	150		ECS97Y1DAA	ECS97Y2DAA	ECS97Y4DAA	ECS97Y8DAA	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS97R4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

5.1

Reduced Voltage Starter

S611 Solid-State Soft Starter

5

Class ECS97—Combination Reduced Voltage Soft Starter—Disconnect Switch (Non-Fusible)—S611, continued

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame D								
242A	200V	75	120 Vac	ECS9721EAA	ECS9722EAA	ECS9724EAA	ECS9728EAA	S611D242P3S
	230V	75		ECS9721BAA	ECS9722BAA	ECS9724BAA	ECS9728BAA	
	460V	200		ECS9721CAA	ECS9722CAA	ECS9724CAA	ECS9728CAA	
	575V	250		ECS9721DAA	ECS9722DAA	ECS9724DAA	ECS9728DAA	
Frame E								
302A	200V	100	120 Vac	ECS9711EAA	ECS9712EAA	ECS9714EAA	ECS9718EAA	S611E302P3S
	230V	100		ECS9711BAA	ECS9712BAA	ECS9714BAA	ECS9718BAA	
	460V	250		ECS9711CAA	ECS9712CAA	ECS9714CAA	ECS9718CAA	
	575V	300		ECS9711DAA	ECS9712DAA	ECS9714DAA	ECS9718DAA	
361A	200V	125	120 Vac	ECS9721EAA	ECS9722EAA	ECS9724EAA	ECS9728EAA	S611E361P3S
	230V	150		ECS9721BAA	ECS9722BAA	ECS9724BAA	ECS9728BAA	
	460V	300		ECS9721CAA	ECS9722CAA	ECS9724CAA	ECS9728CAA	
	575V	350		ECS9721DAA	ECS9722DAA	ECS9724DAA	ECS9728DAA	
Frame F								
414A	200V	150	120 Vac	ECS9731EAA	ECS9732EAA	ECS9734EAA	ECS9738EAA	S611F414P3S
	230V	150		ECS9731BAA	ECS9732BAA	ECS9734BAA	ECS9738BAA	
	460V	350		ECS9731CAA	ECS9732CAA	ECS9734CAA	ECS9738CAA	
	575V	450		ECS9731DAA	ECS9732DAA	ECS9734DAA	ECS9738DAA	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS9724EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

Class ECS97—Combination Reduced Voltage Soft Starter—Disconnect Switch (Fusible)—S611

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame A								
52A	200V	15	120 Vac	ECS97R1EAG	ECS97R2EAG	ECS97R4EAG	ECS97R8EAG	S611A052P3S
	230V	15		ECS97R1BAG	ECS97R2BAG	ECS97R4BAG	ECS97R8BAG	
	460V	40		ECS97R1CAG	ECS97R2CAG	ECS97R4CAG	ECS97R8CAG	
	575V	50		ECS97R1DAG	ECS97R2DAG	ECS97R4DAG	ECS97R8DAG	
65A	200V	20	120 Vac	ECS97S1EAG	ECS97S2EAG	ECS97S4EAG	ECS97S8EAG	S611A065P3S
	230V	20		ECS97S1BAG	ECS97S2BAG	ECS97S4BAG	ECS97S8BAG	
	460V	50		ECS97S1CAG	ECS97S2CAG	ECS97S4CAG	ECS97S8CAG	
	575V	60		ECS97S1DAG	ECS97S2DAG	ECS97S4DAG	ECS97S8DAG	
77A	200V	25	120 Vac	ECS97T1EAG	ECS97T2EAG	ECS97T4EAG	ECS97T8EAG	S611A077P3S
	230V	25		ECS97T1BAG	ECS97T2BAG	ECS97T4BAG	ECS97T8BAG	
	460V	60		ECS97T1CAG	ECS97T2CAG	ECS97T4CAG	ECS97T8CAG	
	575V	75		ECS97T1DAG	ECS97T2DAG	ECS97T4DAG	ECS97T8DAG	
Frame B								
99A	200V	30	120 Vac	ECS97V1EAJ	ECS97V2EAJ	ECS97V4EAJ	ECS97V8EAJ	S611B099P3S
	230V	30		ECS97V1BAJ	ECS97V2BAJ	ECS97V4BAJ	ECS97V8BAJ	
	460V	75		ECS97V1CAJ	ECS97V2CAJ	ECS97V4CAJ	ECS97V8CAJ	
	575V	100		ECS97V1DAJ	ECS97V2DAJ	ECS97V4DAJ	ECS97V8DAJ	
125A	200V	40	120 Vac	ECS97W1EAJ	ECS97W2EAJ	ECS97W4EAJ	ECS97W8EAJ	S611B125P3S
	230V	40		ECS97W1BAJ	ECS97W2BAJ	ECS97W4BAJ	ECS97W8BAJ	
	460V	100		ECS97W1CAJ	ECS97W2CAJ	ECS97W4CAJ	ECS97W8CAJ	
	575V	125		ECS97W1DAJ	ECS97W2DAJ	ECS97W4DAJ	ECS97W8DAJ	
Frame C								
156A	200V	50	120 Vac	ECS97X1EAL	ECS97X2EAL	ECS97X4EAL	ECS97X8EAL	S611C156P3S
	230V	60		ECS97X1BAL	ECS97X2BAL	ECS97X4BAL	ECS97X8BAL	
	460V	125		ECS97X1CAL	ECS97X2CAL	ECS97X4CAL	ECS97X8CAL	
	575V	150		ECS97X1DAL	ECS97X2DAL	ECS97X4DAL	ECS97X8DAL	
180A	200V	60	120 Vac	ECS97Y1EAL	ECS97Y2EAL	ECS97Y4EAL	ECS97Y8EAL	S611C180P3S
	230V	60		ECS97Y1BAL	ECS97Y2BAL	ECS97Y4BAL	ECS97Y8BAL	
	460V	150		ECS97Y1CAL	ECS97Y2CAL	ECS97Y4CAL	ECS97Y8CAL	
	575V	150		ECS97Y1DAL	ECS97Y2DAL	ECS97Y4DAL	ECS97Y8DAL	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS97R4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

5.1

Reduced Voltage Starter

S611 Solid-State Soft Starter

5

Class ECS97—Combination Reduced Voltage Soft Starter—Disconnect Switch (Fusible)—S611, continued

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame D								
242A	200V	75	120 Vac	ECS9721EAL	ECS9722EAL	ECS9724EAL	ECS9728EAL	S611D242P3S
	230V	75		ECS9721BAL	ECS9722BAL	ECS9724BAL	ECS9728BAL	
	460V	200		ECS9721CAL	ECS9722CAL	ECS9724CAL	ECS9728CAL	
	575V	250		ECS9721DAL	ECS9722DAL	ECS9724DAL	ECS9728DAL	
Frame E								
302A	200V	100	120 Vac	ECS9711EAN	ECS9712EAN	ECS9714EAN	ECS9718EAN	S611E302P3S
	230V	100		ECS9711BAN	ECS9712BAN	ECS9714BAN	ECS9718BAN	
	460V	250		ECS9711CAN	ECS9712CAN	ECS9714CAN	ECS9718CAN	
	575V	300		ECS9711DAN	ECS9712DAN	ECS9714DAN	ECS9718DAN	
361A	200V	125	120 Vac	ECS9721EAN	ECS9722EAN	ECS9724EAN	ECS9728EAN	S611E361P3S
	230V	150		ECS9721BAN	ECS9722BAN	ECS9724BAN	ECS9728BAN	
	460V	300		ECS9721CAN	ECS9722CAN	ECS9724CAN	ECS9728CAN	
	575V	350		ECS9721DAN	ECS9722DAN	ECS9724DAN	ECS9728DAN	
Frame F								
414A	200V	150	120 Vac	ECS9731EAN	ECS9732EAN	ECS9734EAN	ECS9738EAN	S611F414P3S
	230V	150		ECS9731BAN	ECS9732BAN	ECS9734BAN	ECS9738BAN	
	460V	350		ECS9731CAN	ECS9732CAN	ECS9734CAN	ECS9738CAN	
	575V	450		ECS9731DAN	ECS9732DAN	ECS9734DAN	ECS9738DAN	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS9724EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

Combination—Circuit Breaker

Class ECS98—Combination Reduced Voltage Soft Starter—Circuit Breaker—S611

Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame A								
52A	200V	15	120 Vac	ECS98R1EAW	ECS98R2EAW	ECS98R4EAW	ECS98R8EAW	S611A052P3S
	230V	15		ECS98R1BAW	ECS98R2BAW	ECS98R4BAW	ECS98R8BAW	
	460V	40		ECS98R1CAW	ECS98R2CAW	ECS98R4CAW	ECS98R8CAW	
	575V	50		ECS98R1DAW	ECS98R2DAW	ECS98R4DAW	ECS98R8DAW	
65A	200V	20	120 Vac	ECS98S1EAG	ECS98S2EAG	ECS98S4EAG	ECS98S8EAG	S611A065P3S
	230V	20		ECS98S1BAG	ECS98S2BAG	ECS98S4BAG	ECS98S8BAG	
	460V	50		ECS98S1CAG	ECS98S2CAG	ECS98S4CAG	ECS98S8CAG	
	575V	60		ECS98S1DAG	ECS98S2DAG	ECS98S4DAG	ECS98S8DAG	
77A	200V	25	120 Vac	ECS98T1EAG	ECS98T2EAG	ECS98T4EAG	ECS98T8EAG	S611A077P3S
	230V	25		ECS98T1BAG	ECS98T2BAG	ECS98T4BAG	ECS98T8BAG	
	460V	60		ECS98T1CAG	ECS98T2CAG	ECS98T4CAG	ECS98T8CAG	
	575V	75		ECS98T1DAG	ECS98T2DAG	ECS98T4DAG	ECS98T8DAG	
Frame B								
99A	200V	30	120 Vac	ECS98V1EAH	ECS98V2EAH	ECS98V4EAH	ECS98V8EAH	S611B099P3S
	230V	30		ECS98V1BAH	ECS98V2BAH	ECS98V4BAH	ECS98V8BAH	
	460V	75		ECS98V1CAH	ECS98V2CAH	ECS98V4CAH	ECS98V8CAH	
	575V	100		ECS98V1DAH	ECS98V2DAH	ECS98V4DAH	ECS98V8DAH	
125A	200V	40	120 Vac	ECS98W1EAH	ECS98W2EAH	ECS98W4EAH	ECS98W8EAH	S611B125P3S
	230V	40		ECS98W1BAH	ECS98W2BAH	ECS98W4BAH	ECS98W8BAH	
	460V	100		ECS98W1CAH	ECS98W2CAH	ECS98W4CAH	ECS98W8CAH	
	575V	125		ECS98W1DAH	ECS98W2DAH	ECS98W4DAH	ECS98W8DAH	
Frame C								
156A	200V	50	120 Vac	ECS98X1EAJ	ECS98X2EAJ	ECS98X4EAJ	ECS98X8EAJ	S611C156P3S
	230V	60		ECS98X1BAJ	ECS98X2BAJ	ECS98X4BAJ	ECS98X8BAJ	
	460V	125		ECS98X1CAJ	ECS98X2CAJ	ECS98X4CAJ	ECS98X8CAJ	
	575V	150		ECS98X1DAJ	ECS98X2DAJ	ECS98X4DAJ	ECS98X8DAJ	
180A	200V	60	120 Vac	ECS98Y1EAJ	ECS98Y2EAJ	ECS98Y4EAJ	ECS98Y8EAJ	S611C180P3S
	230V	60		ECS98Y1BAJ	ECS98Y2BAJ	ECS98Y4BAJ	ECS98Y8BAJ	
	460V	150		ECS98Y1CAJ	ECS98Y2CAJ	ECS98Y4CAJ	ECS98Y8CAJ	
	575V	150		ECS98Y1DAJ	ECS98Y2DAJ	ECS98Y4DAJ	ECS98Y8DAJ	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS98R4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

5.1

Reduced Voltage Starter

S611 Solid-State Soft Starter

5

Class ECS98—Combination Reduced Voltage Soft Starter—Circuit Breaker—S611, continued

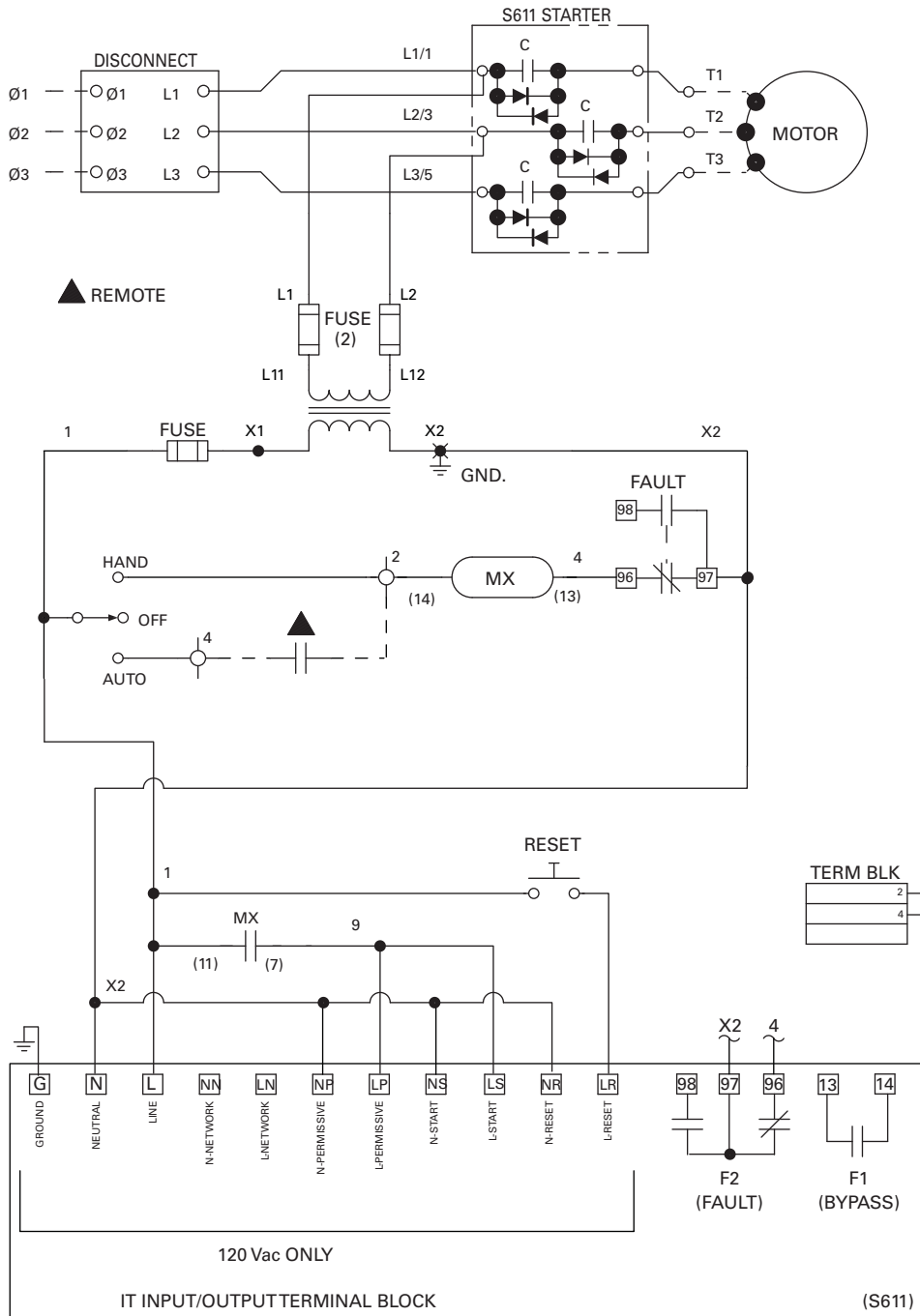
Amps	Motor Voltage	hp ^①	Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^② Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame D								
242A	200V	75	120 Vac	ECS98Z1EAK	ECS98Z2EAK	ECS98Z4EAK	ECS98Z8EAK	S611D242P3S
	230V	75		ECS98Z1BAK	ECS98Z2BAK	ECS98Z4BAK	ECS98Z8BAK	
	460V	200		ECS98Z1CAK	ECS98Z2CAK	ECS98Z4CAK	ECS98Z8CAK	
	575V	250		ECS98Z1DAK	ECS98Z2DAK	ECS98Z4DAK	ECS98Z8DAK	
Frame E								
302A	200V	100	120 Vac	ECS9811EAK	ECS9812EAK	ECS9814EAK	ECS9818EAK	S611E302P3S
	230V	100		ECS9811BAK	ECS9812BAK	ECS9814BAK	ECS9818BAK	
	460V	250		ECS9811CAK	ECS9812CAK	ECS9814CAK	ECS9818CAK	
	575V	300		ECS9811DAK	ECS9812DAK	ECS9814DAK	ECS9818DAK	
361A	200V	125	120 Vac	ECS9821EAL	ECS9822EAL	ECS9824EAL	ECS9828EAL	S611E361P3S
	230V	150		ECS9821BAL	ECS9822BAL	ECS9824BAL	ECS9828BAL	
	460V	300		ECS9821CAL	ECS9822CAL	ECS9824CAL	ECS9828CAL	
	575V	350		ECS9821DAL	ECS9822DAL	ECS9824DAL	ECS9828DAL	
Frame F								
414A	200V	150	120 Vac	ECS9831EAL	ECS9832EAL	ECS9834EAL	ECS9838EAL	S611F414P3S
	230V	150		ECS9831BAL	ECS9832BAL	ECS9834BAL	ECS9838BAL	
	460V	350		ECS9831CAL	ECS9832CAL	ECS9834CAL	ECS9838CAL	
	575V	450		ECS9831DAL	ECS9832DAL	ECS9834DAL	ECS9838DAL	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 15 seconds ramp time, and 115% continuous. Consult Eaton for other ratings.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS98Z4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 12**.

Wiring Diagram

Sample—S611 with CPT and HOA Selector Switch



5.1

Reduced Voltage Starter

S611 Solid-State Soft Starter

Dimensions

See **Tab 14** for box dimensions for Type 1, 3R, 4X and 12.

Minimum Enclosure Box Numbers

Rating	SSRV	Non-Combination Box No. ①	Combination with Disconnect Switch Box No. ①	Combination with Circuit Breaker Box No. ①
52A	S611	D	D	D
65A	S611	D	D	D
77A	S611	D	D	D
99A	S611	D	D	D
125A	S611	D	D	D
156A	S611	E	F1E	E
180A	S611	E	F1E	E
242A	S611	E	F1E	E
302A	S611	F1E	F2E	F1E
361A	S611	F1E	F2E	F1E
414A	S611	F1E	F2E	F1E

Lug Kits

Description	S611 Current Rating	Accessory Kit Part Number
Lug kit—mechanical	52–77A	S611-LUG-M01
	99–125A	S611-LUG-M02
	156–242A	S611-LUG-M03
	302–414A	S611-LUG-M04

Note

① Enclosure space will also accommodate two four-pole relays, CPT, and terminal blocks.

Reduced Voltage Starter



Product Description

Eaton's revolutionary design for soft starters is shown in the S801+ and S811+ soft starter products that are members of the Intelligent Technologies (*IT*) family of products. These reduced voltage soft starters are the most compact, multi-functional, easy-to-install products on the market. Their superiority begins with the control package, which features 24 Vdc control, onboard Digital Signal Processor (DSP), and use of a low impedance run contactor, all of which contribute to the *IT* soft starter's safety, advanced functionality and compact size.

Designed to control acceleration and deceleration of three-phase motors, products are available from 11 to 1000 amps and are suitable for mounting in a variety of enclosures including Type 1, 12, 3R, 4, 4X and 7/9.

- Built-in overload protection
 - Adjustable trip class 5, 10, 20, 30
 - Programmable, 31–100% FLA (3.2:1)
 - Selectable phase loss protection
- Selectable current limit or ramp start
- Adjustable ramp times
 - 0–180 seconds standard
 - Extended ramps available
- Adjustable torque control
- Adjustable kick start control
- Soft stop control
 - 0–60 seconds standard
 - Extended times available
- Built-in low impedance contactor
- Six SCR control in all units
- Selectable phase reversal protection
- Digital interface module

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Features and Benefits

- Mechanical stress on system
 - Reduced wear on belts, gears, chains, clutches, shafts and bearings. You can get up to 2–6 times the life on standard belts by switching to a soft starter
 - Elimination of water-hammer in pumping applications extends component life and helps limit leakage in system
 - Lower shock to product on conveyor lines and material handling gear
 - Able to catch motors and fans on the fly and control their acceleration
- Electrical system improvements
 - Limits the peak inrush current as required by many local codes
 - Helps to eliminate sags on the plant electrical grid when starting large loads, thus avoiding brownout conditions
- 24 Vdc advantages
 - Offers improved personnel safety by eliminating the need for 120 Vac in the enclosure
 - Soft starter able to ride through 50% voltage conditions indefinitely due to 24 Vdc power supply and 0% for up to 100 mS
 - 690V option available on 180A ratings and larger

Digital Interface Module

The S811+ has an easy to use Digital Interface Module (DIM) that allows the user to configure the device and to read system parameters. The DIM includes an LCD display and keypad to scroll through the various menus. The DIM allows the user to modify control parameters, enable or disable protections, set communication variables, monitor system parameters such as line voltages and currents, and access the fault queue.

The DIM can be removed from the S811+ and remote mounted. Kits are available to door mount the DIM, enabling users to safely configure, commission, monitor and troubleshoot the system at the electrical panel without opening the enclosure door.

Additional Reference

Cover Control	V10-T5-18
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Technical Data and Specifications	Tab 17

Options

LCD Display

- 2 line x 20 character LED back-lit LCD display
- NEMA 4 rated
- Parameters
 - Voltage L-L (AB, BC, AC)
 - Phase current
 - Average current
 - Overload current setting
 - Pole temperature
 - Relay trip class
 - Thermal pile
 - Average line current as % of FLA
 - DC control voltage
 - Start count
 - Fault history
- English or Spanish version

Options

Description	Modification Code
Pump control option	P42
Door mount keypad	K5
Extended ramp	R1

Pump Control Option

- Designed to reduce “water- hammer” during start-up and stopping sequences
- Stop ramp extended to 120 seconds to help control larger motors and systems with long piping runs

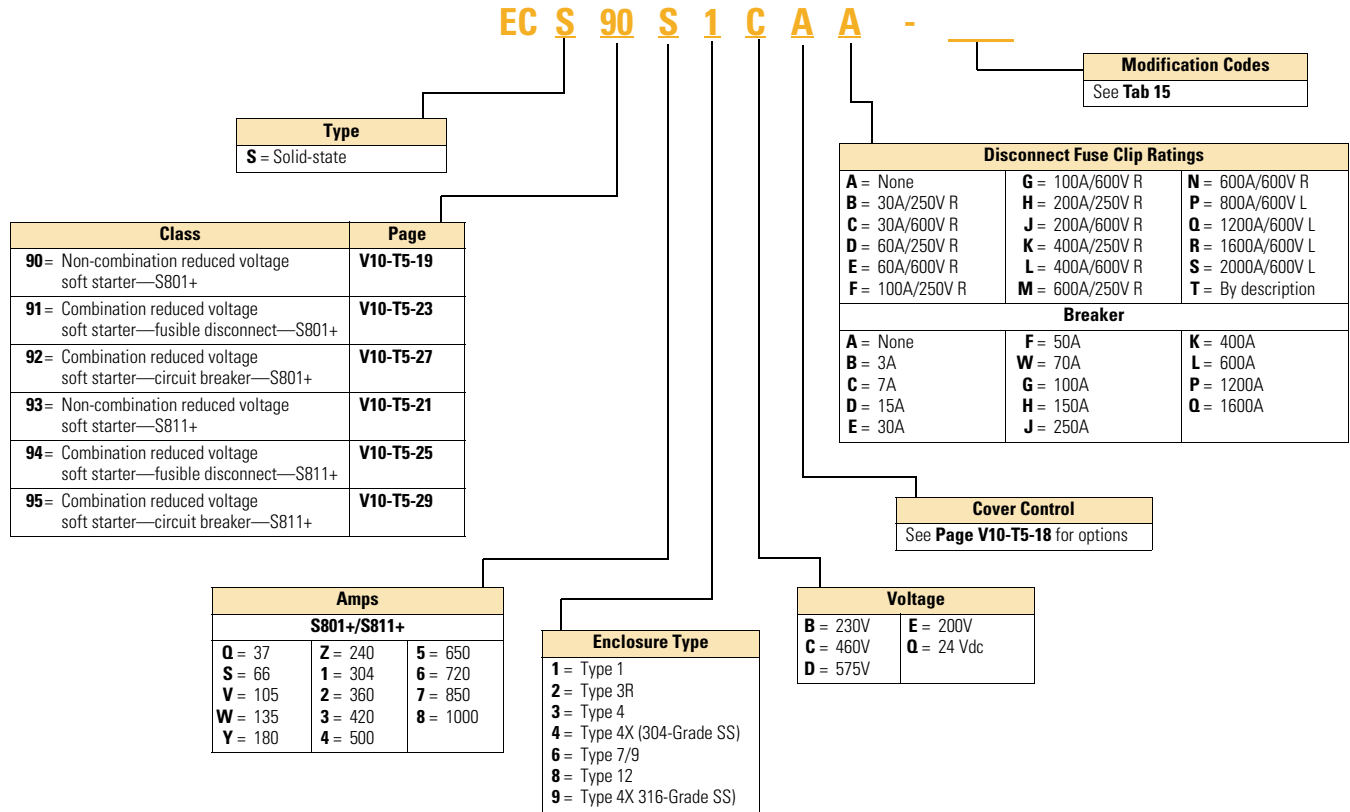
Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- IEC 947-4-2
- EN 60947.2 (for motor controller)
- cUL (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Catalog Number Selection

IT. Solid-State Soft Starters



Cover Control

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed Pilot Devices

To order factory installed pilot devices, change the ninth character of the catalog number to the alpha shown in the table below. Example: To order an **ECS90J4CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, that is, **ECS90J4CCA**.

10250T Cover Control Kits



Non-Reversing Pilot Devices

Description	Factory Installed Flange Control Position 9 Alpha	Field Installation Kits Catalog Number
No cover mounted pilot devices	A	—
START/STOP pushbuttons	B	C400T1
With red RUN pilot light	C	—
With red RUN/green OFF lights	D	—
ON/OFF pushbuttons	E	C400T2
With red RUN pilot light	F	—
With red RUN/green OFF lights	G	—
HAND/OFF/AUTO selector switch	H	C400T12
With red RUN pilot light	J	—
With red RUN/green OFF lights	K	—
START pushbutton	L	C400T3
ON pushbutton	M	C400T4
OFF pushbutton	N	C400T5
Red RUN pilot light	P	C400T9 ①
Green OFF	Q	C400T10 ①
Red RUN/green OFF pilot lights	R	C400T11 ①
START/STOP selector switch	S	C400T13
With red RUN pilot light	T	—
With red RUN/green OFF lights	U	—
ON/OFF selector switch	V	C400T14
With red RUN pilot light	W	—
With red RUN/green OFF lights	X	—

Note

① Add code letter from the table below to catalog number for voltage—kits only. Example: C400T9**B**.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120V 60 Hz	A	240V 60 Hz	B	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D

Product Selection

Non-Combination

Class ECS90—Non-Combination Reduced Voltage Soft Starter—S801+

Amps	Motor Voltage	hp ^{①②}	Coil Voltage ^③	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^④ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—65 mm									
37A	200V	10	24 Vdc	ECS90Q1EAA	ECS90Q2EAA	ECS90Q4EAA	ECS90Q6EAA	ECS90Q8EAA	S801+N37N3S
	230V	10		ECS90Q1BAA	ECS90Q2BAA	ECS90Q4BAA	ECS90Q6BAA	ECS90Q8BAA	
	460V	20		ECS90Q1CAA	ECS90Q2CAA	ECS90Q4CAA	ECS90Q6CAA	ECS90Q8CAA	
	575V	30		ECS90Q1DAA	ECS90Q2DAA	ECS90Q4DAA	ECS90Q6DAA	ECS90Q8DAA	
66A	200V	15	24 Vdc	ECS90S1EAA	ECS90S2EAA	ECS90S4EAA	ECS90S6EAA	ECS90S8EAA	S801+N66N3S
	230V	20		ECS90S1BAA	ECS90S2BAA	ECS90S4BAA	ECS90S6BAA	ECS90S8BAA	
	460V	40		ECS90S1CAA	ECS90S2CAA	ECS90S4CAA	ECS90S6CAA	ECS90S8CAA	
	575V	50		ECS90S1DAA	ECS90S2DAA	ECS90S4DAA	ECS90S6DAA	ECS90S8DAA	
Frame Size—110 mm									
105A	200V	25	24 Vdc	ECS90V1EAA	ECS90V2EAA	ECS90V4EAA	ECS90V6EAA	ECS90V8EAA	S801+R10N3S
	230V	30		ECS90V1BAA	ECS90V2BAA	ECS90V4BAA	ECS90V6BAA	ECS90V8BAA	
	460V	60		ECS90V1CAA	ECS90V2CAA	ECS90V4CAA	ECS90V6CAA	ECS90V8CAA	
	575V	75		ECS90V1DAA	ECS90V2DAA	ECS90V4DAA	ECS90V6DAA	ECS90V8DAA	
135A	200V	30	24 Vdc	ECS90W1EAA	ECS90W2EAA	ECS90W4EAA	ECS90W6EAA	ECS90W8EAA	S801+R13N3S
	230V	40		ECS90W1BAA	ECS90W2BAA	ECS90W4BAA	ECS90W6BAA	ECS90W8BAA	
	460V	75		ECS90W1CAA	ECS90W2CAA	ECS90W4CAA	ECS90W6CAA	ECS90W8CAA	
	575V	100		ECS90W1DAA	ECS90W2DAA	ECS90W4DAA	ECS90W6DAA	ECS90W8DAA	
Frame Size—200 mm									
180A	200V	50	24 Vdc	ECS90Y1EAA	ECS90Y2EAA	ECS90Y4EAA	ECS90Y6EAA	ECS90Y8EAA	S801+T18N3S
	230V	60		ECS90Y1BAA	ECS90Y2BAA	ECS90Y4BAA	ECS90Y6BAA	ECS90Y8BAA	
	460V	125		ECS90Y1CAA	ECS90Y2CAA	ECS90Y4CAA	ECS90Y6CAA	ECS90Y8CAA	
	575V	150		ECS90Y1DAA	ECS90Y2DAA	ECS90Y4DAA	ECS90Y6DAA	ECS90Y8DAA	
240A	200V	60	24 Vdc	ECS90Z1EAA	ECS90Z2EAA	ECS90Z4EAA	ECS90Z6EAA	ECS90Z8EAA	S801+T24N3S
	230V	75		ECS90Z1BAA	ECS90Z2BAA	ECS90Z4BAA	ECS90Z6BAA	ECS90Z8BAA	
	460V	150		ECS90Z1CAA	ECS90Z2CAA	ECS90Z4CAA	ECS90Z6CAA	ECS90Z8CAA	
	575V	200		ECS90Z1DAA	ECS90Z2DAA	ECS90Z4DAA	ECS90Z6DAA	ECS90Z8DAA	
304A	200V	75	24 Vdc	ECS9011EAA	ECS9012EAA	ECS9014EAA	ECS9016EAA	ECS9018EAA	S801+T30N3S
	230V	100		ECS9011BAA	ECS9012BAA	ECS9014BAA	ECS9016BAA	ECS9018BAA	
	460V	200		ECS9011CAA	ECS9012CAA	ECS9014CAA	ECS9016CAA	ECS9018CAA	
	575V	250		ECS9011DAA	ECS9012DAA	ECS9014DAA	ECS9016DAA	ECS9018DAA	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ② Based on 1.15 service factor.
- ③ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code C35 and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS90S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECS90—Non-Combination Reduced Voltage Soft Starter—S801+, continued

Amps	Motor Voltage	hp ^{①②}	Coil Voltage ^③	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^④ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—290 mm									
360A	200V	100	24 Vdc	ECS9021EAA	ECS9022EAA	ECS9024EAA	ECS9026EAA	ECS9028EAA	S801+V36N3S
	230V	125		ECS9021BAA	ECS9022BAA	ECS9024BAA	ECS9026BAA	ECS9028BAA	
	460V	250		ECS9021CAA	ECS9022CAA	ECS9024CAA	ECS9026CAA	ECS9028CAA	
	575V	300		ECS9021DAA	ECS9022DAA	ECS9024DAA	ECS9026DAA	ECS9028DAA	
420A	200V	125	24 Vdc	ECS9031EAA	ECS9032EAA	ECS9034EAA	ECS9036EAA	ECS9038EAA	S801+V42N3S
	230V	150		ECS9031BAA	ECS9032BAA	ECS9034BAA	ECS9036BAA	ECS9038BAA	
	460V	300		ECS9031CAA	ECS9032CAA	ECS9034CAA	ECS9036CAA	ECS9038CAA	
	575V	350		ECS9031DAA	ECS9032DAA	ECS9034DAA	ECS9036DAA	ECS9038DAA	
500A	200V	150	24 Vdc	ECS9041EAA	ECS9042EAA	ECS9044EAA	ECS9046EAA	ECS9048EAA	S801+V50N3S
	230V	150		ECS9041BAA	ECS9042BAA	ECS9044BAA	ECS9046BAA	ECS9048BAA	
	460V	350		ECS9041CAA	ECS9042CAA	ECS9044CAA	ECS9046CAA	ECS9048CAA	
	575V	450		ECS9041DAA	ECS9042DAA	ECS9044DAA	ECS9046DAA	ECS9048DAA	
650A	200V	200	24 Vdc	ECS9051EAA	ECS9052EAA	ECS9054EAA	ECS9056EAA	ECS9058EAA	S801+V65N3S
	230V	200		ECS9051BAA	ECS9052BAA	ECS9054BAA	ECS9056BAA	ECS9058BAA	
	460V	450		ECS9051CAA	ECS9052CAA	ECS9054CAA	ECS9056CAA	ECS9058CAA	
	575V	500		ECS9051DAA	ECS9052DAA	ECS9054DAA	ECS9056DAA	ECS9058DAA	
720A	230V	250	24 Vdc	ECS9061BAA	ECS9062BAA	ECS9064BAA	ECS9066BAA	ECS9068BAA	S801+V72N3S
	460V	500		ECS9061CAA	ECS9062CAA	ECS9064CAA	ECS9066CAA	ECS9068CAA	
	575V	600		ECS9061DAA	ECS9062DAA	ECS9064DAA	ECS9066DAA	ECS9068DAA	
850A	230V	300	24 Vdc	ECS9071BAA	ECS9072BAA	ECS9074BAA	ECS9076BAA	ECS9078BAA	S801+V85N3S
	460V	600		ECS9071CAA	ECS9072CAA	ECS9074CAA	ECS9076CAA	ECS9078CAA	
	575V	700		ECS9071DAA	ECS9072DAA	ECS9074DAA	ECS9076DAA	ECS9078DAA	
1000A	230V	350	24 Vdc	ECS9081BAA	ECS9082BAA	ECS9084BAA	ECS9086BAA	ECS9088BAA	S801+V10N3S
	460V	700		ECS9081CAA	ECS9082CAA	ECS9084CAA	ECS9086CAA	ECS9088CAA	
	575V	800		ECS9081DAA	ECS9082DAA	ECS9084DAA	ECS9086DAA	ECS9088DAA	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ② Based on 1.15 service factor.
- ③ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS90S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECS93—Non-Combination Reduced Voltage Soft Starter—S811+ ①

Amps	Motor Voltage	hp ②③	Coil Voltage ④	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ⑤ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—65 mm									
37A	200V	10	24 Vdc	ECS93Q1EAA	ECS93Q2EAA	ECS93Q4EAA	ECS93Q6EAA	ECS93Q8EAA	S811+N37N3S
	230V	10		ECS93Q1BAA	ECS93Q2BAA	ECS93Q4BAA	ECS93Q6BAA	ECS93Q8BAA	
	460V	20		ECS93Q1CAA	ECS93Q2CAA	ECS93Q4CAA	ECS93Q6CAA	ECS93Q8CAA	
	575V	30		ECS93Q1DAA	ECS93Q2DAA	ECS93Q4DAA	ECS93Q6DAA	ECS93Q8DAA	
66A	200V	15	24 Vdc	ECS93S1EAA	ECS93S2EAA	ECS93S4EAA	ECS93S6EAA	ECS93S8EAA	S811+N66N3S
	230V	20		ECS93S1BAA	ECS93S2BAA	ECS93S4BAA	ECS93S6BAA	ECS93S8BAA	
	460V	40		ECS93S1CAA	ECS93S2CAA	ECS93S4CAA	ECS93S6CAA	ECS93S8CAA	
	575V	50		ECS93S1DAA	ECS93S2DAA	ECS93S4DAA	ECS93S6DAA	ECS93S8DAA	
Frame Size—110 mm									
105A	200V	25	24 Vdc	ECS93V1EAA	ECS93V2EAA	ECS93V4EAA	ECS93V6EAA	ECS93V8EAA	S811+R10N3S
	230V	30		ECS93V1BAA	ECS93V2BAA	ECS93V4BAA	ECS93V6BAA	ECS93V8BAA	
	460V	60		ECS93V1CAA	ECS93V2CAA	ECS93V4CAA	ECS93V6CAA	ECS93V8CAA	
	575V	75		ECS93V1DAA	ECS93V2DAA	ECS93V4DAA	ECS93V6DAA	ECS93V8DAA	
135A	200V	30	24 Vdc	ECS93W1EAA	ECS93W2EAA	ECS93W4EAA	ECS93W6EAA	ECS93W8EAA	S811+R13N3S
	230V	40		ECS93W1BAA	ECS93W2BAA	ECS93W4BAA	ECS93W6BAA	ECS93W8BAA	
	460V	75		ECS93W1CAA	ECS93W2CAA	ECS93W4CAA	ECS93W6CAA	ECS93W8CAA	
	575V	100		ECS93W1DAA	ECS93W2DAA	ECS93W4DAA	ECS93W6DAA	ECS93W8DAA	
Frame Size—200 mm									
180A	200V	50	24 Vdc	ECS93Y1EAA	ECS93Y2EAA	ECS93Y4EAA	ECS93Y6EAA	ECS93Y8EAA	S811+T18N3S
	230V	60		ECS93Y1BAA	ECS93Y2BAA	ECS93Y4BAA	ECS93Y6BAA	ECS93Y8BAA	
	460V	125		ECS93Y1CAA	ECS93Y2CAA	ECS93Y4CAA	ECS93Y6CAA	ECS93Y8CAA	
	575V	150		ECS93Y1DAA	ECS93Y2DAA	ECS93Y4DAA	ECS93Y6DAA	ECS93Y8DAA	
240A	200V	60	24 Vdc	ECS93Z1EAA	ECS93Z2EAA	ECS93Z4EAA	ECS93Z6EAA	ECS93Z8EAA	S811+T24N3S
	230V	75		ECS93Z1BAA	ECS93Z2BAA	ECS93Z4BAA	ECS93Z6BAA	ECS93Z8BAA	
	460V	150		ECS93Z1CAA	ECS93Z2CAA	ECS93Z4CAA	ECS93Z6CAA	ECS93Z8CAA	
	575V	200		ECS93Z1DAA	ECS93Z2DAA	ECS93Z4DAA	ECS93Z6DAA	ECS93Z8DAA	
304A	200V	75	24 Vdc	ECS9311EAA	ECS9312EAA	ECS9314EAA	ECS9316EAA	ECS9318EAA	S811+T30N3S
	230V	100		ECS9311BAA	ECS9312BAA	ECS9314BAA	ECS9316BAA	ECS9318BAA	
	460V	200		ECS9311CAA	ECS9312CAA	ECS9314CAA	ECS9316CAA	ECS9318CAA	
	575V	250		ECS9311DAA	ECS9312DAA	ECS9314DAA	ECS9316DAA	ECS9318DAA	

Notes

- ① Digital Interface Module (DIM) is mounted on door as option.
- ② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ③ Based on 1.15 service factor.
- ④ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **0** (that is, ECS90S1EAA becomes ECS90S10AA-C35).
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS93S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

5.2

Reduced Voltage Starter

S801+/S811+ *IT*. Solid-State Soft Starters

5

Class ECS93—Non-Combination Reduced Voltage Soft Starter—S811+, continued ①

Amps	Motor Voltage	hp ②③	Coil Voltage ④	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ⑤	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—290 mm									
360A	200V	100	24 Vdc	ECS9321EAA	ECS9322EAA	ECS9324EAA	ECS9326EAA	ECS9328EAA	S811+V36N3S
	230V	125		ECS9321BAA	ECS9322BAA	ECS9324BAA	ECS9326BAA	ECS9328BAA	
	460V	250		ECS9321CAA	ECS9322CAA	ECS9324CAA	ECS9326CAA	ECS9328CAA	
	575V	300		ECS9321DAA	ECS9322DAA	ECS9324DAA	ECS9326DAA	ECS9328DAA	
420A	200V	125	24 Vdc	ECS9331EAA	ECS9332EAA	ECS9334EAA	ECS9336EAA	ECS9338EAA	S811+V42N3S
	230V	150		ECS9331BAA	ECS9332BAA	ECS9334BAA	ECS9336BAA	ECS9338BAA	
	460V	300		ECS9331CAA	ECS9332CAA	ECS9334CAA	ECS9336CAA	ECS9338CAA	
	575V	350		ECS9331DAA	ECS9332DAA	ECS9334DAA	ECS9336DAA	ECS9338DAA	
500A	200V	150	24 Vdc	ECS9341EAA	ECS9342EAA	ECS9344EAA	ECS9346EAA	ECS9348EAA	S811+V50N3S
	230V	150		ECS9341BAA	ECS9342BAA	ECS9344BAA	ECS9346BAA	ECS9348BAA	
	460V	350		ECS9341CAA	ECS9342CAA	ECS9344CAA	ECS9346CAA	ECS9348CAA	
	575V	450		ECS9341DAA	ECS9342DAA	ECS9344DAA	ECS9346DAA	ECS9348DAA	
650A	200V	200	24 Vdc	ECS9351EAA	ECS9352EAA	ECS9354EAA	ECS9356EAA	ECS9358EAA	S811+V65N3S
	230V	200		ECS9351BAA	ECS9352BAA	ECS9354BAA	ECS9356BAA	ECS9358BAA	
	460V	450		ECS9351CAA	ECS9352CAA	ECS9354CAA	ECS9356CAA	ECS9358CAA	
	575V	500		ECS9351DAA	ECS9352DAA	ECS9354DAA	ECS9356DAA	ECS9358DAA	
720A	230V	250	24 Vdc	ECS9361BAA	ECS9362BAA	ECS9364BAA	ECS9366BAA	ECS9368BAA	S811+V72N3S
	460V	500		ECS9361CAA	ECS9362CAA	ECS9364CAA	ECS9366CAA	ECS9368CAA	
	575V	600		ECS9361DAA	ECS9362DAA	ECS9364DAA	ECS9366DAA	ECS9368DAA	
850A	230V	300	24 Vdc	ECS9371BAA	ECS9372BAA	ECS9374BAA	ECS9376BAA	ECS9378BAA	S811+V85N3S
	460V	600		ECS9371CAA	ECS9372CAA	ECS9374CAA	ECS9376CAA	ECS9378CAA	
	575V	700		ECS9371DAA	ECS9372DAA	ECS9374DAA	ECS9376DAA	ECS9378DAA	
1000A	230V	350	24 Vdc	ECS9381BAA	ECS9382BAA	ECS9384BAA	ECS9386BAA	ECS9388BAA	S811+V10N3S
	460V	700		ECS9381CAA	ECS9382CAA	ECS9384CAA	ECS9386CAA	ECS9388CAA	
	575V	800		ECS9381DAA	ECS9382DAA	ECS9384DAA	ECS9386DAA	ECS9388DAA	

Notes

- ① Digital Interface Module (DIM) is mounted on door as option.
- ② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ③ Based on 1.15 service factor.
- ④ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS93S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Combination—Fusible Disconnect

Class ECS91—Combination Reduced Voltage Soft Starter—Fusible Disconnect—S801+

Amps	Motor Voltage	hp ^{①②}	Coil Voltage ^③	Switch Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^④ Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—65 mm									
37A	200V	3	24 Vdc	30A	ECS91Q1EAB	ECS91Q2EAB	ECS91Q4EAB	ECS91Q8EAB	S801+N37N3S
		10			ECS91Q1EAD	ECS91Q2EAD	ECS91Q4EAD	ECS91Q8EAD	
	230V	7-1/2	30A	ECS91Q1BAB	ECS91Q2BAB	ECS91Q4BAB	ECS91Q8BAB	S801+N37N3S	
		10		ECS91Q1BAD	ECS91Q2BAD	ECS91Q4BAD	ECS91Q8BAD		
	460V	15	30A	ECS91Q1CAC	ECS91Q2CAC	ECS91Q4CAC	ECS91Q8CAC	S801+N37N3S	
		20		ECS91Q1CAE	ECS91Q2CAE	ECS91Q4CAE	ECS91Q8CAE		
575V	20	30A	ECS91Q1DAC	ECS91Q2DAC	ECS91Q4DAC	ECS91Q8DAC	S801+N37N3S		
	30		ECS91Q1DAE	ECS91Q2DAE	ECS91Q4DAE	ECS91Q8DAE			
66A	200V	15	24 Vdc	100A	ECS91S1EAF	ECS91S2EAF	ECS91S4EAF	ECS91S8EAF	S801+N66N3S
	230V	15	60A	ECS91S1BAD	ECS91S2BAD	ECS91S4BAD	ECS91S8BAD	S801+N66N3S	
		20		100A	ECS91S1BAF	ECS91S2BAF	ECS91S4BAF		ECS91S8BAF
	460V	40	60A	ECS91S1CAG	ECS91S2CAG	ECS91S4CAG	ECS91S8CAG	S801+N66N3S	
	575V	50		ECS91S1DAG	ECS91S2DAG	ECS91S4DAG	ECS91S8DAG	S801+N66N3S	
Frame Size—110 mm									
105A	200V	25	24 Vdc	200A	ECS91V1EAH	ECS91V2EAH	ECS91V4EAH	ECS91V8EAH	S801+R10N3S
	230V	30	ECS91V1BAH		ECS91V2BAH	ECS91V4BAH	ECS91V8BAH		
	460V	60	ECS91V1CAJ		ECS91V2CAJ	ECS91V4CAJ	ECS91V8CAJ		
	575V	75	ECS91V1DAJ		ECS91V2DAJ	ECS91V4DAJ	ECS91V8DAJ		
135A	200V	30	24 Vdc	200A	ECS91W1EAH	ECS91W2EAH	ECS91W4EAH	ECS91W8EAH	S801+R13N3S
	230V	40	ECS91W1BAH		ECS91W2BAH	ECS91W4BAH	ECS91W8BAH		
	460V	75	ECS91W1CAJ		ECS91W2CAJ	ECS91W4CAJ	ECS91W8CAJ		
	575V	100	ECS91W1DAJ		ECS91W2DAJ	ECS91W4DAJ	ECS91W8DAJ		
Frame Size—200 mm									
180A	200V	50	24 Vdc	400A	ECS91Y1EAK	ECS91Y2EAK	ECS91Y4EAK	ECS91Y8EAK	S801+T18N3S
	230V	60	ECS91Y1BAK		ECS91Y2BAK	ECS91Y4BAK	ECS91Y8BAK		
	460V	125	ECS91Y1CAL		ECS91Y2CAL	ECS91Y4CAL	ECS91Y8CAL		
	575V	150	ECS91Y1DAL		ECS91Y2DAL	ECS91Y4DAL	ECS91Y8DAL		
240A	200V	60	24 Vdc	400A	ECS91Z1EAK	ECS91Z2EAK	ECS91Z4EAK	ECS91Z8EAK	S801+T24N3S
	230V	75	ECS91Z1BAK		ECS91Z2BAK	ECS91Z4BAK	ECS91Z8BAK		
	460V	150	ECS91Z1CAL		ECS91Z2CAL	ECS91Z4CAL	ECS91Z8CAL		
	575V	200	ECS91Z1DAL		ECS91Z2DAL	ECS91Z4DAL	ECS91Z8DAL		
304A	200V	75	24 Vdc	400A	ECS9111EAK	ECS9112EAK	ECS9114EAK	ECS9118EAK	S801+T30N3S
	230V	100	ECS9111BAK		ECS9112BAK	ECS9114BAK	ECS9118BAK		
	460V	200	ECS9111CAL		ECS9112CAL	ECS9114CAL	ECS9118CAL		
	575V	250	ECS9111DAL		ECS9112DAL	ECS9114DAL	ECS9118DAL		

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ② Based on 1.15 service factor.
- ③ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS91S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECS91—Combination Reduced Voltage Soft Starter—Fusible Disconnect—S801+, continued

Amps	Motor Voltage	hp ^{①②}	Coil Voltage ^③	Switch Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^④ Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—290 mm									
360A	200V	100	24 Vdc	600A	ECS9121EAM	ECS9122EAM	ECS9124EAM	ECS9128EAM	S801+V36N3S
	230V	125			ECS9121BAM	ECS9122BAM	ECS9124BAM	ECS9128BAM	
	460V	250			ECS9121CAN	ECS9122CAN	ECS9124CAN	ECS9128CAN	
	575V	300			ECS9121DAN	ECS9122DAN	ECS9124DAN	ECS9128DAN	
420A	200V	125	24 Vdc	600A	ECS9131EAM	ECS9132EAM	ECS9134EAM	ECS9138EAM	S801+V42N3S
	230V	150			ECS9131BAM	ECS9132BAM	ECS9134BAM	ECS9138BAM	
	460V	300			ECS9131CAN	ECS9132CAN	ECS9134CAN	ECS9138CAN	
	575V	350			ECS9131DAN	ECS9132DAN	ECS9134DAN	ECS9138DAN	
500A	200V	150	24 Vdc	800A	ECS9141EAP	ECS9142EAP	ECS9144EAP	ECS9148EAP	S801+V50N3S
	230V	150			ECS9141BAP	ECS9142BAP	ECS9144BAP	ECS9148BAP	
	460V	350			ECS9141CAP	ECS9142CAP	ECS9144CAP	ECS9148CAP	
	575V	450			ECS9141DAP	ECS9142DAP	ECS9144DAP	ECS9148DAP	
650A	460V	450	24 Vdc	800A	ECS9151CAP	ECS9152CAP	ECS9154CAP	ECS9158CAP	S801+V65N3S
	575V	500			ECS9151DAP	ECS9152DAP	ECS9154DAP	ECS9158DAP	
720A	460V	500	24 Vdc	1200A	ECS9161CAQ	ECS9162CAQ	ECS9164CAQ	ECS9168CAQ	S801+V72N3S
	575V	600			ECS9161DAQ	ECS9162DAQ	ECS9164DAQ	ECS9168DAQ	
850A	460V	600	24 Vdc	1600A	ECS9171CAR	ECS9172CAR	ECS9174CAR	ECS9178CAR	S801+V85N3S
	575V	700			ECS9171DAR	ECS9172DAR	ECS9174DAR	ECS9178DAR	
1000A	230V	350	24 Vdc	⑤	ECS9181BA_⑤	ECS9182BA_⑤	ECS9184BA_⑤	ECS9188BA_⑤	S801+V10N3S
	460V	700			ECS9181CA_⑤	ECS9182CA_⑤	ECS9184CA_⑤	ECS9188CA_⑤	
	575V	800			ECS9181DA_⑤	ECS9182DA_⑤	ECS9184DA_⑤	ECS9188DA_⑤	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ② Based on 1.15 service factor.
- ③ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS91S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ⑤ Consult Eaton.

Class ECS94—Combination Reduced Voltage Soft Starter—Fusible Disconnect—S811+ ①

Amps	Motor Voltage	hp ②③	Coil Voltage ④	Switch Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ⑤ Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—65 mm									
37A	200V	3	24 Vdc	30A	ECS94Q1EAB	ECS94Q2EAB	ECS94Q4EAB	ECS94Q8EAB	S811+N37N3S
		10			ECS94Q1EAD	ECS94Q2EAD	ECS94Q4EAD	ECS94Q8EAD	
	230V	7-1/2		30A	ECS94Q1BAB	ECS94Q2BAB	ECS94Q4BAB	ECS94Q8BAB	S811+N37N3S
		10			ECS94Q1BAD	ECS94Q2BAD	ECS94Q4BAD	ECS94Q8BAD	
	460V	15		30A	ECS94Q1CAC	ECS94Q2CAC	ECS94Q4CAC	ECS94Q8CAC	S811+N37N3S
		20			ECS94Q1CAE	ECS94Q2CAE	ECS94Q4CAE	ECS94Q8CAE	
	575V	20		30A	ECS94Q1DAC	ECS94Q2DAC	ECS94Q4DAC	ECS94Q8DAC	S811+N37N3S
		30			ECS94Q1DAE	ECS94Q2DAE	ECS94Q4DAE	ECS94Q8DAE	
66A	200V	15	24 Vdc	100A	ECS94S1EAF	ECS94S2EAF	ECS94S4EAF	ECS94S8EAF	S811+N66N3S
	230V	15		60A	ECS94S1BAD	ECS94S2BAD	ECS94S4BAD	ECS94S8BAD	S811+N66N3S
		20		100A	ECS94S1BAF	ECS94S2BAF	ECS94S4BAF	ECS94S8BAF	
	460V	40		ECS94S1CAG	ECS94S2CAG	ECS94S4CAG	ECS94S8CAG	S811+N66N3S	
	575V	50		ECS94S1DAG	ECS94S2DAG	ECS94S4DAG	ECS94S8DAG	S811+N66N3S	
Frame Size—110 mm									
105A	200V	25	24 Vdc	200A	ECS94V1EAH	ECS94V2EAH	ECS94V4EAH	ECS94V8EAH	S811+R10N3S
		30			ECS94V1BAH	ECS94V2BAH	ECS94V4BAH	ECS94V8BAH	
		60			ECS94V1CAJ	ECS94V2CAJ	ECS94V4CAJ	ECS94V8CAJ	
		75			ECS94V1DAJ	ECS94V2DAJ	ECS94V4DAJ	ECS94V8DAJ	
135A	200V	30	24 Vdc	200A	ECS94W1EAH	ECS94W2EAH	ECS94W4EAH	ECS94W8EAH	S811+R13N3S
		40			ECS94W1BAH	ECS94W2BAH	ECS94W4BAH	ECS94W8BAH	
		75			ECS94W1CAJ	ECS94W2CAJ	ECS94W4CAJ	ECS94W8CAJ	
		100			ECS94W1DAJ	ECS94W2DAJ	ECS94W4DAJ	ECS94W8DAJ	
Frame Size—200 mm									
180A	200V	50	24 Vdc	400A	ECS94Y1EAK	ECS94Y2EAK	ECS94Y4EAK	ECS94Y8EAK	S811+T18N3S
		60			ECS94Y1BAK	ECS94Y2BAK	ECS94Y4BAK	ECS94Y8BAK	
		125			ECS94Y1CAL	ECS94Y2CAL	ECS94Y4CAL	ECS94Y8CAL	
		150			ECS94Y1DAL	ECS94Y2DAL	ECS94Y4DAL	ECS94Y8DAL	
240A	200V	60	24 Vdc	400A	ECS94Z1EAK	ECS94Z2EAK	ECS94Z4EAK	ECS94Z8EAK	S811+T24N3S
		75			ECS94Z1BAK	ECS94Z2BAK	ECS94Z4BAK	ECS94Z8BAK	
		150			ECS94Z1CAL	ECS94Z2CAL	ECS94Z4CAL	ECS94Z8CAL	
		200			ECS94Z1DAL	ECS94Z2DAL	ECS94Z4DAL	ECS94Z8DAL	
304A	200V	75	24 Vdc	400A	ECS9411EAK	ECS9412EAK	ECS9414EAK	ECS9418EAK	S811+T30N3S
		100			ECS9411BAK	ECS9412BAK	ECS9414BAK	ECS9418BAK	
		200			ECS9411CAL	ECS9412CAL	ECS9414CAL	ECS9418CAL	
		250			ECS9411DAL	ECS9412DAL	ECS9414DAL	ECS9418DAL	

Notes

- ① Digital Interface Module (DIM) is mounted on door as option.
- ② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ③ Based on 1.15 service factor.
- ④ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **0** (that is, ECS90S1EAA becomes ECS90S10AA-C35).
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS94S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECS94—Combination Reduced Voltage Soft Starter—Fusible Disconnect—S811+, continued ①

Amps	Motor Voltage	hp ②③	Coil Voltage ④	Switch Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ⑤ Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—290 mm									
360A	200V	100	24 Vdc	600A	ECS9421EAM	ECS9422EAM	ECS9424EAM	ECS9428EAM	S811+V36N3S
	230V	125			ECS9421BAM	ECS9422BAM	ECS9424BAM	ECS9428BAM	
	460V	250			ECS9421CAN	ECS9422CAN	ECS9424CAN	ECS9428CAN	
	575V	300			ECS9421DAN	ECS9422DAN	ECS9424DAN	ECS9428DAN	
420A	200V	125	24 Vdc	600A	ECS9431EAM	ECS9432EAM	ECS9434EAM	ECS9438EAM	S811+V42N3S
	230V	150			ECS9431BAM	ECS9432BAM	ECS9434BAM	ECS9438BAM	
	460V	300			ECS9431CAN	ECS9432CAN	ECS9434CAN	ECS9438CAN	
	575V	350			ECS9431DAN	ECS9432DAN	ECS9434DAN	ECS9438DAN	
500A	200V	150	24 Vdc	800A	ECS9441EAP	ECS9442EAP	ECS9444EAP	ECS9448EAP	S811+V50N3S
	230V	150			ECS9441BAP	ECS9442BAP	ECS9444BAP	ECS9448BAP	
	460V	350			ECS9441CAP	ECS9442CAP	ECS9444CAP	ECS9448CAP	
	575V	450			ECS9441DAP	ECS9442DAP	ECS9444DAP	ECS9448DAP	
650A	460V	450	24 Vdc	800A	ECS9451CAP	ECS9452CAP	ECS9454CAP	ECS9458CAP	S811+V65N3S
	575V	500			ECS9451DAP	ECS9452DAP	ECS9454DAP	ECS9458DAP	
720A	460V	500	24 Vdc	1200A	ECS9461CAQ	ECS9462CAQ	ECS9464CAQ	ECS9468CAQ	S811+V72N3S
	575V	600			ECS9461DAQ	ECS9462DAQ	ECS9464DAQ	ECS9468DAQ	
850A	460V	600	24 Vdc	1600A	ECS9471CAR	ECS9472CAR	ECS9474CAR	ECS9478CAR	S811+V85N3S
	575V	700			ECS9471DAR	ECS9472DAR	ECS9474DAR	ECS9478DAR	
1000A	230V	350	24 Vdc	⑥	ECS9481BA_⑥	ECS9482BA_⑥	ECS9484BA_⑥	ECS9488BA_⑥	S811+V10N3S
	460V	700			ECS9481CA_⑥	ECS9482CA_⑥	ECS9484CA_⑥	ECS9488CA_⑥	
	575V	800			ECS9481DA_⑥	ECS9482DA_⑥	ECS9484DA_⑥	ECS9488DA_⑥	

Notes

- ① Digital Interface Module (DIM) is mounted on door as option.
- ② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ③ Based on 1.15 service factor.
- ④ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS94S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ⑥ Consult Eaton.

Combination—Circuit Breaker

Class ECS92—Combination Reduced Voltage Soft Starter—Circuit Breaker—S801+

Amps	Motor Voltage	hp ^{①②}	Coil Voltage ^③	Circuit Breaker Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^④ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number	
Frame Size—65 mm											
37A	200V	1/2	24 Vdc	7A	ECS92Q1EAC	ECS92Q2EAC	ECS92Q4EAC	ECS92Q6EAC	ECS92Q8EAC	S801+N37N3S	
		1		15A	ECS92Q1EAD	ECS92Q2EAD	ECS92Q4EAD	ECS92Q6EAD	ECS92Q8EAD		
		3		30A	ECS92Q1EAE	ECS92Q2EAE	ECS92Q4EAE	ECS92Q6EAE	ECS92Q8EAE		
		10		50A	ECS92Q1EAF	ECS92Q2EAF	ECS92Q4EAF	ECS92Q6EAF	ECS92Q8EAF		
230V		1	24 Vdc	7A	ECS92Q1BAC	ECS92Q2BAC	ECS92Q4BAC	ECS92Q6BAC	ECS92Q8BAC	S801+N37N3S	
		2		15A	ECS92Q1BAD	ECS92Q2BAD	ECS92Q4BAD	ECS92Q6BAD	ECS92Q8BAD		
		3		30A	ECS92Q1BAE	ECS92Q2BAE	ECS92Q4BAE	ECS92Q6BAE	ECS92Q8BAE		
		10		50A	ECS92Q1BAF	ECS92Q2BAF	ECS92Q4BAF	ECS92Q6BAF	ECS92Q8BAF		
460V		3/4	24 Vdc	3A	ECS92Q1CAB	ECS92Q2CAB	ECS92Q4CAB	ECS92Q6CAB	ECS92Q8CAB	S801+N37N3S	
		2		7A	ECS92Q1CAC	ECS92Q2CAC	ECS92Q4CAC	ECS92Q6CAC	ECS92Q8CAC		
		5		15A	ECS92Q1CAD	ECS92Q2CAD	ECS92Q4CAD	ECS92Q6CAD	ECS92Q8CAD		
		10		30A	ECS92Q1CAE	ECS92Q2CAE	ECS92Q4CAE	ECS92Q6CAE	ECS92Q8CAE		
		20		50A	ECS92Q1CAF	ECS92Q2CAF	ECS92Q4CAF	ECS92Q6CAF	ECS92Q8CAF		
575V		1	24 Vdc	3A	ECS92Q1DAB	ECS92Q2DAB	ECS92Q4DAB	ECS92Q6DAB	ECS92Q8DAB	S801+N37N3S	
		3		7A	ECS92Q1DAC	ECS92Q2DAC	ECS92Q4DAC	ECS92Q6DAC	ECS92Q8DAC		
		7-1/2		15A	ECS92Q1DAD	ECS92Q2DAD	ECS92Q4DAD	ECS92Q6DAD	ECS92Q8DAD		
		15		30A	ECS92Q1DAE	ECS92Q2DAE	ECS92Q4DAE	ECS92Q6DAE	ECS92Q8DAE		
		30		50A	ECS92Q1DAF	ECS92Q2DAF	ECS92Q4DAF	ECS92Q6DAF	ECS92Q8DAF		
66A	200V	15	24 Vdc	100A	ECS92S1EAG	ECS92S2EAG	ECS92S4EAG	ECS92S6EAG	ECS92S8EAG	S801+N66N3S	
	230V	15		70A	ECS92S1BAW	ECS92S2BAW	ECS92S4BAW	ECS92S6BAW	ECS92S8BAW		
		20		100A	ECS92S1BAG	ECS92S2BAG	ECS92S4BAG	ECS92S6BAG	ECS92S8BAG		
	460V	40		100A	ECS92S1CAG	ECS92S2CAG	ECS92S4CAG	ECS92S6CAG	ECS92S8CAG	S801+N66N3S	
	575V	50			ECS92S1DAG	ECS92S2DAG	ECS92S4DAG	ECS92S6DAG	ECS92S8DAG	S801+N66N3S	
Frame Size—110 mm											
105A	200V	25	24 Vdc	150A	ECS92V1EAH	ECS92V2EAH	ECS92V4EAH	ECS92V6EAH	ECS92V8EAH	S801+R10N3S	
		230V			30	ECS92V1BAH	ECS92V2BAH	ECS92V4BAH	ECS92V6BAH	ECS92V8BAH	S801+R10N3S
		460V			60	ECS92V1CAH	ECS92V2CAH	ECS92V4CAH	ECS92V6CAH	ECS92V8CAH	S801+R10N3S
		575V			75	ECS92V1DAH	ECS92V2DAH	ECS92V4DAH	ECS92V6DAH	ECS92V8DAH	S801+R10N3S
135A	200V	30	24 Vdc	250A	ECS92W1EAJ	ECS92W2EAJ	ECS92W4EAJ	ECS92W6EAJ	ECS92W8EAJ	S801+R13N3S	
		230V		40	150A	ECS92W1BAH	ECS92W2BAH	ECS92W4BAH	ECS92W6BAH	ECS92W8BAH	
		460V		75	ECS92W1CAH	ECS92W2CAH	ECS92W4CAH	ECS92W6CAH	ECS92W8CAH		
		575V		100	ECS92W1DAH	ECS92W2DAH	ECS92W4DAH	ECS92W6DAH	ECS92W8DAH		

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ② Based on 1.15 service factor.
- ③ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS92S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECS92—Combination Reduced Voltage Soft Starter—Circuit Breaker—S801+, continued

Amps	Motor Voltage	hp ^{①②}	Coil Voltage ^③	Circuit Breaker Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ^④ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—200 mm										
180A	200V	50	24 Vdc	250A	ECS92Y1EAJ	ECS92Y2EAJ	ECS92Y4EAJ	ECS92Y6EAJ	ECS92Y8EAJ	S801+T18N3S
	230V	60			ECS92Y1BAJ	ECS92Y2BAJ	ECS92Y4BAJ	ECS92Y6BAJ	ECS92Y8BAJ	
	460V	125			ECS92Y1CAJ	ECS92Y2CAJ	ECS92Y4CAJ	ECS92Y6CAJ	ECS92Y8CAJ	
	575V	150			ECS92Y1DAJ	ECS92Y2DAJ	ECS92Y4DAJ	ECS92Y6DAJ	ECS92Y8DAJ	
240A	200V	60	24 Vdc	400A	ECS92Z1EAK	ECS92Z2EAK	ECS92Z4EAK	ECS92Z6EAK	ECS92Z8EAK	S801+T24N3S
	230V	75			ECS92Z1BAK	ECS92Z2BAK	ECS92Z4BAK	ECS92Z6BAK	ECS92Z8BAK	
	460V	150		250A	ECS92Z1CAJ	ECS92Z2CAJ	ECS92Z4CAJ	ECS92Z6CAJ	ECS92Z8CAJ	
	575V	200			ECS92Z1DAJ	ECS92Z2DAJ	ECS92Z4DAJ	ECS92Z6DAJ	ECS92Z8DAJ	
304A	200V	75	24 Vdc	400A	ECS9211EAK	ECS9212EAK	ECS9214EAK	ECS9216EAK	ECS9218EAK	S801+T30N3S
	230V	100			ECS9211BAK	ECS9212BAK	ECS9214BAK	ECS9216BAK	ECS9218BAK	
	460V	200			ECS9211CAK	ECS9212CAK	ECS9214CAK	ECS9216CAK	ECS9218CAK	
	575V	250			ECS9211DAK	ECS9212DAK	ECS9214DAK	ECS9216DAK	ECS9218DAK	
Frame Size—290 mm										
360A	200V	100	24 Vdc	600A	ECS9221EAL	ECS9222EAL	ECS9224EAL	—	ECS9228EAL	S801+V36N3S
	230V	125		400A	ECS9221BAK	ECS9222BAK	ECS9224BAK	—	ECS9228BAK	
	460V	250		600A	ECS9221CAL	ECS9222CAL	ECS9224CAL	—	ECS9228CAL	
	575V	300		400A	ECS9221DAK	ECS9222DAK	ECS9224DAK	—	ECS9228DAK	
420A	200V	125	24 Vdc	600A	ECS9231EAL	ECS9232EAL	ECS9234EAL	—	ECS9238EAL	S801+V42N3S
	230V	150			ECS9231BAL	ECS9232BAL	ECS9234BAL	—	ECS9238BAL	
	460V	300			ECS9231CAL	ECS9232CAL	ECS9234CAL	—	ECS9238CAL	
	575V	350			ECS9231DAL	ECS9232DAL	ECS9234DAL	—	ECS9238DAL	
500A	230V	150	24 Vdc	600A	ECS9241BAL	ECS9242BAL	ECS9244BAL	—	ECS9248BAL	S801+V50N3S
	460V	350			ECS9241CAL	ECS9242CAL	ECS9244CAL	—	ECS9248CAL	
	575V	450			ECS9241DAL	ECS9242DAL	ECS9244DAL	—	ECS9248DAL	
650A	200V	200	24 Vdc	1200A	ECS9251EAP	ECS9252EAP	ECS9254EAP	—	ECS9258EAP	S801+V65N3S
	230V	200			ECS9251BAP	ECS9252BAP	ECS9254BAP	—	ECS9258BAP	
	460V	450			ECS9251CAP	ECS9252CAP	ECS9254CAP	—	ECS9258CAP	
	575V	500			ECS9251DAP	ECS9252DAP	ECS9254DAP	—	ECS9258DAP	
720A	230V	250	24 Vdc	1200A	ECS9261BAP	ECS9262BAP	ECS9264BAP	—	ECS9268BAP	S801+V72N3S
	460V	500			ECS9261CAP	ECS9262CAP	ECS9264CAP	—	ECS9268CAP	
	575V	600			ECS9261DAP	ECS9262DAP	ECS9264DAP	—	ECS9268DAP	
850A	460V	600	24 Vdc	1200A	ECS9271CAP	ECS9272CAP	ECS9274CAP	—	ECS9278CAP	S801+V85N3S
	575V	700			ECS9271DAP	ECS9272DAP	ECS9274DAP	—	ECS9278DAP	
1000A	230V	350	24 Vdc	1600A	ECS9281BAQ	ECS9282BAQ	ECS9284BAQ	—	ECS9288BAQ	S801+V10N3S
	460V	700			ECS9281CAQ	ECS9282CAQ	ECS9284CAQ	—	ECS9288CAQ	
	575V	800			ECS9281DAQ	ECS9282DAQ	ECS9284DAQ	—	ECS9288DAQ	

Notes

- ① Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ② Based on 1.15 service factor.
- ③ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS92S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Class ECS95—Combination Reduced Voltage Soft Starter—Circuit Breaker—S811+ ①

Amps	Motor Voltage	hp ②③	Coil Voltage ④	Circuit Breaker Rating	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ⑤ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number			
Frame Size—65 mm													
37A	200V	1/2	24 Vdc	7A	ECS95Q1EAC	ECS95Q2EAC	ECS95Q4EAC	ECS95Q6EAC	ECS95Q8EAC	S811+N37N3S			
		1		15A	ECS95Q1EAD	ECS95Q2EAD	ECS95Q4EAD	ECS95Q6EAD	ECS95Q8EAD				
		3		30A	ECS95Q1EAE	ECS95Q2EAE	ECS95Q4EAE	ECS95Q6EAE	ECS95Q8EAE				
		10		50A	ECS95Q1EAF	ECS95Q2EAF	ECS95Q4EAF	ECS95Q6EAF	ECS95Q8EAF				
230V	24 Vdc	1	7A	ECS95Q1BAC	ECS95Q2BAC	ECS95Q4BAC	ECS95Q6BAC	ECS95Q8BAC	S811+N37N3S				
		2	15A	ECS95Q1BAD	ECS95Q2BAD	ECS95Q4BAD	ECS95Q6BAD	ECS95Q8BAD					
		3	30A	ECS95Q1BAE	ECS95Q2BAE	ECS95Q4BAE	ECS95Q6BAE	ECS95Q8BAE					
		10	50A	ECS95Q1BAF	ECS95Q2BAF	ECS95Q4BAF	ECS95Q6BAF	ECS95Q8BAF					
460V	24 Vdc	3/4	3A	ECS95Q1CAB	ECS95Q2CAB	ECS95Q4CAB	ECS95Q6CAB	ECS95Q8CAB	S811+N37N3S				
		2	7A	ECS95Q1CAC	ECS95Q2CAC	ECS95Q4CAC	ECS95Q6CAC	ECS95Q8CAC					
		5	15A	ECS95Q1CAD	ECS95Q2CAD	ECS95Q4CAD	ECS95Q6CAD	ECS95Q8CAD					
		10	30A	ECS95Q1CAE	ECS95Q2CAE	ECS95Q4CAE	ECS95Q6CAE	ECS95Q8CAE					
		20	50A	ECS95Q1CAF	ECS95Q2CAF	ECS95Q4CAF	ECS95Q6CAF	ECS95Q8CAF					
575V	24 Vdc	1	3A	ECS95Q1DAB	ECS95Q2DAB	ECS95Q4DAB	ECS95Q6DAB	ECS95Q8DAB	S811+N37N3S				
		3	7A	ECS95Q1DAC	ECS95Q2DAC	ECS95Q4DAC	ECS95Q6DAC	ECS95Q8DAC					
		7-1/2	15A	ECS95Q1DAD	ECS95Q2DAD	ECS95Q4DAD	ECS95Q6DAD	ECS95Q8DAD					
		15	30A	ECS95Q1DAE	ECS95Q2DAE	ECS95Q4DAE	ECS95Q6DAE	ECS95Q8DAE					
		30	50A	ECS95Q1DAF	ECS95Q2DAF	ECS95Q4DAF	ECS95Q6DAF	ECS95Q8DAF					
66A	200V	15	24 Vdc	100A	ECS95S1EAG	ECS95S2EAG	ECS95S4EAG	ECS95S6EAG	ECS95S8EAG	S811+N66N3S			
				230V	15	70A	ECS95S1BAW	ECS95S2BAW	ECS95S4BAW	ECS95S6BAW	ECS95S8BAW	S811+N66N3S	
						100A	ECS95S1BAG	ECS95S2BAG	ECS95S4BAG	ECS95S6BAG	ECS95S8BAG	S811+N66N3S	
				460V	40	ECS95S1CAG	ECS95S2CAG	ECS95S4CAG	ECS95S6CAG	ECS95S8CAG	S811+N66N3S		
				575V	50	ECS95S1DAG	ECS95S2DAG	ECS95S4DAG	ECS95S6DAG	ECS95S8DAG	S811+N66N3S		
Frame Size—110 mm													
105A	200V	25	24 Vdc	150A	ECS95V1EAH	ECS95V2EAH	ECS95V4EAH	ECS95V6EAH	ECS95V8EAH	S811+R10N3S			
					ECS95V1BAH	ECS95V2BAH	ECS95V4BAH	ECS95V6BAH	ECS95V8BAH	S811+R10N3S			
					ECS95V1CAH	ECS95V2CAH	ECS95V4CAH	ECS95V6CAH	ECS95V8CAH	S811+R10N3S			
					ECS95V1DAH	ECS95V2DAH	ECS95V4DAH	ECS95V6DAH	ECS95V8DAH	S811+R10N3S			
135A	200V	30	24 Vdc	250A	ECS95W1EAJ	ECS95W2EAJ	ECS95W4EAJ	ECS95W6EAJ	ECS95W8EAJ	S811+R13N3S			
					230V	40	150A	ECS95W1BAH	ECS95W2BAH	ECS95W4BAH	ECS95W6BAH	ECS95W8BAH	S811+R13N3S
							ECS95W1CAH	ECS95W2CAH	ECS95W4CAH	ECS95W6CAH	ECS95W8CAH	S811+R13N3S	
					460V	75	ECS95W1DAH	ECS95W2DAH	ECS95W4DAH	ECS95W6DAH	ECS95W8DAH	S811+R13N3S	

Notes

- ① Digital Interface Module (DIM) is mounted on door as option.
- ② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ③ Based on 1.15 service factor.
- ④ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS95S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

5.2

Reduced Voltage Starter

S801+/S811+ *IT*. Solid-State Soft Starters

Class ECS95—Combination Reduced Voltage Soft Starter—Circuit Breaker—S811+, continued ①

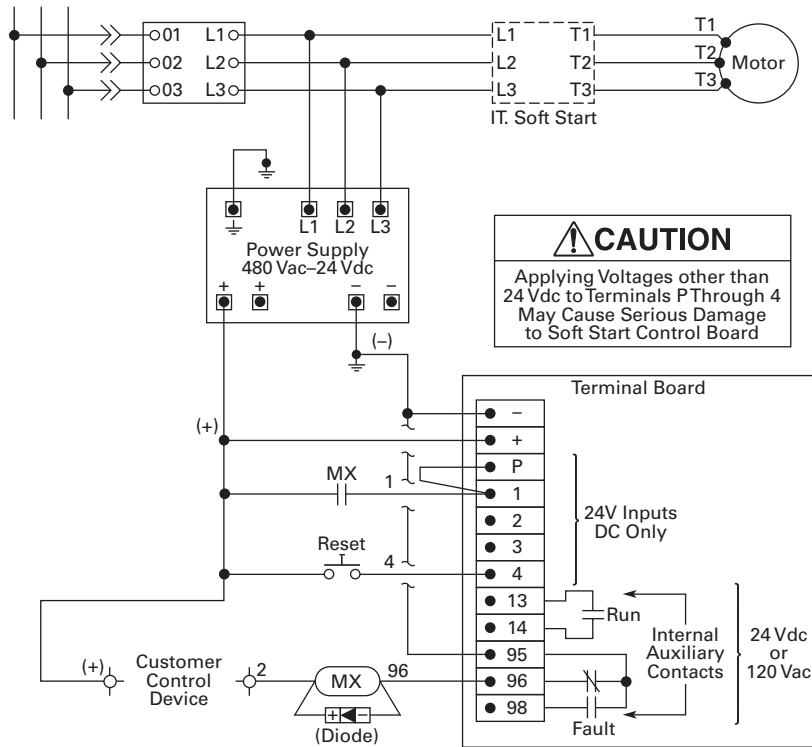
Amps	Motor Voltage	hp ②③	Coil Voltage ④	Circuit Breaker Type	Type 1 Catalog Number	Type 3R Catalog Number	Type 4X ⑤ Catalog Number	Type 7/9 Catalog Number	Type 12 Catalog Number	Component Soft Starter (Open) Catalog Number
Frame Size—200 mm										
180A	200V	50	24 Vdc	250A	ECS95Y1EAJ	ECS95Y2EAJ	ECS95Y4EAJ	ECS95Y6EAJ	ECS95Y8EAJ	S811+T18N3S
	230V	60			ECS95Y1BAJ	ECS95Y2BAJ	ECS95Y4BAJ	ECS95Y6BAJ	ECS95Y8BAJ	
	460V	125			ECS95Y1CAJ	ECS95Y2CAJ	ECS95Y4CAJ	ECS95Y6CAJ	ECS95Y8CAJ	
	575V	150			ECS95Y1DAJ	ECS95Y2DAJ	ECS95Y4DAJ	ECS95Y6DAJ	ECS95Y8DAJ	
240A	200V	60	24 Vdc	400A	ECS95Z1EAK	ECS95Z2EAK	ECS95Z4EAK	ECS95Z6EAK	ECS95Z8EAK	S811+T24N3S
	230V	75			ECS95Z1BAK	ECS95Z2BAK	ECS95Z4BAK	ECS95Z6BAK	ECS95Z8BAK	
	460V	150		250A	ECS95Z1CAJ	ECS95Z2CAJ	ECS95Z4CAJ	ECS95Z6CAJ	ECS95Z8CAJ	
	575V	200			ECS95Z1DAJ	ECS95Z2DAJ	ECS95Z4DAJ	ECS95Z6DAJ	ECS95Z8DAJ	
304A	200V	75	24 Vdc	400A	ECS9511EAK	ECS9512EAK	ECS9514EAK	ECS9516EAK	ECS9518EAK	S811+T30N3S
	230V	100			ECS9511BAK	ECS9512BAK	ECS9514BAK	ECS9516BAK	ECS9518BAK	
	460V	200			ECS9511CAK	ECS9512CAK	ECS9514CAK	ECS9516CAK	ECS9518CAK	
	575V	250			ECS9511DAK	ECS9512DAK	ECS9514DAK	ECS9516DAK	ECS9518DAK	
Frame Size—290 mm										
360A	200V	100	24 Vdc	600A	ECS9521EAL	ECS9522EAL	ECS9524EAL	—	ECS9528EAL	S811+V36N3S
	230V	125		400A	ECS9521BAK	ECS9522BAK	ECS9524BAK	—	ECS9528BAK	
	460V	250		600A	ECS9521CAL	ECS9522CAL	ECS9524CAL	—	ECS9528CAL	
	575V	300		400A	ECS9521DAK	ECS9522DAK	ECS9524DAK	—	ECS9528DAK	
420A	200V	125	24 Vdc	600A	ECS9531EAL	ECS9532EAL	ECS9534EAL	—	ECS9538EAL	S811+V42N3S
	230V	150			ECS9531BAL	ECS9532BAL	ECS9534BAL	—	ECS9538BAL	
	460V	300			ECS9531CAL	ECS9532CAL	ECS9534CAL	—	ECS9538CAL	
	575V	350			ECS9531DAL	ECS9532DAL	ECS9534DAL	—	ECS9538DAL	
500A	230V	150	24 Vdc	600A	ECS9541BAL	ECS9542BAL	ECS9544BAL	—	ECS9548BAL	S811+V50N3S
	460V	350			ECS9541CAL	ECS9542CAL	ECS9544CAL	—	ECS9548CAL	
	575V	450			ECS9541DAL	ECS9542DAL	ECS9544DAL	—	ECS9548DAL	
650A	200V	200	24 Vdc	1200A	ECS9551EAP	ECS9552EAP	ECS9554EAP	—	ECS9558EAP	S811+V65N3S
	230V	200			ECS9551BAP	ECS9552BAP	ECS9554BAP	—	ECS9558BAP	
	460V	450			ECS9551CAP	ECS9552CAP	ECS9554CAP	—	ECS9558CAP	
	575V	500			ECS9551DAP	ECS9552DAP	ECS9554DAP	—	ECS9558DAP	
720A	230V	250	24 Vdc	1200A	ECS9561BAP	ECS9562BAP	ECS9564BAP	—	ECS9568BAP	S811+V72N3S
	460V	500			ECS9561CAP	ECS9562CAP	ECS9564CAP	—	ECS9568CAP	
	575V	600			ECS9561DAP	ECS9562DAP	ECS9564DAP	—	ECS9568DAP	
850A	460V	600	24 Vdc	1200A	ECS9571CAP	ECS9572CAP	ECS9574CAP	—	ECS9578CAP	S811+V85N3S
	575V	700			ECS9571DAP	ECS9572DAP	ECS9574DAP	—	ECS9578DAP	
1000A	230V	350	24 Vdc	1600A	ECS9581BAQ	ECS9582BAQ	ECS9584BAQ	—	ECS9588BAQ	S811+V10N3S
	460V	700			ECS9581CAQ	ECS9582CAQ	ECS9584CAQ	—	ECS9588CAQ	
	575V	800			ECS9581DAQ	ECS9582DAQ	ECS9584DAQ	—	ECS9588DAQ	

Notes

- ① Digital Interface Module (DIM) is mounted on door as option.
- ② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and three starts per hour. Consult Eaton for other ratings.
- ③ Based on 1.15 service factor.
- ④ All *IT* soft starters are furnished with 24 Vdc coils and control power supplies. For 24 Vdc separate control, use modification code **C35** and change the eighth digit to **Q** (that is, ECS90S1EAA becomes ECS90S1QAA-C35).
- ⑤ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECS95S4EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

Wiring Diagrams

S801+/S811+

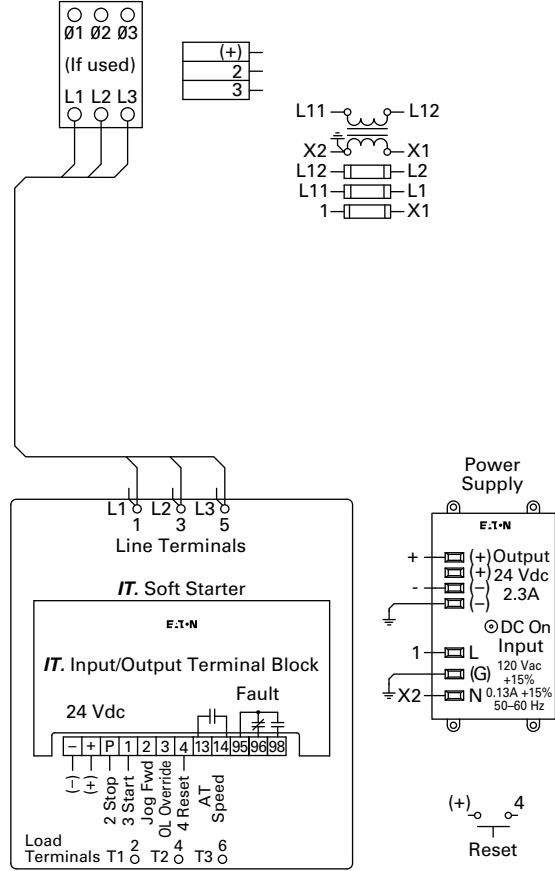
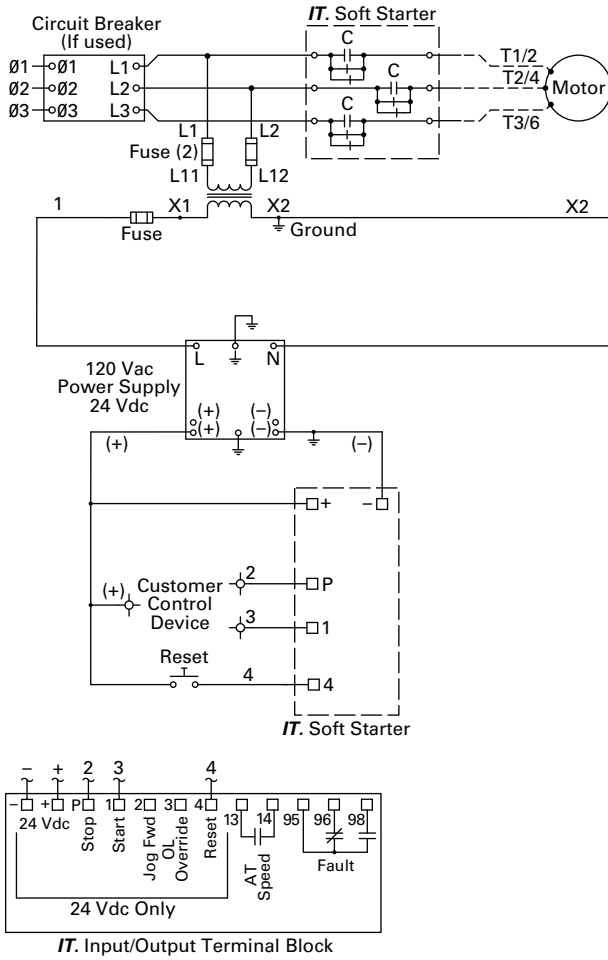


5.2

Reduced Voltage Starter

S801+/S811+ *IT*. Solid-State Soft Starters

S801+/S811+ with CPT and Power Supply



5

Dimensions

See **Tab 14** for box dimensions for Type 1, 3R, 4X and 12.
See **Tab 9** for box dimensions for Type 7/9.

Minimum Enclosure Box Numbers

Rating	SSRV	Non-Combination Box No. ①	Combination with Fuses Box No. ①	Combination with HMCP Box No. ①
37A	S801+/S811+	7A	B1	A1 ②
66A	S801+/S811+	7A	C	A1 ②
105A	S801+/S811+	7A	D	B1
135A	S801+/S811+	B1	D	C
180A	S801+/S811+	C	E	E
240A	S801+/S811+	G1	F1E	E
304A	S801+/S811+	G1	F1E	E
360A	S801+/S811+	G1	F1E	E
420A	S801+/S811+	10	F1E	E
500A	S801+/S811+	10	F1E	E
650A	S801+/S811+	10	F1E	F1E
720A	S801+/S811+	10	F1E	F1E
850A	S801+/S811+	10	F1E	F1E
1000A	S801+/S811+	10	F1E	F1E

Notes

- ① Enclosure space will also accommodate an *IT* power supply, two four-pole relays, CPT, and terminal blocks. Also includes space for a DNA module or MOV.
- ② Same as footnote ①, but CPT is not included. Upsize to B1 enclosure to include space for a CPT and a full voltage bypass contactor.

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Freedom Three-Phase Magnetic Starters	
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Product Selection	
Autotransformer	V10-T5-37
Part Winding	V10-T5-45
Wye Delta	V10-T5-51
Part Winding Pump Control	V10-T5-80
Wiring Diagrams	V10-T5-81

Product Description

Eaton's expanded reduced voltage starter solutions include autotransformer, part winding, and wye delta.

Features

- Autotransformer
 - High torque per amp
 - Three starting torques through taps
 - Optimal for slow starts
- Part Winding
 - Small physical size
 - Limits motor torque and current to 50% at start-up
- Wye Delta
 - Optimal for slow starts and high inertia load
 - High torque efficiency
 - Inrush restrictions at start-up

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

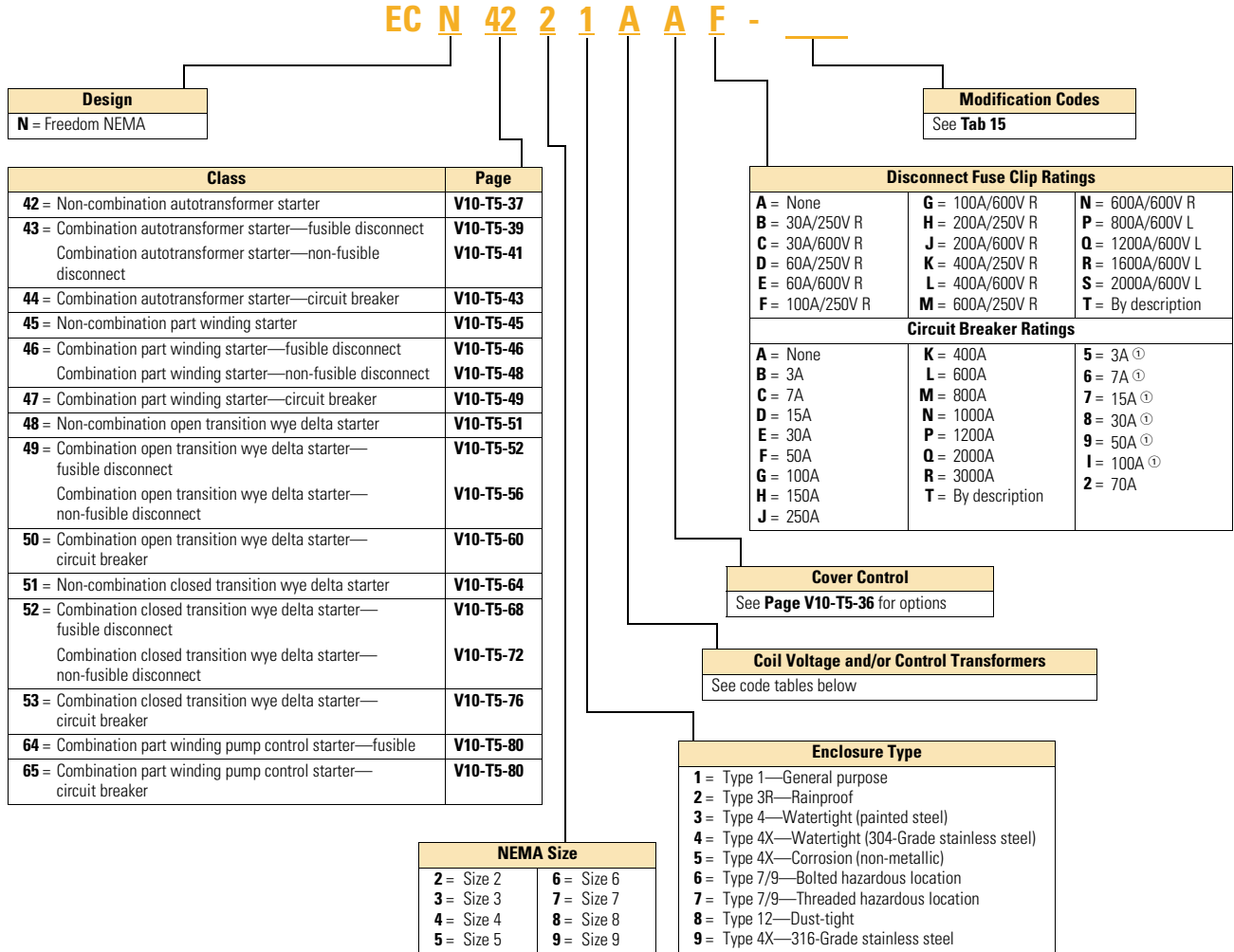
- UL Listed
- cUL (indicates appropriate CSA standard investigation)
- OSHPD Certified (OSP-0015-10)

Additional Reference

Other Magnet Coils	V10-T5-35
Cover Control	V10-T5-36
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Technical Data and Specifications	Tab 17

Catalog Number Selection

Freedom Three-Phase Magnetic Starters



Magnetic Coil Codes (System Voltage) ②

Code	Magnet Coil	Code	Magnet Coil	Code	Magnet Coil
A	120/60110/50	K	240/50	U	24/50
B	240/60220/50	L	380/50	V	32/50
C	460/60440/50	M	415/50	W	48/60
D	575/60550/50	P	12 Vdc	X	104–120/60
E	208/60	Q	24 Vdc	Y	48/50
G	550/50	R	48 Vdc	Z	By description
H	277/60	S	125 Vdc		
J	208–240/60	T	24/60		

Control Power Transformer Codes (System Voltage)

Code	Primary	Secondary
B	240/480–220/440 wired for 240V	120/60–110/50
C	240/480–220/440 wired for 480V	120/60–110/50
D	600/60–550/50	120/60–110/50
E	208/60	120/60
H	277/60	120/60
L	380/50	110/50
M	415/50	110/50
Q	208/60	24
R	240/480–220/440 wired for 240V	24
S	240/480–220/440 wired for 480V	24
T	600/60	24
U	277/60	24
V	380/50	24
W	415/50	24
X	240/480/600 wired for 480V	120
Y	240/480/600 wired for 480V	24
Z	By description	—

Notes

- ① Use for Sizes 0–3, HMCP 600V applications only.
- ② When control power transformer modification codes (C1–C11) are used or when starter class includes CPT (that is, ECN07, 18) see table to the right for system voltage code.

Cover Control

Non-Reversing

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed Cover Control

To order factory installed pilot devices, change the ninth character of the catalog number to the alpha shown in the table below. Example: To order an **ECN0514CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, that is, **ECN0514CCA**.

Type 1 Non-Combination



All Others



Non-Reversing Cover Control

Description	Factory Installed Flange Control			Field Installation Kits	
	Position 9 Alpha	Type 1 Non-Combination ①	All Others ②	Type 1 Non-Combination ①	All Others ②
				Catalog Number	Catalog Number
No cover mounted pilot devices	A	■	■	C400GK0	—
START/STOP pushbuttons	B	■	■	C400GK1	C400T1
With red RUN pilot light	C	■	■	C400GK12 ③	—
With red RUN/green OFF lights	D	■	■	C400GK16 ③	—
ON/OFF pushbuttons	E	—	■	—	C400T2
With red RUN pilot light	F	—	■	—	—
With red RUN/green OFF lights	G	—	■	—	—
HAND/OFF/AUTO selector switch	H	■	■	C400GK3	C400T12
With red RUN pilot light	J	■	■	C400GK32 ③	—
With red RUN/green OFF lights	K	■	■	C400GK36 ③	—
START pushbutton	L	—	■	—	C400T3
ON pushbutton	M	—	■	—	C400T4
OFF pushbutton	N	—	■	—	C400T5
Red RUN pilot light	P	■	■	C400GK42 ③	C400T9 ③
Green OFF	Q	■	■	C400GK41 ③	C400T10 ③
Red RUN/green OFF pilot lights	R	■	■	C400GK46 ③	C400T11 ③
START/STOP selector switch	S	—	■	—	C400T13
With red RUN pilot light	T	—	■	—	—
With red RUN/green OFF lights	U	—	■	—	—
ON/OFF selector switch	V	—	■	—	C400T14
With red RUN pilot light	W	—	■	—	—
With red RUN/green OFF lights	X	—	■	—	—

Notes

- ① Type 1, NEMA Sizes 00–4 non-combination ONLY.
- ② Type 1, NEMA Sizes 5–9 non-combination PLUS all Type 3R, 4X, 12 non-combination PLUS all combination—NEMA sizes only.
- ③ Add code letter from the table below to catalog number for voltage—kits only. Example: C400T9**B**.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120V 60 Hz	A	240V 60 Hz	B	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D

Product Selection

Autotransformer

Features

- Non-combination and combination designs
- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600V maximum

Class ECN42—Non-Combination Autotransformer Starter

NEMA Size	Motor Voltage	hp Rating	Magnet Coil Voltage ①	Type 1	Type 3R	Type 4	Type 12		
				General Purpose	Rainproof	Water and Dust-Tight Painted Steel	Dust-Tight Industrial External Reset ②		
				Catalog Number	Catalog Number	Catalog Number	Catalog Number		
2 (45A)	200	10	120	ECN4221EAA-A8/B1	ECN4222EAA-A8/B1	ECN4223EAA-A8/B1	ECN4228EAA-A8/B1		
		15		ECN4221BAA-A8/B2	ECN4222BAA-A8/B2	ECN4223BAA-A8/B2	ECN4228BAA-A8/B2		
		15		ECN4221BAA-A8/B7	ECN4222BAA-A8/B7	ECN4223BAA-A8/B7	ECN4228BAA-A8/B7		
	460	10		ECN4221CAA-A8/B4	ECN4222CAA-A8/B4	ECN4223CAA-A8/B4	ECN4228CAA-A8/B4		
		15		ECN4221CAA-A8/B9	ECN4222CAA-A8/B9	ECN4223CAA-A8/B9	ECN4228CAA-A8/B9		
		20		ECN4221CAA-A8/B14	ECN4222CAA-A8/B14	ECN4223CAA-A8/B14	ECN4228CAA-A8/B14		
	575	10		25	ECN4221CAA-A8/B19	ECN4222CAA-A8/B19	ECN4223CAA-A8/B19	ECN4228CAA-A8/B19	
				10	ECN4221DAA-A8/B5	ECN4222DAA-A8/B5	ECN4223DAA-A8/B5	ECN4228DAA-A8/B5	
		15		15	ECN4221DAA-A8/B10	ECN4222DAA-A8/B10	ECN4223DAA-A8/B10	ECN4228DAA-A8/B10	
				20	ECN4221DAA-A8/B15	ECN4222DAA-A8/B15	ECN4223DAA-A8/B15	ECN4228DAA-A8/B15	
		20		25	ECN4221DAA-A8/B20	ECN4222DAA-A8/B20	ECN4223DAA-A8/B20	ECN4228DAA-A8/B20	
				25	ECN4221DAA-A8/B20	ECN4222DAA-A8/B20	ECN4223DAA-A8/B20	ECN4228DAA-A8/B20	
3 (90A)	200	15	120	ECN4231EAA-A8/B6	ECN4232EAA-A8/B6	ECN4233EAA-A8/B6	ECN4238EAA-A8/B6		
		20		ECN4231EAA-A8/B11	ECN4232EAA-A8/B11	ECN4233EAA-A8/B11	ECN4238EAA-A8/B11		
		25		ECN4231EAA-A8/B16	ECN4232EAA-A8/B16	ECN4233EAA-A8/B16	ECN4238EAA-A8/B16		
	230	20		ECN4231BAA-A8/B12	ECN4232BAA-A8/B12	ECN4233BAA-A8/B12	ECN4238BAA-A8/B12		
		25		ECN4231BAA-A8/B17	ECN4232BAA-A8/B17	ECN4233BAA-A8/B17	ECN4238BAA-A8/B17		
		30		ECN4231BAA-A8/B22	ECN4232BAA-A8/B22	ECN4233BAA-A8/B22	ECN4238BAA-A8/B22		
	460	30		ECN4231CAA-A8/B24	ECN4232CAA-A8/B24	ECN4233CAA-A8/B24	ECN4238CAA-A8/B24		
		40		ECN4231CAA-A8/B29	ECN4232CAA-A8/B29	ECN4233CAA-A8/B29	ECN4238CAA-A8/B29		
		50		ECN4231CAA-A8/B34	ECN4232CAA-A8/B34	ECN4233CAA-A8/B34	ECN4238CAA-A8/B34		
	575	30		ECN4231DAA-A8/B25	ECN4232DAA-A8/B25	ECN4233DAA-A8/B25	ECN4238DAA-A8/B25		
		40		ECN4231DAA-A8/B30	ECN4232DAA-A8/B30	ECN4233DAA-A8/B30	ECN4238DAA-A8/B30		
		50		ECN4231DAA-A8/B35	ECN4232DAA-A8/B35	ECN4233DAA-A8/B35	ECN4238DAA-A8/B35		
	4 (135A)	200		30	120	ECN4241EAA-A8/B21	ECN4242EAA-A8/B21	ECN4243EAA-A8/B21	ECN4248EAA-A8/B21
				40		ECN4241EAA-A8/B26	ECN4242EAA-A8/B26	ECN4243EAA-A8/B26	ECN4248EAA-A8/B26
		230		40		ECN4241BAA-A8/B27	ECN4242BAA-A8/B27	ECN4243BAA-A8/B27	ECN4248BAA-A8/B27
50			ECN4241BAA-A8/B32	ECN4242BAA-A8/B32		ECN4243BAA-A8/B32	ECN4248BAA-A8/B32		
460		75	ECN4241CAA-A8/B39	ECN4242CAA-A8/B39		ECN4243CAA-A8/B39	ECN4248CAA-A8/B39		
		100	ECN4241CAA-A8/B44	ECN4242CAA-A8/B44		ECN4243CAA-A8/B44	ECN4248CAA-A8/B44		
575		75	ECN4241DAA-A8/B40	ECN4242DAA-A8/B40		ECN4243DAA-A8/B40	ECN4248DAA-A8/B40		
		100	ECN4241DAA-A8/B45	ECN4242DAA-A8/B45		ECN4243DAA-A8/B45	ECN4248DAA-A8/B45		

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, Tab 15.

Notes

① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.

② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

Class ECN42—Non-Combination Autotransformer Starter, continued

NEMA Size	Motor Voltage	hp Rating	Magnet Coil Voltage ①	Type 1	Type 3R	Type 4	Type 12	
				General Purpose	Rainproof	Water and Dust-Tight Painted Steel	Dust-Tight Industrial External Reset ②	
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	
5 (270A)	200	50	120	ECN4251EAA-A8/B31	ECN4252EAA-A8/B31	ECN4253EAA-A8/B31	ECN4258EAA-A8/B31	
		75		ECN4251EAA-A8/B36	ECN4252EAA-A8/B36	ECN4253EAA-A8/B36	ECN4258EAA-A8/B36	
	230	75	ECN4251BAA-A8/B37	ECN4252BAA-A8/B37	ECN4253BAA-A8/B37	ECN4258BAA-A8/B37		
		100	ECN4251BAA-A8/B42	ECN4252BAA-A8/B42	ECN4253BAA-A8/B42	ECN4258BAA-A8/B42		
	460	125	ECN4251CAA-A8/B49	ECN4252CAA-A8/B49	ECN4253CAA-A8/B49	ECN4258CAA-A8/B49		
		150	ECN4251CAA-A8/B54	ECN4252CAA-A8/B54	ECN4253CAA-A8/B54	ECN4258CAA-A8/B54		
		200	ECN4251CAA-A8/B59	ECN4252CAA-A8/B59	ECN4253CAA-A8/B59	ECN4258CAA-A8/B59		
	575	125	ECN4251DAA-A8/B50	ECN4252DAA-A8/B50	ECN4253DAA-A8/B50	ECN4258DAA-A8/B50		
		150	ECN4251DAA-A8/B55	ECN4252DAA-A8/B55	ECN4253DAA-A8/B55	ECN4258DAA-A8/B55		
		200	ECN4251DAA-A8/B60	ECN4252DAA-A8/B60	ECN4253DAA-A8/B60	ECN4258DAA-A8/B60		
	6 (540A)	200	100	120	ECN4261EAA-A8/B41	ECN4262EAA-A8/B41	ECN4263EAA-A8/B41	ECN4268EAA-A8/B41
			125		ECN4261EAA-A8/B46	ECN4262EAA-A8/B46	ECN4263EAA-A8/B46	ECN4268EAA-A8/B46
150			ECN4261EAA-A8/B51		ECN4262EAA-A8/B51	ECN4263EAA-A8/B51	ECN4268EAA-A8/B51	
230		125	ECN4261BAA-A8/B47	ECN4262BAA-A8/B47	ECN4263BAA-A8/B47	ECN4268BAA-A8/B47		
		150	ECN4261BAA-A8/B52	ECN4262BAA-A8/B52	ECN4263BAA-A8/B52	ECN4268BAA-A8/B52		
		200	ECN4261BAA-A8/B57	ECN4262BAA-A8/B57	ECN4263BAA-A8/B57	ECN4268BAA-A8/B57		
460		250	ECN4261CAA-A8/B64	ECN4262CAA-A8/B64	ECN4263CAA-A8/B64	ECN4268CAA-A8/B64		
		300	ECN4261CAA-A8/B69	ECN4262CAA-A8/B69	ECN4263CAA-A8/B69	ECN4268CAA-A8/B69		
		400	ECN4261CAA-A8/B74	ECN4262CAA-A8/B74	ECN4263CAA-A8/B74	ECN4268CAA-A8/B74		
575		250	ECN4261DAA-A8/B65	ECN4262DAA-A8/B65	ECN4263DAA-A8/B65	ECN4268DAA-A8/B65		
		300	ECN4261DAA-A8/B70	ECN4262DAA-A8/B70	ECN4263DAA-A8/B70	ECN4268DAA-A8/B70		
		400	ECN4261DAA-A8/B75	ECN4262DAA-A8/B75	ECN4263DAA-A8/B75	ECN4268DAA-A8/B75		
7 (810A)		230	250	120	ECN4271BAA-A8/B62	ECN4272BAA-A8/B62	ECN4273BAA-A8/B62	ECN4278BAA-A8/B62
			300		ECN4271BAA-A8/B67	ECN4272BAA-A8/B67	ECN4273BAA-A8/B67	ECN4278BAA-A8/B67
		460	450	ECN4271CAA-A8/B78	ECN4272CAA-A8/B78	ECN4273CAA-A8/B78	ECN4278CAA-A8/B78	
	500		ECN4271CAA-A8/B81	ECN4272CAA-A8/B81	ECN4273CAA-A8/B81	ECN4278CAA-A8/B81		
	600		ECN4271CAA-A8/B84	ECN4272CAA-A8/B84	ECN4273CAA-A8/B84	ECN4278CAA-A8/B84		
	575	450	ECN4271DAA-A8/B79	ECN4272DAA-A8/B79	ECN4273DAA-A8/B79	ECN4278DAA-A8/B79		
		500	ECN4271DAA-A8/B82	ECN4272DAA-A8/B82	ECN4273DAA-A8/B82	ECN4278DAA-A8/B82		
		600	ECN4271DAA-A8/B85	ECN4272DAA-A8/B85	ECN4273DAA-A8/B85	ECN4278DAA-A8/B85		
	8 (1215A)	230	400	120	ECN4281BAA-A8/B72	ECN4282BAA-A8/B72	ECN4283BAA-A8/B72	ECN4288BAA-A8/B72
450			ECN4281BAA-A8/B76		ECN4282BAA-A8/B76	ECN4283BAA-A8/B76	ECN4288BAA-A8/B76	
460		700	ECN4281CAA-A8/B87	ECN4282CAA-A8/B87	ECN4283CAA-A8/B87	ECN4288CAA-A8/B87		
		800	ECN4281CAA-A8/B91	ECN4282CAA-A8/B91	ECN4283CAA-A8/B91	ECN4288CAA-A8/B91		
		900	ECN4281CAA-A8/B94	ECN4282CAA-A8/B94	ECN4283CAA-A8/B94	ECN4288CAA-A8/B94		
575		700	ECN4281DAA-A8/B88	ECN4282DAA-A8/B88	ECN4283DAA-A8/B88	ECN4288DAA-A8/B88		
		800	ECN4281DAA-A8/B92	ECN4282DAA-A8/B92	ECN4283DAA-A8/B92	ECN4288DAA-A8/B92		
		900	ECN4281DAA-A8/B95	ECN4282DAA-A8/B95	ECN4283DAA-A8/B95	ECN4288DAA-A8/B95		
9 (2250A)		230	800	120	ECN4291BAA-A8/B89	ECN4292BAA-A8/B89	ECN4293BAA-A8/B89	ECN4298BAA-A8/B89
	460	1600	ECN4291CAA-A8/B96		ECN4292CAA-A8/B96	ECN4293CAA-A8/B96	ECN4298CAA-A8/B96	
	575	1600	ECN4291DAA-A8/B97		ECN4292DAA-A8/B97	ECN4293DAA-A8/B97	ECN4298DAA-A8/B97	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

Class ECN43—Non-Combination Autotransformer Starter—Fusible Disconnect

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4 Water and Dust-Tight Painted Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number
NEMA Size 2 (45A)							
200	10	120	60A	ECN4321EAD-A8/B1	ECN4322EAD-A8/B1	ECN4323EAD-A8/B1	ECN4328EAD-A8/B1
230	10			ECN4321BAD-A8/B2	ECN4322BAD-A8/B2	ECN4323BAD-A8/B2	ECN4328BAD-A8/B2
	15			ECN4321BAD-A8/B7	ECN4322BAD-A8/B7	ECN4323BAD-A8/B7	ECN4328BAD-A8/B7
	15			ECN4321CAE-A8/B4	ECN4322CAE-A8/B4	ECN4323CAE-A8/B4	ECN4328CAE-A8/B4
460	10			ECN4321CAE-A8/B9	ECN4322CAE-A8/B9	ECN4323CAE-A8/B9	ECN4328CAE-A8/B9
	15			ECN4321CAE-A8/B14	ECN4322CAE-A8/B14	ECN4323CAE-A8/B14	ECN4328CAE-A8/B14
	20			ECN4321CAE-A8/B19	ECN4322CAE-A8/B19	ECN4323CAE-A8/B19	ECN4328CAE-A8/B19
	25			ECN4321DAE-A8/B5	ECN4322DAE-A8/B5	ECN4323DAE-A8/B5	ECN4328DAE-A8/B5
575	10			ECN4321DAE-A8/B10	ECN4322DAE-A8/B10	ECN4323DAE-A8/B10	ECN4328DAE-A8/B10
	15			ECN4321DAE-A8/B15	ECN4322DAE-A8/B15	ECN4323DAE-A8/B15	ECN4328DAE-A8/B15
	20			ECN4321DAE-A8/B20	ECN4322DAE-A8/B20	ECN4323DAE-A8/B20	ECN4328DAE-A8/B20
	25						
NEMA Size 3 (90A)							
200	15	120	100A	ECN4331EAF-A8/B6	ECN4332EAF-A8/B6	ECN4333EAF-A8/B6	ECN4338EAF-A8/B6
	20			ECN4331EAF-A8/B11	ECN4332EAF-A8/B11	ECN4333EAF-A8/B11	ECN4338EAF-A8/B11
	25			ECN4331EAF-A8/B16	ECN4332EAF-A8/B16	ECN4333EAF-A8/B16	ECN4338EAF-A8/B16
230	20			ECN4331BAF-A8/B12	ECN4332BAF-A8/B12	ECN4333BAF-A8/B12	ECN4338BAF-A8/B12
	25			ECN4331BAF-A8/B17	ECN4332BAF-A8/B17	ECN4333BAF-A8/B17	ECN4338BAF-A8/B17
	30			ECN4331BAF-A8/B22	ECN4332BAF-A8/B22	ECN4333BAF-A8/B22	ECN4338BAF-A8/B22
460	30			ECN4331CAG-A8/B24	ECN4332CAG-A8/B24	ECN4333CAG-A8/B24	ECN4338CAG-A8/B24
	40			ECN4331CAG-A8/B29	ECN4332CAG-A8/B29	ECN4333CAG-A8/B29	ECN4338CAG-A8/B29
	50			ECN4331CAG-A8/B34	ECN4332CAG-A8/B34	ECN4333CAG-A8/B34	ECN4338CAG-A8/B34
575	30			ECN4331DAG-A8/B25	ECN4332DAG-A8/B25	ECN4333DAG-A8/B25	ECN4338DAG-A8/B25
	40			ECN4331DAG-A8/B30	ECN4332DAG-A8/B30	ECN4333DAG-A8/B30	ECN4338DAG-A8/B30
	50			ECN4331DAG-A8/B35	ECN4332DAG-A8/B35	ECN4333DAG-A8/B35	ECN4338DAG-A8/B35
NEMA Size 4 (135A)							
200	30	120	200A	ECN4341EAH-A8/B21	ECN4342EAH-A8/B21	ECN4343EAH-A8/B21	ECN4348EAH-A8/B21
	40			ECN4341EAH-A8/B26	ECN4342EAH-A8/B26	ECN4343EAH-A8/B26	ECN4348EAH-A8/B26
230	40			ECN4341BAH-A8/B27	ECN4342BAH-A8/B27	ECN4343BAH-A8/B27	ECN4348BAH-A8/B27
	50			ECN4341BAH-A8/B32	ECN4342BAH-A8/B32	ECN4343BAH-A8/B32	ECN4348BAH-A8/B32
460	75			ECN4341CAJ-A8/B39	ECN4342CAJ-A8/B39	ECN4343CAJ-A8/B39	ECN4348CAJ-A8/B39
	100			ECN4341CAJ-A8/B44	ECN4342CAJ-A8/B44	ECN4343CAJ-A8/B44	ECN4348CAJ-A8/B44
575	75			ECN4341DAJ-A8/B40	ECN4342DAJ-A8/B40	ECN4343DAJ-A8/B40	ECN4348DAJ-A8/B40
	100			ECN4341DAJ-A8/B45	ECN4342DAJ-A8/B45	ECN4343DAJ-A8/B45	ECN4348DAJ-A8/B45
NEMA Size 5 (270A)							
200	50	120	400A	ECN4351EAK-A8/B31	ECN4352EAK-A8/B31	ECN4353EAK-A8/B31	ECN4358EAK-A8/B31
	75			ECN4351EAK-A8/B36	ECN4352EAK-A8/B36	ECN4353EAK-A8/B36	ECN4358EAK-A8/B36
230	75			ECN4351BAK-A8/B37	ECN4352BAK-A8/B37	ECN4353BAK-A8/B37	ECN4358BAK-A8/B37
	100			ECN4351BAK-A8/B42	ECN4352BAK-A8/B42	ECN4353BAK-A8/B42	ECN4358BAK-A8/B42
460	125			ECN4351CAL-A8/B49	ECN4352CAL-A8/B49	ECN4353CAL-A8/B49	ECN4358CAL-A8/B49
	150			ECN4351CAL-A8/B54	ECN4352CAL-A8/B54	ECN4353CAL-A8/B54	ECN4358CAL-A8/B54
	200			ECN4351CAL-A8/B59	ECN4352CAL-A8/B59	ECN4353CAL-A8/B59	ECN4358CAL-A8/B59
575	125			ECN4351DAL-A8/B50	ECN4352DAL-A8/B50	ECN4353DAL-A8/B50	ECN4358DAL-A8/B50
	150			ECN4351DAL-A8/B55	ECN4352DAL-A8/B55	ECN4353DAL-A8/B55	ECN4358DAL-A8/B55
	200			ECN4351DAL-A8/B60	ECN4352DAL-A8/B60	ECN4353DAL-A8/B60	ECN4358DAL-A8/B60

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, Tab 15.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door lock.

5.3

Reduced Voltage Starter

Freedom Three-Phase Magnetic Starters

Class ECN43—Non-Combination Autotransformer Starter—Fusible Disconnect, continued

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4 Water and Dust-Tight Painted Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number
NEMA Size 6 (540A)							
200	100	120	600A	ECN4361EAM-A8/B41	ECN4362EAM-A8/B41	ECN4363EAM-A8/B41	ECN4368EAM-A8/B41
	125			ECN4361EAM-A8/B46	ECN4362EAM-A8/B46	ECN4363EAM-A8/B46	ECN4368EAM-A8/B46
	150			ECN4361EAM-A8/B51	ECN4362EAM-A8/B51	ECN4363EAM-A8/B51	ECN4368EAM-A8/B51
230	125			ECN4361BAM-A8/B47	ECN4362BAM-A8/B47	ECN4363BAM-A8/B47	ECN4368BAM-A8/B47
	150			ECN4361BAM-A8/B52	ECN4362BAM-A8/B52	ECN4363BAM-A8/B52	ECN4368BAM-A8/B52
	200			ECN4361BAM-A8/B57	ECN4362BAM-A8/B57	ECN4363BAM-A8/B57	ECN4368BAM-A8/B57
460	250			ECN4361CAN-A8/B64	ECN4362CAN-A8/B64	ECN4363CAN-A8/B64	ECN4368CAN-A8/B64
	300			ECN4361CAN-A8/B69	ECN4362CAN-A8/B69	ECN4363CAN-A8/B69	ECN4368CAN-A8/B69
	400			ECN4361CAN-A8/B74	ECN4362CAN-A8/B74	ECN4363CAN-A8/B74	ECN4368CAN-A8/B74
575	250			ECN4361DAN-A8/B65	ECN4362DAN-A8/B65	ECN4363DAN-A8/B65	ECN4368DAN-A8/B65
	300			ECN4361DAN-A8/B70	ECN4362DAN-A8/B70	ECN4363DAN-A8/B70	ECN4368DAN-A8/B70
	400			ECN4361DAN-A8/B75	ECN4362DAN-A8/B75	ECN4363DAN-A8/B75	ECN4368DAN-A8/B75
NEMA Size 7 (810A)							
230	250	120	④	ECN4371BAU-A8/B62	ECN4372BAU-A8/B62	ECN4373BAU-A8/B62	ECN4378BAU-A8/B62
	300			ECN4371BAU-A8/B67	ECN4372BAU-A8/B67	ECN4373BAU-A8/B67	ECN4378BAU-A8/B67
460	450			ECN4371CAU-A8/B78	ECN4372CAU-A8/B78	ECN4373CAU-A8/B78	ECN4378CAU-A8/B78
	500			ECN4371CAU-A8/B81	ECN4372CAU-A8/B81	ECN4373CAU-A8/B81	ECN4378CAU-A8/B81
	600			ECN4371CAU-A8/B84	ECN4372CAU-A8/B84	ECN4373CAU-A8/B84	ECN4378CAU-A8/B84
575	450			ECN4371DAU-A8/B79	ECN4372DAU-A8/B79	ECN4373DAU-A8/B79	ECN4378DAU-A8/B79
	500			ECN4371DAU-A8/B82	ECN4372DAU-A8/B82	ECN4373DAU-A8/B82	ECN4378DAU-A8/B82
	600			ECN4371DAU-A8/B85	ECN4372DAU-A8/B85	ECN4373DAU-A8/B85	ECN4378DAU-A8/B85
NEMA Size 8 (1215A)							
230	400	120	④	ECN4381BAU-A8/B72	ECN4382BAU-A8/B72	ECN4383BAU-A8/B72	ECN4388BAU-A8/B72
	450			ECN4381BAU-A8/B76	ECN4382BAU-A8/B76	ECN4383BAU-A8/B76	ECN4388BAU-A8/B76
460	700			ECN4381CAU-A8/B87	ECN4382CAU-A8/B87	ECN4383CAU-A8/B87	ECN4388CAU-A8/B87
	800			ECN4381CAU-A8/B91	ECN4382CAU-A8/B91	ECN4383CAU-A8/B91	ECN4388CAU-A8/B91
	900			ECN4381CAU-A8/B94	ECN4382CAU-A8/B94	ECN4383CAU-A8/B94	ECN4388CAU-A8/B94
575	700			ECN4381DAU-A8/B88	ECN4382DAU-A8/B88	ECN4383DAU-A8/B88	ECN4388DAU-A8/B88
	800			ECN4381DAU-A8/B92	ECN4382DAU-A8/B92	ECN4383DAU-A8/B92	ECN4388DAU-A8/B92
	900			ECN4381DAU-A8/B95	ECN4382DAU-A8/B95	ECN4383DAU-A8/B95	ECN4388DAU-A8/B95
NEMA Size 9 (2250A)							
230	800	120	④	ECN4391BAU-A8/B89	ECN4392BAU-A8/B89	ECN4393BAU-A8/B89	ECN4398BAU-A8/B89
460	1600			ECN4391CAU-A8/B96	ECN4392CAU-A8/B96	ECN4393CAU-A8/B96	ECN4398CAU-A8/B96
575	1600			ECN4391DAU-A8/B97	ECN4392DAU-A8/B97	ECN4393DAU-A8/B97	ECN4398DAU-A8/B97

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door lock.
- ④ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

Class ECN43—Combination Autotransformer Starter—Non-Fusible Disconnect

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4 Water and Dust-Tight Painted Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number
NEMA Size 2 (45A)							
200	10	120	60A	ECN4321EAA-A8/B1	ECN4322EAA-A8/B1	ECN4323EAA-A8/B1	ECN4328EAA-A8/B1
230	10			ECN4321BAA-A8/B2	ECN4322BAA-A8/B2	ECN4323BAA-A8/B2	ECN4328BAA-A8/B2
	15			ECN4321BAA-A8/B7	ECN4322BAA-A8/B7	ECN4323BAA-A8/B7	ECN4328BAA-A8/B7
460	10			ECN4321CAA-A8/B4	ECN4322CAA-A8/B4	ECN4323CAA-A8/B4	ECN4328CAA-A8/B4
	15			ECN4321CAA-A8/B9	ECN4322CAA-A8/B9	ECN4323CAA-A8/B9	ECN4328CAA-A8/B9
	20			ECN4321CAA-A8/B14	ECN4322CAA-A8/B14	ECN4323CAA-A8/B14	ECN4328CAA-A8/B14
	25			ECN4321CAA-A8/B19	ECN4322CAA-A8/B19	ECN4323CAA-A8/B19	ECN4328CAA-A8/B19
575	10			ECN4321DAA-A8/B5	ECN4322DAA-A8/B5	ECN4323DAA-A8/B5	ECN4328DAA-A8/B5
	15			ECN4321DAA-A8/B10	ECN4322DAA-A8/B10	ECN4323DAA-A8/B10	ECN4328DAA-A8/B10
	20			ECN4321DAA-A8/B15	ECN4322DAA-A8/B15	ECN4323DAA-A8/B15	ECN4328DAA-A8/B15
	25			ECN4321DAA-A8/B20	ECN4322DAA-A8/B20	ECN4323DAA-A8/B20	ECN4328DAA-A8/B20
NEMA Size 3 (90A)							
200	15	120	100A	ECN4331EAA-A8/B6	ECN4332EAA-A8/B6	ECN4333EAA-A8/B6	ECN4338EAA-A8/B6
	20			ECN4331EAA-A8/B11	ECN4332EAA-A8/B11	ECN4333EAA-A8/B11	ECN4338EAA-A8/B11
	25			ECN4331EAA-A8/B16	ECN4332EAA-A8/B16	ECN4333EAA-A8/B16	ECN4338EAA-A8/B16
230	20			ECN4331BAA-A8/B12	ECN4332BAA-A8/B12	ECN4333BAA-A8/B12	ECN4338BAA-A8/B12
	25			ECN4331BAA-A8/B17	ECN4332BAA-A8/B17	ECN4333BAA-A8/B17	ECN4338BAA-A8/B17
	30			ECN4331BAA-A8/B22	ECN4332BAA-A8/B22	ECN4333BAA-A8/B22	ECN4338BAA-A8/B22
460	30			ECN4331CAA-A8/B24	ECN4332CAA-A8/B24	ECN4333CAA-A8/B24	ECN4338CAA-A8/B24
	40			ECN4331CAA-A8/B29	ECN4332CAA-A8/B29	ECN4333CAA-A8/B29	ECN4338CAA-A8/B29
	50			ECN4331CAA-A8/B34	ECN4332CAA-A8/B34	ECN4333CAA-A8/B34	ECN4338CAA-A8/B34
575	30			ECN4331DAA-A8/B25	ECN4332DAA-A8/B25	ECN4333DAA-A8/B25	ECN4338DAA-A8/B25
	40			ECN4331DAA-A8/B30	ECN4332DAA-A8/B30	ECN4333DAA-A8/B30	ECN4338DAA-A8/B30
	50			ECN4331DAA-A8/B35	ECN4332DAA-A8/B35	ECN4333DAA-A8/B35	ECN4338DAA-A8/B35
NEMA Size 4 (135A)							
200	30	120	200A	ECN4341EAA-A8/B21	ECN4342EAA-A8/B21	ECN4343EAA-A8/B21	ECN4348EAA-A8/B21
	40			ECN4341EAA-A8/B26	ECN4342EAA-A8/B26	ECN4343EAA-A8/B26	ECN4348EAA-A8/B26
230	40			ECN4341BAA-A8/B27	ECN4342BAA-A8/B27	ECN4343BAA-A8/B27	ECN4348BAA-A8/B27
	50			ECN4341BAA-A8/B32	ECN4342BAA-A8/B32	ECN4343BAA-A8/B32	ECN4348BAA-A8/B32
460	75			ECN4341CAA-A8/B39	ECN4342CAA-A8/B39	ECN4343CAA-A8/B39	ECN4348CAA-A8/B39
	100			ECN4341CAA-A8/B44	ECN4342CAA-A8/B44	ECN4343CAA-A8/B44	ECN4348CAA-A8/B44
575	75			ECN4341DAA-A8/B40	ECN4342DAA-A8/B40	ECN4343DAA-A8/B40	ECN4348DAA-A8/B40
	100			ECN4341DAA-A8/B45	ECN4342DAA-A8/B45	ECN4343DAA-A8/B45	ECN4348DAA-A8/B45
NEMA Size 5 (270A)							
200	50	120	400A	ECN4351EAA-A8/B31	ECN4352EAA-A8/B31	ECN4353EAA-A8/B31	ECN4358EAA-A8/B31
	75			ECN4351EAA-A8/B36	ECN4352EAA-A8/B36	ECN4353EAA-A8/B36	ECN4358EAA-A8/B36
230	75			ECN4351BAA-A8/B37	ECN4352BAA-A8/B37	ECN4353BAA-A8/B37	ECN4358BAA-A8/B37
	100			ECN4351BAA-A8/B42	ECN4352BAA-A8/B42	ECN4353BAA-A8/B42	ECN4358BAA-A8/B42
460	125			ECN4351CAA-A8/B49	ECN4352CAA-A8/B49	ECN4353CAA-A8/B49	ECN4358CAA-A8/B49
	150			ECN4351CAA-A8/B54	ECN4352CAA-A8/B54	ECN4353CAA-A8/B54	ECN4358CAA-A8/B54
	200			ECN4351CAA-A8/B59	ECN4352CAA-A8/B59	ECN4353CAA-A8/B59	ECN4358CAA-A8/B59
575	125			ECN4351DAA-A8/B50	ECN4352DAA-A8/B50	ECN4353DAA-A8/B50	ECN4358DAA-A8/B50
	150			ECN4351DAA-A8/B55	ECN4352DAA-A8/B55	ECN4353DAA-A8/B55	ECN4358DAA-A8/B55
	200			ECN4351DAA-A8/B60	ECN4352DAA-A8/B60	ECN4353DAA-A8/B60	ECN4358DAA-A8/B60

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, Tab 15.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door lock.

5.3

Reduced Voltage Starter

Freedom Three-Phase Magnetic Starters

Class ECN43—Non-Combination Autotransformer Starter—Fusible Disconnect, continued

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4 Water and Dust-Tight Painted Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number
NEMA Size 6 (540A)							
200	100	120	600A	ECN4361EAA-A8/B41	ECN4362EAA-A8/B41	ECN4363EAA-A8/B41	ECN4368EAA-A8/B41
	125			ECN4361EAA-A8/B46	ECN4362EAA-A8/B46	ECN4363EAA-A8/B46	ECN4368EAA-A8/B46
	150			ECN4361EAA-A8/B51	ECN4362EAA-A8/B51	ECN4363EAA-A8/B51	ECN4368EAA-A8/B51
230	125			ECN4361BAA-A8/B47	ECN4362BAA-A8/B47	ECN4363BAA-A8/B47	ECN4368BAA-A8/B47
	150			ECN4361BAA-A8/B52	ECN4362BAA-A8/B52	ECN4363BAA-A8/B52	ECN4368BAA-A8/B52
	200			ECN4361BAA-A8/B57	ECN4362BAA-A8/B57	ECN4363BAA-A8/B57	ECN4368BAA-A8/B57
460	250			ECN4361CAA-A8/B64	ECN4362CAA-A8/B64	ECN4363CAA-A8/B64	ECN4368CAA-A8/B64
	300			ECN4361CAA-A8/B69	ECN4362CAA-A8/B69	ECN4363CAA-A8/B69	ECN4368CAA-A8/B69
	400			ECN4361CAA-A8/B74	ECN4362CAA-A8/B74	ECN4363CAA-A8/B74	ECN4368CAA-A8/B74
575	250			ECN4361DAA-A8/B65	ECN4362DAA-A8/B65	ECN4363DAA-A8/B65	ECN4368DAA-A8/B65
	300			ECN4361DAA-A8/B70	ECN4362DAA-A8/B70	ECN4363DAA-A8/B70	ECN4368DAA-A8/B70
	400			ECN4361DAA-A8/B75	ECN4362DAA-A8/B75	ECN4363DAA-A8/B75	ECN4368DAA-A8/B75
NEMA Size 7 (810A)							
230	250	120	④	ECN4371BAA-A8/B62	ECN4372BAA-A8/B62	ECN4373BAA-A8/B62	ECN4378BAA-A8/B62
	300			ECN4371BAA-A8/B67	ECN4372BAA-A8/B67	ECN4373BAA-A8/B67	ECN4378BAA-A8/B67
460	450			ECN4371CAA-A8/B78	ECN4372CAA-A8/B78	ECN4373CAA-A8/B78	ECN4378CAA-A8/B78
	500			ECN4371CAA-A8/B81	ECN4372CAA-A8/B81	ECN4373CAA-A8/B81	ECN4378CAA-A8/B81
	600			ECN4371CAA-A8/B84	ECN4372CAA-A8/B84	ECN4373CAA-A8/B84	ECN4378CAA-A8/B84
575	450			ECN4371DAA-A8/B79	ECN4372DAA-A8/B79	ECN4373DAA-A8/B79	ECN4378DAA-A8/B79
	500			ECN4371DAA-A8/B82	ECN4372DAA-A8/B82	ECN4373DAA-A8/B82	ECN4378DAA-A8/B82
	600			ECN4371DAA-A8/B85	ECN4372DAA-A8/B85	ECN4373DAA-A8/B85	ECN4378DAA-A8/B85
NEMA Size 8 (1215A)							
230	400	120	④	ECN4381BAA-A8/B72	ECN4382BAA-A8/B72	ECN4383BAA-A8/B72	ECN4388BAA-A8/B72
	450			ECN4381BAA-A8/B76	ECN4382BAA-A8/B76	ECN4383BAA-A8/B76	ECN4388BAA-A8/B76
460	700			ECN4381CAA-A8/B87	ECN4382CAA-A8/B87	ECN4383CAA-A8/B87	ECN4388CAA-A8/B87
	800			ECN4381CAA-A8/B91	ECN4382CAA-A8/B91	ECN4383CAA-A8/B91	ECN4388CAA-A8/B91
	900			ECN4381CAA-A8/B94	ECN4382CAA-A8/B94	ECN4383CAA-A8/B94	ECN4388CAA-A8/B94
575	700			ECN4381DAA-A8/B88	ECN4382DAA-A8/B88	ECN4383DAA-A8/B88	ECN4388DAA-A8/B88
	800			ECN4381DAA-A8/B92	ECN4382DAA-A8/B92	ECN4383DAA-A8/B92	ECN4388DAA-A8/B92
	900			ECN4381DAA-A8/B95	ECN4382DAA-A8/B95	ECN4383DAA-A8/B95	ECN4388DAA-A8/B95
NEMA Size 9 (2250A)							
230	800	120	④	ECN4391BAA-A8/B89	ECN4392BAA-A8/B89	ECN4393BAA-A8/B89	ECN4398BAA-A8/B89
460	1600			ECN4391CAA-A8/B96	ECN4392CAA-A8/B96	ECN4393CAA-A8/B96	ECN4398CAA-A8/B96
575	1600			ECN4391DAA-A8/B97	ECN4392DAA-A8/B97	ECN4393DAA-A8/B97	ECN4398DAA-A8/B97

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door lock.
- ④ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

Class ECN44—Combination Autotransformer Starter—Circuit Breaker

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4 Water and Dust-Tight Painted Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number
NEMA Size 2 (45A)							
200	10	120	50A	ECN4421EAF-A8/B1	ECN4422EAF-A8/B1	ECN4423EAF-A8/B1	ECN4428EAF-A8/B1
230	10			ECN4421BAF-A8/B2	ECN4422BAF-A8/B2	ECN4423BAF-A8/B2	ECN4428BAF-A8/B2
	15			ECN4421BAF-A8/B7	ECN4422BAF-A8/B7	ECN4423BAF-A8/B7	ECN4428BAF-A8/B7
460	10			ECN4421CAF-A8/B4	ECN4422CAF-A8/B4	ECN4423CAF-A8/B4	ECN4428CAF-A8/B4
	15			ECN4421CAF-A8/B9	ECN4422CAF-A8/B9	ECN4423CAF-A8/B9	ECN4428CAF-A8/B9
	20			ECN4421CAF-A8/B14	ECN4422CAF-A8/B14	ECN4423CAF-A8/B14	ECN4428CAF-A8/B14
	25			ECN4421CAF-A8/B19	ECN4422CAF-A8/B19	ECN4423CAF-A8/B19	ECN4428CAF-A8/B19
575	10			ECN4421DA9-A8/B5	ECN4422DA9-A8/B5	ECN4423DA9-A8/B5	ECN4428DA9-A8/B5
	15			ECN4421DA9-A8/B10	ECN4422DA9-A8/B10	ECN4423DA9-A8/B10	ECN4428DA9-A8/B10
	20			ECN4421DA9-A8/B15	ECN4422DA9-A8/B15	ECN4423DA9-A8/B15	ECN4428DA9-A8/B15
	25			ECN4421DA9-A8/B20	ECN4422DA9-A8/B20	ECN4423DA9-A8/B20	ECN4428DA9-A8/B20
NEMA Size 3 (90A)							
200	15	120	100A	ECN4431EAG-A8/B6	ECN4432EAG-A8/B6	ECN4433EAG-A8/B6	ECN4438EAG-A8/B6
	20			ECN4431EAG-A8/B11	ECN4432EAG-A8/B11	ECN4433EAG-A8/B11	ECN4438EAG-A8/B11
	25			ECN4431EAG-A8/B16	ECN4432EAG-A8/B16	ECN4433EAG-A8/B16	ECN4438EAG-A8/B16
230	20			ECN4431BAG-A8/B12	ECN4432BAG-A8/B12	ECN4433BAG-A8/B12	ECN4438BAG-A8/B12
	25			ECN4431BAG-A8/B17	ECN4432BAG-A8/B17	ECN4433BAG-A8/B17	ECN4438BAG-A8/B17
	30			ECN4431BAG-A8/B22	ECN4432BAG-A8/B22	ECN4433BAG-A8/B22	ECN4438BAG-A8/B22
460	30			ECN4431CAG-A8/B24	ECN4432CAG-A8/B24	ECN4433CAG-A8/B24	ECN4438CAG-A8/B24
	40			ECN4431CAG-A8/B29	ECN4432CAG-A8/B29	ECN4433CAG-A8/B29	ECN4438CAG-A8/B29
	50			ECN4431CAG-A8/B34	ECN4432CAG-A8/B34	ECN4433CAG-A8/B34	ECN4438CAG-A8/B34
575	30			ECN4431DAI-A8/B25	ECN4432DAI-A8/B25	ECN4433DAI-A8/B25	ECN4438DAI-A8/B25
	40			ECN4431DAI-A8/B30	ECN4432DAI-A8/B30	ECN4433DAI-A8/B30	ECN4438DAI-A8/B30
	50			ECN4431DAI-A8/B35	ECN4432DAI-A8/B35	ECN4433DAI-A8/B35	ECN4438DAI-A8/B35
NEMA Size 4 (135A)							
200	30	120	150A	ECN4441EAH-A8/B21	ECN4442EAH-A8/B21	ECN4443EAH-A8/B21	ECN4448EAH-A8/B21
	40			ECN4441EAH-A8/B26	ECN4442EAH-A8/B26	ECN4443EAH-A8/B26	ECN4448EAH-A8/B26
230	40			ECN4441BAH-A8/B27	ECN4442BAH-A8/B27	ECN4443BAH-A8/B27	ECN4448BAH-A8/B27
	50			ECN4441BAH-A8/B32	ECN4442BAH-A8/B32	ECN4443BAH-A8/B32	ECN4448BAH-A8/B32
460	75			ECN4441CAH-A8/B39	ECN4442CAH-A8/B39	ECN4443CAH-A8/B39	ECN4448CAH-A8/B39
	100			ECN4441CAH-A8/B44	ECN4442CAH-A8/B44	ECN4443CAH-A8/B44	ECN4448CAH-A8/B44
575	75			ECN4441DAH-A8/B40	ECN4442DAH-A8/B40	ECN4443DAH-A8/B40	ECN4448DAH-A8/B40
	100			ECN4441DAH-A8/B45	ECN4442DAH-A8/B45	ECN4443DAH-A8/B45	ECN4448DAH-A8/B45
NEMA Size 5 (270A)							
200	50	120	250A	ECN4451EAJ-A8/B31	ECN4452EAJ-A8/B31	ECN4453EAJ-A8/B31	ECN4458EAJ-A8/B31
	75		400A	ECN4451EAK-A8/B36	ECN4452EAK-A8/B36	ECN4453EAK-A8/B36	ECN4458EAK-A8/B36
230	75		250A	ECN4451BAJ-A8/B37	ECN4452BAJ-A8/B37	ECN4453BAJ-A8/B37	ECN4458BAJ-A8/B37
	100		400A	ECN4451BAK-A8/B42	ECN4452BAK-A8/B42	ECN4453BAK-A8/B42	ECN4458BAK-A8/B42
460	125		250A	ECN4451CAJ-A8/B49	ECN4452CAJ-A8/B49	ECN4453CAJ-A8/B49	ECN4458CAJ-A8/B49
	150			ECN4451CAJ-A8/B54	ECN4452CAJ-A8/B54	ECN4453CAJ-A8/B54	ECN4458CAJ-A8/B54
	200		400A	ECN4451CAK-A8/B59	ECN4452CAK-A8/B59	ECN4453CAK-A8/B59	ECN4458CAK-A8/B59
575	125		250A	ECN4451DAJ-A8/B50	ECN4452DAJ-A8/B50	ECN4453DAJ-A8/B50	ECN4458DAJ-A8/B50
	150			ECN4451DAJ-A8/B55	ECN4452DAJ-A8/B55	ECN4453DAJ-A8/B55	ECN4458DAJ-A8/B55
	200			ECN4451DAJ-A8/B60	ECN4452DAJ-A8/B60	ECN4453DAJ-A8/B60	ECN4458DAJ-A8/B60

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, Tab 15.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door lock.

Class ECN44—Combination Autotransformer Starter—Circuit Breaker, continued

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4 Water and Dust-Tight Painted Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number
NEMA Size 6 (540A)							
200	100	120	600A	ECN4461EAL-A8/B41	ECN4462EAL-A8/B41	ECN4463EAL-A8/B41	ECN4468EAL-A8/B41
	125			ECN4461EAL-A8/B46	ECN4462EAL-A8/B46	ECN4463EAL-A8/B46	ECN4468EAL-A8/B46
	150			ECN4461EAL-A8/B51	ECN4462EAL-A8/B51	ECN4463EAL-A8/B51	ECN4468EAL-A8/B51
230	125			ECN4461BAL-A8/B47	ECN4462BAL-A8/B47	ECN4463BAL-A8/B47	ECN4468BAL-A8/B47
	150			ECN4461BAL-A8/B52	ECN4462BAL-A8/B52	ECN4463BAL-A8/B52	ECN4468BAL-A8/B52
	200			800A	ECN4461BAM-A8/B57	ECN4462BAM-A8/B57	ECN4463BAM-A8/B57
460	250		600A	ECN4461CAL-A8/B64	ECN4462CAL-A8/B64	ECN4463CAL-A8/B64	ECN4468CAL-A8/B64
	300			ECN4461CAL-A8/B69	ECN4462CAL-A8/B69	ECN4463CAL-A8/B69	ECN4468CAL-A8/B69
	400			800A	ECN4461CAM-A8/B74	ECN4462CAM-A8/B74	ECN4463CAM-A8/B74
575	250		600A	ECN4461DAL-A8/B65	ECN4462DAL-A8/B65	ECN4463DAL-A8/B65	ECN4468DAL-A8/B65
	300			ECN4461DAL-A8/B70	ECN4462DAL-A8/B70	ECN4463DAL-A8/B70	ECN4468DAL-A8/B70
	400			ECN4461DAM-A8/B75	ECN4462DAM-A8/B75	ECN4463DAM-A8/B75	ECN4468DAM-A8/B75
NEMA Size 7 (810A)							
230	250	120	④	ECN4471BAU-A8/B62	ECN4472BAU-A8/B62	ECN4473BAU-A8/B62	ECN4478BAU-A8/B62
	300			ECN4471BAU-A8/B67	ECN4472BAU-A8/B67	ECN4473BAU-A8/B67	ECN4478BAU-A8/B67
460	450			ECN4471CAU-A8/B78	ECN4472CAU-A8/B78	ECN4473CAU-A8/B78	ECN4478CAU-A8/B78
	500			ECN4471CAU-A8/B81	ECN4472CAU-A8/B81	ECN4473CAU-A8/B81	ECN4478CAU-A8/B81
	600			ECN4471CAU-A8/B84	ECN4472CAU-A8/B84	ECN4473CAU-A8/B84	ECN4478CAU-A8/B84
575	450			ECN4471DAU-A8/B79	ECN4472DAU-A8/B79	ECN4473DAU-A8/B79	ECN4478DAU-A8/B79
	500			ECN4471DAU-A8/B82	ECN4472DAU-A8/B82	ECN4473DAU-A8/B82	ECN4478DAU-A8/B82
	600			ECN4471DAU-A8/B85	ECN4472DAU-A8/B85	ECN4473DAU-A8/B85	ECN4478DAU-A8/B85
NEMA Size 8 (1215A)							
230	400	120	④	ECN4481BAU-A8/B72	ECN4482BAU-A8/B72	ECN4483BAU-A8/B72	ECN4488BAU-A8/B72
	450			ECN4481BAU-A8/B76	ECN4482BAU-A8/B76	ECN4483BAU-A8/B76	ECN4488BAU-A8/B76
460	700			ECN4481CAU-A8/B87	ECN4482CAU-A8/B87	ECN4483CAU-A8/B87	ECN4488CAU-A8/B87
	800			ECN4481CAU-A8/B91	ECN4482CAU-A8/B91	ECN4483CAU-A8/B91	ECN4488CAU-A8/B91
	900			ECN4481CAU-A8/B94	ECN4482CAU-A8/B94	ECN4483CAU-A8/B94	ECN4488CAU-A8/B94
575	700			ECN4481DAU-A8/B88	ECN4482DAU-A8/B88	ECN4483DAU-A8/B88	ECN4488DAU-A8/B88
	800			ECN4481DAU-A8/B92	ECN4482DAU-A8/B92	ECN4483DAU-A8/B92	ECN4488DAU-A8/B92
	900			ECN4481DAU-A8/B95	ECN4482DAU-A8/B95	ECN4483DAU-A8/B95	ECN4488DAU-A8/B95
NEMA Size 9 (2250A)							
230	800	120	④	ECN4491BAU-A8/B89	ECN4492BAU-A8/B89	ECN4493BAU-A8/B89	ECN4498BAU-A8/B89
460	1600			ECN4491CAU-A8/B96	ECN4492CAU-A8/B96	ECN4493CAU-A8/B96	ECN4498CAU-A8/B96
575	1600			ECN4491DAU-A8/B97	ECN4492DAU-A8/B97	ECN4493DAU-A8/B97	ECN4498DAU-A8/B97

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door lock.
- ④ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

Part Winding

Features

- Non-combination and combination designs
- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600V maximum

Class ECN45—Non-Combination Part Winding Starter

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset ③ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 2PW							
200	20	120	ECN4521EAA	ECN4522EAA	ECN4524EAA	ECN4528EAA	AN16GN0AB
230	25		ECN4521BAA	ECN4522BAA	ECN4524BAA	ECN4528BAA	
460	40		ECN4521CAA	ECN4522CAA	ECN4524CAA	ECN4528CAA	
575	40		ECN4521DAA	ECN4522DAA	ECN4524DAA	ECN4528DAA	
NEMA Size 3PW							
200	40	120	ECN4531EAA	ECN4532EAA	ECN4534EAA	ECN4538EAA	AN16KN0AB
230	50		ECN4531BAA	ECN4532BAA	ECN4534BAA	ECN4538BAA	
460	75		ECN4531CAA	ECN4532CAA	ECN4534CAA	ECN4538CAA	
575	75		ECN4531DAA	ECN4532DAA	ECN4534DAA	ECN4538DAA	
NEMA Size 4PW							
200	75	120	ECN4541EAA	ECN4542EAA	ECN4544EAA	ECN4548EAA	AN16NN0AB
230	75		ECN4541BAA	ECN4542BAA	ECN4544BAA	ECN4548BAA	
460	150		ECN4541CAA	ECN4542CAA	ECN4544CAA	ECN4548CAA	
575	150		ECN4541DAA	ECN4542DAA	ECN4544DAA	ECN4548DAA	
NEMA Size 5PW							
200	150	120	ECN4551EAA	ECN4552EAA	ECN4554EAA	ECN4558EAA	AN16SN0AB
230	150		ECN4551BAA	ECN4552BAA	ECN4554BAA	ECN4558BAA	
460	350		ECN4551CAA	ECN4552CAA	ECN4554CAA	ECN4558CAA	
575	350		ECN4551DAA	ECN4552DAA	ECN4554DAA	ECN4558DAA	
NEMA Size 6PW							
230	300	120	ECN4561BAA	ECN4562BAA	ECN4563BAA ④	ECN4568BAA	AN16TN0AB
460	600		ECN4561CAA	ECN4562CAA	ECN4563CAA ④	ECN4568CAA	
575	600		ECN4561DAA	ECN4562DAA	ECN4563DAA ④	ECN4568DAA	
NEMA Size 7PW							
230	450	120	ECN4571BAA	ECN4572BAA	ECN4573BAA ④	ECN4578BAA	AN16UN0AB
460	900		ECN4571CAA	ECN4572CAA	ECN4573CAA ④	ECN4578CAA	
575	900		ECN4571DAA	ECN4572DAA	ECN4573DAA ④	ECN4578DAA	
NEMA Size 8PW							
230	700	120	ECN4581BAA	ECN4582BAA	ECN4583BAA ④	ECN4588BAA	AN16VN0AB
460	1400		ECN4581CAA	ECN4582CAA	ECN4583CAA ④	ECN4588CAA	
575	1400		ECN4581DAA	ECN4582DAA	ECN4583DAA ④	ECN4588DAA	

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4524EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code R5.
- ④ Type 4 (painted steel) sizes 6–8PW.

Class ECN46—Combination Part Winding Starter—Fusible Disconnect

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset ③④ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 2PW								
200	20	120	100A	ECN4621EAF	ECN4622EAF	ECN4624EAF	ECN4628EAF	AN16GN0AB
230	15		60A	ECN4621BAD	ECN4622BAD	ECN4624BAD	ECN4628BAD	AN16GN0AB
	25		100A	ECN4621BAF	ECN4622BAF	ECN4624BAF	ECN4628BAF	
460	30		60A	ECN4621CAE	ECN4622CAE	ECN4624CAE	ECN4628CAE	AN16GN0AB
	40		100A	ECN4621CAG	ECN4622CAG	ECN4624CAG	ECN4628CAG	
575	20		30A	ECN4621DAC	ECN4622DAC	ECN4624DAC	ECN4628DAC	AN16GN0AB
	40		60A	ECN4621DAE	ECN4622DAE	ECN4624DAE	ECN4628DAE	
NEMA Size 3PW								
200	40	120	200A	ECN4631EAH	ECN4632EAH	ECN4634EAH	ECN4638EAH	AN16KN0AB
230	50			ECN4631BAH	ECN4632BAH	ECN4634BAH	ECN4638BAH	AN16KN0AB
460	50		100A	ECN4631CAG	ECN4632CAG	ECN4634CAG	ECN4638CAG	AN16KN0AB
	75		200A	ECN4631CAJ	ECN4632CAJ	ECN4634CAJ	ECN4638CAJ	
575	60		100A	ECN4631DAG	ECN4632DAG	ECN4634DAG	ECN4638DAG	AN16KN0AB
	75		200A	ECN4631DAJ	ECN4632DAJ	ECN4634DAJ	ECN4638DAJ	
NEMA Size 4PW								
200	50	120	200A	ECN4641EAH	ECN4642EAH	ECN4644EAH	ECN4648EAH	AN16NN0AB
	75		400A	ECN4641EAK	ECN4642EAK	ECN4644EAK	ECN4648EAK	
230	75			ECN4641BAK	ECN4642BAK	ECN4644BAK	ECN4648BAK	AN16NN0AB
460	100		200A	ECN4641CAJ	ECN4642CAJ	ECN4644CAJ	ECN4648CAJ	AN16NN0AB
	150		400A	ECN4641CAL	ECN4642CAL	ECN4644CAL	ECN4648CAL	
575	150		200A	ECN4641DAJ	ECN4642DAJ	ECN4644DAJ	ECN4648DAJ	AN16NN0AB

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ④ Type 12 enclosure is without safety door interlock.

Class ECN46—Combination Part Winding Starter—Fusible Disconnect, continued

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset ③④ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 5PW								
200	100	120	200	ECN4651EAK	ECN4652EAK	ECN4654EAK	ECN4658EAK	AN16SN0AB
	150			ECN4651EAM	ECN4652EAM	ECN4654EAM	ECN4658EAM	
230	100		230	ECN4651BAK	ECN4652BAK	ECN4654BAK	ECN4658BAK	AN16SN0AB
	150			ECN4651BAM	ECN4652BAM	ECN4654BAM	ECN4658BAM	
460	200		460	ECN4651CAL	ECN4652CAL	ECN4654CAL	ECN4658CAL	AN16SN0AB
	350			ECN4651CAN	ECN4652CAN	ECN4654CAN	ECN4658CAN	
575	300		575	ECN4651DAL	ECN4652DAL	ECN4654DAL	ECN4658DAL	AN16SN0AB
	350			ECN4651DAN	ECN4652DAN	ECN4654DAN	ECN4658DAN	
NEMA Size 6PW								
230	300	120	⑤	ECN4661BAU	ECN4662BAU	ECN4663BAU ⑥	ECN4668BAU	AN16TN0AB
460	600			ECN4661CAU	ECN4662CAU	ECN4663CAU ⑥	ECN4668CAU	
575	600			ECN4661DAU	ECN4662DAU	ECN4663DAU ⑥	ECN4668DAU	
NEMA Size 7PW								
230	450	120	⑤	ECN4671BAU	ECN4672BAU	ECN4673BAU ⑥	ECN4678BAU	AN16UN0AB
460	900			ECN4671CAU	ECN4672CAU	ECN4673CAU ⑥	ECN4678CAU	
575	900			ECN4671DAU	ECN4672DAU	ECN4673DAU ⑥	ECN4678DAU	
NEMA Size 8PW								
230	700	120	⑤	ECN4681BAU	ECN4682BAU	ECN4683BAU ⑥	ECN4688BAU	AN16VN0AB
460	1400			ECN4681CAU	ECN4682CAU	ECN4683CAU ⑥	ECN4688CAU	
575	1400			ECN4681DAU	ECN4682DAU	ECN4683DAU ⑥	ECN4688DAU	

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ④ Type 12 enclosure is without safety door interlock.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑥ Type 4 (painted steel) sizes 6–8PW.

Class ECN46—Combination Part Winding Starter—Non-Fusible Disconnect

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Disconnect Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset ③④ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 2PW								
200	20	120	60A	ECN4621EAA	ECN4622EAA	ECN4624EAA	ECN4628EAA	AN16GN0AB
230	25			ECN4621BAA	ECN4622BAA	ECN4624BAA	ECN4628BAA	
460	40			ECN4621CAA	ECN4622CAA	ECN4624CAA	ECN4628CAA	
575	40			ECN4621DAA	ECN4622DAA	ECN4624DAA	ECN4628DAA	
NEMA Size 3PW								
200	40	120	100A	ECN4631EAA	ECN4632EAA	ECN4634EAA	ECN4638EAA	AN16KN0AB
230	50			ECN4631BAA	ECN4632BAA	ECN4634BAA	ECN4638BAA	
460	75			ECN4631CAA	ECN4632CAA	ECN4634CAA	ECN4638CAA	
575	75			ECN4631DAA	ECN4632DAA	ECN4634DAA	ECN4638DAA	
NEMA Size 4PW								
200	75	120	200A	ECN4641EAA	ECN4642EAA	ECN4644EAA	ECN4648EAA	AN16NN0AB
230	75			ECN4641BAA	ECN4642BAA	ECN4644BAA	ECN4648BAA	
460	150			ECN4641CAA	ECN4642CAA	ECN4644CAA	ECN4648CAA	
575	150			ECN4641DAA	ECN4642DAA	ECN4644DAA	ECN4648DAA	
NEMA Size 5PW								
200	150	120	400A	ECN4651EAA	ECN4652EAA	ECN4654EAA	ECN4658EAA	AN16SN0AB
230	150			ECN4651BAA	ECN4652BAA	ECN4654BAA	ECN4658BAA	
460	350			ECN4651CAA	ECN4652CAA	ECN4654CAA	ECN4658CAA	
575	350			ECN4651DAA	ECN4652DAA	ECN4654DAA	ECN4658DAA	
NEMA Size 6PW								
230	300	120	600A	ECN4661BAA	ECN4662BAA	ECN4663BAA ⑤	ECN4668BAA	AN16TN0AB
460	600			ECN4661CAA	ECN4662CAA	ECN4663CAA ⑤	ECN4668CAA	
575	600			ECN4661DAA	ECN4662DAA	ECN4663DAA ⑤	ECN4668DAA	
NEMA Size 7PW								
230	450	120	⑥	ECN4671BAA	ECN4672BAA	ECN4673BAA ⑤	ECN4678BAA	AN16UN0AB
460	900			ECN4671CAA	ECN4672CAA	ECN4673CAA ⑤	ECN4678CAA	
575	900			ECN4671DAA	ECN4672DAA	ECN4673DAA ⑤	ECN4678DAA	
NEMA Size 8PW								
230	700	120	⑥	ECN4681BAA	ECN4682BAA	ECN4683BAA ⑤	ECN4688BAA	AN16VN0AB
460	1400			ECN4681CAA	ECN4682CAA	ECN4683CAA ⑤	ECN4688CAA	
575	1400			ECN4681DAA	ECN4682DAA	ECN4683DAA ⑤	ECN4688DAA	

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ④ Type 12 enclosure is without safety door interlock.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑥ Type 4 (painted steel) sizes 6–8PW.

Class ECN47—Combination Part Winding Starter—Circuit Breaker

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset ③④ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 2PW								
200	15	120	70A	ECN4721EAH	ECN4722EAH	ECN4724EAH	ECN4728EAH	AN16GN0AB
	20		100A	ECN4721EAK	ECN4722EAK	ECN4724EAK	ECN4728EAK	
230	15		70A	ECN4721BAH	ECN4722BAH	ECN4724BAH	ECN4728BAH	AN16GN0AB
	20		90A	ECN4721BAJ	ECN4722BAJ	ECN4724BAJ	ECN4728BAJ	
	25		100A	ECN4721BAK	ECN4722BAK	ECN4724BAK	ECN4728BAK	
460	20		40A	ECN4721CAE	ECN4722CAE	ECN4724CAE	ECN4728CAE	AN16GN0AB
	30		60A	ECN4721CAG	ECN4722CAG	ECN4724CAG	ECN4728CAG	
	40		90A	ECN4721CAJ	ECN4722CAJ	ECN4724CAJ	ECN4728CAJ	
575	25		40A	ECN4721DAE	ECN4722DAE	ECN4724DAE	ECN4728DAE	AN16GN0AB
	30		50A	ECN4721DAF	ECN4722DAF	ECN4724DAF	ECN4728DAF	
	40		60A	ECN4721DAG	ECN4722DAG	ECN4724DAG	ECN4728DAG	
NEMA Size 3PW								
200	40	120	125A	ECN4731EAL	ECN4732EAL	ECN4734EAL	ECN4738EAL	AN16KN0AB
230	40			ECN4731BAL	ECN4732BAL	ECN4734BAL	ECN4738BAL	AN16KN0AB
		50	150A	ECN4731BAM	ECN4732BAM	ECN4734BAM	ECN4738BAM	
460	50		100A	ECN4731CAK	ECN4732CAK	ECN4734CAK	ECN4738CAK	AN16KN0AB
	75		125A	ECN4731CAL	ECN4732CAL	ECN4734CAL	ECN4738CAL	
575	50		90A	ECN4731DAJ	ECN4732DAJ	ECN4734DAJ	ECN4738DAJ	AN16KN0AB
	60		100A	ECN4731DAK	ECN4732DAK	ECN4734DAK	ECN4738DAK	
	75		125A	ECN4731DAL	ECN4732DAL	ECN4734DAL	ECN4738DAL	
NEMA Size 4PW								
200	50	120	200A	ECN4741EAP	ECN4742EAP	ECN4744EAP	ECN4748EAP	AN16NN0AB
	60		225A	ECN4741EAQ	ECN4742EAQ	ECN4744EAQ	ECN4748EAQ	
	75		300A	ECN4741EAS	ECN4742EAS	ECN4744EAS	ECN4748EAS	
230	60		200A	ECN4741BAP	ECN4742BAP	ECN4744BAP	ECN4748BAP	AN16NN0AB
	75		250A	ECN4741BAR	ECN4742BAR	ECN4744BAR	ECN4748BAR	
460	100		150A	ECN4741CAM	ECN4742CAM	ECN4744CAM	ECN4748CAM	AN16NN0AB
	125		225A	ECN4741CAQ	ECN4742CAQ	ECN4744CAQ	ECN4748CAQ	
	150		250A	ECN4741CAR	ECN4742CAR	ECN4744CAR	ECN4748CAR	
575	100		125A	ECN4741DAL	ECN4742DAL	ECN4744DAL	ECN4748DAL	AN16NN0AB
	125		150A	ECN4741DAM	ECN4742DAM	ECN4744DAM	ECN4748DAM	
	150		200A	ECN4741DAP	ECN4742DAP	ECN4744DAP	ECN4748DAP	

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ④ Type 12 enclosure is without safety door interlock.

Class ECN47—Combination Part Winding Starter—Circuit Breaker, continued

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ② Catalog Number	Type 12 Dust-Tight Industrial External Reset ③④ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 5PW								
200	100	120	350A	ECN4751EAV	ECN4752EAV	ECN4754EAV	ECN4758EAV	AN16SN0AB
	125		500A	ECN4751EAY	ECN4752EAY	ECN4754EAY	ECN4758EAY	
	150		600A	ECN4751EAZ	ECN4752EAZ	ECN4754EAZ	ECN4758EAZ	
230	100		350A	ECN4751BAV	ECN4752BAV	ECN4754BAV	ECN4758BAV	AN16SN0AB
	125		400A	ECN4751BAW	ECN4752BAW	ECN4754BAW	ECN4758BAW	
	150		500A	ECN4751BAY	ECN4752BAY	ECN4754BAY	ECN4758BAY	
460	200		350A	ECN4751CAV	ECN4752CAV	ECN4754CAV	ECN4758CAV	AN16SN0AB
	250		400A	ECN4751CAW	ECN4752CAW	ECN4754CAW	ECN4758CAW	
	300		500A	ECN4751CAY	ECN4752CAY	ECN4754CAY	ECN4758CAY	
	350		600A	ECN4751CAZ	ECN4752CAZ	ECN4754CAZ	ECN4758CAZ	
575	200		250A	ECN4751DAR	ECN4752DAR	ECN4754DAR	ECN4758DAR	AN16SN0AB
	300		350A	ECN4751DAV	ECN4752DAV	ECN4754DAV	ECN4758DAV	
	350		500A	ECN4751DAY	ECN4752DAY	ECN4754DAY	ECN4758DAY	
NEMA Size 6PW								
230	300	120	⑤	ECN4761BAU	ECN4762BAU	ECN4763BAU ⑥	ECN4768BAU	AN16TN0AB
460	600			ECN4761CAU	ECN4762CAU	ECN4763CAU ⑥	ECN4768CAU	AN16TN0AB
575	600			ECN4761DAU	ECN4762DAU	ECN4763DAU ⑥	ECN4768DAU	AN16TN0AB
NEMA Size 7PW								
230	450	120	⑤	ECN4771BAU	ECN4772BAU	ECN4773BAU ⑥	ECN4778BAU	AN16UN0AB
460	900			ECN4771CAU	ECN4772CAU	ECN4773CAU ⑥	ECN4778CAU	AN16UN0AB
575	900			ECN4771DAU	ECN4772DAU	ECN4773DAU ⑥	ECN4778DAU	AN16UN0AB
NEMA Size 8PW								
230	700	120	⑤	ECN4781BAU	ECN4782BAU	ECN4783BAU ⑥	ECN4788BAU	AN16VN0AB
460	1400			ECN4781CAU	ECN4782CAU	ECN4783CAU ⑥	ECN4788CAU	AN16VN0AB
575	1400			ECN4781DAU	ECN4782DAU	ECN4783DAU ⑥	ECN4788DAU	AN16VN0AB

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ④ Type 12 enclosure is without safety door interlock.
- ⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑥ Type 4 (painted steel) sizes 6–8PW.

Wye Delta

Features

- Open or closed transition
- Non-combination and combination designs
- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600V maximum

Class ECN48—Non-Combination Open Transition Wye Delta Starter

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ^①	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^③ Catalog Number	Component Starter (Open) ^④ Catalog Number
2YD	200	20	120	ECN4821EAA	ECN4822EAA	ECN4824EAA	ECN4828EAA	AN16GN0AB
3YD		40		ECN4831EAA	ECN4832EAA	ECN4834EAA	ECN4838EAA	AN16KN0AB
4YD		60		ECN4841EAA	ECN4842EAA	ECN4844EAA	ECN4848EAA	AN16NN0AB
5YD		150		ECN4851EAA	ECN4852EAA	ECN4854EAA	ECN4858EAA	AN16SN0AB
6YD		300		ECN4861EAA	ECN4862EAA	ECN4863EAA ^④	ECN4868EAA	AN16TN0AB
7YD		500		ECN4871EAA	ECN4872EAA	ECN4873EAA ^④	ECN4878EAA	AN16UN0AB
8YD		750		ECN4881EAA	ECN4882EAA	ECN4883EAA ^④	ECN4888EAA	AN16VN0AB
2YD	230	25	120	ECN4821BAA	ECN4822BAA	ECN4824BAA	ECN4828BAA	AN16GN0AB
3YD		50		ECN4831BAA	ECN4832BAA	ECN4834BAA	ECN4838BAA	AN16KN0AB
4YD		75		ECN4841BAA	ECN4842BAA	ECN4844BAA	ECN4848BAA	AN16NN0AB
5YD		150		ECN4851BAA	ECN4852BAA	ECN4854BAA	ECN4858BAA	AN16SN0AB
6YD		350		ECN4861BAA	ECN4862BAA	ECN4863BAA ^④	ECN4868BAA	AN16TN0AB
7YD		500		ECN4871BAA	ECN4872BAA	ECN4873BAA ^④	ECN4878BAA	AN16UN0AB
8YD		800		ECN4881BAA	ECN4882BAA	ECN4883BAA ^④	ECN4888BAA	AN16VN0AB
2YD	460	40	120	ECN4821CAA	ECN4822CAA	ECN4824CAA	ECN4828CAA	AN16GN0AB
3YD		75		ECN4831CAA	ECN4832CAA	ECN4834CAA	ECN4838CAA	AN16KN0AB
4YD		150		ECN4841CAA	ECN4842CAA	ECN4844CAA	ECN4848CAA	AN16NN0AB
5YD		300		ECN4851CAA	ECN4852CAA	ECN4854CAA	ECN4858CAA	AN16SN0AB
6YD		700		ECN4861CAA	ECN4862CAA	ECN4863CAA ^④	ECN4868CAA	AN16TN0AB
7YD		1000		ECN4871CAA	ECN4872CAA	ECN4873CAA ^④	ECN4878CAA	AN16UN0AB
8YD		1500		ECN4881CAA	ECN4882CAA	ECN4883CAA ^④	ECN4888CAA	AN16VN0AB
2YD	575	40	120	ECN4821DAA	ECN4822DAA	ECN4824DAA	ECN4828DAA	AN16GN0AB
3YD		75		ECN4831DAA	ECN4832DAA	ECN4834DAA	ECN4838DAA	AN16KN0AB
4YD		150		ECN4841DAA	ECN4842DAA	ECN4844DAA	ECN4848DAA	AN16NN0AB
5YD		300		ECN4851DAA	ECN4852DAA	ECN4854DAA	ECN4858DAA	AN16SN0AB
6YD		700		ECN4861DAA	ECN4862DAA	ECN4863DAA ^④	ECN4868DAA	AN16TN0AB
7YD		1000		ECN4871DAA	ECN4872DAA	ECN4873DAA ^④	ECN4878DAA	AN16UN0AB
8YD		1500		ECN4881DAA	ECN4882DAA	ECN4883DAA ^④	ECN4888DAA	AN16VN0AB

Starters do not include heater packs. Select one carton of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ^① All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ^③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ^④ Also requires matching contactor with mechanical interlock.
- ^⑤ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Fusible Disconnect

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN4921EAD-W10/G1	ECN4922EAD-W10/G1	ECN4924EAD-W10/G1	ECN4928EAD-W10/G1	AN16GN0AB
	20	100A	ECN4921EAF-W10/G3	ECN4922EAF-W10/G3	ECN4924EAF-W10/G3	ECN4928EAF-W10/G3	
3YD	25	100A	ECN4931EAF-W10/G8	ECN4932EAF-W10/G8	ECN4934EAF-W10/G8	ECN4938EAF-W10/G8	AN16KN0AB
	30	200A	ECN4931EAH-W10/G13	ECN4932EAH-W10/G13	ECN4934EAH-W10/G13	ECN4938EAH-W10/G13	
	40		ECN4931EAH-W10/G18	ECN4932EAH-W10/G18	ECN4934EAH-W10/G18	ECN4938EAH-W10/G18	
4YD	50	200A	ECN4941EAH-W10/G23	ECN4942EAH-W10/G23	ECN4944EAH-W10/G23	ECN4948EAH-W10/G23	AN16NN0AB
	60	400A	ECN4941EAK-W10/G28	ECN4942EAK-W10/G28	ECN4944EAK-W10/G28	ECN4948EAK-W10/G28	
5YD	75	400A	ECN4951EAK-W10/G33	ECN4952EAK-W10/G33	ECN4954EAK-W10/G33	ECN4958EAK-W10/G33	AN16SN0AB
	100		ECN4951EAK-W10/G38	ECN4952EAK-W10/G38	ECN4954EAK-W10/G38	ECN4958EAK-W10/G38	
	125	600A	ECN4951EAM-W10/G43	ECN4952EAM-W10/G43	ECN4954EAM-W10/G43	ECN4958EAM-W10/G43	
	150		ECN4951EAM-W10/G48	ECN4952EAM-W10/G48	ECN4954EAM-W10/G48	ECN4958EAM-W10/G48	
6YD	200	⑥	ECN4961EAU-W10/G53	ECN4962EAU-W10/G53	ECN4963EAU-W10/G53 ⑦	ECN4968EAU-W10/G33	AN16TN0AB
	250		ECN4961EAU-W10/G58	ECN4962EAU-W10/G58	ECN4963EAU-W10/G58 ⑦	ECN4968EAU-W10/G58	
	300		ECN4961EAU-W10/G63	ECN4962EAU-W10/G63	ECN4963EAU-W10/G63 ⑦	ECN4968EAU-W10/G63	
7YD	350	⑥	ECN4971EAU-W10/G68	ECN4972EAU-W10/G68	ECN4973EAU-W10/G68 ⑦	ECN4978EAU-W10/G68	AN16UN0AB
	400		ECN4971EAU-W10/G73	ECN4972EAU-W10/G73	ECN4973EAU-W10/G73 ⑦	ECN4978EAU-W10/G73	
	450		ECN4971EAU-W10/G78	ECN4972EAU-W10/G78	ECN4973EAU-W10/G78 ⑦	ECN4978EAU-W10/G78	
	500		ECN4971EAU-W10/G83	ECN4972EAU-W10/G83	ECN4973EAU-W10/G83 ⑦	ECN4978EAU-W10/G83	
8YD	600	⑥	ECN4981EAU-W10/G88	ECN4982EAU-W10/G88	ECN4983EAU-W10/G88 ⑦	ECN4988EAU-W10/G88	AN16VN0AB
	700		ECN4981EAU-W10/G93	ECN4982EAU-W10/G93	ECN4983EAU-W10/G93 ⑦	ECN4988EAU-W10/G93	
	750		ECN4981EAU-W10/G98	ECN4982EAU-W10/G98	ECN4983EAU-W10/G98 ⑦	ECN4988EAU-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN4921BAD-W10/G2	ECN4922BAD-W10/G2	ECN4924BAD-W10/G2	ECN4928BAD-W10/G2	AN16GN0AB
	20	100A	ECN4921BAF-W10/G4	ECN4922BAF-W10/G4	ECN4924BAF-W10/G4	ECN4928BAF-W10/G4	
	25		ECN4921BAF-W10/G9	ECN4922BAF-W10/G9	ECN4924BAF-W10/G9	ECN4928BAF-W10/G9	
3YD	30	100A	ECN4931BAF-W10/G14	ECN4932BAF-W10/G14	ECN4934BAF-W10/G14	ECN4938BAF-W10/G14	AN16KN0AB
	40	200A	ECN4931BAH-W10/G19	ECN4932BAH-W10/G19	ECN4934BAH-W10/G19	ECN4938BAH-W10/G19	
	50		ECN4931BAH-W10/G24	ECN4932BAH-W10/G24	ECN4934BAH-W10/G24	ECN4938BAH-W10/G24	
4YD	60	200A	ECN4941BAH-W10/G29	ECN4942BAH-W10/G29	ECN4944BAH-W10/G29	ECN4948BAH-W10/G29	AN16NN0AB
	75	400A	ECN4941BAK-W10/G34	ECN4942BAK-W10/G34	ECN4944BAK-W10/G34	ECN4948BAK-W10/G34	
5YD	100	400A	ECN4951BAK-W10/G39	ECN4952BAK-W10/G39	ECN4954BAK-W10/G39	ECN4958BAK-W10/G39	AN16SN0AB
	125		ECN4951BAK-W10/G44	ECN4952BAK-W10/G44	ECN4954BAK-W10/G44	ECN4958BAK-W10/G44	
	150	600A	ECN4951BAM-W10/G49	ECN4952BAM-W10/G49	ECN4954BAM-W10/G49	ECN4958BAM-W10/G49	
6YD	200	600A	ECN4961BAM-W10/G54	ECN4962BAM-W10/G54	ECN4963BAM-W10/G54 ⑦	ECN4968BAM-W10/G54	AN16TN0AB
	250	⑥	ECN4961BAU-W10/G59	ECN4962BAU-W10/G59	ECN4963BAU-W10/G59 ⑦	ECN4968BAU-W10/G59	
	300		ECN4961BAU-W10/G64	ECN4962BAU-W10/G64	ECN4963BAU-W10/G64 ⑦	ECN4968BAU-W10/G64	
	350		ECN4961BAU-W10/G69	ECN4962BAU-W10/G69	ECN4963BAU-W10/G69 ⑦	ECN4968BAU-W10/G69	
7YD	400	⑥	ECN4971BAU-W10/G74	ECN4972BAU-W10/G74	ECN4973BAU-W10/G74 ⑦	ECN4978BAU-W10/G74	AN16UN0AB
	450		ECN4971BAU-W10/G79	ECN4972BAU-W10/G79	ECN4973BAU-W10/G79 ⑦	ECN4978BAU-W10/G79	
	500		ECN4971BAU-W10/G84	ECN4972BAU-W10/G84	ECN4973BAU-W10/G84 ⑦	ECN4978BAU-W10/G84	
8YD	600	⑥	ECN4981BAU-W10/G89	ECN4982BAU-W10/G89	ECN4983BAU-W10/G89 ⑦	ECN4988BAU-W10/G89	AN16VN0AB
	700		ECN4981BAU-W10/G94	ECN4982BAU-W10/G94	ECN4983BAU-W10/G94 ⑦	ECN4988BAU-W10/G94	
	750		ECN4981BAU-W10/G99	ECN4982BAU-W10/G99	ECN4983BAU-W10/G99 ⑦	ECN4988BAU-W10/G99	
	800		ECN4981BAU-W10/G103	ECN4982BAU-W10/G103	ECN4983BAU-W10/G103 ⑦	ECN4988BAU-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ⑤							
2YD	20	60A	ECN4921CAE-W10/G6	ECN4922CAE-W10/G6	ECN4924CAE-W10/G6	ECN4928CAE-W10/G6	AN16GN0AB
	25		ECN4921CAE-W10/G11	ECN4922CAE-W10/G11	ECN4924CAE-W10/G11	ECN4928CAE-W10/G11	
	30		ECN4921CAE-W10/G16	ECN4922CAE-W10/G16	ECN4924CAE-W10/G16	ECN4928CAE-W10/G16	
	40		ECN4921CAE-W10/G21	ECN4922CAE-W10/G21	ECN4924CAE-W10/G21	ECN4928CAE-W10/G21	
3YD	50	100A	ECN4931CAG-W10/G26	ECN4932CAG-W10/G26	ECN4934CAG-W10/G26	ECN4938CAG-W10/G26	AN16KN0AB
	60		ECN4931CAG-W10/G31	ECN4932CAG-W10/G31	ECN4934CAG-W10/G31	ECN4938CAG-W10/G31	
	75	200A	ECN4931CAJ-W10/G36	ECN4932CAJ-W10/G36	ECN4934CAJ-W10/G36	ECN4938CAJ-W10/G36	
4YD	100	200A	ECN4941CAJ-W10/G41	ECN4942CAJ-W10/G41	ECN4944CAJ-W10/G41	ECN4948CAJ-W10/G41	AN16NN0AB
	125		ECN4941CAJ-W10/G46	ECN4942CAJ-W10/G46	ECN4944CAJ-W10/G46	ECN4948CAJ-W10/G46	
	150	400A	ECN4941CAL-W10/G51	ECN4942CAL-W10/G51	ECN4944CAL-W10/G51	ECN4948CAL-W10/G51	
5YD	200	400A	ECN4951CAL-W10/G56	ECN4952CAL-W10/G56	ECN4954CAL-W10/G56	ECN4958CAL-W10/G56	AN16SN0AB
	250		ECN4951CAL-W10/G61	ECN4952CAL-W10/G61	ECN4954CAL-W10/G61	ECN4958CAL-W10/G61	
	300	600A	ECN4951CAN-W10/G66	ECN4952CAN-W10/G66	ECN4954CAN-W10/G66	ECN4958CAN-W10/G66	
6YD	350	600A	ECN4961CAN-W10/G71	ECN4962CAN-W10/G71	ECN4963CAN-W10/G71 ⑦	ECN4968CAN-W10/G71	AN16TN0AB
	400		ECN4961CAN-W10/G76	ECN4962CAN-W10/G76	ECN4963CAN-W10/G76 ⑦	ECN4968CAN-W10/G76	
	450		ECN4961CAN-W10/G81	ECN4962CAN-W10/G81	ECN4963CAN-W10/G81 ⑦	ECN4968CAN-W10/G81	
	500	800A	ECN4961CAP-W10/G86	ECN4962CAP-W10/G86	ECN4963CAP-W10/G86 ⑦	ECN4968CAP-W10/G86	
	600	1200A	ECN4961CAQ-W10/G91	ECN4962CAQ-W10/G91	ECN4963CAQ-W10/G91 ⑦	ECN4968CAQ-W10/G91	
	700	ECN4961CAQ-W10/G96	ECN4962CAQ-W10/G96	ECN4963CAQ-W10/G96 ⑦	ECN4968CAQ-W10/G96		
	7YD	750	1200A	ECN4971CAQ-W10/G101	ECN4972CAQ-W10/G101	ECN4973CAQ-W10/G101 ⑦	
	800	⑥	ECN4971CAU-W10/G105	ECN4972CAU-W10/G105	ECN4973CAU-W10/G105 ⑦	ECN4978CAU-W10/G105	
	900		ECN4971CAU-W10/G108	ECN4972CAU-W10/G108	ECN4973CAU-W10/G108 ⑦	ECN4978CAU-W10/G108	
	1000		ECN4971CAU-W10/G111	ECN4972CAU-W10/G111	ECN4973CAU-W10/G111 ⑦	ECN4978CAU-W10/G111	
8YD	1250	⑥	ECN4981CAU-W10/G114	ECN4982CAU-W10/G114	ECN4983CAU-W10/G114 ⑦	ECN4988CAU-W10/G114	AN16VN0AB
	1500		ECN4981CAU-W10/G117	ECN4982CAU-W10/G117	ECN4983CAU-W10/G117 ⑦	ECN4988CAU-W10/G117	

Starters do not include heater packs. Select one carton of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ^① Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{②③} Catalog Number	Component Starter (Open) ^④ Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ^⑤							
2YD	20	30A	ECN4921DAC-W10/G7	ECN4922DAC-W10/G7	ECN4924DAC-W10/G7	ECN4928DAC-W10/G7	AN16GN0AB
	25	60A	ECN4921DAE-W10/G12	ECN4922DAE-W10/G12	ECN4924DAE-W10/G12	ECN4928DAE-W10/G12	
	30		ECN4921DAE-W10/G17	ECN4922DAE-W10/G17	ECN4924DAE-W10/G17	ECN4928DAE-W10/G17	
	40		ECN4921DAE-W10/G22	ECN4922DAE-W10/G22	ECN4924DAE-W10/G22	ECN4928DAE-W10/G22	
3YD	50	100A	ECN4931DAG-W10/G27	ECN4932DAG-W10/G27	ECN4934DAG-W10/G27	ECN4938DAG-W10/G27	AN16KN0AB
	60		ECN4931DAG-W10/G32	ECN4932DAG-W10/G32	ECN4934DAG-W10/G32	ECN4938DAG-W10/G32	
	75		ECN4931DAG-W10/G37	ECN4932DAG-W10/G37	ECN4934DAG-W10/G37	ECN4938DAG-W10/G37	
4YD	100	200A	ECN4941DAJ-W10/G42	ECN4942DAJ-W10/G42	ECN4944DAJ-W10/G42	ECN4948DAJ-W10/G42	AN16NN0AB
	125		ECN4941DAJ-W10/G47	ECN4942DAJ-W10/G47	ECN4944DAJ-W10/G47	ECN4948DAJ-W10/G47	
	150		ECN4941DAJ-W10/G52	ECN4942DAJ-W10/G52	ECN4944DAJ-W10/G52	ECN4948DAJ-W10/G52	
5YD	200	400A	ECN4951DAL-W10/G57	ECN4952DAL-W10/G57	ECN4954DAL-W10/G57	ECN4958DAL-W10/G57	AN16SN0AB
	250		ECN4951DAL-W10/G62	ECN4952DAL-W10/G62	ECN4954DAL-W10/G62	ECN4958DAL-W10/G62	
	300		ECN4951DAL-W10/G67	ECN4952DAL-W10/G67	ECN4954DAL-W10/G67	ECN4958DAL-W10/G67	
6YD	350	400A	ECN4961DAL-W10/G72	ECN4962DAL-W10/G72	ECN4963DAL-W10/G72 ^⑦	ECN4968DAL-W10/G72	AN16TN0AB
	400	600A	ECN4961DAN-W10/G77	ECN4962DAN-W10/G77	ECN4963DAN-W10/G77 ^⑦	ECN4968DAN-W10/G77	
	450		ECN4961DAN-W10/G82	ECN4962DAN-W10/G82	ECN4963DAN-W10/G82 ^⑦	ECN4968DAN-W10/G82	
	500		ECN4961DAN-W10/G87	ECN4962DAN-W10/G87	ECN4963DAN-W10/G87 ^⑦	ECN4968DAN-W10/G87	
	600	800A	ECN4961DAP-W10/G92	ECN4962DAP-W10/G92	ECN4963DAP-W10/G92 ^⑦	ECN4968DAP-W10/G92	
	700		ECN4961DAP-W10/G97	ECN4962DAP-W10/G97	ECN4963DAP-W10/G97 ^⑦	ECN4968DAP-W10/G97	
7YD	750	⑥	ECN4971DAU-W10/G102	ECN4972DAU-W10/G102	ECN4973DAU-W10/G102 ^⑦	ECN4978DAU-W10/G102	AN16UN0AB
	800		ECN4971DAU-W10/G106	ECN4972DAU-W10/G106	ECN4973DAU-W10/G106 ^⑦	ECN4978DAU-W10/G106	
	900		ECN4971DAU-W10/G109	ECN4972DAU-W10/G109	ECN4973DAU-W10/G109 ^⑦	ECN4978DAU-W10/G109	
	1000		ECN4971DAU-W10/G112	ECN4972DAU-W10/G112	ECN4973DAU-W10/G112 ^⑦	ECN4978DAU-W10/G112	
8YD	1250	⑥	ECN4981DAU-W10/G115	ECN4982DAU-W10/G115	ECN4983DAU-W10/G115 ^⑦	ECN4988DAU-W10/G115	AN16VN0AB
	1500		ECN4981DAU-W10/G118	ECN4982DAU-W10/G118	ECN4983DAU-W10/G118 ^⑦	ECN4988DAU-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs (two overload relays—one for each winding). Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Non-Fusible Disconnect

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN4921EAA-W10/G1	ECN4922EAA-W10/G1	ECN4924EAA-W10/G1	ECN4928EAA-W10/G1	AN16GN0AB
	20	100A	ECN4921EAA-W10/G3	ECN4922EAA-W10/G3	ECN4924EAA-W10/G3	ECN4928EAA-W10/G3	
3YD	25	100A	ECN4931EAA-W10/G8	ECN4932EAA-W10/G8	ECN4934EAA-W10/G8	ECN4938EAA-W10/G8	AN16KN0AB
	30	200A	ECN4931EAA-W10/G13	ECN4932EAA-W10/G13	ECN4934EAA-W10/G13	ECN4938EAA-W10/G13	
	40		ECN4931EAA-W10/G18	ECN4932EAA-W10/G18	ECN4934EAA-W10/G18	ECN4938EAA-W10/G18	
4YD	50	200A	ECN4941EAA-W10/G23	ECN4942EAA-W10/G23	ECN4944EAA-W10/G23	ECN4948EAA-W10/G23	AN16NN0AB
	60	400A	ECN4941EAA-W10/G28	ECN4942EAA-W10/G28	ECN4944EAA-W10/G28	ECN4948EAA-W10/G28	
5YD	75	400A	ECN4951EAA-W10/G33	ECN4952EAA-W10/G33	ECN4954EAA-W10/G33	ECN4958EAA-W10/G33	AN16SN0AB
	100		ECN4951EAA-W10/G38	ECN4952EAA-W10/G38	ECN4954EAA-W10/G38	ECN4958EAA-W10/G38	
	125	600A	ECN4951EAA-W10/G43	ECN4952EAA-W10/G43	ECN4954EAA-W10/G43	ECN4958EAA-W10/G43	
	150		ECN4951EAA-W10/G48	ECN4952EAA-W10/G48	ECN4954EAA-W10/G48	ECN4958EAA-W10/G48	
6YD	200	⑥	ECN4961EAA-W10/G53	ECN4962EAA-W10/G53	ECN4963EAA-W10/G53 ⑦	ECN4968EAA-W10/G33	AN16TN0AB
	250		ECN4961EAA-W10/G58	ECN4962EAA-W10/G58	ECN4963EAA-W10/G58 ⑦	ECN4968EAA-W10/G58	
	300		ECN4961EAA-W10/G63	ECN4962EAA-W10/G63	ECN4963EAA-W10/G63 ⑦	ECN4968EAA-W10/G63	
7YD	350	⑥	ECN4971EAA-W10/G68	ECN4972EAA-W10/G68	ECN4973EAA-W10/G68 ⑦	ECN4978EAA-W10/G68	AN16UN0AB
	400		ECN4971EAA-W10/G73	ECN4972EAA-W10/G73	ECN4973EAA-W10/G73 ⑦	ECN4978EAA-W10/G73	
	450		ECN4971EAA-W10/G78	ECN4972EAA-W10/G78	ECN4973EAA-W10/G78 ⑦	ECN4978EAA-W10/G78	
	500		ECN4971EAA-W10/G83	ECN4972EAA-W10/G83	ECN4973EAA-W10/G83 ⑦	ECN4978EAA-W10/G83	
8YD	600	⑥	ECN4981EAA-W10/G88	ECN4982EAA-W10/G88	ECN4983EAA-W10/G88 ⑦	ECN4988EAA-W10/G88	AN16VN0AB
	700		ECN4981EAA-W10/G93	ECN4982EAA-W10/G93	ECN4983EAA-W10/G93 ⑦	ECN4988EAA-W10/G93	
	750		ECN4981EAA-W10/G98	ECN4982EAA-W10/G98	ECN4983EAA-W10/G98 ⑦	ECN4988EAA-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Non-Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN4921BAA-W10/G2	ECN4922BAA-W10/G2	ECN4924BAA-W10/G2	ECN4928BAA-W10/G2	AN16GN0AB
	20	100A	ECN4921BAA-W10/G4	ECN4922BAA-W10/G4	ECN4924BAA-W10/G4	ECN4928BAA-W10/G4	
	25		ECN4921BAA-W10/G9	ECN4922BAA-W10/G9	ECN4924BAA-W10/G9	ECN4928BAA-W10/G9	
3YD	30	100A	ECN4931BAA-W10/G14	ECN4932BAA-W10/G14	ECN4934BAA-W10/G14	ECN4938BAA-W10/G14	AN16KN0AB
	40	200A	ECN4931BAA-W10/G19	ECN4932BAA-W10/G19	ECN4934BAA-W10/G19	ECN4938BAA-W10/G19	
	50		ECN4931BAA-W10/G24	ECN4932BAA-W10/G24	ECN4934BAA-W10/G24	ECN4938BAA-W10/G24	
4YD	60	200A	ECN4941BAA-W10/G29	ECN4942BAA-W10/G29	ECN4944BAA-W10/G29	ECN4948BAA-W10/G29	AN16NN0AB
	75	400A	ECN4941BAA-W10/G34	ECN4942BAA-W10/G34	ECN4944BAA-W10/G34	ECN4948BAA-W10/G34	
5YD	100	400A	ECN4951BAA-W10/G39	ECN4952BAA-W10/G39	ECN4954BAA-W10/G39	ECN4958BAA-W10/G39	AN16SN0AB
	125		ECN4951BAA-W10/G44	ECN4952BAA-W10/G44	ECN4954BAA-W10/G44	ECN4958BAA-W10/G44	
	150	600A	ECN4951BAA-W10/G49	ECN4952BAA-W10/G49	ECN4954BAA-W10/G49	ECN4958BAA-W10/G49	
6YD	200	600A	ECN4961BAA-W10/G54	ECN4962BAA-W10/G54	ECN4963BAA-W10/G54 ⑦	ECN4968BAA-W10/G54	AN16TN0AB
	250	⑥	ECN4961BAA-W10/G59	ECN4962BAA-W10/G59	ECN4963BAA-W10/G59 ⑦	ECN4968BAA-W10/G59	
	300		ECN4961BAA-W10/G64	ECN4962BAA-W10/G64	ECN4963BAA-W10/G64 ⑦	ECN4968BAA-W10/G64	
	350		ECN4961BAA-W10/G69	ECN4962BAA-W10/G69	ECN4963BAA-W10/G69 ⑦	ECN4968BAA-W10/G69	
7YD	400	⑥	ECN4971BAA-W10/G74	ECN4972BAA-W10/G74	ECN4973BAA-W10/G74 ⑦	ECN4978BAA-W10/G74	AN16UN0AB
	450		ECN4971BAA-W10/G79	ECN4972BAA-W10/G79	ECN4973BAA-W10/G79 ⑦	ECN4978BAA-W10/G79	
	500		ECN4971BAA-W10/G84	ECN4972BAA-W10/G84	ECN4973BAA-W10/G84 ⑦	ECN4978BAA-W10/G84	
8YD	600	⑥	ECN4981BAA-W10/G89	ECN4982BAA-W10/G89	ECN4983BAA-W10/G89 ⑦	ECN4988BAA-W10/G89	AN16VN0AB
	700		ECN4981BAA-W10/G94	ECN4982BAA-W10/G94	ECN4983BAA-W10/G94 ⑦	ECN4988BAA-W10/G94	
	750		ECN4981BAA-W10/G99	ECN4982BAA-W10/G99	ECN4983BAA-W10/G99 ⑦	ECN4988BAA-W10/G99	
	800		ECN4981BAA-W10/G103	ECN4982BAA-W10/G103	ECN4983BAA-W10/G103 ⑦	ECN4988BAA-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, Tab 15.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the seventh digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to 9. To order Type 4 painted steel, change that digit to 3. To order non-metallic, change that digit to 5. For details on these alternate enclosures, see Tab 13.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code R5.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code C35 separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Non-Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ⑤							
2YD	20	60A	ECN4921CAA-W10/G6	ECN4922CAA-W10/G6	ECN4924CAA-W10/G6	ECN4928CAA-W10/G6	AN16GN0AB
	25		ECN4921CAA-W10/G11	ECN4922CAA-W10/G11	ECN4924CAA-W10/G11	ECN4928CAA-W10/G11	
	30		ECN4921CAA-W10/G16	ECN4922CAA-W10/G16	ECN4924CAA-W10/G16	ECN4928CAA-W10/G16	
	40		ECN4921CAA-W10/G21	ECN4922CAA-W10/G21	ECN4924CAA-W10/G21	ECN4928CAA-W10/G21	
3YD	50	100A	ECN4931CAA-W10/G26	ECN4932CAA-W10/G26	ECN4934CAA-W10/G26	ECN4938CAA-W10/G26	AN16KN0AB
	60		ECN4931CAA-W10/G31	ECN4932CAA-W10/G31	ECN4934CAA-W10/G31	ECN4938CAA-W10/G31	
	75	200A	ECN4931CAA-W10/G36	ECN4932CAA-W10/G36	ECN4934CAA-W10/G36	ECN4938CAA-W10/G36	
4YD	100	200A	ECN4941CAA-W10/G41	ECN4942CAA-W10/G41	ECN4944CAA-W10/G41	ECN4948CAA-W10/G41	AN16NN0AB
	125		ECN4941CAA-W10/G46	ECN4942CAA-W10/G46	ECN4944CAA-W10/G46	ECN4948CAA-W10/G46	
	150	400A	ECN4941CAA-W10/G51	ECN4942CAA-W10/G51	ECN4944CAA-W10/G51	ECN4948CAA-W10/G51	
5YD	200	400A	ECN4951CAA-W10/G56	ECN4952CAA-W10/G56	ECN4954CAA-W10/G56	ECN4958CAA-W10/G56	AN16SN0AB
	250		ECN4951CAA-W10/G61	ECN4952CAA-W10/G61	ECN4954CAA-W10/G61	ECN4958CAA-W10/G61	
	300	600A	ECN4951CAA-W10/G66	ECN4952CAA-W10/G66	ECN4954CAA-W10/G66	ECN4958CAA-W10/G66	
6YD	350	600A	ECN4961CAA-W10/G71	ECN4962CAA-W10/G71	ECN4963CAA-W10/G71 ⑦	ECN4968CAA-W10/G71	AN16TN0AB
	400		ECN4961CAA-W10/G76	ECN4962CAA-W10/G76	ECN4963CAA-W10/G76 ⑦	ECN4968CAA-W10/G76	
	450		ECN4961CAA-W10/G81	ECN4962CAA-W10/G81	ECN4963CAA-W10/G81 ⑦	ECN4968CAA-W10/G81	
	500	800A	ECN4961CAA-W10/G86	ECN4962CAA-W10/G86	ECN4963CAA-W10/G86 ⑦	ECN4968CAA-W10/G86	
	600	1200A	ECN4961CAA-W10/G91	ECN4962CAA-W10/G91	ECN4963CAA-W10/G91 ⑦	ECN4968CAA-W10/G91	
	700	ECN4961CAA-W10/G96	ECN4962CAA-W10/G96	ECN4963CAA-W10/G96 ⑦	ECN4968CAA-W10/G96		
7YD	750	1200A	ECN4971CAA-W10/G101	ECN4972CAA-W10/G101	ECN4973CAA-W10/G101 ⑦	ECN4978CAA-W10/G101	AN16UN0AB
	800	⑥	ECN4971CAA-W10/G105	ECN4972CAA-W10/G105	ECN4973CAA-W10/G105 ⑦	ECN4978CAA-W10/G105	
	900	ECN4971CAA-W10/G108	ECN4972CAA-W10/G108	ECN4973CAA-W10/G108 ⑦	ECN4978CAA-W10/G108		
	1000	ECN4971CAA-W10/G111	ECN4972CAA-W10/G111	ECN4973CAA-W10/G111 ⑦	ECN4978CAA-W10/G111		
8YD	1250	⑥	ECN4981CAA-W10/G114	ECN4982CAA-W10/G114	ECN4983CAA-W10/G114 ⑦	ECN4988CAA-W10/G114	AN16VN0AB
	1500	ECN4981CAA-W10/G117	ECN4982CAA-W10/G117	ECN4983CAA-W10/G117 ⑦	ECN4988CAA-W10/G117		

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN49—Combination Open Transition Wye Delta Starter—Non-Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ^① Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{②③} Catalog Number	Component Starter (Open) ^④ Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ^⑤							
2YD	20	30A	ECN4921DAA-W10/G7	ECN4922DAA-W10/G7	ECN4924DAA-W10/G7	ECN4928DAA-W10/G7	AN16GN0AB
	25	60A	ECN4921DAA-W10/G12	ECN4922DAA-W10/G12	ECN4924DAA-W10/G12	ECN4928DAA-W10/G12	
	30		ECN4921DAA-W10/G17	ECN4922DAA-W10/G17	ECN4924DAA-W10/G17	ECN4928DAA-W10/G17	
	40		ECN4921DAA-W10/G22	ECN4922DAA-W10/G22	ECN4924DAA-W10/G22	ECN4928DAA-W10/G22	
3YD	50	100A	ECN4931DAA-W10/G27	ECN4932DAA-W10/G27	ECN4934DAA-W10/G27	ECN4938DAA-W10/G27	AN16KN0AB
	60		ECN4931DAA-W10/G32	ECN4932DAA-W10/G32	ECN4934DAA-W10/G32	ECN4938DAA-W10/G32	
	75		ECN4931DAA-W10/G37	ECN4932DAA-W10/G37	ECN4934DAA-W10/G37	ECN4938DAA-W10/G37	
4YD	100	200A	ECN4941DAA-W10/G42	ECN4942DAA-W10/G42	ECN4944DAA-W10/G42	ECN4948DAA-W10/G42	AN16NN0AB
	125		ECN4941DAA-W10/G47	ECN4942DAA-W10/G47	ECN4944DAA-W10/G47	ECN4948DAA-W10/G47	
	150		ECN4941DAA-W10/G52	ECN4942DAA-W10/G52	ECN4944DAA-W10/G52	ECN4948DAA-W10/G52	
5YD	200	400A	ECN4951DAA-W10/G57	ECN4952DAA-W10/G57	ECN4954DAA-W10/G57	ECN4958DAA-W10/G57	AN16SN0AB
	250		ECN4951DAA-W10/G62	ECN4952DAA-W10/G62	ECN4954DAA-W10/G62	ECN4958DAA-W10/G62	
	300		ECN4951DAA-W10/G67	ECN4952DAA-W10/G67	ECN4954DAA-W10/G67	ECN4958DAA-W10/G67	
6YD	350	400A	ECN4961DAA-W10/G72	ECN4962DAA-W10/G72	ECN4963DAA-W10/G72 ^⑦	ECN4968DAA-W10/G72	AN16TN0AB
	400	600A	ECN4961DAA-W10/G77	ECN4962DAA-W10/G77	ECN4963DAA-W10/G77 ^⑦	ECN4968DAA-W10/G77	
	450		ECN4961DAA-W10/G82	ECN4962DAA-W10/G82	ECN4963DAA-W10/G82 ^⑦	ECN4968DAA-W10/G82	
	500		ECN4961DAA-W10/G87	ECN4962DAA-W10/G87	ECN4963DAA-W10/G87 ^⑦	ECN4968DAA-W10/G87	
	600	800A	ECN4961DAA-W10/G92	ECN4962DAA-W10/G92	ECN4963DAA-W10/G92 ^⑦	ECN4968DAA-W10/G92	
	700		ECN4961DAA-W10/G97	ECN4962DAA-W10/G97	ECN4963DAA-W10/G97 ^⑦	ECN4968DAA-W10/G97	
7YD	750	⑥	ECN4971DAA-W10/G102	ECN4972DAA-W10/G102	ECN4973DAA-W10/G102 ^⑦	ECN4978DAA-W10/G102	AN16UN0AB
	800		ECN4971DAA-W10/G106	ECN4972DAA-W10/G106	ECN4973DAA-W10/G106 ^⑦	ECN4978DAA-W10/G106	
	900		ECN4971DAA-W10/G109	ECN4972DAA-W10/G109	ECN4973DAA-W10/G109 ^⑦	ECN4978DAA-W10/G109	
	1000		ECN4971DAA-W10/G112	ECN4972DAA-W10/G112	ECN4973DAA-W10/G112 ^⑦	ECN4978DAA-W10/G112	
8YD	1250	⑥	ECN4981DAA-W10/G115	ECN4982DAA-W10/G115	ECN4983DAA-W10/G115 ^⑦	ECN4988DAA-W10/G115	AN16VN0AB
	1500		ECN4981DAA-W10/G118	ECN4982DAA-W10/G118	ECN4983DAA-W10/G118 ^⑦	ECN4988DAA-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN50—Combination Open Transition Wye Delta Starter—Circuit Breaker

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ⑤							
2YD	15	70A	ECN5021EAH-W10/G1	ECN5022EAH-W10/G1	ECN5024EAH-W10/G1	ECN5028EAH-W10/G1	AN16GN0AB
	20	90A	ECN5021EAJ-W10/G3	ECN5022EAJ-W10/G3	ECN5024EAJ-W10/G3	ECN5028EAJ-W10/G3	
3YD	25	100A	ECN5031EAK-W10/G8	ECN5032EAK-W10/G8	ECN5034EAK-W10/G8	ECN5038EAK-W10/G8	AN16KN0AB
	30	125A	ECN5031EAL-W10/G13	ECN5032EAL-W10/G13	ECN5034EAL-W10/G13	ECN5038EAL-W10/G13	
	40	175A	ECN5031EAN-W10/G18	ECN5032EAN-W10/G18	ECN5034EAN-W10/G18	ECN5038EAN-W10/G18	
4YD	50	200A	ECN5041EAP-W10/G23	ECN5042EAP-W10/G23	ECN5044EAP-W10/G23	ECN5048EAP-W10/G23	AN16NN0AB
	60	225A	ECN5041EAQ-W10/G28	ECN5042EAQ-W10/G28	ECN5044EAQ-W10/G28	ECN5048EAQ-W10/G28	
5YD	75	300A	ECN5051EAS-W10/G33	ECN5052EAS-W10/G33	ECN5054EAS-W10/G33	ECN5058EAS-W10/G33	AN16SN0AB
	100	350A	ECN5051EAV-W10/G38	ECN5052EAV-W10/G38	ECN5054EAV-W10/G38	ECN5058EAV-W10/G38	
	125	450A	ECN5051EAX-W10/G43	ECN5052EAX-W10/G43	ECN5054EAX-W10/G43	ECN5058EAX-W10/G43	
	150	500A	ECN5051EAY-W10/G48	ECN5052EAY-W10/G48	ECN5054EAY-W10/G48	ECN5058EAY-W10/G48	
6YD	200	800A	ECN5061EA2-W10/G53	ECN5062EA2-W10/G53	ECN5063EA2-W10/G53 ⑦	ECN5068EA2-W10/G53	AN16TN0AB
	250	1000A	ECN5061EA3-W10/G58	ECN5062EA3-W10/G58	ECN5063EA3-W10/G58 ⑦	ECN5068EA3-W10/G58	
	300	1200A	ECN5061EA4-W10/G63	ECN5062EA4-W10/G63	ECN5063EA4-W10/G63 ⑦	ECN5068EA4-W10/G63	
7YD	350	⑥	ECN5071EAU-W10/G68	ECN5072EAU-W10/G68	ECN5073EAU-W10/G68 ⑦	ECN5078EAU-W10/G68	AN16UN0AB
	400		ECN5071EAU-W10/G73	ECN5072EAU-W10/G73	ECN5073EAU-W10/G73 ⑦	ECN5078EAU-W10/G73	
	450		ECN5071EAU-W10/G78	ECN5072EAU-W10/G78	ECN5073EAU-W10/G78 ⑦	ECN5078EAU-W10/G78	
	500		ECN5071EAU-W10/G83	ECN5072EAU-W10/G83	ECN5073EAU-W10/G83 ⑦	ECN5078EAU-W10/G83	
8YD	600	⑥	ECN5081EAU-W10/G88	ECN5082EAU-W10/G88	ECN5083EAU-W10/G88 ⑦	ECN5088EAU-W10/G88	AN16VN0AB
	700		ECN5081EAU-W10/G93	ECN5082EAU-W10/G93	ECN5083EAU-W10/G93 ⑦	ECN5088EAU-W10/G93	
	750		ECN5081EAU-W10/G98	ECN5082EAU-W10/G98	ECN5083EAU-W10/G98 ⑦	ECN5088EAU-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN50—Combination Open Transition Wye Delta Starter—Circuit Breaker, continued

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) ④
			General Purpose	Rainproof	Water and Dust-Tight Stainless Steel ①	Dust-Tight Industrial External Reset ②③	
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN5021BAG-W10/G2	ECN5022BAG-W10/G2	ECN5024BAG-W10/G2	ECN5028BAG-W10/G2	AN16GN0AB
	20	70A	ECN5021BAH-W10/G4	ECN5022BAH-W10/G4	ECN5024BAH-W10/G4	ECN5028BAH-W10/G4	
	25	90A	ECN5021BAJ-W10/G9	ECN5022BAJ-W10/G9	ECN5024BAJ-W10/G9	ECN5028BAJ-W10/G9	
3YD	30	125A	ECN5031BAL-W10/G14	ECN5032BAL-W10/G14	ECN5034BAL-W10/G14	ECN5038BAL-W10/G14	AN16KN0AB
	40	150A	ECN5031BAM-W10/G19	ECN5032BAM-W10/G19	ECN5034BAM-W10/G19	ECN5038BAM-W10/G19	
	50	175A	ECN5031BAN-W10/G24	ECN5032BAN-W10/G24	ECN5034BAN-W10/G24	ECN5038BAN-W10/G24	
4YD	60	200A	ECN5041BAP-W10/G29	ECN5042BAP-W10/G29	ECN5044BAP-W10/G29	ECN5048BAP-W10/G29	AN16NN0AB
	75	250A	ECN5041BAR-W10/G34	ECN5042BAR-W10/G34	ECN5044BAR-W10/G34	ECN5048BAR-W10/G34	
5YD	100	350A	ECN5051BAV-W10/G39	ECN5052BAV-W10/G39	ECN5054BAV-W10/G39	ECN5058BAV-W10/G39	AN16SN0AB
	125	400A	ECN5051BAW-W10/G44	ECN5052BAW-W10/G44	ECN5054BAW-W10/G44	ECN5058BAW-W10/G44	
	150	500A	ECN5051BAY-W10/G49	ECN5052BAY-W10/G49	ECN5054BAY-W10/G49	ECN5058BAY-W10/G49	
6YD	200	600A	ECN5061BAZ-W10/G54	ECN5062BAZ-W10/G54	ECN5063BAZ-W10/G54 ⑦	ECN5068BAZ-W10/G54	AN16TN0AB
	250	800A	ECN5061BA2-W10/G59	ECN5062BA2-W10/G59	ECN5063BA2-W10/G59 ⑦	ECN5068BA2-W10/G59	
	300	1000A	ECN5061BA3-W10/G64	ECN5062BA3-W10/G64	ECN5063BA3-W10/G64 ⑦	ECN5068BA3-W10/G64	
	350	1200A	ECN5061BA4-W10/G69	ECN5062BA4-W10/G69	ECN5063BA4-W10/G69 ⑦	ECN5068BA4-W10/G69	
7YD	400	⑥	ECN5071BAU-W10/G74	ECN5072BAU-W10/G74	ECN5073BAU-W10/G74 ⑦	ECN5078BAU-W10/G74	AN16UN0AB
	450		ECN5071BAU-W10/G79	ECN5072BAU-W10/G79	ECN5073BAU-W10/G79 ⑦	ECN5078BAU-W10/G79	
	500		ECN5071BAU-W10/G84	ECN5072BAU-W10/G84	ECN5073BAU-W10/G84 ⑦	ECN5078BAU-W10/G84	
8YD	600	⑥	ECN5081BAU-W10/G89	ECN5082BAU-W10/G89	ECN5083BAU-W10/G89 ⑦	ECN5088BAU-W10/G89	AN16VN0AB
	700		ECN5081BAU-W10/G94	ECN5082BAU-W10/G94	ECN5083BAU-W10/G94 ⑦	ECN5088BAU-W10/G94	
	750		ECN5081BAU-W10/G99	ECN5082BAU-W10/G99	ECN5083BAU-W10/G99 ⑦	ECN5088BAU-W10/G99	
	800		ECN5081BAU-W10/G103	ECN5082BAU-W10/G103	ECN5083BAU-W10/G103 ⑦	ECN5088BAU-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN50—Combination Open Transition Wye Delta Starter—Circuit Breaker, continued

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ⑤							
2YD	20	40A	ECN5021CAE-W10/G6	ECN5022CAE-W10/G6	ECN5024CAE-W10/G6	ECN5028CAE-W10/G6	AN16GN0AB
	25	50A	ECN5021CAF-W10/G11	ECN5022CAF-W10/G11	ECN5024CAF-W10/G11	ECN5028CAF-W10/G11	
	30	60A	ECN5021CAG-W10/G16	ECN5022CAG-W10/G16	ECN5024CAG-W10/G16	ECN5028CAG-W10/G16	
	40	70A	ECN5021CAH-W10/G21	ECN5022CAH-W10/G21	ECN5024CAH-W10/G21	ECN5028CAH-W10/G21	
3YD	50	90A	ECN5031CAJ-W10/G26	ECN5032CAJ-W10/G26	ECN5034CAJ-W10/G26	ECN5038CAJ-W10/G26	AN16KN0AB
	60	100A	ECN5031CAK-W10/G31	ECN5032CAK-W10/G31	ECN5034CAK-W10/G31	ECN5038CAK-W10/G31	
	75	125A	ECN5031CAL-W10/G36	ECN5032CAL-W10/G36	ECN5034CAL-W10/G36	ECN5038CAL-W10/G36	
4YD	100	175A	ECN5041CAN-W10/G41	ECN5042CAN-W10/G41	ECN5044CAN-W10/G41	ECN5048CAN-W10/G41	AN16NN0AB
	125	225A	ECN5041CAQ-W10/G46	ECN5042CAQ-W10/G46	ECN5044CAQ-W10/G46	ECN5048CAQ-W10/G46	
	150	250A	ECN5041CAR-W10/G51	ECN5042CAR-W10/G51	ECN5044CAR-W10/G51	ECN5048CAR-W10/G51	
5YD	200	350A	ECN5051CAV-W10/G56	ECN5052CAV-W10/G56	ECN5054CAV-W10/G56	ECN5058CAV-W10/G56	AN16SN0AB
	250	400A	ECN5051CAW-W10/G61	ECN5052CAW-W10/G61	ECN5054CAW-W10/G61	ECN5058CAW-W10/G61	
	300	500A	ECN5051CAY-W10/G66	ECN5052CAY-W10/G66	ECN5054CAY-W10/G66	ECN5058CAY-W10/G66	
6YD	350	600A	ECN5061CAZ-W10/G71	ECN5062CAZ-W10/G71	ECN5063CAZ-W10/G71 ⑦	ECN5068CAZ-W10/G71	AN16TN0AB
	400		ECN5061CAZ-W10/G76	ECN5062CAZ-W10/G76	ECN5063CAZ-W10/G76 ⑦	ECN5068CAZ-W10/G76	
	450	700A	ECN5061CA1-W10/G81	ECN5062CA1-W10/G81	ECN5063CA1-W10/G81 ⑦	ECN5068CA1-W10/G81	
	500	800A	ECN5061CA2-W10/G86	ECN5062CA2-W10/G86	ECN5063CA2-W10/G86 ⑦	ECN5068CA2-W10/G86	
	600	1000A	ECN5061CA3-W10/G91	ECN5062CA3-W10/G91	ECN5063CA3-W10/G91 ⑦	ECN5068CA3-W10/G91	
	700	1200A	ECN5061CA4-W10/G96	ECN5062CA4-W10/G96	ECN5063CA4-W10/G96 ⑦	ECN5068CA4-W10/G96	
7YD	750	⑥	ECN5071CAU-W10/G101	ECN5072CAU-W10/G101	ECN5073CAU-W10/G101 ⑦	ECN5078CAU-W10/G101	AN16UN0AB
	800		ECN5071CAU-W10/G105	ECN5072CAU-W10/G105	ECN5073CAU-W10/G105 ⑦	ECN5078CAU-W10/G105	
	900		ECN5071CAU-W10/G108	ECN5072CAU-W10/G108	ECN5073CAU-W10/G108 ⑦	ECN5078CAU-W10/G108	
	1000		ECN5071CAU-W10/G111	ECN5072CAU-W10/G111	ECN5073CAU-W10/G111 ⑦	ECN5078CAU-W10/G111	
8YD	1250	⑥	ECN5081CAU-W10/G114	ECN5082CAU-W10/G114	ECN5083CAU-W10/G114 ⑦	ECN5088CAU-W10/G114	AN16VN0AB
	1500		ECN5081CAU-W10/G117	ECN5082CAU-W10/G117	ECN5083CAU-W10/G117 ⑦	ECN5088CAU-W10/G117	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN50—Combination Open Transition Wye Delta Starter—Circuit Breaker, continued

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) ④
			General Purpose	Rainproof	Water and Dust-Tight Stainless Steel ①	Dust-Tight Industrial External Reset ②③	
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ⑤							
2YD	20	30A	ECN5021DAD-W10/G7	ECN5022DAD-W10/G7	ECN5024DAD-W10/G7	ECN5028DAD-W10/G7	AN16GN0AB
	25	40A	ECN5021DAE-W10/G12	ECN5022DAE-W10/G12	ECN5024DAE-W10/G12	ECN5028DAE-W10/G12	
	30	50A	ECN5021DAF-W10/G17	ECN5022DAF-W10/G17	ECN5024DAF-W10/G17	ECN5028DAF-W10/G17	
	40	60A	ECN5021DAG-W10/G22	ECN5022DAG-W10/G22	ECN5024DAG-W10/G22	ECN5028DAG-W10/G22	
3YD	50	70A	ECN5031DAH-W10/G27	ECN5032DAH-W10/G27	ECN5034DAH-W10/G27	ECN5038DAH-W10/G27	AN16KN0AB
	60	90A	ECN5031DAJ-W10/G32	ECN5032DAJ-W10/G32	ECN5034DAJ-W10/G32	ECN5038DAJ-W10/G32	
	75	100A	ECN5031DAK-W10/G37	ECN5032DAK-W10/G37	ECN5034DAK-W10/G37	ECN5038DAK-W10/G37	
4YD	100	125A	ECN5041DAL-W10/G42	ECN5042DAL-W10/G42	ECN5044DAL-W10/G42	ECN5048DAL-W10/G42	AN16NN0AB
	125	175A	ECN5041DAN-W10/G47	ECN5042DAN-W10/G47	ECN5044DAN-W10/G47	ECN5048DAN-W10/G47	
	150	200A	ECN5041DAP-W10/G52	ECN5042DAP-W10/G52	ECN5044DAP-W10/G52	ECN5048DAP-W10/G52	
5YD	200	250A	ECN5051DAR-W10/G57	ECN5052DAR-W10/G57	ECN5054DAR-W10/G57	ECN5058DAR-W10/G57	AN16SN0AB
	250	350A	ECN5051DAV-W10/G62	ECN5052DAV-W10/G62	ECN5054DAV-W10/G62	ECN5058DAV-W10/G62	
	300		ECN5051DAV-W10/G67	ECN5052DAV-W10/G67	ECN5054DAV-W10/G67	ECN5058DAV-W10/G67	
6YD	350	500A	ECN5061DAY-W10/G72	ECN5062DAY-W10/G72	ECN5063DAY-W10/G72 ⑦	ECN5068DAY-W10/G72	AN16TN0AB
	400		ECN5061DAY-W10/G77	ECN5062DAY-W10/G77	ECN5063DAY-W10/G77 ⑦	ECN5068DAY-W10/G77	
	450	600A	ECN5061DAZ-W10/G82	ECN5062DAZ-W10/G82	ECN5063DAZ-W10/G82 ⑦	ECN5068DAZ-W10/G82	
	500		ECN5061DAZ-W10/G87	ECN5062DAZ-W10/G87	ECN5063DAZ-W10/G87 4⑦	ECN5068DAZ-W10/G87	
	600	800A	ECN5061DA2-W10/G92	ECN5062DA2-W10/G92	ECN5063DA2-W10/G92 ⑦	ECN5068DA2-W10/G92	
	700	1000A	ECN5061DA3-W10/G97	ECN5062DA3-W10/G97	ECN5063DA3-W10/G97 ⑦	ECN5068DA3-W10/G97	
7YD	750	⑥	ECN5071DAU-W10/G102	ECN5072DAU-W10/G102	ECN5073DAU-W10/G102 ⑦	ECN5078DAU-W10/G102	AN16UN0AB
	800		ECN5071DAU-W10/G106	ECN5072DAU-W10/G106	ECN5073DAU-W10/G106 ⑦	ECN5078DAU-W10/G106	
	900		ECN5071DAU-W10/G109	ECN5072DAU-W10/G109	ECN5073DAU-W10/G109 ⑦	ECN5078DAU-W10/G109	
	1000		ECN5071DAU-W10/G112	ECN5072DAU-W10/G112	ECN5073DAU-W10/G112 ⑦	ECN5078DAU-W10/G112	
8YD	1250	⑥	ECN5081DAU-W10/G115	ECN5082DAU-W10/G115	ECN5083DAU-W10/G115 ⑦	ECN5088DAU-W10/G115	AN16VN0AB
	1500		ECN5081DAU-W10/G118	ECN5082DAU-W10/G118	ECN5083DAU-W10/G118 ⑦	ECN5088DAU-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN51—Non-Combination Closed Transition Wye Delta Starter

NEMA Size	Max. hp Rating	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ② Catalog Number	Component Starter (Open) ③ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ④						
2YD	15	ECN5121EAA-W10/G1	ECN5122EAA-W10/G1	ECN5124EAA-W10/G1	ECN5128EAA-W10/G1	AN16GN0AB
	20	ECN5121EAA-W10/G3	ECN5122EAA-W10/G3	ECN5124EAA-W10/G3	ECN5128EAA-W10/G3	
3YD	25	ECN5131EAA-W10/G8	ECN5132EAA-W10/G8	ECN5134EAA-W10/G8	ECN5138EAA-W10/G8	AN16KN0AB
	30	ECN5131EAA-W10/G13	ECN5132EAA-W10/G13	ECN5134EAA-W10/G13	ECN5138EAA-W10/G13	
	40	ECN5131EAA-W10/G18	ECN5132EAA-W10/G18	ECN5134EAA-W10/G18	ECN5138EAA-W10/G18	
4YD	50	ECN5141EAA-W10/G23	ECN5142EAA-W10/G23	ECN5144EAA-W10/G23	ECN5148EAA-W10/G23	AN16NN0AB
	60	ECN5141EAA-W10/G28	ECN5142EAA-W10/G28	ECN5144EAA-W10/G28	ECN5148EAA-W10/G28	
5YD	75	ECN5151EAA-W10/G33	ECN5152EAA-W10/G33	ECN5154EAA-W10/G33	ECN5158EAA-W10/G33	AN16SN0AB
	100	ECN5151EAA-W10/G38	ECN5152EAA-W10/G38	ECN5154EAA-W10/G38	ECN5158EAA-W10/G38	
	125	ECN5151EAA-W10/G43	ECN5152EAA-W10/G43	ECN5154EAA-W10/G43	ECN5158EAA-W10/G43	
	150	ECN5151EAA-W10/G48	ECN5152EAA-W10/G48	ECN5154EAA-W10/G48	ECN5158EAA-W10/G48	
6YD	200	ECN5161EAA-W10/G53	ECN5162EAA-W10/G53	ECN5163EAA-W10/G53 ⑤	ECN5168EAA-W10/G33	AN16TN0AB
	250	ECN5161EAA-W10/G58	ECN5162EAA-W10/G58	ECN5163EAA-W10/G58 ⑤	ECN5168EAA-W10/G58	
	300	ECN5161EAA-W10/G63	ECN5162EAA-W10/G63	ECN5163EAA-W10/G63 ⑤	ECN5168EAA-W10/G63	
7YD	350	ECN5171EAA-W10/G68	ECN5172EAA-W10/G68	ECN5173EAA-W10/G68 ⑤	ECN5178EAA-W10/G68	AN16UN0AB
	400	ECN5171EAA-W10/G73	ECN5172EAA-W10/G73	ECN5173EAA-W10/G73 ⑤	ECN5178EAA-W10/G73	
	450	ECN5171EAA-W10/G78	ECN5172EAA-W10/G78	ECN5173EAA-W10/G78 ⑤	ECN5178EAA-W10/G78	
	500	ECN5171EAA-W10/G83	ECN5172EAA-W10/G83	ECN5173EAA-W10/G83 ⑤	ECN5178EAA-W10/G83	
8YD	600	ECN5181EAA-W10/G88	ECN5182EAA-W10/G88	ECN5183EAA-W10/G88 ⑤	ECN5188EAA-W10/G88	AN16VN0AB
	700	ECN5181EAA-W10/G93	ECN5182EAA-W10/G93	ECN5183EAA-W10/G93 ⑤	ECN5188EAA-W10/G93	
	750	ECN5181EAA-W10/G98	ECN5182EAA-W10/G98	ECN5183EAA-W10/G98 ⑤	ECN5188EAA-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Also requires matching contactor with mechanical interlock.
- ④ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑤ Type 4 (painted steel) sizes 6–8YD.

Class ECN51 – Non-Combination Closed Transition Wye Delta Starter, continued

NEMA Size	Max. hp Rating	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ② Catalog Number	Component Starter (Open) ③ Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ④						
2YD	15	ECN5121BAA-W10/G2	ECN5122BAA-W10/G2	ECN5124BAA-W10/G2	ECN5128BAA-W10/G2	AN16GN0AB
	20	ECN5121BAA-W10/G4	ECN5122BAA-W10/G4	ECN5124BAA-W10/G4	ECN5128BAA-W10/G4	
	25	ECN5121BAA-W10/G9	ECN5122BAA-W10/G9	ECN5124BAA-W10/G9	ECN5128BAA-W10/G9	
3YD	30	ECN5131BAA-W10/G14	ECN5132BAA-W10/G14	ECN5134BAA-W10/G14	ECN5138BAA-W10/G14	AN16KN0AB
	40	ECN5131BAA-W10/G19	ECN5132BAA-W10/G19	ECN5134BAA-W10/G19	ECN5138BAA-W10/G19	
	50	ECN5131BAA-W10/G24	ECN5132BAA-W10/G24	ECN5134BAA-W10/G24	ECN5138BAA-W10/G24	
4YD	60	ECN5141BAA-W10/G29	ECN5142BAA-W10/G29	ECN5144BAA-W10/G29	ECN5148BAA-W10/G29	AN16NN0AB
	75	ECN5141BAA-W10/G34	ECN5142BAA-W10/G34	ECN5144BAA-W10/G34	ECN5148BAA-W10/G34	
5YD	100	ECN5151BAA-W10/G39	ECN5152BAA-W10/G39	ECN5154BAA-W10/G39	ECN5158BAA-W10/G39	AN16SN0AB
	125	ECN5151BAA-W10/G44	ECN5152BAA-W10/G44	ECN5154BAA-W10/G44	ECN5158BAA-W10/G44	
	150	ECN5151BAA-W10/G49	ECN5152BAA-W10/G49	ECN5154BAA-W10/G49	ECN5158BAA-W10/G49	
6YD	200	ECN5161BAA-W10/G54	ECN5162BAA-W10/G54	ECN5163BAA-W10/G54 ⑤	ECN5168BAA-W10/G54	AN16TN0AB
	250	ECN5161BAA-W10/G59	ECN5162BAA-W10/G59	ECN5163BAA-W10/G59 ⑤	ECN5168BAA-W10/G59	
	300	ECN5161BAA-W10/G64	ECN5162BAA-W10/G64	ECN5163BAA-W10/G64 ⑤	ECN5168BAA-W10/G64	
	350	ECN5161BAA-W10/G69	ECN5162BAA-W10/G69	ECN5163BAA-W10/G69 ⑤	ECN5168BAA-W10/G69	
7YD	400	ECN5171BAA-W10/G74	ECN5172BAA-W10/G74	ECN5173BAA-W10/G74 ⑤	ECN5178BAA-W10/G74	AN16UN0AB
	450	ECN5171BAA-W10/G79	ECN5172BAA-W10/G79	ECN5173BAA-W10/G79 ⑤	ECN5178BAA-W10/G79	
	500	ECN5171BAA-W10/G84	ECN5172BAA-W10/G84	ECN5173BAA-W10/G84 ⑤	ECN5178BAA-W10/G84	
8YD	600	ECN5181BAA-W10/G89	ECN5182BAA-W10/G89	ECN5183BAA-W10/G89 ⑤	ECN5188BAA-W10/G89	AN16VN0AB
	700	ECN5181BAA-W10/G94	ECN5182BAA-W10/G94	ECN5183BAA-W10/G94 ⑤	ECN5188BAA-W10/G94	
	750	ECN5181BAA-W10/G99	ECN5182BAA-W10/G99	ECN5183BAA-W10/G99 ⑤	ECN5188BAA-W10/G99	
	800	ECN5181BAA-W10/G103	ECN5182BAA-W10/G103	ECN5183BAA-W10/G103 ⑤	ECN5188BAA-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Also requires matching contactor with mechanical interlock.
- ④ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑤ Type 4 (painted steel) sizes 6–8YD.

Class ECN51—Non-Combination Closed Transition Wye Delta Starter, continued

NEMA Size	Max. hp Rating	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) ^③
		General Purpose	Rainproof	Water and Dust-Tight Stainless Steel ^①	Dust-Tight Industrial External Reset ^②	
		Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ^④						
2YD	20	ECN5121CAA-W10/G6	ECN5122CAA-W10/G6	ECN5124CAA-W10/G6	ECN5128CAA-W10/G6	AN16GN0AB
	25	ECN5121CAA-W10/G11	ECN5122CAA-W10/G11	ECN5124CAA-W10/G11	ECN5128CAA-W10/G11	
	30	ECN5121CAA-W10/G16	ECN5122CAA-W10/G16	ECN5124CAA-W10/G16	ECN5128CAA-W10/G16	
	40	ECN5121CAA-W10/G21	ECN5122CAA-W10/G21	ECN5124CAA-W10/G21	ECN5128CAA-W10/G21	
3YD	50	ECN5131CAA-W10/G26	ECN5132CAA-W10/G26	ECN5134CAA-W10/G26	ECN5138CAA-W10/G26	AN16KN0AB
	60	ECN5131CAA-W10/G31	ECN5132CAA-W10/G31	ECN5134CAA-W10/G31	ECN5138CAA-W10/G31	
	75	ECN5131CAA-W10/G36	ECN5132CAA-W10/G36	ECN5134CAA-W10/G36	ECN5138CAA-W10/G36	
4YD	100	ECN5141CAA-W10/G41	ECN5142CAA-W10/G41	ECN5144CAA-W10/G41	ECN5148CAA-W10/G41	AN16NN0AB
	125	ECN5141CAA-W10/G46	ECN5142CAA-W10/G46	ECN5144CAA-W10/G46	ECN5148CAA-W10/G46	
	150	ECN5141CAA-W10/G51	ECN5142CAA-W10/G51	ECN5144CAA-W10/G51	ECN5148CAA-W10/G51	
5YD	200	ECN5151CAA-W10/G56	ECN5152CAA-W10/G56	ECN5154CAA-W10/G56	ECN5158CAA-W10/G56	AN16SN0AB
	250	ECN5151CAA-W10/G61	ECN5152CAA-W10/G61	ECN5154CAA-W10/G61	ECN5158CAA-W10/G61	
	300	ECN5151CAA-W10/G66	ECN5152CAA-W10/G66	ECN5154CAA-W10/G66	ECN5158CAA-W10/G66	
6YD	350	ECN5161CAA-W10/G71	ECN5162CAA-W10/G71	ECN5163CAA-W10/G71 ^⑤	ECN5168CAA-W10/G71	AN16TN0AB
	400	ECN5161CAA-W10/G76	ECN5162CAA-W10/G76	ECN5163CAA-W10/G76 ^⑤	ECN5168CAA-W10/G76	
	450	ECN5161CAA-W10/G81	ECN5162CAA-W10/G81	ECN5163CAA-W10/G81 ^⑤	ECN5168CAA-W10/G81	
	500	ECN5161CAA-W10/G86	ECN5162CAA-W10/G86	ECN5163CAA-W10/G86 ^⑤	ECN5168CAA-W10/G86	
	600	ECN5161CAA-W10/G91	ECN5162CAA-W10/G91	ECN5163CAA-W10/G91 ^⑤	ECN5168CAA-W10/G91	
	650	ECN5161CAA-W10/G96	ECN5162CAA-W10/G96	ECN5163CAA-W10/G96 ^⑤	ECN5168CAA-W10/G96	
	700	ECN5161CAA-W10/G96	ECN5162CAA-W10/G96	ECN5163CAA-W10/G96 ^⑤	ECN5168CAA-W10/G96	
7YD	750	ECN5171CAA-W10/G101	ECN5172CAA-W10/G101	ECN5173CAA-W10/G101 ^⑤	ECN5178CAA-W10/G101	AN16UN0AB
	800	ECN5171CAA-W10/G105	ECN5172CAA-W10/G105	ECN5173CAA-W10/G105 ^⑤	ECN5178CAA-W10/G105	
	900	ECN5171CAA-W10/G108	ECN5172CAA-W10/G108	ECN5173CAA-W10/G108 ^⑤	ECN5178CAA-W10/G108	
	1000	ECN5171CAA-W10/G111	ECN5172CAA-W10/G111	ECN5173CAA-W10/G111 ^⑤	ECN5178CAA-W10/G111	
8YD	1250	ECN5181CAA-W10/G114	ECN5182CAA-W10/G114	ECN5183CAA-W10/G114 ^⑤	ECN5188CAA-W10/G114	AN16VN0AB
	1500	ECN5181CAA-W10/G117	ECN5182CAA-W10/G117	ECN5183CAA-W10/G117 ^⑤	ECN5188CAA-W10/G117	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Also requires matching contactor with mechanical interlock.
- ④ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑤ Type 4 (painted steel) sizes 6–8YD.

Class ECN51 – Non-Combination Closed Transition Wye Delta Starter, continued

NEMA Size	Max. hp Rating	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ② Catalog Number	Component Starter (Open) ③ Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ④						
2YD	20	ECN5121DAA-W10/G7	ECN5122DAA-W10/G7	ECN5124DAA-W10/G7	ECN5128DAA-W10/G7	AN16GN0AB
	25	ECN5121DAA-W10/G12	ECN5122DAA-W10/G12	ECN5124DAA-W10/G12	ECN5128DAA-W10/G12	
	30	ECN5121DAA-W10/G17	ECN5122DAA-W10/G17	ECN5124DAA-W10/G17	ECN5128DAA-W10/G17	
	40	ECN5121DAA-W10/G22	ECN5122DAA-W10/G22	ECN5124DAA-W10/G22	ECN5128DAA-W10/G22	
3YD	50	ECN5131DAA-W10/G27	ECN5132DAA-W10/G27	ECN5134DAA-W10/G27	ECN5138DAA-W10/G27	AN16KN0AB
	60	ECN5131DAA-W10/G32	ECN5132DAA-W10/G32	ECN5134DAA-W10/G32	ECN5138DAA-W10/G32	
	75	ECN5131DAA-W10/G37	ECN5132DAA-W10/G37	ECN5134DAA-W10/G37	ECN5138DAA-W10/G37	
4YD	100	ECN5141DAA-W10/G42	ECN5142DAA-W10/G42	ECN5144DAA-W10/G42	ECN5148DAA-W10/G42	AN16NN0AB
	125	ECN5141DAA-W10/G47	ECN5142DAA-W10/G47	ECN5144DAA-W10/G47	ECN5148DAA-W10/G47	
	150	ECN5141DAA-W10/G52	ECN5142DAA-W10/G52	ECN5144DAA-W10/G52	ECN5148DAA-W10/G52	
5YD	200	ECN5151DAA-W10/G57	ECN5152DAA-W10/G57	ECN5154DAA-W10/G57	ECN5158DAA-W10/G57	AN16SN0AB
	250	ECN5151DAA-W10/G62	ECN5152DAA-W10/G62	ECN5154DAA-W10/G62	ECN5158DAA-W10/G62	
	300	ECN5151DAA-W10/G67	ECN5152DAA-W10/G67	ECN5154DAA-W10/G67	ECN5158DAA-W10/G67	
6YD	350	ECN5161DAA-W10/G72	ECN5162DAA-W10/G72	ECN5163DAA-W10/G72 ⑤	ECN5168DAA-W10/G72	AN16TN0AB
	400	ECN5161DAA-W10/G77	ECN5162DAA-W10/G77	ECN5163DAA-W10/G77 ⑤	ECN5168DAA-W10/G77	
	450	ECN5161DAA-W10/G82	ECN5162DAA-W10/G82	ECN5163DAA-W10/G82 ⑤	ECN5168DAA-W10/G82	
	500	ECN5161DAA-W10/G87	ECN5162DAA-W10/G87	ECN5163DAA-W10/G87 ⑤	ECN5168DAA-W10/G87	
	600	ECN5161DAA-W10/G92	ECN5162DAA-W10/G92	ECN5163DAA-W10/G92 ⑤	ECN5168DAA-W10/G92	
	700	ECN5161DAA-W10/G97	ECN5162DAA-W10/G97	ECN5163DAA-W10/G97 ⑤	ECN5168DAA-W10/G97	
7YD	750	ECN5171DAA-W10/G102	ECN5172DAA-W10/G102	ECN5173DAA-W10/G102 ⑤	ECN5178DAA-W10/G102	AN16UN0AB
	800	ECN5171DAA-W10/G106	ECN5172DAA-W10/G106	ECN5173DAA-W10/G106 ⑤	ECN5178DAA-W10/G106	
	900	ECN5171DAA-W10/G109	ECN5172DAA-W10/G109	ECN5173DAA-W10/G109 ⑤	ECN5178DAA-W10/G109	
	1000	ECN5171DAA-W10/G112	ECN5172DAA-W10/G112	ECN5173DAA-W10/G112 ⑤	ECN5178DAA-W10/G112	
8YD	1250	ECN5181DAA-W10/G115	ECN5182DAA-W10/G115	ECN5183DAA-W10/G115 ⑤	ECN5188DAA-W10/G115	AN16VN0AB
	1500	ECN5181DAA-W10/G118	ECN5182DAA-W10/G118	ECN5183DAA-W10/G118 ⑤	ECN5188DAA-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Also requires matching contactor with mechanical interlock.
- ④ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑤ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Fusible Disconnect

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN5221EAD-W10/G1	ECN5222EAD-W10/G1	ECN5224EAD-W10/G1	ECN5228EAD-W10/G1	AN16GN0AB
	20	100A	ECN5221EAF-W10/G3	ECN5222EAF-W10/G3	ECN5224EAF-W10/G3	ECN5228EAF-W10/G3	
3YD	25	100A	ECN5231EAF-W10/G8	ECN5232EAF-W10/G8	ECN5234EAF-W10/G8	ECN5238EAF-W10/G8	AN16KN0AB
	30	200A	ECN5231EAH-W10/G13	ECN5232EAH-W10/G13	ECN5234EAH-W10/G13	ECN5238EAH-W10/G13	
	40		ECN5231EAH-W10/G18	ECN5232EAH-W10/G18	ECN5234EAH-W10/G18	ECN5238EAH-W10/G18	
4YD	50	200A	ECN5241EAH-W10/G23	ECN5242EAH-W10/G23	ECN5244EAH-W10/G23	ECN5248EAH-W10/G23	AN16NN0AB
	60	400A	ECN5241EAK-W10/G28	ECN5242EAK-W10/G28	ECN5244EAK-W10/G28	ECN5248EAK-W10/G28	
5YD	75	400A	ECN5251EAK-W10/G33	ECN5252EAK-W10/G33	ECN5254EAK-W10/G33	ECN5258EAK-W10/G33	AN16SN0AB
	100		ECN5251EAK-W10/G38	ECN5252EAK-W10/G38	ECN5254EAK-W10/G38	ECN5258EAK-W10/G38	
	125	600A	ECN5251EAM-W10/G43	ECN5252EAM-W10/G43	ECN5254EAM-W10/G43	ECN5258EAM-W10/G43	
	150		ECN5251EAM-W10/G48	ECN5252EAM-W10/G48	ECN5254EAM-W10/G48	ECN5258EAM-W10/G48	
6YD	200	⑥	ECN5261EAU-W10/G53	ECN5262EAU-W10/G53	ECN5263EAU-W10/G53 ⑦	ECN5268EAU-W10/G53	AN16TN0AB
	250		ECN5261EAU-W10/G58	ECN5262EAU-W10/G58	ECN5263EAU-W10/G58 ⑦	ECN5268EAU-W10/G58	
	300		ECN5261EAU-W10/G63	ECN5262EAU-W10/G63	ECN5263EAU-W10/G63 ⑦	ECN5268EAU-W10/G63	
7YD	350	⑥	ECN5271EAU-W10/G68	ECN5272EAU-W10/G68	ECN5273EAU-W10/G68 ⑦	ECN5278EAU-W10/G68	AN16UN0AB
	400		ECN5271EAU-W10/G73	ECN5272EAU-W10/G73	ECN5273EAU-W10/G73 ⑦	ECN5278EAU-W10/G73	
	450		ECN5271EAU-W10/G78	ECN5272EAU-W10/G78	ECN5273EAU-W10/G78 ⑦	ECN5278EAU-W10/G78	
	500		ECN5271EAU-W10/G83	ECN5272EAU-W10/G83	ECN5273EAU-W10/G83 ⑦	ECN5278EAU-W10/G83	
8YD	600	⑥	ECN5281EAU-W10/G88	ECN5282EAU-W10/G88	ECN5283EAU-W10/G88 ⑦	ECN5288EAU-W10/G88	AN16VN0AB
	700		ECN5281EAU-W10/G93	ECN5282EAU-W10/G93	ECN5283EAU-W10/G93 ⑦	ECN5288EAU-W10/G93	
	750		ECN5281EAU-W10/G98	ECN5282EAU-W10/G98	ECN5283EAU-W10/G98 ⑦	ECN5288EAU-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN5221BAD-W10/G2	ECN5222BAD-W10/G2	ECN5224BAD-W10/G2	ECN5228BAD-W10/G2	AN16GN0AB
	20	100A	ECN5221BAF-W10/G4	ECN5222BAF-W10/G4	ECN5224BAF-W10/G4	ECN5228BAF-W10/G4	
	25		ECN5221BAF-W10/G9	ECN5222BAF-W10/G9	ECN5224BAF-W10/G9	ECN5228BAF-W10/G9	
3YD	30	100A	ECN5231BAF-W10/G14	ECN5232BAF-W10/G14	ECN5234BAF-W10/G14	ECN5238BAF-W10/G14	AN16KN0AB
	40	200A	ECN5231BAH-W10/G19	ECN5232BAH-W10/G19	ECN5234BAH-W10/G19	ECN5238BAH-W10/G19	
	50		ECN5231BAH-W10/G24	ECN5232BAH-W10/G24	ECN5234BAH-W10/G24	ECN5238BAH-W10/G24	
4YD	60	200A	ECN5241BAH-W10/G29	ECN5242BAH-W10/G29	ECN5244BAH-W10/G29	ECN5248BAH-W10/G29	AN16NN0AB
	75	400A	ECN5241BAK-W10/G34	ECN5242BAK-W10/G34	ECN5244BAK-W10/G34	ECN5248BAK-W10/G34	
5YD	100	400A	ECN5251BAK-W10/G39	ECN5252BAK-W10/G39	ECN5254BAK-W10/G39	ECN5258BAK-W10/G39	AN16SN0AB
	125		ECN5251BAK-W10/G44	ECN5252BAK-W10/G44	ECN5254BAK-W10/G44	ECN5258BAK-W10/G44	
	150	600A	ECN5251BAM-W10/G49	ECN5252BAM-W10/G49	ECN5254BAM-W10/G49	ECN5258BAM-W10/G49	
6YD	200	600A ⑥	ECN5261BAM-W10/G54	ECN5262BAM-W10/G54	ECN5263BAM-W10/G54 ⑦	ECN5268BAM-W10/G54	AN16TN0AB
	250		ECN5261BAU-W10/G59	ECN5262BAU-W10/G59	ECN5263BAU-W10/G59 ⑦	ECN5268BAU-W10/G59	
	300		ECN5261BAU-W10/G64	ECN5262BAU-W10/G64	ECN5263BAU-W10/G64 ⑦	ECN5268BAU-W10/G64	
	350		ECN5261BAU-W10/G69	ECN5262BAU-W10/G69	ECN5263BAU-W10/G69 ⑦	ECN5268BAU-W10/G69	
7YD	400	⑥	ECN5271BAU-W10/G74	ECN5272BAU-W10/G74	ECN5273BAU-W10/G74 ⑦	ECN5278BAU-W10/G74	AN16UN0AB
	450		ECN5271BAU-W10/G79	ECN5272BAU-W10/G79	ECN5273BAU-W10/G79 ⑦	ECN5278BAU-W10/G79	
	500		ECN5271BAU-W10/G84	ECN5272BAU-W10/G84	ECN5273BAU-W10/G84 ⑦	ECN5278BAU-W10/G84	
8YD	600	⑥	ECN5281BAU-W10/G89	ECN5282BAU-W10/G89	ECN5283BAU-W10/G89 ⑦	ECN5288BAU-W10/G89	AN16VN0AB
	700		ECN5281BAU-W10/G94	ECN5282BAU-W10/G94	ECN5283BAU-W10/G94 ⑦	ECN5288BAU-W10/G94	
	750		ECN5281BAU-W10/G99	ECN5282BAU-W10/G99	ECN5283BAU-W10/G99 ⑦	ECN5288BAU-W10/G99	
	800		ECN5281BAU-W10/G103	ECN5282BAU-W10/G103	ECN5283BAU-W10/G103 ⑦	ECN5288BAU-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number	
Motor Volts 460/Magnet Coil Voltage 120 ⑤								
2YD	20	60A	ECN5221CAE-W10/G6	ECN5222CAE-W10/G6	ECN5224CAE-W10/G6	ECN5228CAE-W10/G6	AN16GN0AB	
	25		ECN5221CAE-W10/G11	ECN5222CAE-W10/G11	ECN5224CAE-W10/G11	ECN5228CAE-W10/G11		
	30		ECN5221CAE-W10/G16	ECN5222CAE-W10/G16	ECN5224CAE-W10/G16	ECN5228CAE-W10/G16		
	40		ECN5221CAE-W10/G21	ECN5222CAE-W10/G21	ECN5224CAE-W10/G21	ECN5228CAE-W10/G21		
3YD	50	100A	ECN5231CAG-W10/G26	ECN5232CAG-W10/G26	ECN5234CAG-W10/G26	ECN5238CAG-W10/G26	AN16KN0AB	
	60		ECN5231CAG-W10/G31	ECN5232CAG-W10/G31	ECN5234CAG-W10/G31	ECN5238CAG-W10/G31		
	75		200A	ECN5231CAJ-W10/G36	ECN5232CAJ-W10/G36	ECN5234CAJ-W10/G36		ECN5238CAJ-W10/G36
4YD	100	200A	ECN5241CAJ-W10/G41	ECN5242CAJ-W10/G41	ECN5244CAJ-W10/G41	ECN5248CAJ-W10/G41	AN16NN0AB	
	125		ECN5241CAJ-W10/G46	ECN5242CAJ-W10/G46	ECN5244CAJ-W10/G46	ECN5248CAJ-W10/G46		
	150		400A	ECN5241CAL-W10/G51	ECN5242CAL-W10/G51	ECN5244CAL-W10/G51		ECN5248CAL-W10/G51
5YD	200	400A	ECN5251CAL-W10/G56	ECN5252CAL-W10/G56	ECN5254CAL-W10/G56	ECN5258CAL-W10/G56	AN16SN0AB	
	250		ECN5251CAL-W10/G61	ECN5252CAL-W10/G61	ECN5254CAL-W10/G61	ECN5258CAL-W10/G61		
	300		600A	ECN5251CAN-W10/G66	ECN5252CAN-W10/G66	ECN5254CAN-W10/G66		ECN5258CAN-W10/G66
6YD	350	600A	ECN5261CAN-W10/G71	ECN5262CAN-W10/G71	ECN5263CAN-W10/G71 ⑦	ECN5268CAN-W10/G71	AN16TN0AB	
	400		ECN5261CAN-W10/G76	ECN5262CAN-W10/G76	ECN5263CAN-W10/G76 ⑦	ECN5268CAN-W10/G76		
	450		ECN5261CAN-W10/G81	ECN5262CAN-W10/G81	ECN5263CAN-W10/G81 ⑦	ECN5268CAN-W10/G81		
	500		800A	ECN5261CAP-W10/G86	ECN5262CAP-W10/G86	ECN5263CAP-W10/G86 ⑦		ECN5268CAP-W10/G86
	600		1200A	ECN5261CAQ-W10/G91	ECN5262CAQ-W10/G91	ECN5263CAQ-W10/G91 ⑦		ECN5268CAQ-W10/G91
	700		ECN5261CAQ-W10/G96	ECN5262CAQ-W10/G96	ECN5263CAQ-W10/G96 ⑦	ECN5268CAQ-W10/G96		
7YD	750	1200A ⑥	ECN5271CAQ-W10/G101	ECN5272CAQ-W10/G101	ECN5273CAQ-W10/G101 ⑦	ECN5278CAQ-W10/G101	AN16UN0AB	
	800		ECN5271CAU-W10/G105	ECN5272CAU-W10/G105	ECN5273CAU-W10/G105 ⑦	ECN5278CAU-W10/G105		
	900		ECN5271CAU-W10/G108	ECN5272CAU-W10/G108	ECN5273CAU-W10/G108 ⑦	ECN5278CAU-W10/G108		
	1000		ECN5271CAU-W10/G111	ECN5272CAU-W10/G111	ECN5273CAU-W10/G111 ⑦	ECN5278CAU-W10/G111		
8YD	1250	⑥	ECN5281CAU-W10/G114	ECN5282CAU-W10/G114	ECN5283CAU-W10/G114 ⑦	ECN5288CAU-W10/G114	AN16VN0AB	
	1500		ECN5281CAU-W10/G117	ECN5282CAU-W10/G117	ECN5283CAU-W10/G117 ⑦	ECN5288CAU-W10/G117		

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ⑤							
2YD	20	30A	ECN5221DAC-W10/G7	ECN5222DAC-W10/G7	ECN5224DAC-W10/G7	ECN5228DAC-W10/G7	AN16GN0AB
	25	60A	ECN5221DAE-W10/G12	ECN5222DAE-W10/G12	ECN5224DAE-W10/G12	ECN5228DAE-W10/G12	
	30		ECN5221DAE-W10/G17	ECN5222DAE-W10/G17	ECN5224DAE-W10/G17	ECN5228DAE-W10/G17	
	40		ECN5221DAE-W10/G22	ECN5222DAE-W10/G22	ECN5224DAE-W10/G22	ECN5228DAE-W10/G22	
3YD	50	100A	ECN5231DAG-W10/G27	ECN5232DAG-W10/G27	ECN5234DAG-W10/G27	ECN5238DAG-W10/G27	AN16KN0AB
	60		ECN5231DAG-W10/G32	ECN5232DAG-W10/G32	ECN5234DAG-W10/G32	ECN5238DAG-W10/G32	
	75		ECN5231DAG-W10/G37	ECN5232DAG-W10/G37	ECN5234DAG-W10/G37	ECN5238DAG-W10/G37	
4YD	100	200A	ECN5241DAJ-W10/G42	ECN5242DAJ-W10/G42	ECN5244DAJ-W10/G42	ECN5248DAJ-W10/G42	AN16NN0AB
	125		ECN5241DAJ-W10/G47	ECN5242DAJ-W10/G47	ECN5244DAJ-W10/G47	ECN5248DAJ-W10/G47	
	150		ECN5241DAJ-W10/G52	ECN5242DAJ-W10/G52	ECN5244DAJ-W10/G52	ECN5248DAJ-W10/G52	
5YD	200	400A	ECN5251DAL-W10/G57	ECN5252DAL-W10/G57	ECN5254DAL-W10/G57	ECN5258DAL-W10/G57	AN16SN0AB
	250		ECN5251DAL-W10/G62	ECN5252DAL-W10/G62	ECN5254DAL-W10/G62	ECN5258DAL-W10/G62	
	300		ECN5251DAL-W10/G67	ECN5252DAL-W10/G67	ECN5254DAL-W10/G67	ECN5258DAL-W10/G67	
6YD	350	400A	ECN5261DAL-W10/G72	ECN5262DAL-W10/G72	ECN5263DAL-W10/G72 ⑦	ECN5268DAL-W10/G72	AN16TN0AB
	400	600A	ECN5261DAN-W10/G77	ECN5262DAN-W10/G77	ECN5263DAN-W10/G77 ⑦	ECN5268DAN-W10/G77	
	450		ECN5261DAN-W10/G82	ECN5262DAN-W10/G82	ECN5263DAN-W10/G82 ⑦	ECN5268DAN-W10/G82	
	500		ECN5261DAN-W10/G87	ECN5262DAN-W10/G87	ECN5263DAN-W10/G87 ⑦	ECN5268DAN-W10/G87	
	600	800A	ECN5261DAP-W10/G92	ECN5262DAP-W10/G92	ECN5263DAP-W10/G92 ⑦	ECN5268DAP-W10/G92	
	700		ECN5261DAP-W10/G97	ECN5262DAP-W10/G97	ECN5263DAP-W10/G97 ⑦	ECN5268DAP-W10/G97	
7YD	750	⑥	ECN5271DAU-W10/G102	ECN5272DAU-W10/G102	ECN5273DAU-W10/G102 ⑦	ECN5278DAU-W10/G102	AN16UN0AB
	800		ECN5271DAU-W10/G106	ECN5272DAU-W10/G106	ECN5273DAU-W10/G106 ⑦	ECN5278DAU-W10/G106	
	900		ECN5271DAU-W10/G109	ECN5272DAU-W10/G109	ECN5273DAU-W10/G109 ⑦	ECN5278DAU-W10/G109	
	1000		ECN5271DAU-W10/G112	ECN5272DAU-W10/G112	ECN5273DAU-W10/G112 ⑦	ECN5278DAU-W10/G112	
8YD	1250	⑥	ECN5281DAU-W10/G115	ECN5282DAU-W10/G115	ECN5283DAU-W10/G115 ⑦	ECN5288DAU-W10/G115	AN16VN0AB
	1500		ECN5281DAU-W10/G118	ECN5282DAU-W10/G118	ECN5283DAU-W10/G118 ⑦	ECN5288DAU-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Non-Fusible Disconnect

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN5221EAA-W10/G1	ECN5222EAA-W10/G1	ECN5224EAA-W10/G1	ECN5228EAA-W10/G1	AN16GN0AB
	20	100A	ECN5221EAA-W10/G3	ECN5222EAA-W10/G3	ECN5224EAA-W10/G3	ECN5228EAA-W10/G3	
3YD	25	100A	ECN5231EAA-W10/G8	ECN5232EAA-W10/G8	ECN5234EAA-W10/G8	ECN5238EAA-W10/G8	AN16KN0AB
	30	200A	ECN5231EAA-W10/G13	ECN5232EAA-W10/G13	ECN5234EAA-W10/G13	ECN5238EAA-W10/G13	
	40		ECN5231EAA-W10/G18	ECN5232EAA-W10/G18	ECN5234EAA-W10/G18	ECN5238EAA-W10/G18	
4YD	50	200A	ECN5241EAA-W10/G23	ECN5242EAA-W10/G23	ECN5244EAA-W10/G23	ECN5248EAA-W10/G23	AN16NN0AB
	60	400A	ECN5241EAA-W10/G28	ECN5242EAA-W10/G28	ECN5244EAA-W10/G28	ECN5248EAA-W10/G28	
5YD	75	400A	ECN5251EAA-W10/G33	ECN5252EAA-W10/G33	ECN5254EAA-W10/G33	ECN5258EAA-W10/G33	AN16SN0AB
	100		ECN5251EAA-W10/G38	ECN5252EAA-W10/G38	ECN5254EAA-W10/G38	ECN5258EAA-W10/G38	
	125	600A	ECN5251EAA-W10/G43	ECN5252EAA-W10/G43	ECN5254EAA-W10/G43	ECN5258EAA-W10/G43	
	150		ECN5251EAA-W10/G48	ECN5252EAA-W10/G48	ECN5254EAA-W10/G48	ECN5258EAA-W10/G48	
6YD	200	⑥	ECN5261EAA-W10/G53	ECN5262EAA-W10/G53	ECN5263EAA-W10/G53 ⑦	ECN5268EAA-W10/G33	AN16TN0AB
	250		ECN5261EAA-W10/G58	ECN5262EAA-W10/G58	ECN5263EAA-W10/G58 ⑦	ECN5268EAA-W10/G58	
	300		ECN5261EAA-W10/G63	ECN5262EAA-W10/G63	ECN5263EAA-W10/G63 ⑦	ECN5268EAA-W10/G63	
7YD	350	⑥	ECN5271EAA-W10/G68	ECN5272EAA-W10/G68	ECN5273EAA-W10/G68 ⑦	ECN5278EAA-W10/G68	AN16UN0AB
	400		ECN5271EAA-W10/G73	ECN5272EAA-W10/G73	ECN5273EAA-W10/G73 ⑦	ECN5278EAA-W10/G73	
	450		ECN5271EAA-W10/G78	ECN5272EAA-W10/G78	ECN5273EAA-W10/G78 ⑦	ECN5278EAA-W10/G78	
	500		ECN5271EAA-W10/G83	ECN5272EAA-W10/G83	ECN5273EAA-W10/G83 ⑦	ECN5278EAA-W10/G83	
8YD	600	⑥	ECN5281EAA-W10/G88	ECN5282EAA-W10/G88	ECN5283EAA-W10/G88 ⑦	ECN5288EAA-W10/G88	AN16VN0AB
	700		ECN5281EAA-W10/G93	ECN5282EAA-W10/G93	ECN5283EAA-W10/G93 ⑦	ECN5288EAA-W10/G93	
	750		ECN5281EAA-W10/G98	ECN5282EAA-W10/G98	ECN5283EAA-W10/G98 ⑦	ECN5288EAA-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Non-Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN5221BAA-W10/G2	ECN5222BAA-W10/G2	ECN5224BAA-W10/G2	ECN5228BAA-W10/G2	AN16GN0AB
	20	100A	ECN5221BAA-W10/G4	ECN5222BAA-W10/G4	ECN5224BAA-W10/G4	ECN5228BAA-W10/G4	
	25		ECN5221BAA-W10/G9	ECN5222BAA-W10/G9	ECN5224BAA-W10/G9	ECN5228BAA-W10/G9	
3YD	30	100A	ECN5231BAA-W10/G14	ECN5232BAA-W10/G14	ECN5234BAA-W10/G14	ECN5238BAA-W10/G14	AN16KN0AB
	40	200A	ECN5231BAA-W10/G19	ECN5232BAA-W10/G19	ECN5234BAA-W10/G19	ECN5238BAA-W10/G19	
	50		ECN5231BAA-W10/G24	ECN5232BAA-W10/G24	ECN5234BAA-W10/G24	ECN5238BAA-W10/G24	
4YD	60	200A	ECN5241BAA-W10/G29	ECN5242BAA-W10/G29	ECN5244BAA-W10/G29	ECN5248BAA-W10/G29	AN16NN0AB
	75	400A	ECN5241BAA-W10/G34	ECN5242BAA-W10/G34	ECN5244BAA-W10/G34	ECN5248BAA-W10/G34	
5YD	100	400A	ECN5251BAA-W10/G39	ECN5252BAA-W10/G39	ECN5254BAA-W10/G39	ECN5258BAA-W10/G39	AN16SN0AB
	125		ECN5251BAA-W10/G44	ECN5252BAA-W10/G44	ECN5254BAA-W10/G44	ECN5258BAA-W10/G44	
	150	600A	ECN5251BAA-W10/G49	ECN5252BAA-W10/G49	ECN5254BAA-W10/G49	ECN5258BAA-W10/G49	
6YD	200	600A	ECN5261BAA-W10/G54	ECN5262BAA-W10/G54	ECN5263BAA-W10/G54 ⑦	ECN5268BAA-W10/G54	AN16TN0AB
	250	⑥	ECN5261BAA-W10/G59	ECN5262BAA-W10/G59	ECN5263BAA-W10/G59 ⑦	ECN5268BAA-W10/G59	
	300		ECN5261BAA-W10/G64	ECN5262BAA-W10/G64	ECN5263BAA-W10/G64 ⑦	ECN5268BAA-W10/G64	
	350		ECN5261BAA-W10/G69	ECN5262BAA-W10/G69	ECN5263BAA-W10/G69 ⑦	ECN5268BAA-W10/G69	
7YD	400	⑥	ECN5271BAA-W10/G74	ECN5272BAA-W10/G74	ECN5273BAA-W10/G74 ⑦	ECN5278BAA-W10/G74	AN16UN0AB
	450		ECN5271BAA-W10/G79	ECN5272BAA-W10/G79	ECN5273BAA-W10/G79 ⑦	ECN5278BAA-W10/G79	
	500		ECN5271BAA-W10/G84	ECN5272BAA-W10/G84	ECN5273BAA-W10/G84 ⑦	ECN5278BAA-W10/G84	
8YD	600	⑥	ECN5281BAA-W10/G89	ECN5282BAA-W10/G89	ECN5283BAA-W10/G89 ⑦	ECN5288BAA-W10/G89	AN16VN0AB
	700		ECN5281BAA-W10/G94	ECN5282BAA-W10/G94	ECN5283BAA-W10/G94 ⑦	ECN5288BAA-W10/G94	
	750		ECN5281BAA-W10/G99	ECN5282BAA-W10/G99	ECN5283BAA-W10/G99 ⑦	ECN5288BAA-W10/G99	
	800		ECN5281BAA-W10/G103	ECN5282BAA-W10/G103	ECN5283BAA-W10/G103 ⑦	ECN5288BAA-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary. If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Non-Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number	
Motor Volts 460/Magnet Coil Voltage 120 ⑤								
2YD	20	60A	ECN5221CAA-W10/G6	ECN5222CAA-W10/G6	ECN5224CAA-W10/G6	ECN5228CAA-W10/G6	AN16GN0AB	
	25		ECN5221CAA-W10/G11	ECN5222CAA-W10/G11	ECN5224CAA-W10/G11	ECN5228CAA-W10/G11		
	30		ECN5221CAA-W10/G16	ECN5222CAA-W10/G16	ECN5224CAA-W10/G16	ECN5228CAA-W10/G16		
	40		ECN5221CAA-W10/G21	ECN5222CAA-W10/G21	ECN5224CAA-W10/G21	ECN5228CAA-W10/G21		
3YD	50	100A	ECN5231CAA-W10/G26	ECN5232CAA-W10/G26	ECN5234CAA-W10/G26	ECN5238CAA-W10/G26	AN16KN0AB	
	60		ECN5231CAA-W10/G31	ECN5232CAA-W10/G31	ECN5234CAA-W10/G31	ECN5238CAA-W10/G31		
	75		200A	ECN5231CAA-W10/G36	ECN5232CAA-W10/G36	ECN5234CAA-W10/G36		ECN5238CAA-W10/G36
4YD	100	200A	ECN5241CAA-W10/G41	ECN5242CAA-W10/G41	ECN5244CAA-W10/G41	ECN5248CAA-W10/G41	AN16NN0AB	
	125		ECN5241CAA-W10/G46	ECN5242CAA-W10/G46	ECN5244CAA-W10/G46	ECN5248CAA-W10/G46		
	150		400A	ECN5241CAA-W10/G51	ECN5242CAA-W10/G51	ECN5244CAA-W10/G51		ECN5248CAA-W10/G51
5YD	200	400A	ECN5251CAA-W10/G56	ECN5252CAA-W10/G56	ECN5254CAA-W10/G56	ECN5258CAA-W10/G56	AN16SN0AB	
	250		ECN5251CAA-W10/G61	ECN5252CAA-W10/G61	ECN5254CAA-W10/G61	ECN5258CAA-W10/G61		
	300		600A	ECN5251CAA-W10/G66	ECN5252CAA-W10/G66	ECN5254CAA-W10/G66		ECN5258CAA-W10/G66
6YD	350	600A	ECN5261CAA-W10/G71	ECN5262CAA-W10/G71	ECN5263CAA-W10/G71 ⑦	ECN5268CAA-W10/G71	AN16TN0AB	
	400		ECN5261CAA-W10/G76	ECN5262CAA-W10/G76	ECN5263CAA-W10/G76 ⑦	ECN5268CAA-W10/G76		
	450		ECN5261CAA-W10/G81	ECN5262CAA-W10/G81	ECN5263CAA-W10/G81 ⑦	ECN5268CAA-W10/G81		
	500		800A	ECN5261CAA-W10/G86	ECN5262CAA-W10/G86	ECN5263CAA-W10/G86 ⑦		ECN5268CAA-W10/G86
	600		1200A	ECN5261CAA-W10/G91	ECN5262CAA-W10/G91	ECN5263CAA-W10/G91 ⑦		ECN5268CAA-W10/G91
	700		ECN5261CAA-W10/G96	ECN5262CAA-W10/G96	ECN5263CAA-W10/G96 ⑦	ECN5268CAA-W10/G96		
7YD	750	1200A	ECN5271CAA-W10/G101	ECN5272CAA-W10/G101	ECN5273CAA-W10/G101 ⑦	ECN5278CAA-W10/G101	AN16UN0AB	
	800		⑥	ECN5271CAA-W10/G105	ECN5272CAA-W10/G105	ECN5273CAA-W10/G105 ⑦		ECN5278CAA-W10/G105
	900		ECN5271CAA-W10/G108	ECN5272CAA-W10/G108	ECN5273CAA-W10/G108 ⑦	ECN5278CAA-W10/G108		
	1000		ECN5271CAA-W10/G111	ECN5272CAA-W10/G111	ECN5273CAA-W10/G111 ⑦	ECN5278CAA-W10/G111		
8YD	1250	⑥	ECN5281CAA-W10/G114	ECN5282CAA-W10/G114	ECN5283CAA-W10/G114 ⑦	ECN5288CAA-W10/G114	AN16VN0AB	
	1500		ECN5281CAA-W10/G117	ECN5282CAA-W10/G117	ECN5283CAA-W10/G117 ⑦	ECN5288CAA-W10/G117		

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN52—Combination Closed Transition Wye Delta Starter—Non-Fusible Disconnect, continued

NEMA Size	Max. hp Rating	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ^① Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{②③} Catalog Number	Component Starter (Open) ^④ Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ^⑤							
2YD	20	30A	ECN5221DAA-W10/G7	ECN5222DAA-W10/G7	ECN5224DAA-W10/G7	ECN5228DAA-W10/G7	AN16GN0AB
	25	60A	ECN5221DAA-W10/G12	ECN5222DAA-W10/G12	ECN5224DAA-W10/G12	ECN5228DAA-W10/G12	
	30		ECN5221DAA-W10/G17	ECN5222DAA-W10/G17	ECN5224DAA-W10/G17	ECN5228DAA-W10/G17	
	40		ECN5221DAA-W10/G22	ECN5222DAA-W10/G22	ECN5224DAA-W10/G22	ECN5228DAA-W10/G22	
3YD	50	100A	ECN5231DAA-W10/G27	ECN5232DAA-W10/G27	ECN5234DAA-W10/G27	ECN5238DAA-W10/G27	AN16KN0AB
	60		ECN5231DAA-W10/G32	ECN5232DAA-W10/G32	ECN5234DAA-W10/G32	ECN5238DAA-W10/G32	
	75		ECN5231DAA-W10/G37	ECN5232DAA-W10/G37	ECN5234DAA-W10/G37	ECN5238DAA-W10/G37	
4YD	100	200A	ECN5241DAA-W10/G42	ECN5242DAA-W10/G42	ECN5244DAA-W10/G42	ECN5248DAA-W10/G42	AN16NN0AB
	125		ECN5241DAA-W10/G47	ECN5242DAA-W10/G47	ECN5244DAA-W10/G47	ECN5248DAA-W10/G47	
	150		ECN5241DAA-W10/G52	ECN5242DAA-W10/G52	ECN5244DAA-W10/G52	ECN5248DAA-W10/G52	
5YD	200	400A	ECN5251DAA-W10/G57	ECN5252DAA-W10/G57	ECN5254DAA-W10/G57	ECN5258DAA-W10/G57	AN16SN0AB
	250		ECN5251DAA-W10/G62	ECN5252DAA-W10/G62	ECN5254DAA-W10/G62	ECN5258DAA-W10/G62	
	300		ECN5251DAA-W10/G67	ECN5252DAA-W10/G67	ECN5254DAA-W10/G67	ECN5258DAA-W10/G67	
6YD	350	400A	ECN5261DAA-W10/G72	ECN5262DAA-W10/G72	ECN5263DAA-W10/G72 ^⑦	ECN5268DAA-W10/G72	AN16TN0AB
	400	600A	ECN5261DAA-W10/G77	ECN5262DAA-W10/G77	ECN5263DAA-W10/G77 ^⑦	ECN5268DAA-W10/G77	
	450		ECN5261DAA-W10/G82	ECN5262DAA-W10/G82	ECN5263DAA-W10/G82 ^⑦	ECN5268DAA-W10/G82	
	500		ECN5261DAA-W10/G87	ECN5262DAA-W10/G87	ECN5263DAA-W10/G87 ^⑦	ECN5268DAA-W10/G87	
	600	800A	ECN5261DAA-W10/G92	ECN5262DAA-W10/G92	ECN5263DAA-W10/G92 ^⑦	ECN5268DAA-W10/G92	
	700		ECN5261DAA-W10/G97	ECN5262DAA-W10/G97	ECN5263DAA-W10/G97 ^⑦	ECN5268DAA-W10/G97	
7YD	750	⑥	ECN5271DAA-W10/G102	ECN5272DAA-W10/G102	ECN5273DAA-W10/G102 ^⑦	ECN5278DAA-W10/G102	AN16UN0AB
	800		ECN5271DAA-W10/G106	ECN5272DAA-W10/G106	ECN5273DAA-W10/G106 ^⑦	ECN5278DAA-W10/G106	
	900		ECN5271DAA-W10/G109	ECN5272DAA-W10/G109	ECN5273DAA-W10/G109 ^⑦	ECN5278DAA-W10/G109	
	1000		ECN5271DAA-W10/G112	ECN5272DAA-W10/G112	ECN5273DAA-W10/G112 ^⑦	ECN5278DAA-W10/G112	
8YD	1250	⑥	ECN5281DAA-W10/G115	ECN5282DAA-W10/G115	ECN5283DAA-W10/G115 ^⑦	ECN5288DAA-W10/G115	AN16VN0AB
	1500		ECN5281DAA-W10/G118	ECN5282DAA-W10/G118	ECN5283DAA-W10/G118 ^⑦	ECN5288DAA-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN53—Combination Closed Transition Wye Delta Starter—Circuit Breaker

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ⑤							
2YD	15	70A	ECN5321EAH-W10/G1	ECN5322EAH-W10/G1	ECN5324EAH-W10/G1	ECN5328EAH-W10/G1	AN16GN0AB
	20	90A	ECN5321EAJ-W10/G3	ECN5322EAJ-W10/G3	ECN5324EAJ-W10/G3	ECN5328EAJ-W10/G3	
3YD	25	100A	ECN5331EAK-W10/G8	ECN5332EAK-W10/G8	ECN5334EAK-W10/G8	ECN5338EAK-W10/G8	AN16KN0AB
	30	125A	ECN5331EAL-W10/G13	ECN5332EAL-W10/G13	ECN5334EAL-W10/G13	ECN5338EAL-W10/G13	
	40	175A	ECN5331EAN-W10/G18	ECN5332EAN-W10/G18	ECN5334EAN-W10/G18	ECN5338EAN-W10/G18	
4YD	50	200A	ECN5341EAP-W10/G23	ECN5342EAP-W10/G23	ECN5344EAP-W10/G23	ECN5348EAP-W10/G23	AN16NN0AB
	60	225A	ECN5341EAQ-W10/G28	ECN5342EAQ-W10/G28	ECN5344EAQ-W10/G28	ECN5348EAQ-W10/G28	
5YD	75	300A	ECN5351EAS-W10/G33	ECN5352EAS-W10/G33	ECN5354EAS-W10/G33	ECN5358EAS-W10/G33	AN16SN0AB
	100	350A	ECN5351EAV-W10/G38	ECN5352EAV-W10/G38	ECN5354EAV-W10/G38	ECN5358EAV-W10/G38	
	125	450A	ECN5351EAX-W10/G43	ECN5352EAX-W10/G43	ECN5354EAX-W10/G43	ECN5358EAX-W10/G43	
	150	500A	ECN5351EAY-W10/G48	ECN5352EAY-W10/G48	ECN5354EAY-W10/G48	ECN5358EAY-W10/G48	
6YD	200	800A	ECN5361EA2-W10/G53	ECN5362EA2-W10/G53	ECN5363EA2-W10/G53 ⑦	ECN5368EA2-W10/G53	AN16TN0AB
	250	1000A	ECN5361EA3-W10/G58	ECN5362EA3-W10/G58	ECN5363EA3-W10/G58 ⑦	ECN5368EA3-W10/G58	
	300	1200A	ECN5361EA4-W10/G63	ECN5362EA4-W10/G63	ECN5363EA4-W10/G63 ⑦	ECN5368EA4-W10/G63	
7YD	350	⑥	ECN5371EAU-W10/G68	ECN5372EAU-W10/G68	ECN5373EAU-W10/G68 ⑦	ECN5378EAU-W10/G68	AN16UN0AB
	400		ECN5371EAU-W10/G73	ECN5372EAU-W10/G73	ECN5373EAU-W10/G73 ⑦	ECN5378EAU-W10/G73	
	450		ECN5371EAU-W10/G78	ECN5372EAU-W10/G78	ECN5373EAU-W10/G78 ⑦	ECN5378EAU-W10/G78	
	500		ECN5371EAU-W10/G83	ECN5372EAU-W10/G83	ECN5373EAU-W10/G83 ⑦	ECN5378EAU-W10/G83	
8YD	600	⑥	ECN5381EAU-W10/G88	ECN5382EAU-W10/G88	ECN5383EAU-W10/G88 ⑦	ECN5388EAU-W10/G88	AN16VN0AB
	700		ECN5381EAU-W10/G93	ECN5382EAU-W10/G93	ECN5383EAU-W10/G93 ⑦	ECN5388EAU-W10/G93	
	750		ECN5381EAU-W10/G98	ECN5382EAU-W10/G98	ECN5383EAU-W10/G98 ⑦	ECN5388EAU-W10/G98	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN53—Combination Closed Transition Wye Delta Starter—Circuit Breaker, continued

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) ④
			General Purpose	Rainproof	Water and Dust-Tight Stainless Steel ①	Dust-Tight Industrial External Reset ②③	
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 230/Magnet Coil Voltage 120 ⑤							
2YD	15	60A	ECN5321BAG-W10/G2	ECN5322BAG-W10/G2	ECN5324BAG-W10/G2	ECN5328BAG-W10/G2	AN16GN0AB
	20	70A	ECN5321BAH-W10/G4	ECN5322BAH-W10/G4	ECN5324BAH-W10/G4	ECN5328BAH-W10/G4	
	25	90A	ECN5321BAJ-W10/G9	ECN5322BAJ-W10/G9	ECN5324BAJ-W10/G9	ECN5328BAJ-W10/G9	
3YD	30	125A	ECN5331BAL-W10/G14	ECN5332BAL-W10/G14	ECN5334BAL-W10/G14	ECN5338BAL-W10/G14	AN16KN0AB
	40	150A	ECN5331BAM-W10/G19	ECN5332BAM-W10/G19	ECN5334BAM-W10/G19	ECN5338BAM-W10/G19	
	50	175A	ECN5331BAN-W10/G24	ECN5332BAN-W10/G24	ECN5334BAN-W10/G24	ECN5338BAN-W10/G24	
4YD	60	200A	ECN5341BAP-W10/G29	ECN5342BAP-W10/G29	ECN5344BAP-W10/G29	ECN5348BAP-W10/G29	AN16NN0AB
	75	250A	ECN5341BAR-W10/G34	ECN5342BAR-W10/G34	ECN5344BAR-W10/G34	ECN5348BAR-W10/G34	
5YD	100	350A	ECN5351BAV-W10/G39	ECN5352BAV-W10/G39	ECN5354BAV-W10/G39	ECN5358BAV-W10/G39	AN16SN0AB
	125	400A	ECN5351BAW-W10/G44	ECN5352BAW-W10/G44	ECN5354BAW-W10/G44	ECN5358BAW-W10/G44	
	150	500A	ECN5351BAY-W10/G49	ECN5352BAY-W10/G49	ECN5354BAY-W10/G49	ECN5358BAY-W10/G49	
6YD	200	600A	ECN5361BAZ-W10/G54	ECN5362BAZ-W10/G54	ECN5363BAZ-W10/G54 ⑦	ECN5368BAZ-W10/G54	AN16TN0AB
	250	800A	ECN5361BA2-W10/G59	ECN5362BA2-W10/G59	ECN5363BA2-W10/G59 ⑦	ECN5368BA2-W10/G59	
	300	1000A	ECN5361BA3-W10/G64	ECN5362BA3-W10/G64	ECN5363BA3-W10/G64 ⑦	ECN5368BA3-W10/G64	
	350	1200A	ECN5361BA4-W10/G69	ECN5362BA4-W10/G69	ECN5363BA4-W10/G69 ⑦	ECN5368BA4-W10/G69	
7YD	400	⑥	ECN5371BAU-W10/G74	ECN5372BAU-W10/G74	ECN5373BAU-W10/G74 ⑦	ECN5378BAU-W10/G74	AN16UN0AB
	450		ECN5371BAU-W10/G79	ECN5372BAU-W10/G79	ECN5373BAU-W10/G79 ⑦	ECN5378BAU-W10/G79	
	500		ECN5371BAU-W10/G84	ECN5372BAU-W10/G84	ECN5373BAU-W10/G84 ⑦	ECN5378BAU-W10/G84	
8YD	600	⑥	ECN5381BAU-W10/G89	ECN5382BAU-W10/G89	ECN5383BAU-W10/G89 ⑦	ECN5388BAU-W10/G89	AN16VN0AB
	700		ECN5381BAU-W10/G94	ECN5382BAU-W10/G94	ECN5383BAU-W10/G94 ⑦	ECN5388BAU-W10/G94	
	750		ECN5381BAU-W10/G99	ECN5382BAU-W10/G99	ECN5383BAU-W10/G99 ⑦	ECN5388BAU-W10/G99	
	800		ECN5381BAU-W10/G103	ECN5382BAU-W10/G103	ECN5383BAU-W10/G103 ⑦	ECN5388BAU-W10/G103	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN462**4**EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN53—Combination Closed Transition Wye Delta Starter—Circuit Breaker, continued

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Water and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ⑤							
2YD	20	40A	ECN5321CAE-W10/G6	ECN5322CAE-W10/G6	ECN5324CAE-W10/G6	ECN5328CAE-W10/G6	AN16GN0AB
	25	50A	ECN5321CAF-W10/G11	ECN5322CAF-W10/G11	ECN5324CAF-W10/G11	ECN5328CAF-W10/G11	
	30	60A	ECN5321CAG-W10/G16	ECN5322CAG-W10/G16	ECN5324CAG-W10/G16	ECN5328CAG-W10/G16	
	40	70A	ECN5321CAH-W10/G21	ECN5322CAH-W10/G21	ECN5324CAH-W10/G21	ECN5328CAH-W10/G21	
3YD	50	90A	ECN5331CAJ-W10/G26	ECN5332CAJ-W10/G26	ECN5334CAJ-W10/G26	ECN5338CAJ-W10/G26	AN16KN0AB
	60	100A	ECN5331CAK-W10/G31	ECN5332CAK-W10/G31	ECN5334CAK-W10/G31	ECN5338CAK-W10/G31	
	75	125A	ECN5331CAL-W10/G36	ECN5332CAL-W10/G36	ECN5334CAL-W10/G36	ECN5338CAL-W10/G36	
4YD	100	175A	ECN5341CAN-W10/G41	ECN5342CAN-W10/G41	ECN5344CAN-W10/G41	ECN5348CAN-W10/G41	AN16NN0AB
	125	225A	ECN5341CAQ-W10/G46	ECN5342CAQ-W10/G46	ECN5344CAQ-W10/G46	ECN5348CAQ-W10/G46	
	150	250A	ECN5341CAR-W10/G51	ECN5342CAR-W10/G51	ECN5344CAR-W10/G51	ECN5348CAR-W10/G51	
5YD	200	350A	ECN5351CAV-W10/G56	ECN5352CAV-W10/G56	ECN5354CAV-W10/G56	ECN5358CAV-W10/G56	AN16SN0AB
	250	400A	ECN5351CAW-W10/G61	ECN5352CAW-W10/G61	ECN5354CAW-W10/G61	ECN5358CAW-W10/G61	
	300	500A	ECN5351CAY-W10/G66	ECN5352CAY-W10/G66	ECN5354CAY-W10/G66	ECN5358CAY-W10/G66	
6YD	350	600A	ECN5361CAZ-W10/G71	ECN5362CAZ-W10/G71	ECN5363CAZ-W10/G71 ⑦	ECN5368CAZ-W10/G71	AN16TN0AB
	400		ECN5361CAZ-W10/G76	ECN5362CAZ-W10/G76	ECN5363CAZ-W10/G76 ⑦	ECN5368CAZ-W10/G76	
	450	700A	ECN5361CA1-W10/G81	ECN5362CA1-W10/G81	ECN5363CA1-W10/G81 ⑦	ECN5368CA1-W10/G81	
	500	800A	ECN5361CA2-W10/G86	ECN5362CA2-W10/G86	ECN5363CA2-W10/G86 ⑦	ECN5368CA2-W10/G86	
	600	1000A	ECN5361CA3-W10/G91	ECN5362CA3-W10/G91	ECN5363CA3-W10/G91 ⑦	ECN5368CA3-W10/G91	
	700	1200A	ECN5361CA4-W10/G96	ECN5362CA4-W10/G96	ECN5363CA4-W10/G96 ⑦	ECN5368CA4-W10/G96	
	750	⑥	ECN5371CAU-W10/G101	ECN5372CAU-W10/G101	ECN5373CAU-W10/G101 ⑦	ECN5378CAU-W10/G101	
7YD	800		ECN5371CAU-W10/G105	ECN5372CAU-W10/G105	ECN5373CAU-W10/G105 ⑦	ECN5378CAU-W10/G105	
	900		ECN5371CAU-W10/G108	ECN5372CAU-W10/G108	ECN5373CAU-W10/G108 ⑦	ECN5378CAU-W10/G108	
	1000		ECN5371CAU-W10/G111	ECN5372CAU-W10/G111	ECN5373CAU-W10/G111 ⑦	ECN5378CAU-W10/G111	
	1250	⑥	ECN5381CAU-W10/G114	ECN5382CAU-W10/G114	ECN5383CAU-W10/G114 ⑦	ECN5388CAU-W10/G114	
8YD	1500	ECN5381CAU-W10/G117	ECN5382CAU-W10/G117	ECN5383CAU-W10/G117 ⑦	ECN5388CAU-W10/G117	AN16VN0AB	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

Class ECN53—Combination Closed Transition Wye Delta Starter—Circuit Breaker, continued

NEMA Size	Max. hp Rating	Circuit Breaker Size	Type 1	Type 3R	Type 4X	Type 12	Component Starter (Open) ④
			General Purpose	Rainproof	Water and Dust-Tight Stainless Steel ①	Dust-Tight Industrial External Reset ②③	
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 575/Magnet Coil Voltage 120 ⑤							
2YD	20	30A	ECN5321DAD-W10/G7	ECN5322DAD-W10/G7	ECN5324DAD-W10/G7	ECN5328DAD-W10/G7	AN16GN0AB
	25	40A	ECN5321DAE-W10/G12	ECN5322DAE-W10/G12	ECN5324DAE-W10/G12	ECN5328DAE-W10/G12	
	30	50A	ECN5321DAF-W10/G17	ECN5322DAF-W10/G17	ECN5324DAF-W10/G17	ECN5328DAF-W10/G17	
	40	60A	ECN5321DAG-W10/G22	ECN5322DAG-W10/G22	ECN5324DAG-W10/G22	ECN5328DAG-W10/G22	
3YD	50	70A	ECN5331DAH-W10/G27	ECN5332DAH-W10/G27	ECN5334DAH-W10/G27	ECN5338DAH-W10/G27	AN16KN0AB
	60	90A	ECN5331DAJ-W10/G32	ECN5332DAJ-W10/G32	ECN5334DAJ-W10/G32	ECN5338DAJ-W10/G32	
	75	100A	ECN5331DAK-W10/G37	ECN5332DAK-W10/G37	ECN5334DAK-W10/G37	ECN5338DAK-W10/G37	
4YD	100	125A	ECN5341DAL-W10/G42	ECN5342DAL-W10/G42	ECN5344DAL-W10/G42	ECN5348DAL-W10/G42	AN16NN0AB
	125	175A	ECN5341DAN-W10/G47	ECN5342DAN-W10/G47	ECN5344DAN-W10/G47	ECN5348DAN-W10/G47	
	150	200A	ECN5341DAP-W10/G52	ECN5342DAP-W10/G52	ECN5344DAP-W10/G52	ECN5348DAP-W10/G52	
5YD	200	250A	ECN5351DAR-W10/G57	ECN5352DAR-W10/G57	ECN5354DAR-W10/G57	ECN5358DAR-W10/G57	AN16SN0AB
	250	350A	ECN5351DAV-W10/G62	ECN5352DAV-W10/G62	ECN5354DAV-W10/G62	ECN5358DAV-W10/G62	
	300		ECN5351DAV-W10/G67	ECN5352DAV-W10/G67	ECN5354DAV-W10/G67	ECN5358DAV-W10/G67	
6YD	350	500A	ECN5361DAY-W10/G72	ECN5362DAY-W10/G72	ECN5363DAY-W10/G72 ⑦	ECN5368DAY-W10/G72	AN16TN0AB
	400		ECN5361DAY-W10/G77	ECN5362DAY-W10/G77	ECN5363DAY-W10/G77 ⑦	ECN5368DAY-W10/G77	
	450	600A	ECN5361DAZ-W10/G82	ECN5362DAZ-W10/G82	ECN5363DAZ-W10/G82 ⑦	ECN5368DAZ-W10/G82	
	500		ECN5361DAZ-W10/G87	ECN5362DAZ-W10/G87	ECN5363DAZ-W10/G87 ⑦	ECN5368DAZ-W10/G87	
	600	800A	ECN5361DA2-W10/G92	ECN5362DA2-W10/G92	ECN5363DA2-W10/G92 ⑦	ECN5368DA2-W10/G92	
	700	1000A	ECN5361DA3-W10/G97	ECN5362DA3-W10/G97	ECN5363DA3-W10/G97 ⑦	ECN5368DA3-W10/G97	
7YD	750	⑥	ECN5371DAU-W10/G102	ECN5372DAU-W10/G102	ECN5373DAU-W10/G102 ⑦	ECN5378DAU-W10/G102	AN16UN0AB
	800		ECN5371DAU-W10/G106	ECN5372DAU-W10/G106	ECN5373DAU-W10/G106 ⑦	ECN5378DAU-W10/G106	
	900		ECN5371DAU-W10/G109	ECN5372DAU-W10/G109	ECN5373DAU-W10/G109 ⑦	ECN5378DAU-W10/G109	
	1000		ECN5371DAU-W10/G112	ECN5372DAU-W10/G112	ECN5373DAU-W10/G112 ⑦	ECN5378DAU-W10/G112	
8YD	1250	⑥	ECN5381DAU-W10/G115	ECN5382DAU-W10/G115	ECN5383DAU-W10/G115 ⑦	ECN5388DAU-W10/G115	AN16VN0AB
	1500		ECN5381DAU-W10/G118	ECN5382DAU-W10/G118	ECN5383DAU-W10/G118 ⑦	ECN5388DAU-W10/G118	

Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**.

Notes

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN4624EAF. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock.
- ④ Also requires matching contactor with mechanical interlock.
- ⑤ All reduced voltage starters are furnished with 120V coils and control transformer connected for 120V secondary.
If modification code **C35** separate control is specified, the control transformer is omitted.
- ⑥ Supply hp, voltage, FLA and whether motor is design E or not when ordering starter.
- ⑦ Type 4 (painted steel) sizes 6–8YD.

5.3

Reduced Voltage Starter

Freedom Three-Phase Magnetic Starters

Part Winding Pump Control

Product Description

Standard ECN64, 65 controllers have a HAND/OFF/AUTO selector switch and START pushbutton mounted on the

flange of the enclosure and are wired as illustrated on **Page V10-T5-83**.

Note: If branch circuit protective device is 45A or greater, C320FBR1 fuse kit (panel mounted) may be required for control circuit protection per NEC 430-72.

Features

- Three-phase magnetic
- Interchangeable heater OLR

Class ECN64—Combination Part Winding Pump Control Starter—Fusible

NEMA Size	Motor Voltage	Max. hp 50/60 Hz ^①	Fuse Clip Rating Amperes	Volts	Catalog Number
3PW	230	50	200	250	ECN6432BAH
		460	50	100	ECN6432CAG
			75	200	ECN6432CAJ
4PW	230	75	400	250	ECN6442BAK
		460	125	200	ECN6442CAJ
			150	400	ECN6442CAL
5PW	230	100	400	250	ECN6452BAK
		460	150	600	ECN6452BAM
			200	400	600
6PW	230	300	1200 ^②	250	ECN6462BAQ
		460	600	600	ECN6462CAQ

Class ECN65—Combination Part Winding Pump Control Starter—Circuit Breaker

NEMA Size	Motor Voltage	Max. hp 50/60 Hz ^①	Circuit Breaker Type	Catalog Number	
3PW	230	40	HFD 125	ECN6532BAL	
		50	HFD 150	ECN6532BAM	
		460	50	HFD 100	ECN6532CAK
			75	HFD 125	ECN6532CAL
4PW	230	60	JD 200	ECN6542BAP	
		75	JD 250	ECN6542BAR	
	460	100	HFD 150	ECN6542CAM	
		125	JD 225	ECN6542BAQ	
		150	JD 250	ECN6542CAR	
5PW	230	100	KD 350	ECN6552BAV	
		125	KD 400	ECN6552BAW	
		150	LD 500	ECN6552BAY	
		460	200	KD 350	ECN6552CAV
	250		KD 400	ECN6552CAW	
	300		LD 500	ECN6552CAY	
	350		LD 600	ECN6552CAZ	
	6PW	230	350	ND 1200	ECN6562BA4
460		600		ECN6562CA4	

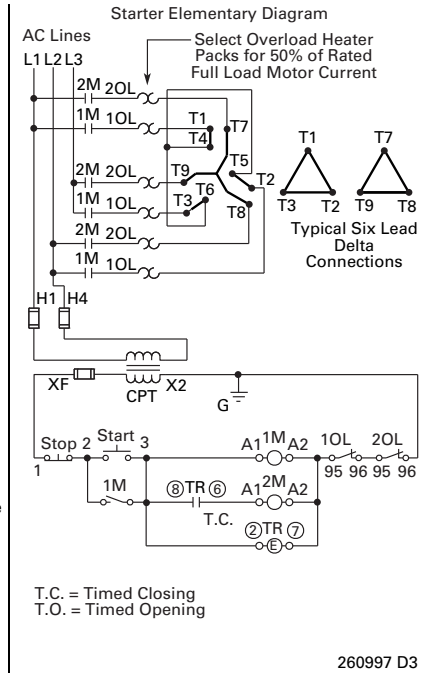
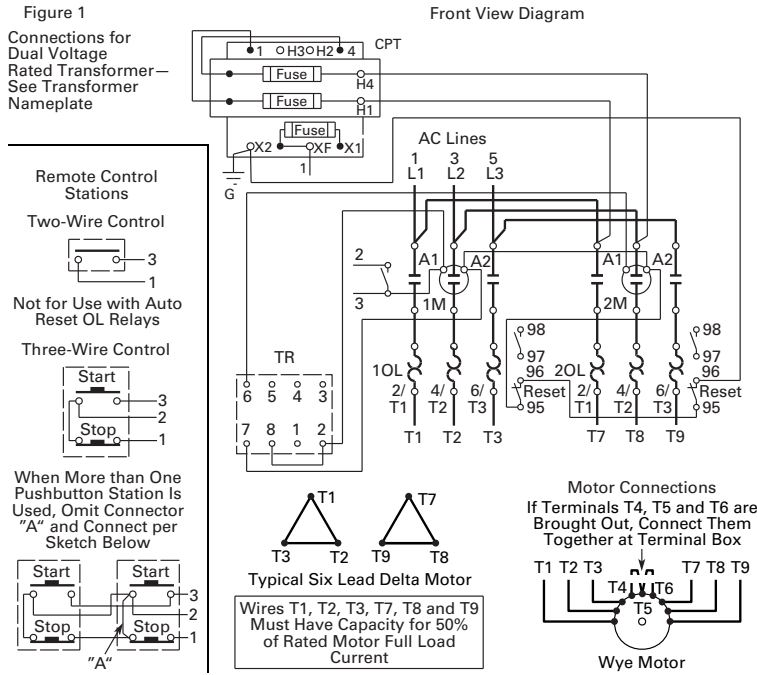
Starters do not include heater packs. Select one carton of three heater packs. Heater pack selection, **Tab 15**. Starters with electronic overload—see modification codes, **Tab 15**.

Notes

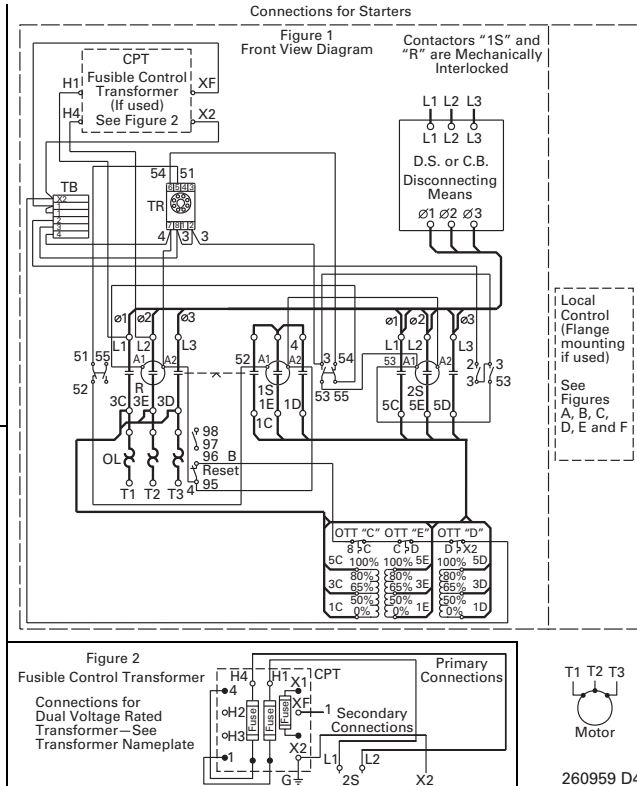
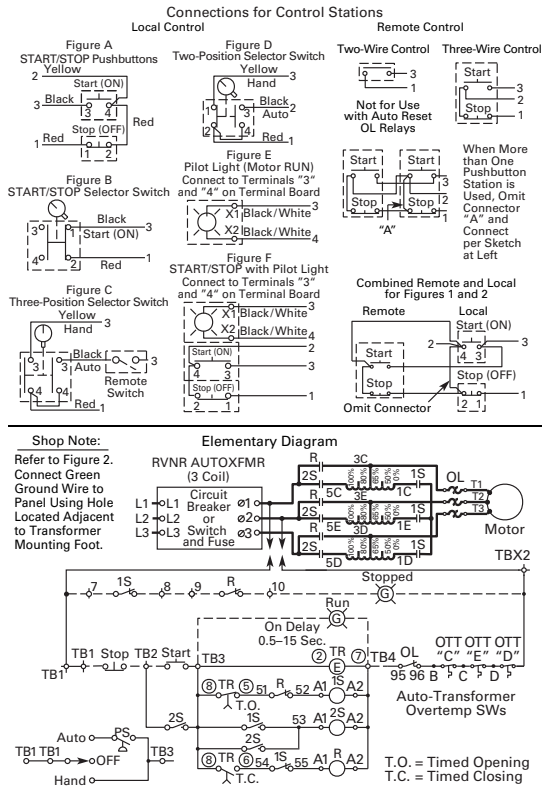
- ① Horsepower ratings based on dual element fuses.
- ② Class L fuse mounting.

Wiring Diagrams

Part Winding—Non-Combination



Autotransformer—Combination

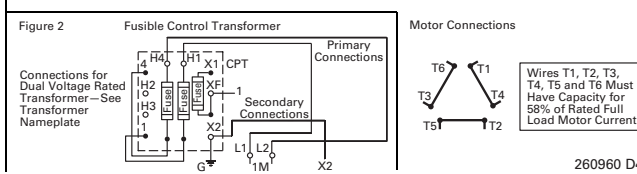
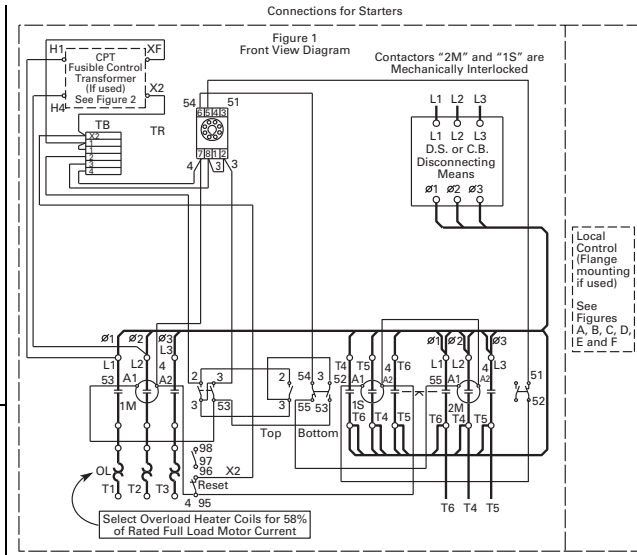
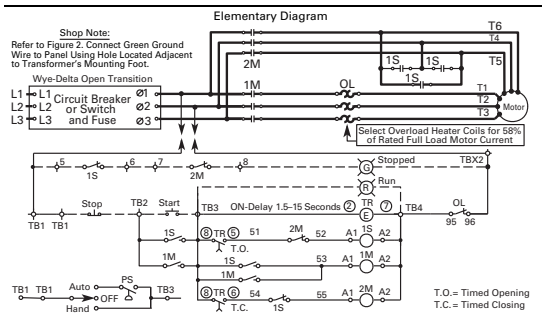
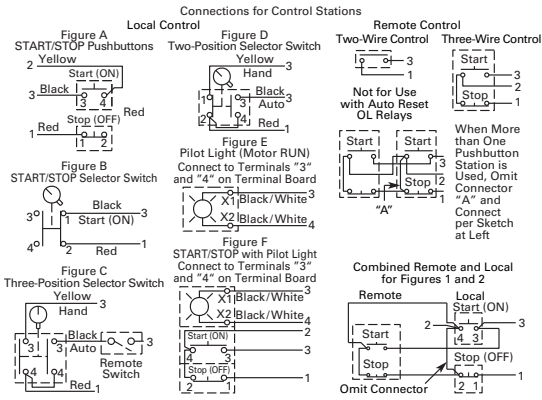


5.3

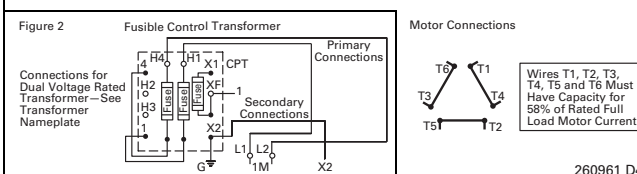
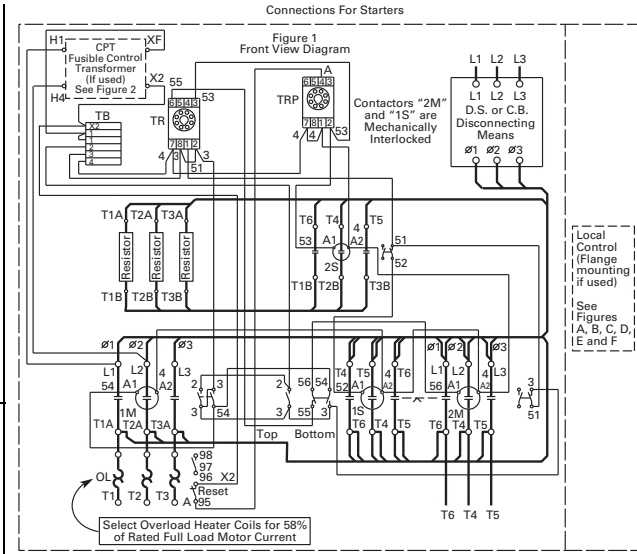
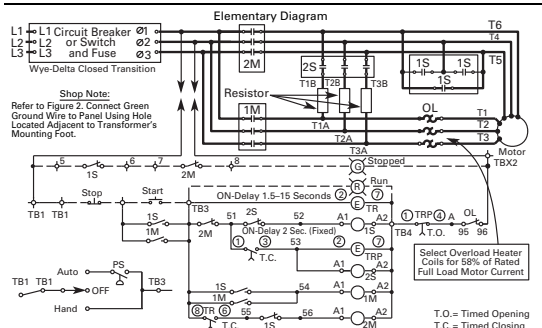
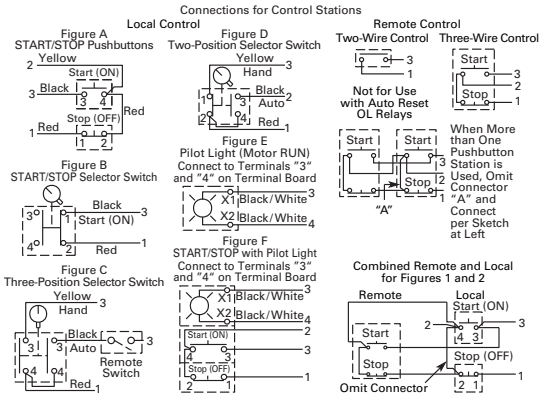
Reduced Voltage Starter

Freedom Three-Phase Magnetic Starters

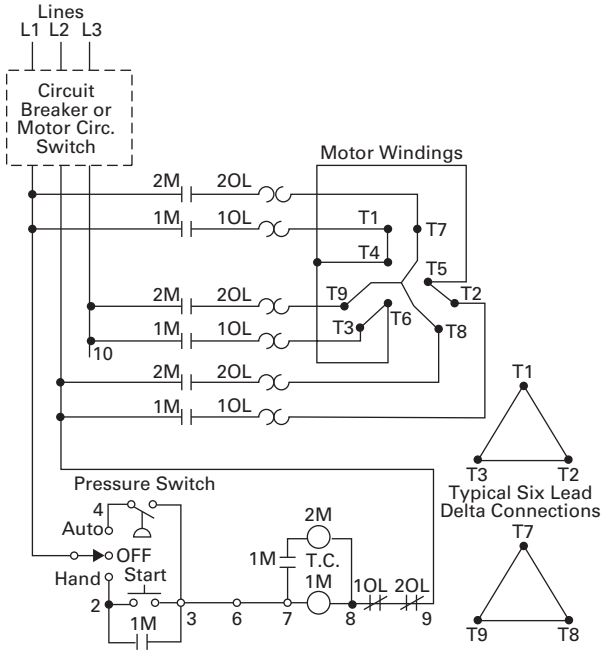
Wye Delta—Open Transition Combination



Wye Delta—Closed Transition Combination



Typical Part Winding Pump Control Wiring Diagram



Type 3R Industrial Pump Panel—C440 SSOL



Narrow Enclosure Pump Panel



Irrigation Pump Panel—C440 SSOL



A200 Pump Panel



6.1 Industrial Pump Panels

Product Overview	V10-T6-2
Freedom—Fusible Disconnect	V10-T6-7
Freedom—Circuit Breaker	V10-T6-9
A200—Fusible Disconnect	V10-T6-11
A200—Circuit Breaker	V10-T6-13

6.2 Vacuum Starter Pump Panels

Freedom—Fusible Disconnect and Circuit Breaker	
Product Description	V10-T6-15
Standards and Certifications	V10-T6-15
Additional Reference	V10-T6-15
Product Selection	V10-T6-16
Wiring Diagram	V10-T6-16

6.3 Irrigation Pump Panels

Product Description	V10-T6-17
Features	V10-T6-17
Standards and Certifications	V10-T6-17
Additional Reference	V10-T6-17
Catalog Number Selection	V10-T6-18
Pump Panels—Interchangeable Heater Overload	V10-T6-19
Pump Panels—Solid-State Overload	V10-T6-20

6.4 Duplex Pump Panels

Product Description	V10-T6-23
Standards and Certifications	V10-T6-23
Additional Reference	V10-T6-23
Catalog Number Selection	V10-T6-24
Cover Control	V10-T6-25
Non-Combination	V10-T6-26
Combination	V10-T6-27

Industrial Pump Panels



Product Overview

Product Description

Eaton’s pump controllers are combination starters with accessories and modifications designed to meet the particular requirements of the irrigation, oil well, gas and other pump application industries. The enclosure is Type 3R to provide weather-tight protection and is available in several sizes, depending on the customer’s control option requirements. The disconnect, contactor and overload relay are the same as used in Freedom lines of combination starters. These controllers are available in standard full voltage as well as reduced voltage configurations, with vacuum contactors as well as the standard electromechanical contactors.

Eaton’s revolutionary design for soft starters is shown in the S801+ and S811+ soft starter products which are members of the Intelligent Technologies (*IT.*) family of products. These reduced voltage soft starters are the most compact, multi-functional, easy-to-install products on the market. Their superiority begins with the control package, which features 24 Vdc control, onboard Digital Signal Processor (DSP), and use of a low impedance run contactor, all of which contribute to the *IT.* soft starter’s safety, advanced functionality and compact size.

Contents

Description

	<i>Page</i>
Industrial Pump Panels	
Standards and Certifications	V10-T6-3
Additional Reference	V10-T6-3
Catalog Number Selection	V10-T6-4
Accessories	V10-T6-5
Freedom—Fusible Disconnect	V10-T6-7
Freedom—Circuit Breaker	V10-T6-9
A200—Fusible Disconnect	V10-T6-11
A200—Circuit Breaker	V10-T6-13

Features

The Freedom series starters are available in either fusible or circuit breaker types utilizing Type 3R rainproof and sleet resistant enclosures. Convenient straight-through wiring with top line connections and bottom load connections features easily accessible pressure connections for line, load and control. Starter and disconnect are factory wired.

- **Motor Circuit Switch**— Long life, heavy-duty, quick acting, double break action. Positive ON and positive OFF available in either fusible or non-fusible versions. Fuse clip kits are available for field installation and can be converted in the field for maximum job flexibility
- **Motor Circuit Protector**— Similar to a magnetic trip only circuit breaker. Features an adjustable magnetic trip characteristic for accurate, dependable fault protection and simultaneous trip of all poles to prevent single phasing
- **Overload Relay**—Freedom overload relays with trip indication feature bimetallic type operation with ambient compensation and a choice of either manual or automatic reset
C440 electronic overload relays are available up to 100A as a self-powered, self-contained unit. With external CTs, C440 can protect motor up to 1500 FLA. Available add-on accessories include remote reset capability and communication modules with I/O for DeviceNet, PROFIBUS, and Modbus.
- **HAND/OFF/AUTO Selector Switch and START Pushbutton**— 10250T heavy-duty units mounted on the flange of the enclosure for outside accessibility
- **RESET Button**— Accessible from front of enclosure (booted for environmental protection) for operation of overload relay reset function

- **Enclosure**—Type 3R rainproof and sleet resistant construction with stainless steel door latches and special corrosion resistant paint. Enclosure features include grounding lugs, padlocking feature on door latch, drip hood over door and provisions for top mounting conduit hubs. Most enclosures include generous panel space for mounting optional control and accessories
- **Mounting**—Pole mounting feet with keyhole slots for easy mounting are standard on enclosures for Sizes 1–5 (removable for Sizes 1–5 standard width flange type enclosures). Brackets can be formed to the contour of the pole after mounting
- **Padlocking**—Provision on door latch for locking door closed, as well as provision for padlocking disconnect switch in OFF position. With a simple modification, disconnect can also be padlocked in ON position
- **UL Listed**—Underwriters Laboratories Inc. includes the “Suitable for Use as Service Equipment” label

Interrupting Ratings

- **Fusible**—Sizes 1–5 suitable for use on a circuit capable of delivering not more than 100,000 rms symmetrical amperes. 600V maximum where a Class R fuse clip kit is properly installed and Class R fuses are used. If Class R fuses are not used, the switch should not be installed on circuits capable of delivering more than 10,000 rms symmetrical amperes. Size 6 is limited to 18,000 and Size 7 is limited to 30,000 rms symmetrical amperes
- **Circuit Breaker**—Sizes 1–3 controllers are suitable for use on circuits capable of delivering not more than 100,000 rms symmetrical amperes at 480V maximum; for 600V applications not more than 65,000 rms symmetrical amperes
- **ECP Irrigation Pump Panel**—Suitable for use on circuits capable of delivering not more than 10,000 rms symmetrical amperes at 480V maximum

Optional Features

- **Backspin Timer**—0.2 seconds to 3 minutes. Prevents restart until motor and pump have stopped
- **Program Timer**—24 hour, 7 day with day omission
- **Control Transformer**—Available as standard, either as a field kit or factory installed. Includes two primary and one secondary fuses
- **Electrical Interlocks**—Side mounted in NO, NC and NO-NC. Maximum of two contacts on either side of starter through Size 2, maximum of three per side Sizes 3–5
- **Control Circuit Fuse Kit**—30A, 600V rating
- **Lightning Arrestor**—Offers protection to control from lightning induced surges
- **“R” Fuse Clip Kits**—30–200A, 250V and 600V ratings
- **Disconnect Control Circuit Interlock**—To disconnect separate control circuits

- **Enclosure Conduit Hubs**—Hole provided in enclosure top covered with hole closer. Will accept 3/4 in, 1-1/4 in, 1-1/2 in, 2 in, 2-1/2 in, and three inch conduit sizes
- **Pad Mounting Feet**—For standard width enclosures Sizes 1–5
- **Electronic Overload (SSOL)**
- **304-Grade Stainless Steel Enclosure**—For additional corrosion resistance, any of the pump panels can be ordered as 304-Grade stainless steel, still keeping the Type 3R rating
- **Soft Starter Pump Control Options**
 - Designed to reduce “water-hammer” during start-up and stopping sequences
 - Stop ramp extended to 60 seconds to help control larger motors and systems with long piping runs

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Additional Reference

Kits	V10-T6-5
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Technical Data and Specifications	Tab 17

6.1

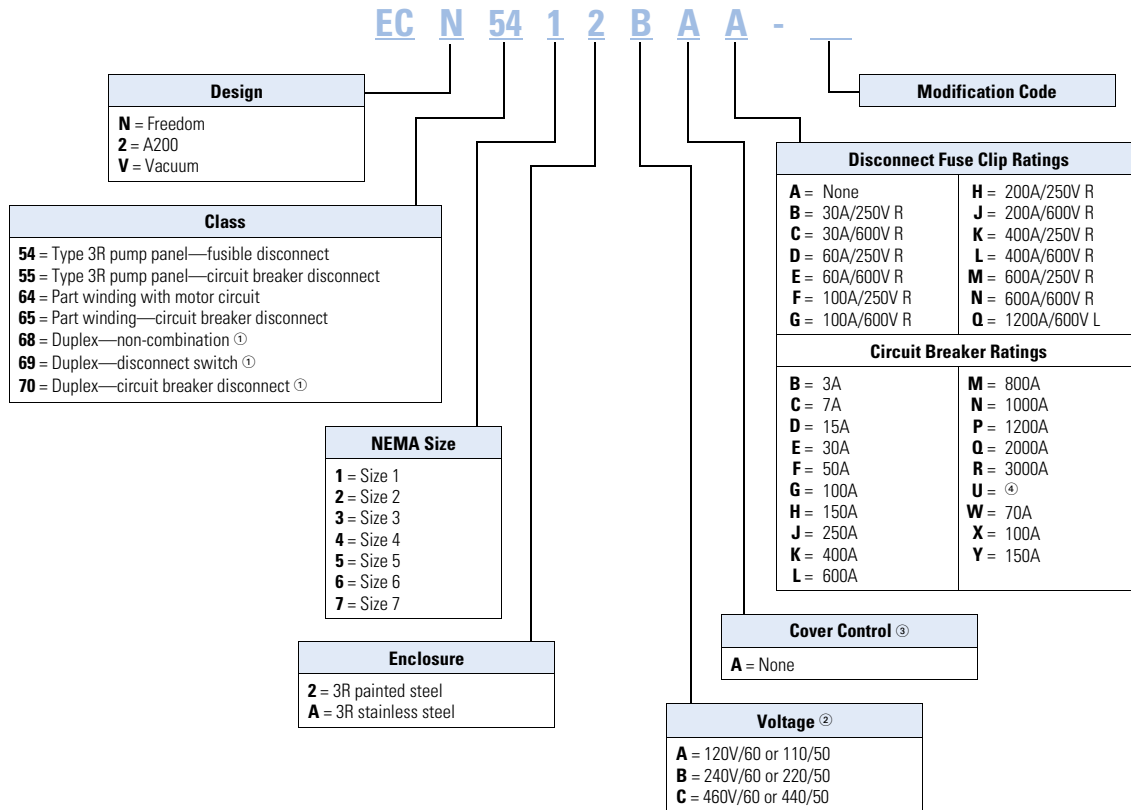
Pump Panels

Industrial Pump Panels

Catalog Number Selection

Pump Panel

6



Notes

- ① More information on Type 1, 3R, 4X and 12 duplex pump panels is on **Page V10-T6-23**. Product Selection is on **Page V10-T6-26**.
- ② For other voltages and single-phase applications, consult your Eaton representative.
- ③ HOA selector switch and START pushbutton provided as standard.
- ④ Engineering determination depending on size, horsepower FLA, NEC or other considerations.

Accessories

Kits

Kits for Field Mounting

Description	Catalog Number Suffix	Catalog Number
Backspin timer—0.2 sec. to 3 min. (60 Hz)	B12	—
Control transformers 240/480V primary, 120V secondary		
Size 1	C1	—
Size 2	C1	—
Size 3	C1	—
Size 4	C1	—
Size 5	C1	—
Lightning arrester	L3	—
Control circuit fuse kit (600V)	C31	—
Electrical interlocks—Freedom line/vacuum		
NO	A27	—
NC	A28	C320KGS2
NO and NC	A29	C320KGS3
Time delay relay—3 minutes		
ON delay (unwired)	T6	—
OFF delay (unwired)	T7	—
24-hour programming clock	P44	—
Interchangeable hubs for enclosure. ^①		
Enclosure has removable top plate. If conduit hub is required, order:		
3/4 in conduit size	—	DS075H1
1-1/4 in conduit size	—	DS125H1
1-1/2 in conduit size	—	DS150H1
2 in conduit size	—	DS200H1
2-1/2 in conduit size	—	DS250H2
3 in conduit size	—	DS300H2
Power supply	C34	—

Note

^① Does not apply to reduced voltage controllers.

Overload Relays**Freedom Solid-State Overload Relays**

NEMA Size	Full Load Current Adjustment Range (A)	Three-Phase without Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30	Three-Phase with Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30
00	0.33–1.65 ^①	R63/A	R64/A
	1–5	R63/B	R64/B
	4–20	R63/C	R64/C
0 and 1	0.33–1.65 ^①	R63/A	R64/A
	1–5	R63/B	R64/B
	4–20	R63/C	R64/C
	9–45	R63/D	R64/D
2	9–45	R63/D	R64/D
3	20–100	R63/E	R64/E
4	28–140	R63/F	R64/F
5	60–300 ^②	R63/G	R64/G
6	120–600 ^③	R63/H	R64/H

Notes

- ① Not UL Listed.
- ② NEMA Size 5 starter available with 60–300A panel mounted CTs. Starter as an assembled unit with 1–5A C440 overload relay (C440A1A005SELAX or C440A2A005SELAX).
- ③ NEMA Size 6 starter available with 120–600A panel mounted CTs. Starter as an assembled unit with 1–5A C440 overload relay (C440A1A005SELAX or C440A2A005SELAX).

Freedom—Fusible Disconnect

Product Description

- Three-phase magnetic
- Interchangeable heater OLR

Standard ECN54 controllers have a HAND/OFF/AUTO selector switch and START and RESET pushbuttons mounted on the enclosure and are wired as illustrated on **Page V10-T6-8**.

Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form—see **Page V10-T6-5**.

If branch circuit protective device is 45A or greater, C320FBR1 fuse kit (panel mounted) may be required for control circuit protection per NEC 430-72.

Stainless steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R rating will still apply.

Product Selection

Class ECN54—Combination Pump Panel—Fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp 50/60 Hz	Fuse Clip Rating ②		Narrow Width ③	Standard Width ③
			Amperes	Volts	Catalog Number	Catalog Number
1 ④	230	7-1/2	30	250	ECN5412BAB-E14	ECN5412BAB
	460	10		600	ECN5412CAC-E14	ECN5412CAC
	—	—	Not installed	Not installed	ECN5412AAA-E14	ECN5412AAA
2	230	15	60	250	ECN5422BAD-E14	ECN5422BAD
	460	25		600	ECN5422CAE-E14	ECN5422CAE
	—	—	Not installed	Not installed	ECN5422AAA-E14	ECN5422AAA
3	230	30	100	250	—	ECN5432BAF
	460	50		600	—	ECN5432CAG
	—	—	Not installed	Not installed	—	ECN5432AAA
4 ④	230	50	200	250	—	ECN5442BAH
	460	100		600	—	ECN5442CAJ
	—	—	Not installed	Not installed	—	ECN5442AAA
5	230	100	400	250	—	ECN5452BAK
	460	200		600	—	ECN5452CAL
6	230	200	600	250	—	ECN5462BAM
	460	400		600	—	ECN5462CAN
7	460	600	1200	600	—	ECN5472CAQ

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see Modification Codes in **Tab 15**.

① Dual element fuse ratings.

② Class R fuse clips, except for Size 7 which uses Class L fuse clips. For starters with clips “Not Installed,” select fuse clip kit on **Page V10-T6-8**.

③ To order without the START pushbutton, add modification code **P6**.

④ For Compact NEMA Size 1 or Size 4 Pump Panel, add modification code **C60**. (Example: ECN5412AAA-C60).

Compact NEMA Size 1 and Size 4 Starters Electrical Life at Rated Continuous Current

NEMA Size	Rated Current (Amp) AC3/AC4	Operations
1C	27/150	2,500,000/40,000
1	27/153	5,000,000/110,000
4C	135/516	500,000/40,000
4	135/822	800,000/70,000

For Other Volts and Hertz Applications

For other than listed volts and hertz, select required controller by catalog number and replace the magnet coil alpha designation, eighth digit in catalog number, with proper code suffix from the table below.

Example: For 600V 60 Hz coil, change ECN5412**B**AC to ECN5412**D**AC.

Coil Voltage

Coil Volts and Hertz	Suffix Code
120/60 or 110/50	A
240/60 or 220/50	B
480/60 or 440/50	C
600/60 or 550/50	D
208/60	E

6.1

Pump Panels

Industrial Pump Panels

6

Accessories

C351—Fuse Clip Selection—Three-Pole (Three Fuses)

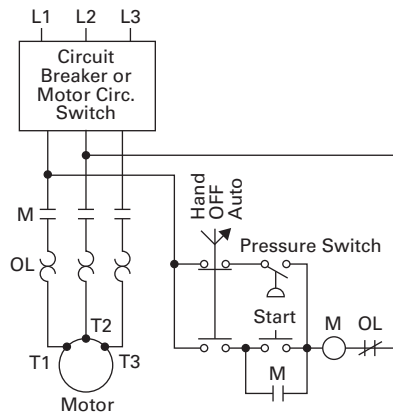
NEMA Size	Motor Voltage	Fuse Clip Rating Amperes	Volts	Fuse Clip Kit for Field Installation in Non-Fusible Starter	
				For Non-Rejection Type Fuses Catalog Number	For Use with "R" Rejection Type Fuses Catalog Number
1	200/230	30	250	C351KC21	C351KC21R
	460-575		600	C351KD22-61	C351KD22-61R
2	200	60	250	C351KD22-61	C351KD22-61R
	230		250	C351KD22-61	C351KD22-61R
	460-575		600	C351KD62	C351KD62R
3	200	100	250	C351KE23-63	C351KE23-63 ①
	230		250	C351KE23-63	C351KE23-63 ①
	460-575		600	C351KE23-63	C351KE23-63 ①
4	200	200	250	C351KF24-64	C351KF24-64 ①
	230		250	C351KF24-64	C351KF24-64 ①
	460-575		600	C351KF24-64	C351KF24-64 ①

Note

① Fuse clip "R" rejection members for use with Class R fuses are supplied loose both in fuse clip kits and when fuse clips are factory installed.

Wiring Diagram

Typical Wiring Diagram



Freedom—Circuit Breaker

Product Description

- Three-phase magnetic
- Interchangeable heater OLR

These ECN55 pump controllers feature the Freedom line starters. They have a HAND/OFF/AUTO selector switch and START pushbutton mounted on the

enclosure and a RESET button on the front—wiring is as illustrated in the wiring diagram on **Page V10-T6-8**.

Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form—see table on **Page V10-T6-5**.

If branch circuit protective device is 45A or greater, C320FBR1 fuse kit (panel mounted) may be required for control circuit protection per NEC 430-72.

Stainless steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R rating will still apply.

Product Selection

Class ECN55—Combination Pump Panel—Circuit Breaker

NEMA Size	Motor Voltage	Max. hp 50/60 Hz	Circuit Breaker Size	Narrow Width ^① Catalog Number	Standard Width ^① Catalog Number
1 ^②	230	1	7A	ECN5512BAC-E14	ECN5512BAC
		3	15A	ECN5512BAD-E14	ECN5512BAD
		7-1/2	30A	ECN5512BAE-E14	ECN5512BAE
	460	1	3A	ECN5512CAB-E14	ECN5512CAB
		3	7A	ECN5512CAC-E14	ECN5512CAC
		5	15A	ECN5512CAD-E14	ECN5512CAD
2	230	10	50A	ECN5522BAF-E14	ECN5522BAF
	460	25		ECN5522CAF-E14	ECN5522CAF
3	230	30	100A	—	ECN5532BAG
	460	50		—	ECN5532CAG
4 ^②	230	50	150A	—	ECN5542BAH
	460	100		—	ECN5542CAH
5	230	60	250A	—	ECN5552BAJ
	230	100	400A	—	ECN5552BAK
	460	150	250A	—	ECN5552CAJ
	460	200	400A	—	ECN5552CAK
6	230	125	600A	—	ECN5562BAL
	230	200	800A	—	ECN5562BAM
	460	300	600A	—	ECN5562CAL
	460	400	800A	—	ECN5562CAM
7	230	250	③	—	ECN5572BAU
	230	300		—	ECN5572BAU
	460	500		—	ECN5572CAU
	460	600		—	ECN5572CAU

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

① To order without the START pushbutton, add modification code **P6**.

② For Compact NEMA Size 1 or Size 4 Pump Panel, add modification code **C60**. (Example: ECN5412AAA-C60).

Compact NEMA Size 1 and Size 4 Starters Electrical Life at Rated Continuous Current

NEMA Size	Rated Current (Amp) AC3/AC4	Operations
1C	27/150	2,500,000/40,000
1	27/153	5,000,000/110,000
4C	135/516	500,000/40,000
4	135/822	800,000/70,000

③ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

For Other Volts and Hertz Applications

For other than listed volts and hertz, select required controller by catalog number and replace the magnet coil alpha designation, eighth digit in catalog number, with proper code suffix from the table below.

Example: For 600V 60 Hz coil, change ECN5512**C**AC to ECN5512**D**AC.

Coil Voltage

Coil Volts and Hertz	Suffix Code
120/60 or 110/50	A
240/60 or 220/50	B
480/60 or 440/50	C
600/60 or 550/50	D
208/60	E

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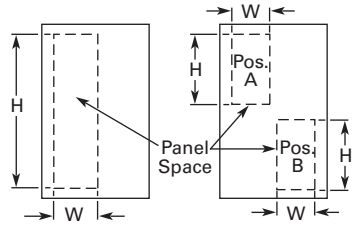
Pump Panels

Industrial Pump Panels

Dimensions

Approximate Dimensions in Inches (mm)

Panel Space



NEMA Sizes 1-4

NEMA Size 5

Panel Size	NEMA Size	Position (see figure above)	Width W	Height H
Narrow ^①	1-2	—	5.5 (140)	6.0 (152)
Standard	1-3	—	8.5 (216)	26.0 (660)
	4	—	8.5 (216)	39.0 (991)
	5	A	10.0 (254)	22.0 (559)
		B	15.0 (381)	12.0 (305)
Oversize	1-2	—	12.0 (318)	39.0 (991)
	3	—	11.0 (279)	39.0 (991)

Note

^① Space is between disconnect switch or circuit breaker and starter.

A200—Fusible Disconnect

Product Description

- Three-phase magnetic
- Interchangeable heater OLR

Standard ECN54 controllers have a HAND/OFF/AUTO selector switch and START and RESET pushbuttons mounted on the enclosure and are wired as illustrated on **Page V10-T6-12**.

Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form—see table on **Page V10-T6-5**.

If branch circuit protective device is 45A or greater, C320FBR1 fuse kit (panel mounted) may be required for control circuit protection per NEC 430-72.

Stainless steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R rating will still apply.

Product Selection

Class EC254—Combination A200 Pump Panel—Fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp 50/60 Hz	Fuse Clip Rating ②		Narrow Width ③	Standard Width ③
			Amperes	Volts	Catalog Number	Catalog Number
1	230	7-1/2	30	250	EC25412BAB-E14	EC25412BAB
	460	10		600	EC25412CAC-E14	EC25412CAC
	—	—	Not installed	Not installed	EC25412AAA-E14	EC25412AAA
2	230	15	60	250	EC25422BAD-E14	EC25422BAD
	460	25		600	EC25422CAE-E14	EC25422CAE
	—	—	Not installed	Not installed	EC25422AAA-E14	EC25422AAA
3	230	30	100	250	—	EC25432BAF
	460	50		600	—	EC25432CAG
	—	—	Not installed	Not installed	—	EC25432AAA
4	230	50	200	250	—	EC25442BAH
	460	100		600	—	EC25442CAJ
	—	—	Not installed	Not installed	—	EC25442AAA
5	230	100	400	250	—	EC25452BAK
	460	200		600	—	EC25452CAL
6	230	200	600	250	—	EC25462BAM
	460	400		600	—	EC25462CAN
7	460	600	1200	600	—	EC25472CAQ

Notes

Starters do not include heater packs. Select 1 carton of 3 heater packs. For heater pack selection, see **Tab 15**.

① Dual element fuse ratings.

② Class R fuse clips, except for Size 7 which uses Class L fuse clips. For starters with clips “Not Installed”, select fuse clip kit on **Page V10-T6-8**.

③ To order without the START pushbutton, add modification code **P6**.

For Other Volts and Hertz Applications

For other than listed volts and hertz, select required controller by catalog number and replace the magnet coil alpha designation, eighth digit in catalog number, with proper code suffix from the table below.

Example: For 600V 60 Hz coil, change EC25412**B**AC to EC25412**D**AC.

Coil Voltage

Coil Volts and Hertz	Suffix Code
120/60 or 110/50	A
240/60 or 220/50	B
480/60 or 440/50	C
600/60 or 550/50	D
208/60	E

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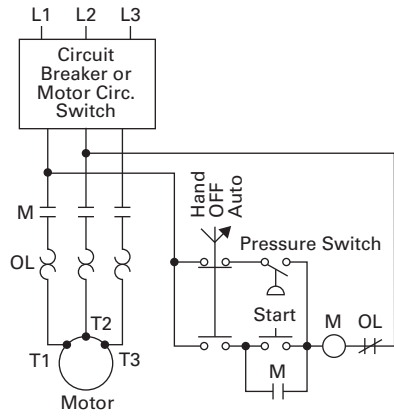
Pump Panels

Industrial Pump Panels

Wiring Diagram

Typical Wiring Diagram

6



A200—Circuit Breaker

Product Description

- Three-phase magnetic
- Interchangeable heater OLR

These ECN55 pump controllers feature the A200 starters. They have a HAND/OFF/AUTO selector switch and START pushbutton mounted on the enclosure and a RESET button on the front—wiring is as illustrated in the wiring diagram on **Page V10-T6-12**.

Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form—see **Page V10-T6-5**.

If branch circuit protective device is 45A or greater, C320FBR1 fuse kit (panel mounted) may be required for control circuit protection per NEC 430-72.

Stainless steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R rating will still apply.

Product Selection

Class EC255—Combination A200 Pump Panel—Circuit Breaker

NEMA Size	Motor Voltage	Max. hp 50/60 Hz	Circuit Breaker Size	Narrow Width ^①	Standard Width ^②
				Catalog Number	Catalog Number
1	230	1	7A	EC25512BAC-E14	EC25512BAC
		3	15A	EC25512BAD-E14	EC25512BAD
		7-1/2	30A	EC25512BAE-E14	EC25512BAE
	460	1	3A	EC25512CAB-E14	EC25512CAB
		3	7A	EC25512CAC-E14	EC25512CAC
		5	15A	EC25512CAD-E14	EC25512CAD
2	230	10	50A	EC25522BAF-E14	EC25522BAF
		25		EC25522CAF-E14	EC25522CAF
		30	100A	—	EC25532BAG
	460	50		—	EC25532CAG
		50	150A	—	EC25542BAH
		100		—	EC25542CAH
3	230	60	250A	—	EC25552BAJ
		100	400A	—	EC25552BAK
		150	250A	—	EC25552CAJ
	460	200	400A	—	EC25552CAK
		125	600A	—	EC25562BAL
		200	800A	—	EC25562BAM
4	230	300	600A	—	EC25562CAL
		400	800A	—	EC25562CAM
	460	250	③	—	EC25572BAU
		300		—	EC25572BAU
5	230	500		—	EC25572CAU
		600		—	EC25572CAU

For Other Volts and Hertz Applications

For other than listed volts and hertz, select required controller by catalog number and replace the magnet coil alpha designation, eighth digit in catalog number with proper code suffix from the table below.

Example: For 600V 60 Hz coil, change EC25512**C**AC to EC25512**D**AC.

Coil Voltage

Coil Volts and Hertz	Suffix Code
120/60 or 110/50	A
240/60 or 220/50	B
480/60 or 440/50	C
600/60 or 550/50	D
208/60	E

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

- ① To order without the START pushbutton, add modification code **P6**.
- ② Consult factory in the event ground fault protection is required.
- ③ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

6.1

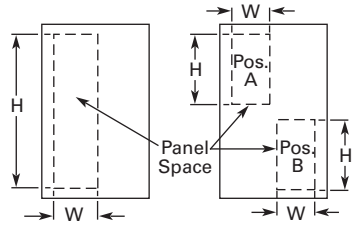
Pump Panels

Industrial Pump Panels

Dimensions

Approximate Dimensions in Inches (mm)

Panel Space



NEMA Sizes 1-4

NEMA Size 5

Panel Size	NEMA Size	Position (see figure above)	Width W	Height H
Narrow ①	1-2	—	5.5 (140)	6.0 (152)
Standard	1-3	—	8.5 (216)	26.0 (660)
	4	—	8.5 (216)	39.0 (991)
	5	A	10.0 (254)	22.0 (559)
		B	15.0 (381)	12.0 (305)
Oversize	1-2	—	12.0 (318)	39.0 (991)
	3	—	11.0 (279)	39.0 (991)

Note

① Space is between disconnect switch or circuit breaker and starter.

Vacuum Starter Pump Panels



Contents

<i>Description</i>	<i>Page</i>
Vacuum Starter Pump Panels	
Product Selection	V10-T6-16
Wiring Diagram	V10-T6-16

Freedom—Fusible Disconnect and Circuit Breaker

Product Description

- Three-phase magnetic
- Interchangeable heater OLR

Standard ECV54, 55 controllers have a HAND/OFF/AUTO selector switch and START pushbutton mounted on the enclosure and are wired as illustrated on **Page V10-T6-16**.

Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form—see **Page V10-T6-5**.

If branch circuit protective device is 45A or greater, C320FBR1 fuse kit (panel mounted) may be required for control circuit protection per NEC 430-72.

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Additional Reference

<i>Description</i>	<i>Page</i>
Kits	V10-T6-5
Dimensions	Tab 14
Accessories and Modifications	Tab 15

Product Selection

Class ECV54—Combination Vacuum Pump Panel—Fusible Disconnect

NEMA Size	Motor Voltage	Max. hp 50/60 Hz	Fuse Clip Rating Amperes	Volts	With START Pushbutton Catalog Number
4	230	50	200	250	ECV5442BAH
	460	100		600	ECV5442CAJ
5	230	100	400	250	ECV5452BAK
	460	200		600	ECV5452CAL
6	230	200	600	250	ECV5462BAM
	460	400		600	ECV5462CAN

Class ECV55—Combination Vacuum Pump Panel—Circuit Breaker

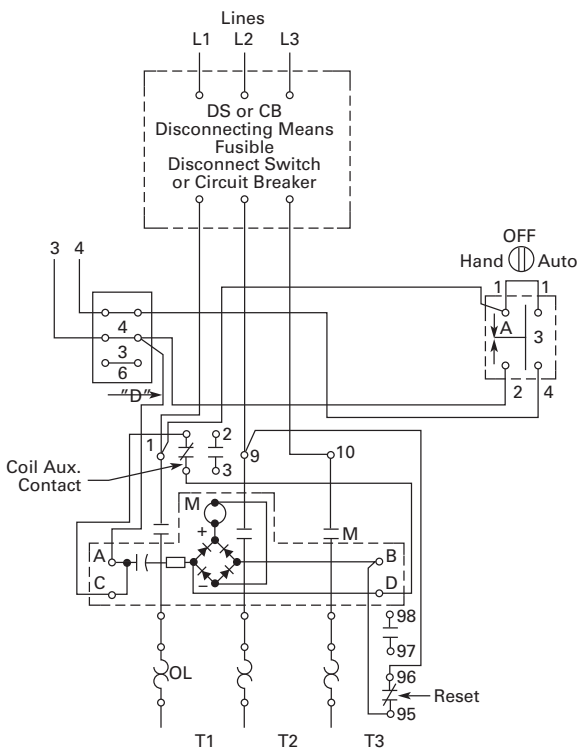
NEMA Size	Motor Voltage	Max. hp 50/60 Hz	Circuit Breaker Size	With START Pushbutton Catalog Number
4	230	50	150A	ECV5542BAH
	460	100		ECV5542CAH
5	230	75	250A	ECV5552BAJ
		100	400A	ECV5552BAK
	460	150	250A	ECV5552CAJ
		200	400A	ECV5552CAK
6	230	200	600A	ECV5562BAL
	460	400		ECV5562CAL

Note

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see Tab 15.

Wiring Diagram

Typical Wiring Diagram



Irrigation Pump Panel—C440 SSOL



Contents

Description	Page
Irrigation Pump Panels	
Catalog Number Selection	V10-T6-18
Pump Panels—Interchangeable Heater Overload	
Product Selection	V10-T6-19
Pump Panels—Solid-State Overload	
Product Selection	V10-T6-20
Wiring Diagram	V10-T6-22

Product Description

Eaton’s irrigation pump controllers are combination starters designed to meet the requirements of the agricultural industry. The enclosure is UL Type 3R rated to provide weathertight protection and is available in two sizes. Irrigation application specific accessories and modifications are available to fit the customer’s requirements.

The irrigation pump panels use Freedom series motor starting technology to control motors up to 100 hp at 460V. These controllers have two styles of overload protection available, interchangeable heater and solid-state overload (SSOL).

Features

- The interchangeable heater overload (C306) uses individual heater packs to allow customers the ability to use various heater styles
- The solid-state overload relay (C440) provides enhanced protection and adjustment ranges as compared to bimetallic overload relays. Trip Class 10, 20, and 30 are available, along with a very wide trip current range to make setup very easy

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Additional Reference

Kits	V10-T6-5
Dimensions	Tab 14
Accessories and Modifications	Tab 15

6.3

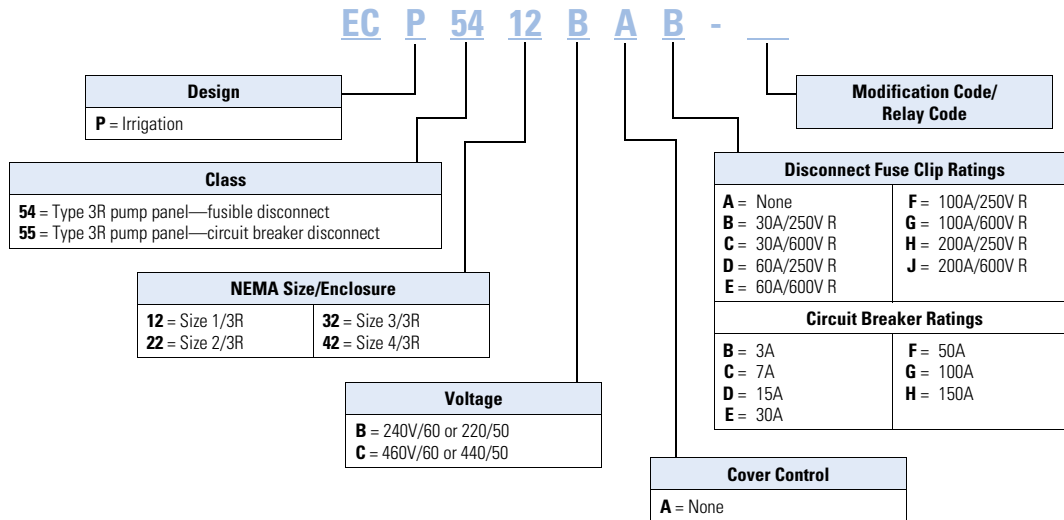
Pump Panels

Irrigation Pump Panels

Catalog Number Selection

Irrigation Pump Panel

6



Pump Panels—Interchangeable Heater Overload

Product Selection

Standard ECP54 controllers have a HAND/OFF/AUTO selector switch and START

pushbutton mounted on the enclosure and are wired as illustrated on **Page V10-T6-22**.

Class ECP54—Combination Irrigation Pump Panel—Fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp 50/60 Hz	Fuse Clip Rating ②		Standard Width Catalog Number
			Amperes	Volts	
1 ③	230	7-1/2	30	250	ECP5412BAB
	460	10		600	ECP5412CAC
	—	—	Not installed	Not installed	ECP5412AAA
2	230	15	60	250	ECP5422BAD
	460	25		600	ECP5422CAE
	—	—	Not installed	Not installed	ECP5422AAA
3	230	30	100	250	ECP5432BAF
	460	50		600	ECP5432CAG
	—	—	Not installed	Not installed	ECP5432AAA

For Other Volts and Hertz Applications

For other than listed volts and hertz, select required controller by catalog number and replace the magnet coil alpha designation, eighth digit in catalog number with proper code suffix from the table below.

Example: For 600V 60 Hz coil, change ECP5412BAB to ECP5412DAB.

Coil Voltage

Coil Volts and Hertz	Suffix Code
120/60 or 110/50	A
240/60 or 220/50	B
480/60 or 440/50	C
600/60 or 550/50	D
208/60	E

Fuse Clips

C351—Fuse Clip Selection—Three-Pole (Three Fuses)

NEMA Size	Motor Voltage	Fuse Clip Rating Amperes	Volts	Fuse Clip Kit for Field Installation in Non-Fusible Starter	
				For Non-Rejection Type Fuses Catalog Number	For Use with "R" Rejection Type Fuses Catalog Number
1	200/230	30	250	C351KC21	C351KC21R
	460-575		600	C351KD22-61	C351KD22-61R
2	200	60	250	C351KD22-61	C351KD22-61R
	230			C351KD22-61	C351KD22-61R
	460-575			C351KD62	C351KD62R
3	200	100	250	C351KE23-63	C351KE23-63 ④
	230			C351KE23-63	C351KE23-63 ④
	460-575		600	C351KE23-63	C351KE23-63 ④

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

- ① Dual element fuse ratings.
- ② Class R fuse clips.
- ③ For Compact NEMA Size 1 or Size 4 Pump Panel, add modification code **C60**. (Example: ECN5412AAA-C60).

Compact NEMA Size 1 and Size 4 Starters Electrical Life at Rated Continuous Current

NEMA Size	Rated Current (Amp)	
	AC3/AC4	Operations
1C	27/150	2,500,000/40,000
1	27/153	5,000,000/110,000

- ④ Fuse clip "R" rejection members for use with Class R fuses are supplied loose both in fuse clip kits and when fuse clips are factory installed.

Pump Panels—Solid-State Overload

Product Selection

Class ECP54—Combination Irrigation Pump Panel with Solid-State Overload—Fusible Disconnect ^①

Motor Voltage	NEMA Size	Maximum hp	Fuse Clip Amperes	Trip Range	Catalog Number
240V	1 ^②	1	30	1.0–5.0	ECP5412BAB-R63/B
		3		4–20	ECP5412BAB-R63/C
		7-1/2		9–45	ECP5412BAB-R63/D
	2	10	60	9–45	ECP5422BAD-R63/D
		15		ECP5422BAD-R63/D	
	3	25	100	20–100	ECP5432BAF-R63/E
480V	1 ^②	1	30	1.0–5.0	ECP5412CAC-R63/B
		2		ECP5412CAC-R63/B	
		5		4–20	ECP5412CAC-R63/C
		10		ECP5412CAC-R63/C	
	2	20	60	9–45	ECP5422CAE-R63/D
		25		ECP5422CAE-R63/D	
	3	50	100	20–100	ECP5432CAG-R63/E

Class ECP55—Combination Irrigation Pump Panel with Solid-State Overload—Circuit Breaker ^①

Motor Voltage	NEMA Size	Maximum hp	Breaker Rating	Trip Range	Catalog Number
240V	1 ^②	1	7	1.0–5.0	ECP5512BAC-R63/B
		3	15	4–20	ECP5512BAD-R63/C
		7-1/2	30	9–45	ECP5512BAE-R63/D
	2	10	50	9–45	ECP5522BAF-R63/D
		15	20–100	ECP5522BAF-R63/E	
	3	25	100	20–100	ECP5532BAG-R63/E
	4 ^②	50	28–140	ECP5532BAH-R63/F	
480V	1 ^②	1	30	1.0–5.0	ECP5512CAB-R63/B
		2		ECP5512CAC-R63/B	
		5		4–20	ECP5512CAD-R63/C
		10		ECP5512CAE-R63/C	
	2	20	60	9–45	ECP5522CAE-R63/D
		25		ECP5522CAF-R63/D	
	3	50	100	20–100	ECP5532CAG-R63/E
	4 ^②	100	150	28–140	ECP5532CAG-R63/F

Note

^① Motor FLA based on NEC Table.

^② For Compact NEMA Size 1 or Size 4 Pump Panel, add modification code **C60**. (Example: ECN5412AAA-C60).

Compact NEMA Size 1 and Size 4 Starters Electrical Life at Rated Continuous Current

NEMA Size	Rated Current (Amp) AC3/AC4	Operations
1C	27/150	2,500,000/40,000
1	27/153	5,000,000/110,000
4C	135/516	500,000/40,000
4	135/822	800,000/70,000

Class ECP55—Combination Irrigation Pump Panel—Circuit Breaker

Motor Voltage	NEMA Size	Maximum hp	Breaker Rating	Catalog Number	Motor Voltage	NEMA Size	Maximum hp	Breaker Rating	Catalog Number
240V	1 ①	1	7	ECP5512BAC	480V	1 ①	1	3	ECP5512CAB
		3	15	ECP5512BAD			3	7	ECP5512CAC
		7-1/2	30	ECP5512BAE			5	15	ECP5512CAD
	2	10	50	ECP5522BAF		2	10	30	ECP5512CAE
		15	70	ECP5522BAW			10	30	ECP5522CAE
	3	25	100	ECP5532BAG		25	50	ECP5522CAF	
	4 ①	50	150	ECP5542BAH		3	50	100	ECP5532CAG
				4 ①	100	175	ECP5542CAN		

Overload Relays

Freedom Solid-State Overload Relays

NEMA Size	Full Load Current Adjustment Range (A)	Three-Phase without Ground Fault	Three-Phase with Ground Fault
		Auto/Manual Reset Overload Selectable Class 10/20/30	Auto/Manual Reset Overload Selectable Class 10/20/30
00	0.33–1.65 ②	R63/A	R64/A
	1–5	R63/B	R64/B
	4–20	R63/C	R64/C
0 and 1	0.33–1.65 ②	R63/A	R64/A
	1–5	R63/B	R64/B
	4–20	R63/C	R64/C
	9–45	R63/D	R64/D
2	9–45	R63/D	R64/D
3	20–100	R63/E	R64/E
4	28–140	R63/F	R64/F
5	60–300 ③	R63/G	R64/G
6	120–600 ④	R63/H	R64/H

Notes

① Compact NEMA Size 1 or Size 4 Pump Panel, add modification code **C60**. (Example: ECN5412AAA-**C60**).

**Compact NEMA Size 1 and Size 4 Starters
Electrical Life at Rated Continuous Current**

NEMA Size	Rated Current (Amp)	
	AC3/AC4	Operations
1C	27/150	2,500,000/40,000
1	27/153	5,000,000/110,000
4C	135/516	500,000/40,000
4	135/822	800,000/70,000

② Not UL Listed.

③ NEMA Size 5 starter available with 60–300A panel mounted CTs. Starter as an assembled unit with 1–5A C440 overload relay (C440A1A005SELAX or C440A2A005SELAX).

④ NEMA Size 6 starter available with 120–600A panel mounted CTs. Starter as an assembled unit with 1–5A C440 overload relay (C440A1A005SELAX or C440A2A005SELAX).

Features:

- Self powered
- Phase loss protection
- Current adjustment knob
- ±1% repeat accuracy
- 1NO and 1NC isolated contacts
- Predictive indication
- Enhanced protection and monitoring
- Communication capabilities

6.3

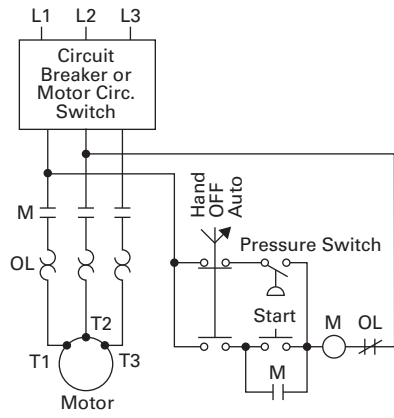
Pump Panels

Irrigation Pump Panels

Wiring Diagram

Typical Wiring Diagram

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Combination	
Features	V10-T6-27
Product Selection	V10-T6-27

Product Description

Eaton’s duplex pump panels are controllers with or without disconnect, and designed to meet the requirement for two alternating pumps in critical installations. All duplex pump panels are provided standard with two three-phase magnetic starters and an automatic alternator to provide equal pump wear. During periods for heavy demand, both pumps will operate.

The enclosure options include UL Type 1, 12, 3R, or 4X.

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

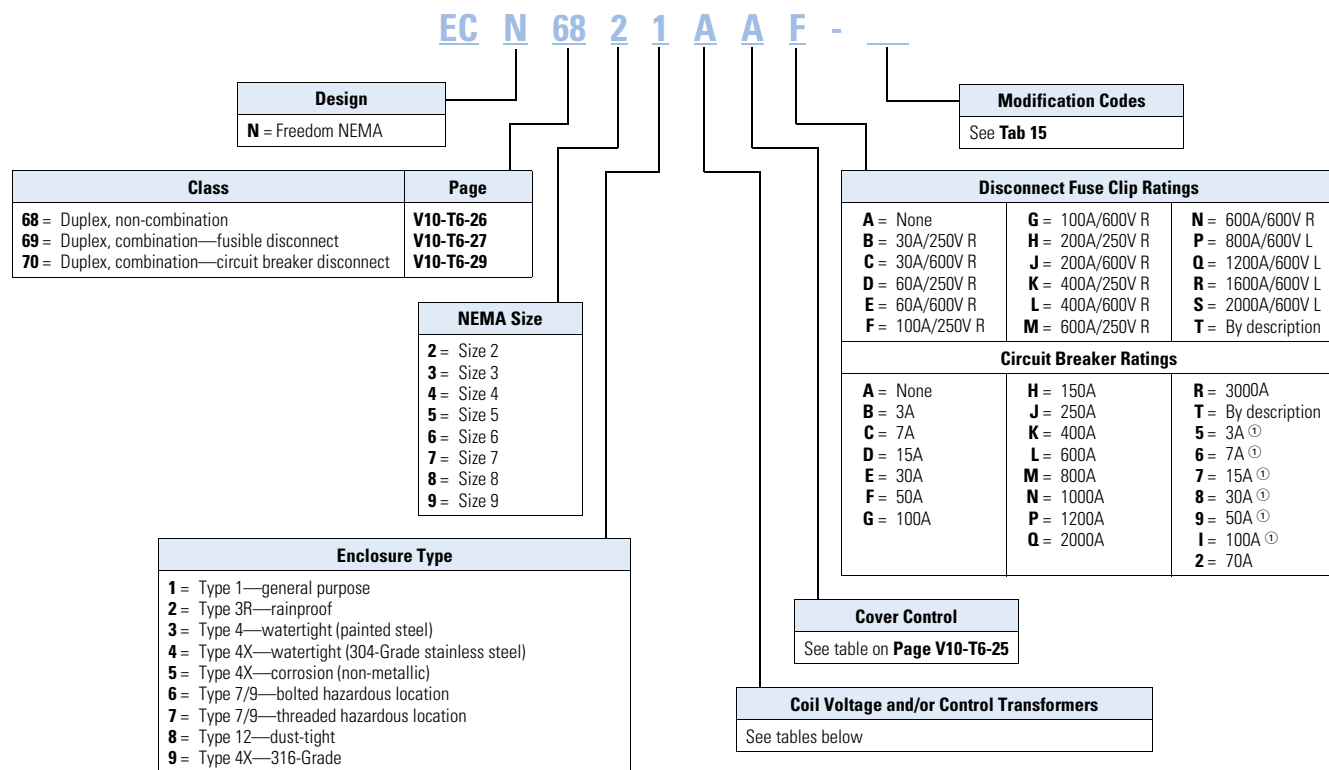
Additional Reference

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Catalog Number Selection

Freedom Duplex Pump Panels

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Magnetic Coil Codes (System Voltage) ②

Code	Magnet Coil	Code	Magnet Coil	Code	Magnet Coil
A	120/60110/50	K	240/50	U	24/50
B	240/60220/50	L	380/50	V	32/50
C	460/60440/50	M	415/50	W	48/60
D	575/60550/50	P	12 Vdc	X	104–120/60
E	208/60	Q	24 Vdc	Y	48/50
G	550/50	R	48 Vdc	Z	By description
H	277/60	S	125 Vdc		
J	208–240/60	T	24/60		

Control Power Transformer Codes (System Voltage)

Code	Primary	Secondary
B	240/480–220/440 wired for 240V	120/60–110/50
C	240/480–220/440 wired for 480V	120/60–110/50
D	600/60–550/50	120/60–110/50
E	208/60	120/60
H	277/60	120/60
L	380/50	110/50
M	415/50	110/50
Q	208/60	24
R	240/480–220/440 wired for 240V	24
S	240/480–220/440 wired for 480V	24
T	600/60	24
U	277/60	24
V	380/50	24
W	415/50	24
X	240/480/600 wired for 480V	120
Y	240/480/600 wired for 480V	24
Z	By description	—

Notes

- ① Use for Sizes 0–3, HMCP 600V applications only.
- ② When control power transformer modification codes (C1–C11) are used or when starter class includes CPT (that is, ECN07, 18) see table to the right for system voltage code.

Cover Control

Non-Reversing

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed Pilot Devices

To order factory installed pilot devices, change the 9th character of the catalog number to the alpha shown in the table below. Example: to order an **ECN0514CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, for example, **ECN0514CCA**.

Type 1 Cover Control



All Other Cover Controls



Non-Reversing Cover Control

Description	Factory Installed Flange Control			Field Installation Kits	
	Position 9 Alpha	Type 1 Non-Combination ①	All Others ②	Type 1 Non-Combination ① Catalog Number	All Others ② Catalog Number
No cover mounted pilot devices	A	■	■	C400GK0	—
START/STOP pushbuttons	B	■	■	C400GK1	C400T1
With red RUN pilot light	C	■	■	C400GK12 ③	—
With red RUN/green OFF lights	D	■	■	C400GK16 ③	—
ON/OFF pushbuttons	E	—	■	—	C400T2
With red RUN pilot light	F	—	■	—	—
With red RUN/green OFF lights	G	—	■	—	—
HAND/OFF/AUTO selector switch	H	■	■	C400GK3	C400T12
With red RUN pilot light	J	■	■	C400GK32 ③	—
With red RUN/green OFF lights	K	■	■	C400GK36 ③	—
START pushbutton	L	—	■	—	C400T3
ON pushbutton	M	—	■	—	C400T4
OFF pushbutton	N	—	■	—	C400T5
Red RUN pilot light	P	■	■	C400GK42 ③	C400T9 ③
Green OFF	Q	■	■	C400GK41 ③	C400T10 ③
Red RUN/green OFF pilot lights	R	■	■	C400GK46 ③	C400T11 ③
START/STOP selector switch	S	—	■	—	C400T13
With red RUN pilot light	T	—	■	—	—
With red RUN/green OFF lights	U	—	■	—	—
ON/OFF selector switch	V	—	■	—	C400T14
With red RUN pilot light	W	—	■	—	—
With red RUN/green OFF lights	X	—	■	—	—

Notes

- ① Type 1, NEMA Sizes 00–4 non-combination ONLY.
- ② Type 1, NEMA Sizes 5–9 non-combination PLUS all Type 3R, 4X, 12 non-combination PLUS all combination—NEMA sizes only.
- ③ Add code letter from the table below to catalog number for voltage—kits only. Example: C400T9B.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120V 60 Hz	A	240V 60 Hz	B	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D

Non-Combination

Features

- Full voltage non-reversing non-combination
- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600V maximum

Alternator

In normal operation, the alternator automatically selects alternate pumps for each succeeding cycle to equalize pump wear. During periods of heavy demand, both pumps will operate.

Product Selection

Class ECN68—Non-Combination Duplex Pump Panels with Automatic Alternator ^{①②}

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ^③ Watertight and Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ^④ Catalog Number	Component Starter (Open) ^⑤ Catalog Number
0	—	—	120	ECN6801AAA	ECN6802AAA	ECN6804AAA	ECN6808AAA	AN16BN0AC
	200	3	208	ECN6801EAA	ECN6802EAA	ECN6804EAA	ECN6808EAA	AN16BN0EC
	230		240	ECN6801BAA	ECN6802BAA	ECN6804BAA	ECN6808BAA	AN16BN0BC
	460	5	480	ECN6801CAA	ECN6802CAA	ECN6804CAA	ECN6808CAA	AN16BN0CC
	575		600	ECN6801DAA	ECN6802DAA	ECN6804DAA	ECN6808DAA	AN16BN0DC
1	—	—	120	ECN6811AAA	ECN6812AAA	ECN6814AAA	ECN6818AAA	AN16DN0AB
	200	7-1/2	208	ECN6811EAA	ECN6812EAA	ECN6814EAA	ECN6818EAA	AN16DN0EB
	230		240	ECN6811BAA	ECN6812BAA	ECN6814BAA	ECN6818BAA	AN16DN0BB
	460	10	480	ECN6811CAA	ECN6812CAA	ECN6814CAA	ECN6818CAA	AN16DN0CB
	575		600	ECN6811DAA	ECN6812DAA	ECN6814DAA	ECN6818DAA	AN16DN0DB
2	—	—	120	ECN6821AAA	ECN6822AAA	ECN6824AAA	ECN6828AAA	AN16GN0AB
	200	10	208	ECN6821EAA	ECN6822EAA	ECN6824EAA	ECN6828EAA	AN16GN0EB
	230	15	240	ECN6821BAA	ECN6822BAA	ECN6824BAA	ECN6828BAA	AN16GN0BB
	460	25	480	ECN6821CAA	ECN6822CAA	ECN6824CAA	ECN6828CAA	AN16GN0CB
	575		600	ECN6821DAA	ECN6822DAA	ECN6824DAA	ECN6828DAA	AN16GN0DB
3	—	—	120	ECN6831AAA	ECN6832AAA	ECN6834AAA	ECN6838AAA	AN16KN0A
	200	25	208	ECN6831EAA	ECN6832EAA	ECN6834EAA	ECN6838EAA	AN16KN0E
	230	30	240	ECN6831BAA	ECN6832BAA	ECN6834BAA	ECN6838BAA	AN16KN0B
	460	50	480	ECN6831CAA	ECN6832CAA	ECN6834CAA	ECN6838CAA	AN16KN0C
	575		600	ECN6831DAA	ECN6832DAA	ECN6834DAA	ECN6838DAA	AN16KN0D
4	—	—	120	ECN6841AAA	ECN6842AAA	ECN6844AAA	ECN6848AAA	AN16NN0A
	200	40	208	ECN6841EAA	ECN6842EAA	ECN6844EAA	ECN6848EAA	AN16NN0E
	230	50	240	ECN6841BAA	ECN6842BAA	ECN6844BAA	ECN6848BAA	AN16NN0B
	460	100	480	ECN6841CAA	ECN6842CAA	ECN6844CAA	ECN6848CAA	AN16NN0C
	575		600	ECN6841DAA	ECN6842DAA	ECN6844DAA	ECN6848DAA	AN16NN0D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each motor). For heater pack selection, see **Tab 15**.

① Circuitry arranged for two-pole pilot devices.

② All duplexes come standard with alternator. To remove, add modification code **D12**.

③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN6804AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

⑤ Requires two starters.

Combination

Features

- Full voltage non-reversing combination
- Three-phase magnetic, three-pole
- Interchangeable heater OLR
- 600V maximum

Alternator

In normal operation, the alternator automatically selects alternate pumps for each succeeding cycle to equalize pump wear. During periods of heavy demand, both pumps will operate.

Product Selection

Class ECN69—Combination Duplex Pump Panels with Automatic Alternator—Fusible Disconnect ^{①②}

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ③	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ④ Watertight and Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ⑤⑥	Component Starter (Open) ⑦ Catalog Number
0	230	3	120	30A	ECN6901AAB	ECN6902AAB	ECN6904AAB	ECN6908AAB	AN16BN0AC
	460	5			ECN6901AAC	ECN6902AAC	ECN6904AAC	ECN6908AAC	AN16BN0AC
	200	3	208		ECN6901EAB	ECN6902EAB	ECN6904EAB	ECN6908EAB	AN16BN0EC
	230		240		ECN6901BAB	ECN6902BAB	ECN6904BAB	ECN6908BAB	AN16BN0BC
	460	5	480		ECN6901CAC	ECN6902CAC	ECN6904CAC	ECN6908CAC	AN16BN0CC
	575		600		ECN6901DAC	ECN6902DAC	ECN6904DAC	ECN6908DAC	AN16BN0DC
1	230	7-1/2	120	30A	ECN6911AAB	ECN6912AAB	ECN6914AAB	ECN6918AAB	AN16DN0AB
	460	10			ECN6911AAC	ECN6912AAC	ECN6914AAC	ECN6918AAC	AN16DN0AB
	200	7-1/2	208		ECN6911EAB	ECN6912EAB	ECN6914EAB	ECN6918EAB	AN16DN0EB
	230		240		ECN6911BAB	ECN6912BAB	ECN6914BAB	ECN6918BAB	AN16DN0BB
	460	10	480		ECN6911CAC	ECN6912CAC	ECN6914CAC	ECN6918CAC	AN16DN0CB
	575		600		ECN6911DAC	ECN6912DAC	ECN6914DAC	ECN6918DAC	AN16DN0DB
2	230	15	120	60A	ECN6921AAD	ECN6922AAD	ECN6924AAD	ECN6928AAD	AN16GN0AB
	460	25			ECN6921AAE	ECN6922AAE	ECN6924AAE	ECN6928AAE	AN16GN0AB
	200	10	208		ECN6921EAD	ECN6922EAD	ECN6924EAD	ECN6928EAD	AN16GN0EB
	230	15	240		ECN6921BAD	ECN6922BAD	ECN6924BAD	ECN6928BAD	AN16GN0BB
	460	25	480		ECN6921CAE	ECN6922CAE	ECN6924CAE	ECN6928CAE	AN16GN0CB
	575		600		ECN6921DAE	ECN6922DAE	ECN6924DAE	ECN6928DAE	AN16GN0DB
3	230	30	120	100A	ECN6931AAF	ECN6932AAF	ECN6934AAF	ECN6938AAF	AN16KN0A
	460	50			ECN6931AAG	ECN6932AAG	ECN6934AAG	ECN6938AAG	AN16KN0A
	200	25	208		ECN6931EAF	ECN6932EAF	ECN6934EAF	ECN6938EAF	AN16KN0E
	230	30	240		ECN6931BAF	ECN6932BAF	ECN6934BAF	ECN6938BAF	AN16KN0B
	460	50	480		ECN6931CAG	ECN6932CAG	ECN6934CAG	ECN6938CAG	AN16KN0C
	575		600		ECN6931DAG	ECN6932DAG	ECN6934DAG	ECN6938DAG	AN16KN0D
4	230	50	120	200A	ECN6941AAH	ECN6942AAH	ECN6944AAH	ECN6948AAH	AN16NN0A
	460	100			ECN6941AAJ	ECN6942AAJ	ECN6944AAJ	ECN6948AAJ	AN16NN0A
	200	40	208		ECN6941EAH	ECN6942EAH	ECN6944EAH	ECN6948EAH	AN16NN0E
	230	50	240		ECN6941BAH	ECN6942BAH	ECN6944BAH	ECN6948BAH	AN16NN0B
	460	100	480		ECN6941CAJ	ECN6942CAJ	ECN6944CAJ	ECN6948CAJ	AN16NN0C
	575		600		ECN6941DAJ	ECN6942DAJ	ECN6944DAJ	ECN6948DAJ	AN16NN0D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each motor). For heater pack selection, see **Tab 15**.

- ① Circuitry arranged for two-pole pilot devices.
- ② All duplexes come standard with alternator. To remove, add modification code **D12**.
- ③ For 200V and 575V motors—starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the eighth character of the listed catalog number.
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN6904AAB. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ⑤ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ⑥ Type 12 enclosure is without safety door interlock.
- ⑦ Requires two starters.

Class ECN69—Combination Duplex Pump Panels with Automatic Alternator—Non-Fusible Disconnect ^{①②}

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Disconnect Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ^③ Watertight and Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{④⑤} Catalog Number	Component Starter (Open) ^⑥ Catalog Number
0	—	—	120	30A	ECN6901AAA	ECN6902AAA	ECN6904AAA	ECN6908AAA	AN16BN0AC
	200	3	208		ECN6901EAA	ECN6902EAA	ECN6904EAA	ECN6908EAA	AN16BN0EC
	230		240		ECN6901BAA	ECN6902BAA	ECN6904BAA	ECN6908BAA	AN16BN0BC
	460	5	480		ECN6901CAA	ECN6902CAA	ECN6904CAA	ECN6908CAA	AN16BN0CC
	575		600		ECN6901DAA	ECN6902DAA	ECN6904DAA	ECN6908DAA	AN16BN0DC
1	—	—	120	30A	ECN6911AAA	ECN6912AAA	ECN6914AAA	ECN6918AAA	AN16DN0AB
	200	7-1/2	208		ECN6911EAA	ECN6912EAA	ECN6914EAA	ECN6918EAA	AN16DN0EB
	230		240		ECN6911BAA	ECN6912BAA	ECN6914BAA	ECN6918BAA	AN16DN0BB
	460	10	480		ECN6911CAA	ECN6912CAA	ECN6914CAA	ECN6918CAA	AN16DN0CB
	575		600		ECN6911DAA	ECN6912DAA	ECN6914DAA	ECN6918DAA	AN16DN0DB
2	—	—	120	60A	ECN6921AAA	ECN6922AAA	ECN6924AAA	ECN6928AAA	AN16GN0AB
	200	10	208		ECN6921EAA	ECN6922EAA	ECN6924EAA	ECN6928EAA	AN16GN0EB
	230	15	240		ECN6921BAA	ECN6922BAA	ECN6924BAA	ECN6928BAA	AN16GN0BB
	460	25	480		ECN6921CAA	ECN6922CAA	ECN6924CAA	ECN6928CAA	AN16GN0CB
	575		600		ECN6921DAA	ECN6922DAA	ECN6924DAA	ECN6928DAA	AN16GN0DB
3	—	—	120	100A	ECN6931AAA	ECN6932AAA	ECN6934AAA	ECN6938AAA	AN16KN0A
	200	25	208		ECN6931EAA	ECN6932EAA	ECN6934EAA	ECN6938EAA	AN16KN0E
	230	30	240		ECN6931BAA	ECN6932BAA	ECN6934BAA	ECN6938BAA	AN16KN0B
	460	50	480		ECN6931CAA	ECN6932CAA	ECN6934CAA	ECN6938CAA	AN16KN0C
	575		600		ECN6931DAA	ECN6932DAA	ECN6934DAA	ECN6938DAA	AN16KN0D
4	—	—	120	200A	ECN6941AAA	ECN6942AAA	ECN6944AAA	ECN6948AAA	AN16NN0A
	200	40	208		ECN6941EAA	ECN6942EAA	ECN6944EAA	ECN6948EAA	AN16NN0E
	230	50	240		ECN6941BAA	ECN6942BAA	ECN6944BAA	ECN6948BAA	AN16NN0B
	460	100	480		ECN6941CAA	ECN6942CAA	ECN6944CAA	ECN6948CAA	AN16NN0C
	575		600		ECN6941DAA	ECN6942DAA	ECN6944DAA	ECN6948DAA	AN16NN0D

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each motor). For heater pack selection, see **Tab 15**.

- ① Circuitry arranged for two-pole pilot devices.
- ② All duplexes come standard with alternator. To remove, add modification code **D12**.
- ③ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECN6904AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ④ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ⑤ Type 12 enclosure is without safety door interlock.
- ⑥ Requires two starters.

Class ECN70—Combination Duplex Pump Panels with Automatic Alternator—Circuit Breaker ^{①②}

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ^③	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ^④ Watertight and Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{⑤⑥} Catalog Number	Component Starter (Open) ^⑦ Catalog Number	
0	200	1	208	7A	ECN7001EAC	ECN7002EAC	ECN7004EAC	ECN7008EAC	AN16BN0EC	
		3		15A	ECN7001EAD	ECN7002EAD	ECN7004EAD	ECN7008EAD		
	230	1	240	7A	ECN7001BAC	ECN7002BAC	ECN7004BAC	ECN7008BAC	AN16BN0BC	
		3		15A	ECN7001BAD	ECN7002BAD	ECN7004BAD	ECN7008BAD		
	460	3/4	480	3A	ECN7001CAB	ECN7002CAB	ECN7004CAB	ECN7008CAB	AN16BN0CC	
		2		7A	ECN7001CAC	ECN7002CAC	ECN7004CAC	ECN7008CAC		
		5		15A	ECN7001CAD	ECN7002CAD	ECN7004CAD	ECN7008CAD		
	575	1	600	3A	ECN7001DAB	ECN7002DAB	ECN7004DAB	ECN7008DAB	AN16BN0DC	
		3		7A	ECN7001DAC	ECN7002DAC	ECN7004DAC	ECN7008DAC		
				15A	ECN7001DAD	ECN7002DAD	ECN7004DAD	ECN7008DAD		
	1	200	1	208	7A	ECN7011EAC	ECN7012EAC	ECN7014EAC	ECN7018EAC	AN16DN0EB
			2		15A	ECN7011EAD	ECN7012EAD	ECN7014EAD	ECN7018EAD	
7-1/2			30A		ECN7011EAE	ECN7012EAE	ECN7014EAE	ECN7018EAE		
230		1	240	7A	ECN7011BAC	ECN7012BAC	ECN7014BAC	ECN7018BAC	AN16DN0BB	
		2		15A	ECN7011BAD	ECN7012BAD	ECN7014BAD	ECN7018BAD		
		7-1/2		30A	ECN7011BAE	ECN7012BAE	ECN7014BAE	ECN7018BAE		
460		3/4	480	3A	ECN7011CAB	ECN7012CAB	ECN7014CAB	ECN7018CAB	AN16DN0CB	
		2		7A	ECN7011CAC	ECN7012CAC	ECN7014CAC	ECN7018CAC		
		5		15A	ECN7011CAD	ECN7012CAD	ECN7014CAD	ECN7018CAD		
		10		30A	ECN7011CAE	ECN7012CAE	ECN7014CAE	ECN7018CAE		
575		1	600	3A	ECN7011DAB	ECN7012DAB	ECN7014DAB	ECN7018DAB	AN16DN0DB	
		3		7A	ECN7011DAC	ECN7012DAC	ECN7014DAC	ECN7018DAC		
		7-1/2		15A	ECN7011DAD	ECN7012DAD	ECN7014DAD	ECN7018DAD		
		10		30A	ECN7011DAE	ECN7012DAE	ECN7014DAE	ECN7018DAE		
2		200	10	208	50A	ECN7021EAF	ECN7022EAF	ECN7024EAF	ECN7028EAF	AN16GN0EB
		230	15		240	ECN7021BAF	ECN7022BAF	ECN7024BAF	ECN7028BAF	AN16GN0BB
		460	25		480	ECN7021CAF	ECN7022CAF	ECN7024CAF	ECN7028CAF	AN16GN0CB
		575			600	ECN7021DAF	ECN7022DAF	ECN7024DAF	ECN7028DAF	AN16GN0DB
3	200	25	208	100A	ECN7031EAG	ECN7032EAG	ECN7034EAG	ECN7038EAG	AN16KN0E	
	230	30		240	ECN7031BAG	ECN7032BAG	ECN7034BAG	ECN7038BAG	AN16KN0B	
	460	50		480	ECN7031CAG	ECN7032CAG	ECN7034CAG	ECN7038CAG	AN16KN0C	
	575			600	ECN7031DAI	ECN7032DAI	ECN7034DAI	ECN7038DAI	AN16KN0D	
4	200	40	208	150A	ECN7041EAH	ECN7042EAH	ECN7044EAH	ECN7048EAH	AN16NN0E	
	230	50		240	ECN7041BAH	ECN7042BAH	ECN7044BAH	ECN7048BAH	AN16NN0B	
	460	100		480	ECN7041CAH	ECN7042CAH	ECN7044CAH	ECN7048CAH	AN16NN0C	
	575			600	ECN7041DAH	ECN7042DAH	ECN7044DAH	ECN7048DAH	AN16NN0D	

Notes

Starters do not include heater packs. Select two cartons of three heater packs (two overload relays—one for each motor). For heater pack selection, see **Tab 15**.

- ① Circuitry arranged for two-pole pilot devices.
- ② All duplexes come standard with alternator. To remove, add modification code **D12**.
- ③ For 200V and 575V motors—starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the eighth character of the listed catalog number.
- ④ The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECN7004EAC. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ⑤ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ⑥ Type 12 enclosure is without safety door interlock.
- ⑦ Requires two starters.

HVAC Starters



7.1 Freedom Full Voltage HVAC Starters

Product Description	V10-T7-2
Features	V10-T7-2
Standards and Certifications	V10-T7-3
Additional Reference	V10-T7-3
Catalog Number Selection	V10-T7-3
Cover Control	V10-T7-3
Product Selection	V10-T7-4
Modification Codes	V10-T7-8
Wiring Diagram	V10-T7-9
Dimensions	V10-T7-10

Freedom Full Voltage HVAC Starters



7

Product Description

Eaton's ECH line of combination starters was developed specifically for customers in the HVAC industry. The ECH product combines the requirements of motor overload and short-circuit protection into one package. These starters were designed to be compact and to offer the basic features prevalent in the HVAC marketplace. The line includes the Freedom line of FVNR NEMA starters with either (C306) interchangeable heaters or solid-state overload relays, a CPT, HOA and red pilot light.

Features

- Compact design
- Type 1 enclosure
- CPT available
- Bimetal or solid-state overload options
- 30 mm pilot devices
- HOA
- Red RUN pilot
- Disconnect switch or HMCPE
- NEMA Sizes 0–2

Interchangeable Heater Features

C306 overload relays are designed for use with CE or CN non-reversing and reversing contactors. Four sizes are available for overload protection up to 144A.

- Selectable manual or automatic reset operation
- Interchangeable heater packs adjustable $\pm 24\%$ to match motor FLA and calibrated for use with 1.0 and 1.15 service factor motors. Heater packs for 32A overload relay will mount in 75A overload relay—useful in derating applications such as jogging
- Class 10 or 20 heater packs
- Load lugs built into relay base

Contents

Description

Freedom Full Voltage HVAC Starters

	<i>Page</i>
Standards and Certifications	V10-T7-3
Additional Reference	V10-T7-3
Catalog Number Selection	V10-T7-3
Cover Control	V10-T7-3
Product Selection	V10-T7-4
Modification Codes	V10-T7-8
Wiring Diagram	V10-T7-9
Dimensions	V10-T7-10

- Bimetallic, ambient compensated operated. Trip free mechanism
- Electrically isolated NO-NC contacts (pull RESET button to test). (Electrical Ratings see **Tab 17**)
- Overload trip indication
- Shrouded or fingerproof terminals to reduce possibility of electrical shock
- Meets UL 508 single-phasing requirements
- UL listed, CSA certified, NEMA compliance

Solid-State Overload Features

- Reliable, accurate, electronic motor protection
- Easy to select, install and maintain
- Flexible, intelligent design

Size/Range

- Broad FLA range (0.33–100A)
- Selectable trip class (10A, 10, 20, 30)
- Direct mounting to NEMA contactors
- Most compact electronic overload in its class

Motor Control

- Two B600 alarm (NO) and fault (NC) contacts
- Test/Trip button

Motor Protection

- Thermal overload
- Phase loss
- Selectable (ON/OFF) phase unbalance
- Selectable (ON/OFF) ground fault (if selected GF SSOL relay)

User Interface

- Large FLA selection dial
- Trip status indicator
- Operating mode LED
- DIP switch selectable trip class, phase unbalance and ground fault
- Selectable Auto/Manual reset

Feature Options

- Remote reset
- 120 Vac
- 24 Vac
- 24 Vdc
- Tamper-proof cover
- Communications modules

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

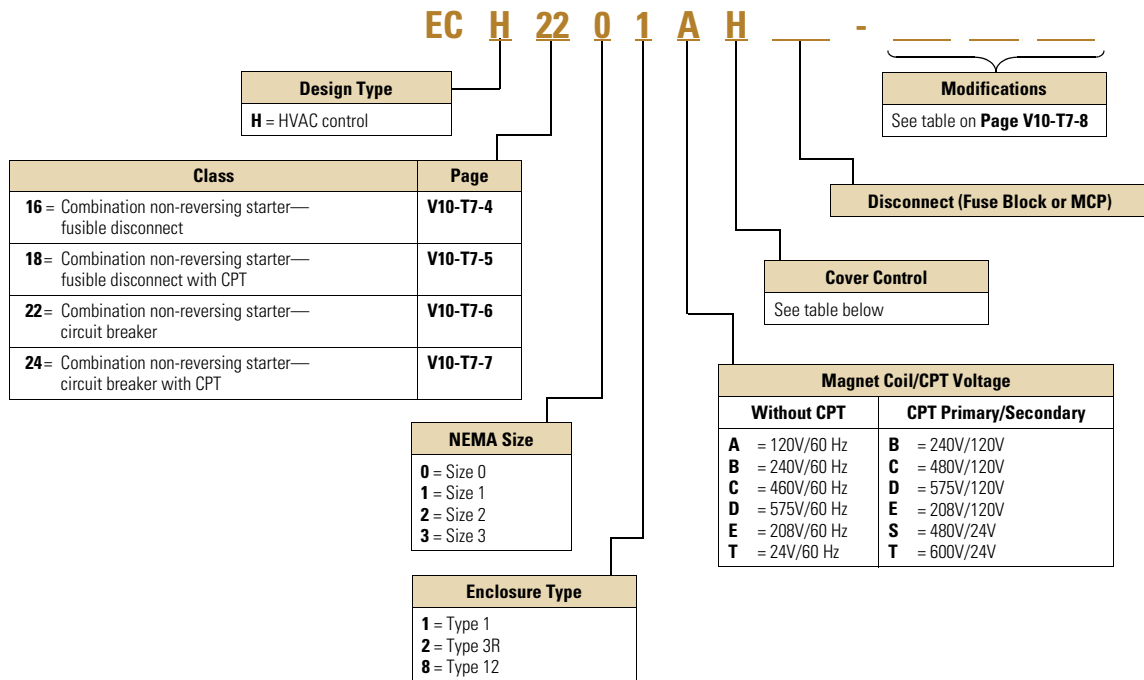
- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Additional Reference

Modification Codes	V10-T7-8
Wiring Diagram	V10-T7-9
Dimensions	V10-T7-10

Catalog Number Selection

Freedom HVAC Starters



Cover Control

Pilot Device Factory Installation

Description	Position 9 Alpha
None	A
HAND/OFF/AUTO	H
HAND/OFF/AUTO with red RUN pilot	J

Product Selection

Class ECH16—Combination Non-Reversing Starter—Fusible Disconnect

NEMA Size	Motor Voltage	Maximum hp	Coil Voltage	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Type 1 with HOA Catalog Number ①	Type 1 with HOA and Red RUN Pilot Catalog Number ①	Component Starter (Open) Catalog Number ②
0	—	—	120	ECH1601AA_	ECH1602AA_	ECH1608AA_	ECH1601AH_	ECH1601AJ_	AN16BN0AC
	—	—	24	ECH1601TA_	ECH1602TA_	ECH1608TA_	ECH1601TH_	ECH1601TJ_	AN16BN0TC
	200	3	208	ECH1601EA_	ECH1602EA_	ECH1608EA_	ECH1601EH_	ECH1601EJ_	AN16BN0EC
	240	—	240	ECH1601BA_	ECH1602BA_	ECH1608BA_	ECH1601BH_	ECH1601BJ_	AN16BN0BC
	460	5	460	ECH1601CA_	ECH1602CA_	ECH1608CA_	ECH1601CH_	ECH1601CJ_	AN16BN0CC
	575	—	575	ECH1601DA_	ECH1602DA_	ECH1608DA_	ECH1601DH_	ECH1601DJ_	AN16BN0DC
1	—	—	120	ECH1611AA_	ECH1612AA_	ECH1618AA_	ECH1611AH_	ECH1611AJ_	AN16DN0AB
	—	—	24	ECH1611TA_	ECH1612TA_	ECH1618TA_	ECH1611TH_	ECH1611TJ_	AN16DN0TB
	200	7-1/2	208	ECH1611EA_	ECH1612EA_	ECH1618EA_	ECH1611EH_	ECH1611EJ_	AN16DN0EB
	240	—	240	ECH1611BA_	ECH1612BA_	ECH1618BA_	ECH1611BH_	ECH1611BJ_	AN16DN0BB
	460	10	460	ECH1611CA_	ECH1612CA_	ECH1618CA_	ECH1611CH_	ECH1611CJ_	AN16DN0CB
	575	—	575	ECH1611DA_	ECH1612DA_	ECH1618DA_	ECH1611DH_	ECH1611DJ_	AN16DN0DB
2	—	—	120	ECH1621AA_	ECH1622AA_	ECH1628AA_	ECH1621AH_	ECH1621AJ_	AN16GN0AB
	—	—	24	ECH1621TA_	ECH1622TA_	ECH1628TA_	ECH1621TH_	ECH1621TJ_	AN16GN0TB
	200	10	208	ECH1621EA_	ECH1622EA_	ECH1628EA_	ECH1621EH_	ECH1621EJ_	AN16GN0EB
	240	15	240	ECH1621BA_	ECH1622BA_	ECH1628BA_	ECH1621BH_	ECH1621BJ_	AN16GN0BB
	460	25	460	ECH1621CA_	ECH1622CA_	ECH1628CA_	ECH1621CH_	ECH1621CJ_	AN16GN0CB
	575	—	575	ECH1621DA_	ECH1622DA_	ECH1628DA_	ECH1621DH_	ECH1621DJ_	AN16GN0DB
3	—	—	120	ECH1631AA_	ECH1632AA_	ECH1638AA_	ECH1631AH_	ECH1631AJ_	AN16KN0A
	—	—	24	ECH1631TA_	ECH1632TA_	ECH1638TA_	ECH1631TH_	ECH1631TJ_	AN16KN0T
	200	25	208	ECH1631EA_	ECH1632EA_	ECH1638EA_	ECH1631EH_	ECH1631EJ_	AN16KN0E
	240	30	240	ECH1631BA_	ECH1632BA_	ECH1638BA_	ECH1631BH_	ECH1631BJ_	AN16KN0B
	460	50	460	ECH1631CA_	ECH1632CA_	ECH1638CA_	ECH1631CH_	ECH1631CJ_	AN16KN0C
	575	—	575	ECH1631DA_	ECH1632DA_	ECH1638DA_	ECH1631DH_	ECH1631DJ_	AN16KN0D

Notes

① A “—” denotes catalog numbers are incomplete without the fuse block code. To complete the catalog number, select the appropriate code from the following table:

Rating	Fuse Block Code
No block	A
30A/600V “J”	C
60A/600V “J”	E (Size 2 only)
100A/600V “J”	G

② If the solid-state overload option is selected, refer to Publication Number TD03408001E, Relay for MCCs and Enclosed Control Technical Data, for component selection.

Class ECH18—Combination Non-Reversing Starter—Fusible Disconnect with CPT

NEMA Size	Motor Voltage	Maximum hp	CPT Primary/Secondary (Coil Voltage)	Type 1 General Purpose Catalog Number ^①	Type 3R Rainproof Catalog Number ^①	Type 12 Dust-Tight Industrial Catalog Number ^①	Type 1 with HOA Catalog Number ^①	Type 1 with HOA and Red RUN Pilot Catalog Number ^①	Component Starter (Open) Catalog Number ^②
0	200	3	208/120	ECH1801EA_	ECH1802EA_	ECH1808EA_	ECH1801EH_	ECH1801EJ_	AN16BN0EC
			240/120	ECH1801BA_	ECH1802BA_	ECH1808BA_	ECH1801BH_	ECH1801BJ_	AN16BN0BC
	460	5	460/120	ECH1801CA_	ECH1802CA_	ECH1808CA_	ECH1801CH_	ECH1801CJ_	AN16BN0CC
			575/120	ECH1801DA_	ECH1802DA_	ECH1808DA_	ECH1801DH_	ECH1801DJ_	AN16BN0DC
1	200	7-1/2	208/120	ECH1811EA_	ECH1812EA_	ECH1818EA_	ECH1811EH_	ECH1811EJ_	AN16DN0EB
			240/120	ECH1811BA_	ECH1812BA_	ECH1818BA_	ECH1811BH_	ECH1811BJ_	AN16DN0BB
	460	10	460/120	ECH1811CA_	ECH1812CA_	ECH1818CA_	ECH1811CH_	ECH1811CJ_	AN16DN0CB
			575/120	ECH1811DA_	ECH1812DA_	ECH1818DA_	ECH1811DH_	ECH1811DJ_	AN16DN0DB
2	200	10	208/120	ECH1821EA_	ECH1822EA_	ECH1828EA_	ECH1821EH_	ECH1821EJ_	AN16GN0EB
			240/120	ECH1821BA_	ECH1822BA_	ECH1828BA_	ECH1821BH_	ECH1821BJ_	AN16GN0BB
	460	25	460/120	ECH1821CA_	ECH1822CA_	ECH1828CA_	ECH1821CH_	ECH1821CJ_	AN16GN0CB
			575/120	ECH1821DA_	ECH1822DA_	ECH1828DA_	ECH1821DH_	ECH1821DJ_	AN16GN0DB
3	200	25	208/120	ECH1831EA_	ECH1832EA_	ECH1838EA_	ECH1831EH_	ECH1831EJ_	AN16KN0E
			240/120	ECH1831BA_	ECH1832BA_	ECH1838BA_	ECH1831BH_	ECH1831BJ_	AN16KN0B
	460	50	460/120	ECH1831CA_	ECH1832CA_	ECH1838CA_	ECH1831CH_	ECH1831CJ_	AN16KN0C
			575/120	ECH1831DA_	ECH1832DA_	ECH1838DA_	ECH1831DH_	ECH1831DJ_	AN16KN0D

Notes

① A “-” denotes catalog numbers are incomplete without the fuse block code. To complete the catalog number, select the appropriate code from the following table:

Rating	Fuse Block Code
No block	A
30A/600V “J”	C
60A/600V “J”	E (Size 2 only)
100A/600V “J”	G

② If the solid-state overload option is selected, refer to Publication Number TD03408001E, Relay for MCCs and Enclosed Control Technical Data, for component selection.

Class ECH22—Combination Non-Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp	Coil Voltage	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Type 1 with HOA Catalog Number ①	Type 1 with HOA and Red RUN Pilot Catalog Number ①	Component Starter (Open) Catalog Number ②
0	—	—	120	ECH2201AA_	ECH2202AA_	ECH2208AA_	ECH2201AH_	ECH2201AJ_	AN16BN0AC
	—	—	24	ECH2201TA_	ECH2202TA_	ECH2208TA_	ECH2201TH_	ECH2201TJ_	AN16BN0TC
	200	3	208	ECH2201EA_	ECH2202EA_	ECH2208EA_	ECH2201EH_	ECH2201EJ_	AN16BN0EC
	240	—	240	ECH2201BA_	ECH2202BA_	ECH2208BA_	ECH2201BH_	ECH2201BJ_	AN16BN0BC
	460	5	460	ECH2201CA_	ECH2202CA_	ECH2208CA_	ECH2201CH_	ECH2201CJ_	AN16BN0CC
	575	—	575	ECH2201DA_	ECH2202DA_	ECH2208DA_	ECH2201DH_	ECH2201DJ_	AN16BN0DC
1	—	—	120	ECH2211AA_	ECH2212AA_	ECH2218AA_	ECH2211AH_	ECH2211AJ_	AN16DN0AB
	—	—	24	ECH2211TA_	ECH2212TA_	ECH2218TA_	ECH2211TH_	ECH2211TJ_	AN16DN0TB
	200	7-1/2	208	ECH2211EA_	ECH2212EA_	ECH2218EA_	ECH2211EH_	ECH2211EJ_	AN16DN0EB
	240	—	240	ECH2211BA_	ECH2212BA_	ECH2218BA_	ECH2211BH_	ECH2211BJ_	AN16DN0BB
	460	10	460	ECH2211CA_	ECH2212CA_	ECH2218CA_	ECH2211CH_	ECH2211CJ_	AN16DN0CB
	575	—	575	ECH2211DA_	ECH2212DA_	ECH2218DA_	ECH2211DH_	ECH2211DJ_	AN16DN0DB
2	—	—	120	ECH2221AA_	ECH2222AA_	ECH2228AA_	ECH2221AH_	ECH2221AJ_	AN16GN0AB
	—	—	24	ECH2221TA_	ECH2222TA_	ECH2228TA_	ECH2221TH_	ECH2221TJ_	AN16GN0TB
	200	10	208	ECH2221EA_	ECH2222EA_	ECH2228EA_	ECH2221EH_	ECH2221EJ_	AN16GN0EB
	240	15	240	ECH2221BA_	ECH2222BA_	ECH2228BA_	ECH2221BH_	ECH2221BJ_	AN16GN0BB
	460	25	460	ECH2221CA_	ECH2222CA_	ECH2228CA_	ECH2221CH_	ECH2221CJ_	AN16GN0CB
	575	—	575	ECH2221DA_	ECH2222DA_	ECH2228DA_	ECH2221DH_	ECH2221DJ_	AN16GN0DB
3	—	—	120	ECH2231AA_	ECH2232AA_	ECH2238AA_	ECH2231AH_	ECH2231AJ_	AN16KN0A
	—	—	24	ECH2231TA_	ECH2232TA_	ECH2238TA_	ECH2231TH_	ECH2231TJ_	AN16KN0T
	200	25	208	ECH2231EA_	ECH2232EA_	ECH2238EA_	ECH2231EH_	ECH2231EJ_	AN16KN0E
	240	30	240	ECH2231BA_	ECH2232BA_	ECH2238BA_	ECH2231BH_	ECH2231BJ_	AN16KN0B
	460	50	460	ECH2231CA_	ECH2232CA_	ECH2238CA_	ECH2231CH_	ECH2231CJ_	AN16KN0C
	575	—	575	ECH2231DA_	ECH2232DA_	ECH2238DA_	ECH2231DH_	ECH2231DJ_	AN16KN0D

Notes

① A “—” denotes catalog numbers are incomplete without the magnetic circuit protector code. To complete the catalog number, select the appropriate code from the following table:

Rating	Magnetic Circuit Protector Code	Rating	Magnetic Circuit Protector Code
—	A	30A	E
3A	B	50A	F
7A	C	100A	G
15A	D		

② If the solid-state overload option is selected, refer to Publication Number TD03408001E, Relay for MCCs and Enclosed Control Technical Data, for component selection.

Class ECH24—Combination Non-Reversing Starter—Circuit Breaker with CPT

NEMA Size	Motor Voltage	Maximum hp	CPT Primary/Secondary (Coil Voltage)	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Type 1 with HOA Catalog Number ①	Type 1 with HOA and Red RUN Pilot Catalog Number ①	Component Starter (Open) Catalog Number ②
0	200	3	208/120	ECH2401EA_	ECH2402EA_	ECH2408EA_	ECH2401EH_	ECH2401EJ_	AN16BN0EC
			240/120	ECH2401BA_	ECH2402BA_	ECH2408BA_	ECH2401BH_	ECH2401BJ_	AN16BN0BC
	460	5	460/120	ECH2401CA_	ECH2402CA_	ECH2408CA_	ECH2401CH_	ECH2401CJ_	AN16BN0CC
			575/120	ECH2401DA_	ECH2402DA_	ECH2408DA_	ECH2401DH_	ECH2401DJ_	AN16BN0DC
1	200	7-1/2	208/120	ECH2411EA_	ECH2412EA_	ECH2418EA_	ECH2411EH_	ECH2411EJ_	AN16DN0EB
			240/120	ECH2411BA_	ECH2412BA_	ECH2418BA_	ECH2411BH_	ECH2411BJ_	AN16DN0BB
	460	10	460/120	ECH2411CA_	ECH2412CA_	ECH2418CA_	ECH2411CH_	ECH2411CJ_	AN16DN0CB
			575/120	ECH2411DA_	ECH2412DA_	ECH2418DA_	ECH2411DH_	ECH2411DJ_	AN16DN0DB
2	200	10	208/120	ECH2421EA_	ECH2422EA_	ECH2428EA_	ECH2421EH_	ECH2421EJ_	AN16GN0EB
			240/120	ECH2421BA_	ECH2422BA_	ECH2428BA_	ECH2421BH_	ECH2421BJ_	AN16GN0BB
	460	25	460/120	ECH2421CA_	ECH2422CA_	ECH2428CA_	ECH2421CH_	ECH2421CJ_	AN16GN0CB
			575/120	ECH2421DA_	ECH2422DA_	ECH2428DA_	ECH2421DH_	ECH2421DJ_	AN16GN0DB
3	200	25	208/120	ECH2431EA_	ECH2432EA_	ECH2438EA_	ECH2431EH_	ECH2431EJ_	AN16KN0E
			240/120	ECH2431BA_	ECH2432BA_	ECH2438BA_	ECH2431BH_	ECH2431BJ_	AN16KN0B
	460	50	460/120	ECH2431CA_	ECH2432CA_	ECH2438CA_	ECH2431CH_	ECH2431CJ_	AN16KN0C
			575/120	ECH2431DA_	ECH2432DA_	ECH2438DA_	ECH2431DH_	ECH2431DJ_	AN16KN0D

Notes

① A “-” denotes catalog numbers are incomplete without the magnetic circuit protector code. To complete the catalog number, select the appropriate code from the following table:

Rating	Magnetic Circuit Protector Code	Rating	Magnetic Circuit Protector Code
—	A	30A	E
3A	B	50A	F
7A	C	100A	G
15A	D		

② If the solid-state overload option is selected, refer to Publication Number TD03408001E, Relay for MCCs and Enclosed Control Technical Data, for component selection.

Modification Codes

HVAC Modification Codes

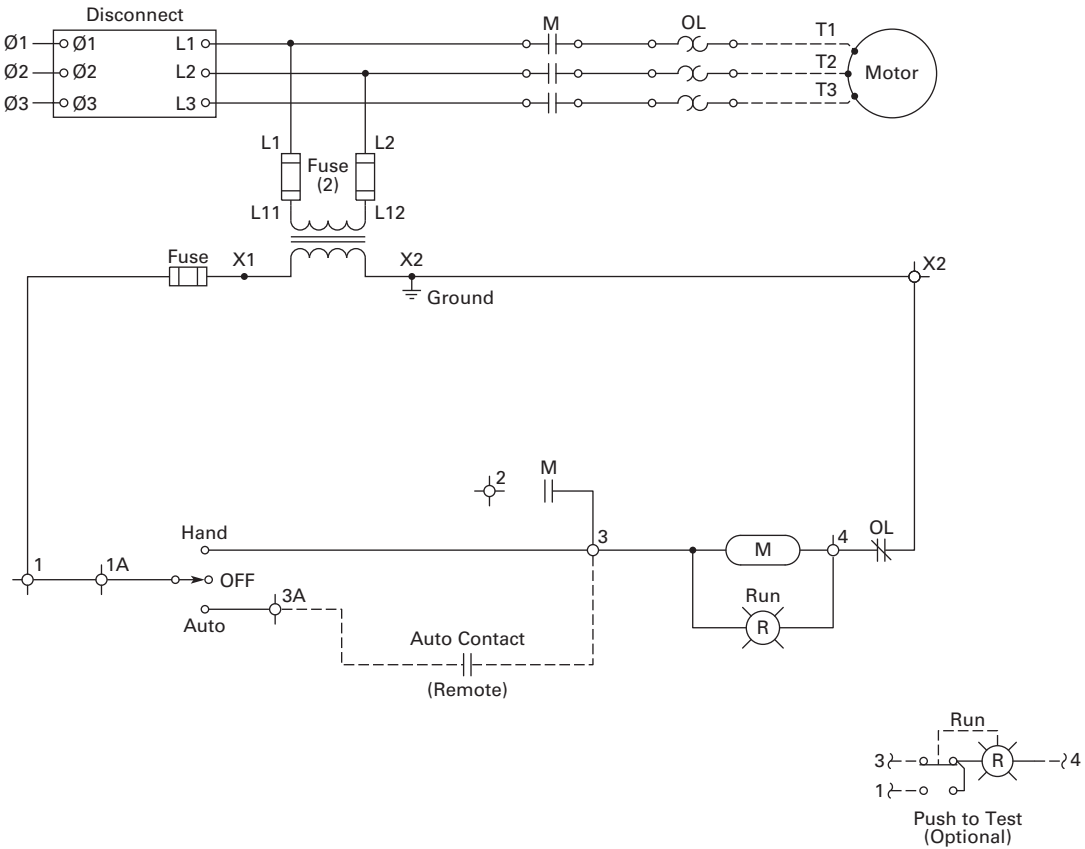
Modification	Description	Catalog Number Suffix
Auxiliary contacts	1NO—wired	A27
	1NC—wired	A28
	1NO 1NC—wired	A29
Solid-state overload (standard)	Size 0 and 1: 0.33–1.65 [Ⓢ]	R63/A
	Size 0 and 1: 1–5	R63/B
	Size 0 and 1: 4–20	R63/C
	Size 2: 9–45	R63/D
	Size 3: 20–100	R63/E
Solid-state overload (with ground fault)	Size 0 and 1: 0.33–1.65 [Ⓢ]	R64/A
	Size 0 and 1: 1–5	R64/B
	Size 0 and 1: 4–20	R64/C
	Size 2: 9–45	R64/D
	Size 3: 20–100	R64/E
Heaters	0.254–0.411A	H5/D1
	0.375–0.607A	H5/D2
	0.560–0.907A	H5/D3
	0.814–1.32A	H5/D4
	1.20–1.96A	H5/D5
	1.79–2.90A	H5/D6
	2.15–3.49A	H5/D7
	3.23–5.23A	H5/D8
	4.55–7.40A	H5/D9
	6.75–11.0A	H5/D10
	9.14–14.0A	H5/D11
	14.0–22.8A	H5/D12
	18.7–30.7A	H5/D13
	23.5–38.5A	H5/D14
	29.0–44.1A	H5/D15
	39.6–57.4A	H5/D16
	53.9–74.9A	H5/D17
	18.0–24.5A	H5/D18
	24.6–33.4A	H5/D19
	33.5–45.6A	H5/D20
45.7–62.1A	H5/D21	
62.2–84.6A	H5/D22	
Labels and timers	Carton label	L10
	Pneumatic timer (0.1–30 seconds maximum)	T1
	Pneumatic timer (10–180 seconds maximum)	T2
	Solid-state ON delay timer (1–30 seconds)	T4
	Solid-state ON delay timer (30–300 seconds)	T5

Note

[Ⓢ] Not UL Listed.

Wiring Diagram

HVAC Combination Starter with CPT, HOA and Indicating Light



7.1

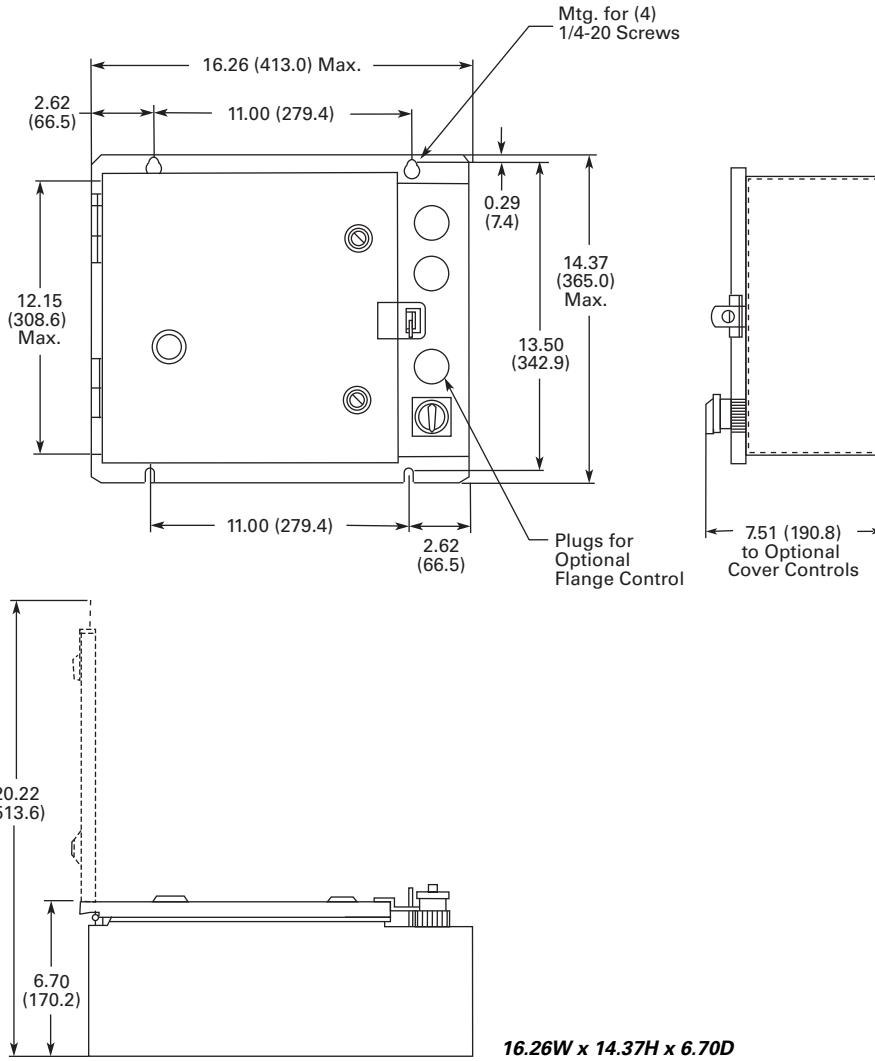
HVAC Control

Freedom Full Voltage HVAC Starters

Dimensions

Approximate Dimensions in Inches (mm)

Box 7, Type 1



7

NEMA Vacuum Break Contactors and Starters

NEMA Vacuum Break Starter



Type 12 Non-Reversing Vacuum Starter with HMCP



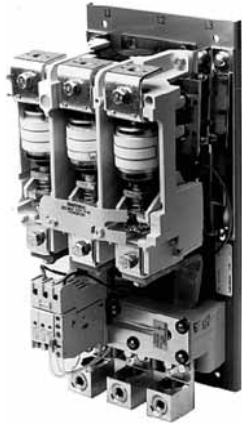
Type 12 Non-Reversing Vacuum Starter with Fused Disconnect



8.1 Special Purpose and Mining Rating

Product Description	V10-T8-2
Application Description	V10-T8-2
Operation	V10-T8-2
Features and Benefits	V10-T8-3
Standards and Certifications	V10-T8-3
Additional Reference	V10-T8-3
Catalog Number Selection	V10-T8-4
Cover Control	
Non-Reversing	V10-T8-5
Reversing	V10-T8-6
Product Selection—Contactors	V10-T8-7
Field Modification Kits	V10-T8-8
Product Selection—Starters	
Non-Combination Starters	V10-T8-9
Combination Starters	V10-T8-12
Wiring Diagrams	V10-T8-18

Special Purpose and Mining Rating



8

Product Description

- Three-phase magnetic
- Three-pole full voltage
- Non-reversing and reversing
- 600 and 1500 Vac maximum
- Starters with interchangeable heater OLR

Application Description

Eaton's vacuum contactors are designed for starting and controlling three-phase, 50/60 Hz, AC motors. Motor full load current should not exceed the contactor current rating. These contactors are built in several versions—the nameplate on a specific contactor states the authorized ratings.

Low voltage vacuum contactors can be applied to a wide range of voltages up to 1500V. These applications include full voltage control of three-phase squirrel cage motors, primary control of low voltage wound rotor motors and circuit switching for low voltage capacitors for power factor improvement.

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Operation

The contact structures of these vacuum break contactors are located inside sealed ceramic tubes that have been evacuated of air. Any arc occurring across the contacts upon opening is automatically extinguished because ionized air is not available to sustain it—the arc breaks when the current passes through zero. The arc typically does not survive beyond the first half cycle once the contacts begin to separate. The large arc chutes normally associated with starters of this size are not required. The ceramic tube with the moving and stationary contacts enclosed is called a **vacuum interrupter** or a **bottle**, and there is one bottle for each pole of the contactor. A metal bellows (like a small, circular accordion) within the bottle allows the moving contact to be closed and pulled open from the outside without leaking air into the bottle. Both the bellows and the metal-to-ceramic seals of these state-of-the-art bottles have been refined to the point where the possibility of loss of vacuum has been virtually eliminated.

Contact Force and Altitude

A vacuum contactor is affected by atmospheric pressure on the bellows of the vacuum bottles. Up to an altitude of 6600 ft, the contactor is designed to tolerate normal variations in barometric pressure. If the contactor is to be operated above 6600 ft above sea level, consult Eaton.

Features and Benefits

- Rugged, compact, lightweight
- Quiet operation
- Front removable coil and auxiliaries
- Electrical and mechanical interlocking capability
- Low chop interrupters eliminate the need for surge suppressors
- Contact wear indication allows for planned maintenance program
- Long service life
- Manual push-to-reset button on Sizes 5 and 6
- Freedom overload
- SSOL

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- CE Mark available
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Additional Reference

Cover Control	V10-T8-5
Wiring Diagram	V10-T8-18
Dimensions	Tab 14
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

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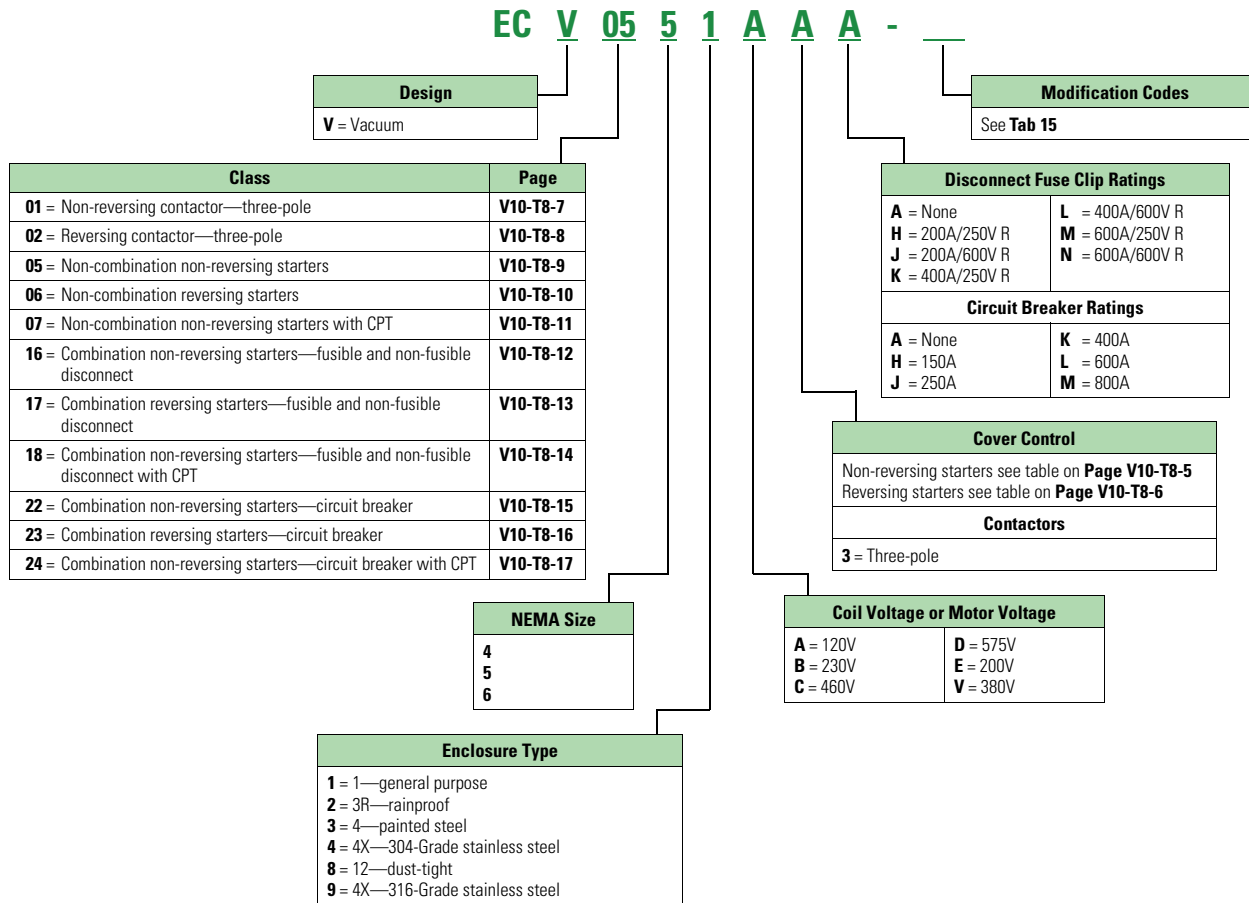
NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Catalog Number Selection

NEMA Vacuum Break

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Alternate "Open" Catalog Numbers

Listed "Open" Catalog Number	Alternate "Open" Catalog Number	Listed "Open" Catalog Number	Alternate "Open" Catalog Number
AV10FNOA	V200M4CJC	CV10FN3A	V201K4CJ
AV10GNOAB	V200M5CJC	CV10GN3A	V201K5CJZ1
AV10JNOAB	V200M6CJC	CV10JN3A	V201K6CJZ1

Note

Above are NEMA rated devices for applications up to 600V. For special purpose devices up to 1500V consult Eaton.

Cover Control

Non-Reversing

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed

To order factory installed pilot devices, change the ninth character of the catalog number to the alpha shown in the table below. Example: to order an **ECV0548AAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, that is, ECV0548**CA**.

Non-Reversing Cover Control



Non-Reversing Cover Control Field Kits and Factory Installation

Description	Factory Installed Flange Control Position 9 Alpha	Field Installation Kits	
		Type 1 Non-Combination ① Catalog Number	All Others ② Catalog Number
No cover mounted pilot devices	A	C400GK0	—
START/STOP pushbuttons	B	C400GK1	C400T1
With red RUN pilot light	C	C400GK12 ③	—
With red RUN/green OFF lights	D	C400GK16 ③	—
ON/OFF pushbuttons	E	—	C400T2
With red RUN pilot light	F	—	—
With red RUN/green OFF lights	G	—	—
HAND/OFF/AUTO selector switch	H	C400GK3	C400T12
With red RUN pilot light	J	C400GK32 ③	—
With red RUN/green OFF lights	K	C400GK36 ③	—
START pushbutton	L	—	C400T3
ON pushbutton	M	—	C400T4
OFF pushbutton	N	—	C400T5
Red RUN pilot light	P	C400GK42 ③	C400T9 ③
Green OFF	Q	C400GK41 ③	C400T10 ③
Red RUN/green OFF pilot lights	R	C400GK46 ③	C400T11 ③
START/STOP selector switch	S	—	C400T13
With red RUN pilot light	T	—	—
With red RUN/green OFF lights	U	—	—
ON/OFF selector switch	V	—	C400T14
With red RUN pilot light	W	—	—
With red RUN/green OFF lights	X	—	—

Notes

- ① Type 1 non-combination, Size 4.
- ② Type 1 non-combination, Sizes 5 and 6; Type 3R, 4X, 12 non-combination, all sizes; all combination control.
- ③ Add code letter from table below to catalog number for voltage—kits only. Example: C400T9**B**.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120V 60 Hz	A	240V 60 Hz	B	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D

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NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Reversing

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed

To order factory installed pilot devices, change the ninth character of the catalog number to the alpha shown in the table below. Example: to order an **ECV1748AAH** with FOR/REV/STOP pushbuttons and 2 red pilot lights, change the **A** to a **C**, that is, **ECV1748ACH**.

Reversing Cover Control Field Kits and Factory Installation

Description	Factory Installed Flange Control Position 9 Alpha	Field Installation Kits	
		Type 1 Non-Combination ^① Catalog Number	All Others ^② Catalog Number
No cover mounted pilot devices	A	C400GK0	—
FOR/REV/STOP pushbuttons	B	C400GR1	C400T6
With 2 red pilot lights	C	C400GR14 ^③	—
With 2 red/1 green pilot lights	D	—	—
UP/STOP/DOWN pushbuttons	E	C400GR2	—
With 2 red pilot lights	F	C400GR24 ^③	—
FOR/OFF/REV selector switch	H	—	C400T15
With 2 red pilot lights	J	—	—
With 2 red/1 green pilot lights	K	—	—
Two red pilot lights	P	C400GK44 ^③	^④
One green pilot light	Q	C400GK41 ^③	C400T10 ^③
Two red/one green pilot lights	R	—	—
OPEN/OFF/CLOSE selector switch	V	—	C400T16
With 2 red pilot lights	W	—	—
With 2 red/1 green pilot lights	X	—	—

Notes

- ^① Type 1 non-combination, Size 4.
- ^② Type 1 non-combination, Sizes 5 and 6; Type 3R, 4X, 12 non-combination, all sizes; all combination control.
- ^③ Add code letter from table below to catalog number for voltage—kits only. Example: C400T9B.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120V 60 Hz	A	240V 60 Hz	B	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D

- ^④ Order quantity two of **C400T9** ^③.

Contactors

Product Selection

Class ECV01—Non-Reversing Contactor—Three-Pole

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^①	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial Catalog Number	Component Contactor (Open) ^③ Catalog Number
4	135	—	—	110/120	ECV0141A3A	ECV0142A3A	ECV0144A3A	ECV0148A3A	CV10FN3A
		200	40						
		230	50						
		380	75						
		460	100						
		575	100						
5	270	—	—	110/120	ECV0151A3A	ECV0152A3A	ECV0154A3A	ECV0158A3A	CV10GN3A
		200	75						
		230	100						
		380	150						
		460	200						
		575	200						
6	540	—	—	110/120	ECV0161A3A	ECV0162A3A	ECV0164A3A	ECV0168A3A	CV10JN3A
		200	150						
		230	200						
		380	300						
		460	400						
		575	400						

Notes

- ① Wired for separate control.
- ② These are the catalog numbers for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV0144A3A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

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NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Class ECV02—Reversing Contactor—Three-Pole

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^①	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial Catalog Number	Component Contactor (Open) ^③ Catalog Number
4	135	—	—	110/120	ECV0241A3A	ECV0242A3A	ECV0244A3A	ECV0248A3A	V211K4CJ
		200	40						
		230	50						
		380	75						
		460	100						
		575	100						
5	270	—	—	110/120	ECV0251A3A	ECV0252A3A	ECV0254A3A	ECV0258A3A	V211K5CJ1
		200	75						
		230	100						
		380	150						
		460	200						
		575	200						
6	540	—	—	110/120	ECV0261A3A	ECV0262A3A	ECV0264A3A	ECV0268A3A	V211K6CJ1
		200	—						
		230	150						
		380	300						
		460	400						
		575	400						

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Field Modification Kits

Auxiliary Electrical Contacts

Two Type J auxiliary contacts may be mounted on each side to provide four auxiliary, isolated 600V, 10A double break contacts for use in control circuits.

Auxiliary Contacts

Contact Arrangement	Catalog Number
1N0-1NC	J11
2N0	J20
2NC	J02

Horizontal Mechanical Interlock

Size	Catalog Number
4	180C113G04
5	180C113G12
6	180C113G13

Notes

- ① Wired for separate control.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV0244A3A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ Alternate catalog numbers for those listed can be found in the table on **V10-T8-4**.

Non-Combination Starters

Product Selection

Class ECV05—Non-Combination Non-Reversing Starter

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^①	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^③ Catalog Number	Component Starter (Open) ^④ Catalog Number
4	135	—	—	110/120	ECV0541AAA	ECV0542AAA	ECV0544AAA	ECV0548AAA	AV10FNOA
		200	40						
		230	50						
		380	75						
		460	100						
		575	100						
5	270	—	—	110/120	ECV0551AAA	ECV0552AAA	ECV0554AAA	ECV0558AAA	AV10GNOAB
		200	75						
		230	100						
		380	150						
		460	200						
		575	200						
6	540	—	—	110/120	ECV0561AAA	ECV0562AAA	ECV0564AAA	ECV0568AAA	AV10JNOAB
		200	150						
		230	200						
		380	300						
		460	400						
		575	400						

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① Wired for separate control.

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.
Example: ECV0541AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**.
To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

^④ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

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NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Class ECV06—Non-Combination Reversing Starter

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^①	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^③ Catalog Number	Component Starter (Open) Catalog Number
4	135	—	—	110/120	ECV0641AAA	ECV0642AAA	ECV0644AAA	ECV0648AAA	V210M4CJC
		200	40						
		230	50						
		380	75						
		460	100						
		575							
5	270	—	—	110/120	ECV0651AAA	ECV0652AAA	ECV0654AAA	ECV0658AAA	V210M5CJC
		200	75						
		230	100						
		380	150						
		460	200						
		575							
6	540	—	—	110/120	ECV0661AAA	ECV0662AAA	ECV0664AAA	ECV0668AAA	V210M6CJC
		200	150						
		230	200						
		380	300						
		460	400						
		575							

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① Wired for separate control.

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit.

Example: ECV0644AAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

Class ECV07—Non-Combination Non-Reversing Starter with CPT

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^① Catalog Number	Type 12 Dust-Tight Industrial External Reset ^② Catalog Number	Component Starter (Open) ^③ Catalog Number
4	135	200	40	110/120	ECV0741EAA	ECV0742EAA	ECV0744EAA	ECV0748EAA	AV10FNOA
		230	50		ECV0741BAA	ECV0742BAA	ECV0744BAA	ECV0748BAA	
		380	75		ECV0741VAA	ECV0742VAA	ECV0744VAA	ECV0748VAA	
		460	100		ECV0741CAA	ECV0742CAA	ECV0744CAA	ECV0748CAA	
		575			ECV0741DAA	ECV0742DAA	ECV0744DAA	ECV0748DAA	
5	270	200	75	110/120	ECV0751EAA	ECV0752EAA	ECV0754EAA	ECV0758EAA	AV10GNOAB
		230	100		ECV0751BAA	ECV0752BAA	ECV0754BAA	ECV0758BAA	
		380	150		ECV0751VAA	ECV0752VAA	ECV0754VAA	ECV0758VAA	
		460	200		ECV0751CAA	ECV0752CAA	ECV0754CAA	ECV0758CAA	
		575			ECV0751DAA	ECV0752DAA	ECV0754DAA	ECV0758DAA	
6	540	200	150	110/120	ECV0761EAA	ECV0762EAA	ECV0764EAA	ECV0768EAA	AV10JNOAB
		230	200		ECV0761BAA	ECV0762BAA	ECV0764BAA	ECV0768BAA	
		380	300		ECV0761VAA	ECV0762VAA	ECV0764VAA	ECV0768VAA	
		460	400		ECV0761CAA	ECV0762CAA	ECV0764CAA	ECV0768CAA	
		575			ECV0761DAA	ECV0762DAA	ECV0764DAA	ECV0768DAA	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV0744EAA. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

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NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Combination Starters

Product Selection

Class ECV16—Combination Non-Reversing Starter—Fusible and Non-Fusible Disconnect

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ①	Fuse Clip Amperes/ Disconnect Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open) ⑤
Fusible									
4	200	40	110/120	200A	ECV1641AAH	ECV1642AAH	ECV1644AAH	ECV1648AAH	AV10FNOA
	230	50			ECV1641AAH	ECV1642AAH	ECV1644AAH	ECV1648AAH	
	380	75			ECV1641AAJ	ECV1642AAJ	ECV1644AAJ	ECV1648AAJ	
	460	100			ECV1641AAJ	ECV1642AAJ	ECV1644AAJ	ECV1648AAJ	
	575				ECV1641AAJ	ECV1642AAJ	ECV1644AAJ	ECV1648AAJ	
5	200	75	110/120	400A	ECV1651AAK	ECV1652AAK	ECV1654AAK	ECV1658AAK	AV10GNOA
	230	100			ECV1651AAK	ECV1652AAK	ECV1654AAK	ECV1658AAK	
	380	150			ECV1651AAL	ECV1652AAL	ECV1654AAL	ECV1658AAL	
	460	200			ECV1651AAL	ECV1652AAL	ECV1654AAL	ECV1658AAL	
	575				ECV1651AAL	ECV1652AAL	ECV1654AAL	ECV1658AAL	
6	200	150	110/120	600A	ECV1661AAM	ECV1662AAM	ECV1664AAM	ECV1668AAM	AV10JNOA
	230	200			ECV1661AAM	ECV1662AAM	ECV1664AAM	ECV1668AAM	
	380	300			ECV1661AAN	ECV1662AAN	ECV1664AAN	ECV1668AAN	
	460	400			ECV1661AAN	ECV1662AAN	ECV1664AAN	ECV1668AAN	
	575				ECV1661AAN	ECV1662AAN	ECV1664AAN	ECV1668AAN	
Non-Fusible									
4	—	—	110/120	200A	ECV1641AAA	ECV1642AAA	ECV1644AAA	ECV1648AAA	AV10FNOA
	200	40							
	230	50							
	380	75							
	460	100							
5	—	—	110/120	400A	ECV1651AAA	ECV1652AAA	ECV1654AAA	ECV1658AAA	AV10GNOA
	200	75							
	230	100							
	380	150							
	460	200							
6	—	—	110/120	600A	ECV1661AAA	ECV1662AAA	ECV1664AAA	ECV1668AAA	AV10JNOA
	200	150							
	230	200							
	380	300							
	460	400							
575									

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

① Wired for separate control.

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV1644AAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification code **E11**.

⑤ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

Class ECV17—Combination Reversing Starter—Fusible and Non-Fusible Disconnect

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amperes/ Disconnect Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) Catalog Number
Fusible									
4	200	40	110/120	200A	ECV1741AAH	ECV1742AAH	ECV1744AAH	ECV1748AAH	V210M4CJC
	230	50			ECV1741AAH	ECV1742AAH	ECV1744AAH	ECV1748AAH	
	380	75			ECV1741AAJ	ECV1742AAJ	ECV1744AAJ	ECV1748AAJ	
	460	100			ECV1741AAJ	ECV1742AAJ	ECV1744AAJ	ECV1748AAJ	
	575				ECV1741AAJ	ECV1742AAJ	ECV1744AAJ	ECV1748AAJ	
5	200	75	110/120	400A	ECV1751AAK	ECV1752AAK	ECV1754AAK	ECV1758AAK	V210M5CJC
	230	100			ECV1751AAK	ECV1752AAK	ECV1754AAK	ECV1758AAK	
	380	150			ECV1751AAL	ECV1752AAL	ECV1754AAL	ECV1758AAL	
	460	200			ECV1751AAL	ECV1752AAL	ECV1754AAL	ECV1758AAL	
	575				ECV1751AAL	ECV1752AAL	ECV1754AAL	ECV1758AAL	
6	200	150	110/120	600A	ECV1761AAM	ECV1762AAM	ECV1764AAM	ECV1768AAM	V210M6CJC
	230	200			ECV1761AAM	ECV1762AAM	ECV1764AAM	ECV1768AAM	
	380	300			ECV1761AAN	ECV1762AAN	ECV1764AAN	ECV1768AAN	
	460	400			ECV1761AAN	ECV1762AAN	ECV1764AAN	ECV1768AAN	
	575				ECV1761AAN	ECV1762AAN	ECV1764AAN	ECV1768AAN	
Non-Fusible									
4	—	—	110/120	200A	ECV1741AAA	ECV1742AAA	ECV1744AAA	ECV1748AAA	V210M4CJC
	200	40							
	230	50							
	380	75							
	460	100							
5	—	—	110/120	400A	ECV1751AAA	ECV1752AAA	ECV1754AAA	ECV1758AAA	V210M5CJC
	200	75							
	230	100							
	380	150							
	460	200							
6	—	—	110/120	600A	ECV1761AAA	ECV1762AAA	ECV1764AAA	ECV1768AAA	V210M6CJC
	200	150							
	230	200							
	380	300							
	460	400							
575									

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV1744AAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification code **E11**.

8.1

NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Class ECV18—Combination Non-Reversing Starter—Fusible and Non-Fusible Disconnect with CPT

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amperes/ Disconnect Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ① Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ④ Catalog Number
Fusible									
4	200	40	110/120	200A	ECV1841EAH	ECV1842EAH	ECV1844EAH	ECV1848EAH	AV10FN0A
	230	50			ECV1841BAH	ECV1842BAH	ECV1844BAH	ECV1848BAH	
	380	75			ECV1841VAJ	ECV1842VAJ	ECV1844VAJ	ECV1848VAJ	
	460	100			ECV1841CAJ	ECV1842CAJ	ECV1844CAJ	ECV1848CAJ	
	575				ECV1841DAJ	ECV1842DAJ	ECV1844DAJ	ECV1848DAJ	
5	200	75	110/120	400A	ECV1851EAK	ECV1852EAK	ECV1854EAK	ECV1858EAK	AV10GN0A
	230	100			ECV1851BAK	ECV1852BAK	ECV1854BAK	ECV1858BAK	
	380	150			ECV1851VAL	ECV1852VAL	ECV1854VAL	ECV1858VAL	
	460	200			ECV1851CAL	ECV1852CAL	ECV1854CAL	ECV1858CAL	
	575				ECV1851DAL	ECV1852DAL	ECV1854DAL	ECV1858DAL	
6	200	150	110/120	600A	ECV1861EAM	ECV1862EAM	ECV1864EAM	ECV1868EAM	AV10JN0A
	230	200			ECV1861BAM	ECV1862BAM	ECV1864BAM	ECV1868BAM	
	380	300			ECV1861VAN	ECV1862VAN	ECV1864VAN	ECV1868VAN	
	460	400			ECV1861CAN	ECV1862CAN	ECV1864CAN	ECV1868CAN	
	575				ECV1861DAN	ECV1862DAN	ECV1864DAN	ECV1868DAN	
Non-Fusible									
4	200	40	110/120	200A	ECV1841EAA	ECV1842EAA	ECV1844EAA	ECV1848EAA	AV10FN0A
	230	50			ECV1841BAA	ECV1842BAA	ECV1844BAA	ECV1848BAA	
	380	75			ECV1841VAA	ECV1842VAA	ECV1844VAA	ECV1848VAA	
	460	100			ECV1841CAA	ECV1842CAA	ECV1844CAA	ECV1848CAA	
	575				ECV1841DAA	ECV1842DAA	ECV1844DAA	ECV1848DAA	
5	200	75	110/120	400A	ECV1851EAA	ECV1852EAA	ECV1854EAA	ECV1858EAA	AV10GN0A
	230	100			ECV1851BAA	ECV1852BAA	ECV1854BAA	ECV1858BAA	
	380	150			ECV1851VAA	ECV1852VAA	ECV1854VAA	ECV1858VAA	
	460	200			ECV1851CAA	ECV1852CAA	ECV1854CAA	ECV1858CAA	
	575				ECV1851DAA	ECV1852DAA	ECV1854DAA	ECV1858DAA	
6	200	150	110/120	600A	ECV1861EAA	ECV1862EAA	ECV1864EAA	ECV1868EAA	AV10JN0A
	230	200			ECV1861BAA	ECV1862BAA	ECV1864BAA	ECV1868BAA	
	380	300			ECV1861VAA	ECV1862VAA	ECV1864VAA	ECV1868VAA	
	460	400			ECV1861CAA	ECV1862CAA	ECV1864CAA	ECV1868CAA	
	575				ECV1861DAA	ECV1862DAA	ECV1864DAA	ECV1868DAA	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV1841EAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification code **E11**.

④ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

Class ECV22—Combination Non-Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ^①	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{③④} Catalog Number	Component Starter (Open) ^⑤ Catalog Number	
4	200	40	110/120	150A	ECV2241AAH	ECV2242AAH	ECV2244AAH	ECV2248AAH	AV10FNOA	
	230	50								
	380	75								
	460	100								
	575									
5	200	60	110/120	250A	ECV2251AAJ	ECV2252AAJ	ECV2254AAJ	ECV2258AAJ	AV10GN0A	
	230	75								
	460	150	110/120	400A	ECV2251AAK	ECV2252AAK	ECV2254AAK	ECV2258AAK	AV10GN0A	
	575	200								
	200	75								
	230	100								
	380	150								
	460	200								
	6	200	100	110/120	600A	ECV2261AAL	ECV2262AAL	ECV2264AAL	ECV2268AAL	AV10JNOA
		230	150							
460		300								
575			110/120	800A	ECV2261AAM	ECV2262AAM	ECV2264AAM	ECV2268AAM	AV10JNOA	
230		200								
460		400								
575										

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① Wired for separate control.

^② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV2244AAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

^③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.

^④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification code **E11**.

^⑤ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

8.1

NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Class ECV23—Combination Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ^①	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^② Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{③④} Catalog Number	Component Starter (Open) Catalog Number							
4	200	40	110/120	150A	ECV2341AAH	ECV2342AAH	ECV2344AAH	ECV2348AAH	V210M4CJC							
	230	50														
	380	75														
	460	100														
	575															
5	200	60	110/120	250A	ECV2351AAJ	ECV2352AAJ	ECV2354AAJ	ECV2358AAJ	V210M5CJC							
	230	75														
	460	150														
	575	200														
	200	75								110/120	400A	ECV2351AAK	ECV2352AAK	ECV2354AAK	ECV2358AAK	V210M5CJC
	230	100														
	380	150														
	460	200														
	6	200								100	110/120	600A	ECV2361AAL	ECV2362AAL	ECV2364AAL	ECV2368AAL
230		150														
460		300														
575																
230		200	110/120	800A	ECV2361AAM	ECV2362AAM	ECV2364AAM	ECV2368AAM	V210M6CJC							
460		400														
575																

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

- ① Wired for separate control.
- ② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV2344AAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ③ All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ④ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification code **E11**.

Class ECV24—Combination Non-Reversing Starter—Circuit Breaker with CPT

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Circuit Breaker Size	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight and Dust-Tight Stainless Steel ^① Catalog Number	Type 12 Dust-Tight Industrial External Reset ^{②③} Catalog Number	Component Starter (Open) ^④ Catalog Number
4	200	40	110/120	150A	ECV2441EAH	ECV2442EAH	ECV2444EAH	ECV2448EAH	AV10FNOA
	230	50			ECV2441BAH	ECV2442BAH	ECV2444BAH	ECV2448BAH	
	380	75			ECV2441VAH	ECV2442VAH	ECV2444VAH	ECV2448VAH	
	460	100			ECV2441CAH	ECV2442CAH	ECV2444CAH	ECV2448CAH	
	575				ECV2441DAH	ECV2442DAH	ECV2444DAH	ECV2448DAH	
5	200	60	110/120	250A	ECV2451EAJ	ECV2452EAJ	ECV2454EAJ	ECV2458EAJ	AV10GNOA
	230	75			ECV2451BAJ	ECV2452BAJ	ECV2454BAJ	ECV2458BAJ	
	460	150			ECV2451CAJ	ECV2452CAJ	ECV2454CAJ	ECV2458CAJ	
	575	200			ECV2451DAJ	ECV2452DAJ	ECV2454DAJ	ECV2458DAJ	
	200	75			110/120	400A	ECV2451EAK	ECV2452EAK	
	230	100	ECV2451BAK	ECV2452BAK	ECV2454BAK	ECV2458BAK			
	380	150	ECV2451VAK	ECV2452VAK	ECV2454VAK	ECV2458VAK			
	460	200	ECV2451CAK	ECV2452CAK	ECV2454CAK	ECV2458CAK			
	200	100	110/120	600A	ECV2461EAL	ECV2462EAL	ECV2464EAL	ECV2468EAL	AV10JNOA
	230	150			ECV2461BAL	ECV2462BAL	ECV2464BAL	ECV2468BAL	
460	300	ECV2461CAL			ECV2462CAL	ECV2464CAL	ECV2468CAL		
575		ECV2461DAL			ECV2462DAL	ECV2464DAL	ECV2468DAL		
230	200	110/120			800A	ECV2461BAM	ECV2462BAM	ECV2464BAM	
460	400	ECV2461CAM	ECV2462CAM	ECV2464CAM	ECV2468CAM				
575		ECV2461DAM	ECV2462DAM	ECV2464DAM	ECV2468DAM				

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

- ① The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECV2444EAH. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.
- ② All Type 12 enclosures are standardized with external reset. For internal reset, order modification code **R5**.
- ③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification code **E11**.
- ④ Alternate catalog numbers for those listed can be found in the table on **Page V10-T8-4**.

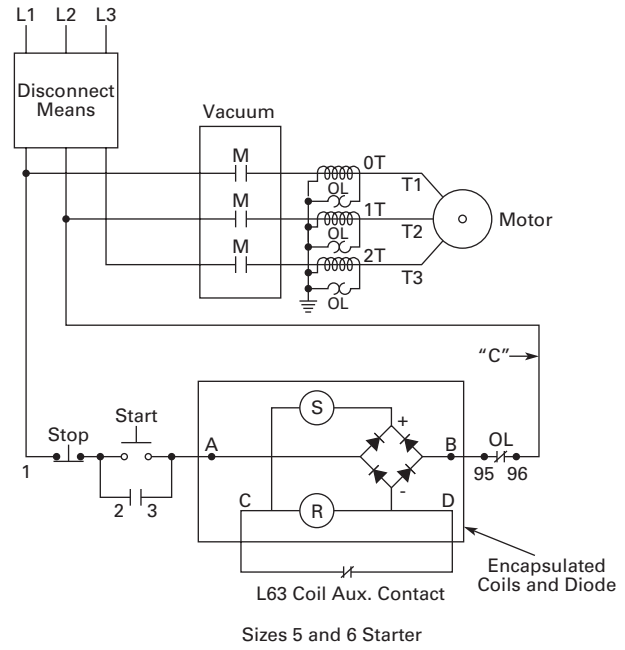
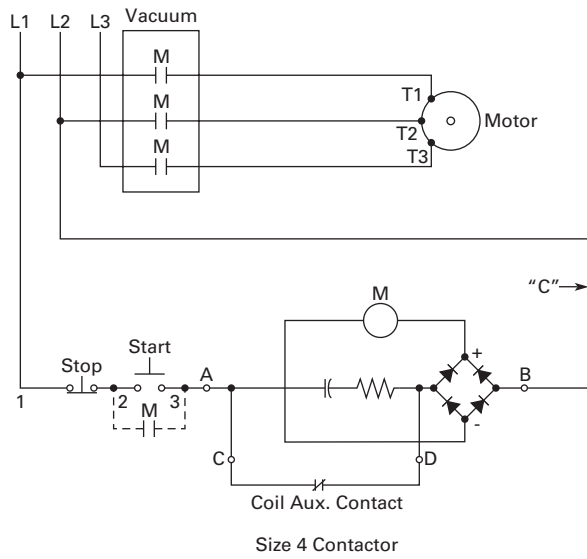
8.1

NEMA Vacuum Break Contactors and Starters

Special Purpose and Mining Rating

Wiring Diagrams

Typical Wiring Diagrams



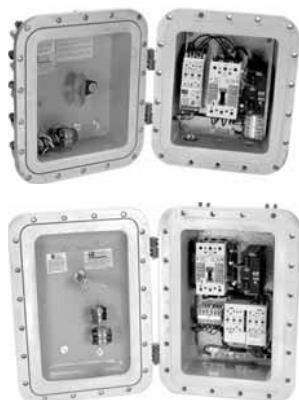
8

Type 7/9 Hazardous Location Starters

Type 7/9 Explosion Proof Enclosed Control



Other Hazardous Location Controls



9.1 NEMA Cast Aluminum Enclosed Starters

Product Description	V10-T9-2
Features	V10-T9-2
Standards and Certifications	V10-T9-3
Code Definitions	V10-T9-3
Additional Reference	V10-T9-3
Catalog Number Selection	V10-T9-4
Cover Control	V10-T9-5
Product Selection	
Freedom Full Voltage Non-Combination	V10-T9-6
Freedom Full Voltage Combination	V10-T9-9
Other Hazardous Location Control	V10-T9-12
Wiring Diagrams	V10-T9-13
Dimensions	V10-T9-18

NEMA Cast Aluminum Enclosed Starters



9

Product Description

Eaton's combination and non-combination hazardous location cast aluminum motor starters are used in areas where hazardous materials are handled or stored. These units provide disconnecting means, under voltage protection, circuit protection and motor running protection.

Features

- 65,000 AI cUL classified—highest interrupt rated enclosure in the industry
- Copper-free cast aluminum
- Precision machine flame path between box and cover
- Bolt-on slotted mounting feet
- Stainless steel block hinges
- Stainless steel, captive quad-lead cover bolts (disengaged in 1-1/2 turns)
- External stainless steel breaker operating handle
- Breaker and operator shafts are stainless steel
- Ground lug package and installation instructions for termination of ground wire enclosed
- Four point control terminal block, NEMA 1B with wire markers
- Breaker operators can be locked in the ON or OFF position (combination starters only)
- Four plugged 3/4 in NPSM outlets drilled and tapped for control devices
- Standard outlets top and bottom
- Plugged 1/2 in outlets top and bottom for breather/drain
- Components are mounted on a galvanized steel removable pan
- O-ring gasket ensures watertight integrity

Standard Materials

- Bodies and covers: copper-free aluminum
- Cover bolts: stainless steel
- O-ring: neoprene
- Hinges: stainless steel

Finishes

- Bodies and covers: corrosion resistant grey epoxy power coat inside and outside standard to provide Type 4X

Contents

Description

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NEMA Cast Aluminum Enclosed Starters	
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Freedom Full Voltage Non-Combination	V10-T9-6
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Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Classified—Standard 886 File #104565
 - Class I, Groups B, C and D
 - Class II, Groups E, F and G
 - Class III
 - Type 4, 4X, 7 and 9
 - Zone 1, IIB + H2
- CSA Certified—Standard C22.2 File #28361
 - Class I, Groups B, C and D
 - Class II, Groups E, F and G
 - Class III
 - Type 4, 4X, 7 and 9
 - Zone 1, IIB + H2

Code Definitions

Class I locations require the type of explosion-proof electrical equipment where, in case of explosion, the hazardous flames would be contained. In Class II or III locations, dust, fibers and flyings are the combustible materials and it is only necessary to keep these materials out of the electrical equipment (where an arc may take place) and to maintain safe external temperatures.

A brief explanation of the three classifications covering hazardous locations follows:

Class I Locations—are those in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class I, Div. 1—are those where such hazardous concentrations of flammable liquids or vapors exist under normal operating conditions.

Class I, Div. 2—are those where such hazardous concentrations of flammable liquids or vapors are handled in closed containers or closed systems.

Class II Locations—are those where the presence of combustible dust presents a fire or explosion hazard.

Class II, Div. 1—are those where dust is suspended in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures.

Class II, Div. 2—are those where such dust is not normally in the air, but where deposits of it accumulating on the electrical equipment will interfere with safe dissipation of heat, causing a fire hazard.

Class III Locations—are those where easily ignitable fibers or flyings are present but not likely to be suspended in the air in quantities sufficient to produce ignitable mixtures.

Class III, Div. 1—are those where ignitable fibers or materials producing combustible flyings are handled, manufactured or used.

Class III, Div. 2—are those where easily ignitable fibers are stored or handled (except in process or manufacture).

Further refinement created for the purpose of testing and approving electrical equipment divides Class I into four separate designations: A, B, C, D and Class II into three separate designations; E, F and G. Underwriters Laboratories test and approve electrical equipment for the following specific groups:

Class I, Group A—atmospheres containing acetylene.

Class I, Group B—atmospheres containing hydrogen, gases and vapors of equivalent hazard such as manufactured gas.

Class I, Group C—atmospheres containing ethyl-ether vapors, ethylene or cyclopropane.

Class I, Group D—atmospheres containing gasoline, hexane, naphtha, benzene, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors or natural gas.

Class II, Group E—atmospheres containing metal dust, including aluminum, magnesium and their commercial alloys, and other metals of similarly hazardous characteristics.

Class II, Group F—atmospheres containing carbon black, coal or coke dust.

Class II, Group G—atmospheres containing flour, starch or grain dusts.

Additional Reference

Cover Control	V10-T9-5
Wiring Diagrams	V10-T9-13
Dimensions	V10-T9-18
Accessories and Modifications	Tab 15
Renewal Parts	Tab 16
Technical Data and Specifications	Tab 17

Catalog Number Selection

Type 7/9 Hazardous Location

EC N 22 1 6 B A C -

Design
N = Freedom NEMA
S = Soft starter ①

Modification Codes
See Tab 15

Class	Page
05 = Type 7/9 non-combination non-reversing starter	V10-T9-6
06 = Type 7/9 non-combination reversing starter	V10-T9-7
07 = Type 7/9 non-combination starter with CPT	V10-T9-8
22 = Type 7/9 combination non-reversing starter—circuit breaker	V10-T9-9
23 = Type 7/9 combination reversing starter—circuit breaker	V10-T9-10
24 = Type 7/9 combination starter with CPT—circuit breaker	V10-T9-11

Circuit Breaker Ratings		
A = None	W = 70A	5 = 3A ⑤
B = 3A	G = 100A/R3C	6 = 7A ⑤
C = 7A	X = 100A/T3C	7 = 15A ⑤
D = 15A	H = 150A	8 = 30A ⑤
E = 30A	J = 250A	9 = 50A ⑤
F = 50A	K = 400A	I = 100A ⑤

Cover Control
Non-rev. starters see Table
Rev. starters see Table

NEMA Size	
A = Size 00	3 = Size 3
0 = Size 0	4 = Size 4
1 = Size 1	5 = Size 5
2 = Size 2	

Motor Voltage/Power Supply ②③
A = 120/60 110/50
B = 240/60 220/50 Freedom; 230/60 <i>IT</i>
C = 480/60 440/50 Freedom; 460/60 <i>IT</i>
D = 600/60 550/50
E = 208/60 Freedom; 200/60 <i>IT</i>
Q = 24 Vdc ④
L = 380V/50 Hz

Enclosure Type
6 = Type 7/9—bolted

Notes

- ① For soft starter information see **Tab 5**.
- ② *IT*: If CPT is selected, power supply to be 120V–24 Vdc.
- ③ Freedom: When control power transformer modification codes (**C1–C11**) are used or when starter class includes CPT (that is, ECN07, 24) see table below for system voltage code.

Code	Primary	Secondary
B	240/480–220/440 wired for 240V	120/60–110/50
C	240/480–220/440 wired for 480V	120/60–110/50
D	600/60–550/50	120/60–110/50
E	208/60	120/60

- ④ Power supply omitted.
- ⑤ Use for Sizes 0–3, HMCP 600V applications only.

Cover Control

To order factory installed pilot devices, change the ninth character of the catalog number to the alpha shown in the table below.

Example: to order an **ECN0516CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, that is, **ECN0516CCA**.

Cover Control



Non-Reversing and Reversing Cover Control

Description	Factory Installed Flange Control Position 9 Alpha
Non-Reversing Cover Control	
No cover mounted pilot devices	A
START/STOP pushbuttons	B
With red RUN pilot light	C
With red RUN/green OFF lights	D
ON/OFF pushbuttons	E
With red RUN pilot light	F
With red RUN/green OFF lights	G
HAND/OFF/AUTO selector switch	H
With red RUN pilot light	J
With red RUN/green OFF lights	K
START pushbutton	L
ON pushbutton	M
OFF pushbutton	N
Red RUN pilot light	P
Green OFF pilot light	Q
Red RUN/green OFF pilot lights	R
START/STOP selector switch	S
With red RUN pilot light	T
With red RUN/green OFF lights	U
ON/OFF selector switch	V
With red RUN Pilot Light	W
With red RUN/green OFF lights	X
Reversing Cover Control	
No cover mounted pilot devices	A
FOR/REV/STOP pushbuttons	B
With 2 red pilot lights	C
With 2 red/1 green pilot lights	D
UP/STOP/DOWN pushbuttons	E
With 2 red pilot lights	F
FOR/OFF/REV selector switch	H
With 2 red pilot lights	J
With 2 red/1 green pilot lights	K
Two red pilot lights	P
One green pilot light	Q
Two red/1 green pilot lights	R
OPEN/OFF/CLOSE selector switch	V
With 2 red pilot lights	W
With 2 red/1 green pilot lights	X

Freedom Full Voltage Non-Combination

Features

- Full voltage
- Standard interchangeable heater OLR
- Optional electronic overload
- 600V maximum

Product Selection

Class ECN05—Type 7/9 Non-Combination Non-Reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Three-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	ECN0506AAA	AN16BN0AC
	200	3	208	ECN0506EAA	AN16BN0EC
	230		240	ECN0506BAA	AN16BN0BC
	460	5	480	ECN0506CAA	AN16BN0CC
	575		600	ECN0506DAA	AN16BN0DC
1	—	—	120	ECN0516AAA	AN16DN0AB
	200	7-1/2	208	ECN0516EAA	AN16DN0EB
	230		240	ECN0516BAA	AN16DN0BB
	460	10	480	ECN0516CAA	AN16DN0CB
	575		600	ECN0516DAA	AN16DN0DB
2	—	—	120	ECN0526AAA	AN16GN0AB
	200	10	208	ECN0526EAA	AN16GN0EB
	230	15	240	ECN0526BAA	AN16GN0BB
	460	25	480	ECN0526CAA	AN16GN0CB
	575		600	ECN0526DAA	AN16GN0DB
3	—	—	120	ECN0536AAA	AN16KN0A
	200	25	208	ECN0536EAA	AN16KN0E
	230	30	240	ECN0536BAA	AN16KN0B
	460	50	480	ECN0536CAA	AN16KN0C
	575		600	ECN0536DAA	AN16KN0D
4	—	—	120	ECN0546AAA	AN16NN0A
	200	40	208	ECN0546EAA	AN16NN0E
	230	50	240	ECN0546BAA	AN16NN0B
	460	100	480	ECN0546CAA	AN16NN0C
	575		600	ECN0546DAA	AN16NN0D
5	—	—	120	ECN0556AAA	AN16SN0AB
	200	75	208	ECN0556EAA	AN16SN0EB
	230	100	240	ECN0556BAA	AN16SN0BB
	460	200	480	ECN0556CAA	AN16SN0CB
	575		600	ECN0556DAA	AN16SN0DB

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① Maximum horsepower rating of starters for 380V 50 Hz applications:

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

Class ECN06—Type 7/9 Non-Combination Reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ^①	Magnet Coil Voltage	Three-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	ECN0606AAA	AN56BN0AC
	200	3	208	ECN0606EAA	AN56BN0EC
	230		240	ECN0606BAA	AN56BN0BC
	460	5	480	ECN0606CAA	AN56BN0CC
	575		600	ECN0606DAA	AN56BN0DC
1	—	—	120	ECN0616AAA	AN56DN0AB
	200	7-1/2	208	ECN0616EAA	AN56DN0EB
	230		240	ECN0616BAA	AN56DN0BB
	460	10	480	ECN0616CAA	AN56DN0CB
	575		600	ECN0616DAA	AN56DN0DB
2	—	—	120	ECN0626AAA	AN56GN0AB
	200	10	208	ECN0626EAA	AN56GN0EB
	230	15	240	ECN0626BAA	AN56GN0BB
	460	25	480	ECN0626CAA	AN56GN0CB
	575		600	ECN0626DAA	AN56GN0DB
3	—	—	120	ECN0636AAA	AN56KN0A
	200	25	208	ECN0636EAA	AN56KN0E
	230	30	240	ECN0636BAA	AN56KN0B
	460	50	480	ECN0636CAA	AN56KN0C
	575		600	ECN0636DAA	AN56KN0D

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① Maximum horsepower rating of starters for 380V 50 Hz applications:

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

9.1

Type 7/9 Hazardous Location Starters

NEMA Cast Aluminum Enclosed Starters

9

Class ECN07—Type 7/9 Non-Combination Non-Reversing Starter with CPT

NEMA Size	Primary Voltage ^①	Maximum hp Rating ^②	Magnet Coil Voltage	Three-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	208	3	120	ECN0706EAA	AN16BN0AC
	240			ECN0706BAA	
	480	ECN0706CAA			
	600	ECN0706DAA			
1	208	7-1/2	120	ECN0716EAA	AN16DN0AB
	240			ECN0716BAA	
	480	ECN0716CAA			
	600	ECN0716DAA			
2	208	10	120	ECN0726EAA	AN16GN0AB
	240	15		ECN0726BAA	
	480	25		ECN0726CAA	
	600	ECN0726DAA			
3	208	25	120	ECN0736EAA	AN16KN0A
	240	30		ECN0736BAA	
	480	50		ECN0736CAA	
	600	ECN0736DAA			
4	208	40	120	ECN0746EAA	AN16NN0A
	240	50		ECN0746BAA	
	480	100		ECN0746CAA	
	600	ECN0746DAA			
5	208	75	120	ECN0756EAA	AN16SN0AB
	240	100		ECN0756BAA	
	480	200		ECN0756CAA	
	600	ECN0756DAA			

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① For other control power transformer primary and/or secondary voltage options, see **Tab 2**.

^② Maximum horsepower rating of starters for 380V 50 Hz applications:

NEMA Size	00	0	1	2	3	4	5	6
Horsepower	1-1/2	5	10	25	50	75	150	300

Freedom Full Voltage Combination

Features

- Full voltage
- Standard interchangeable heater OLR
- Optional electronic overload
- 600V maximum

Product Selection

ECN22—Type 7/9 Combination Non-Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ^①	Circuit Breaker Size	Three-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number	
0	200	1	208	7A	ECN2206EAC	AN16BN0EC	
		3		15A	ECN2206EAD		
		5		30A	ECN2206EAE		
	230	1	240	7A	ECN2206BAC	AN16BN0BC	
		3		15A	ECN2206BAD		
		5		30A	ECN2206BAE		
	460	1	480	3A	ECN2206CAB	AN16BN0CC	
		3		7A	ECN2206CAC		
		5		15A	ECN2206CAD		
	575	1	600	3A	ECN2206DA5	AN16BN0DC	
		3		7A	ECN2206DA6		
		5		15A	ECN2206DA7		
1	200	1	208	7A	ECN2216EAC	AN16DN0EB	
		3		15A	ECN2216EAD		
		5		30A	ECN2216EAE		
		7-1/2		50A	ECN2216EAF		
	230	1	240	7A	ECN2216BAC	AN16DN0BB	
		3		15A	ECN2216BAD		
		5		30A	ECN2216BAE		
		7-1/2		50A	ECN2216BAF		
	460	1	480	3A	ECN2216CZB	AN16DN0CB	
		3		7A	ECN2216CAC		
		5		15A	ECN2216CAD		
		10		30A	ECN2216CAE		
	575	1	600	3A	ECN2216DA5	AN16DN0DB	
		3		7A	ECN2216DA6		
		5		15A	ECN2216DA7		
		10		30A	ECN2216DA8		
	2	200	10	208	50A	ECN2226EAF	AN16GN0EB
		230	10	240	50A	ECN2226BAF	AN16GN0BB
			15		70A	ECN2226BAW	
		460	25	480	50A	ECN2226CAF	AN16GN0CB
		575	15	600	30A	ECN2226DA8	AN16GN0DB
			25		50A	ECN2226DA9	
	3	200	20	208	100A	ECN2236EAG	AN16KN0E
			25		100A	ECN2236EAG	
230		25	240	100A	ECN2236BAG	AN16KN0B	
		30		100A	ECN2236BAG		
460		50	480	100A	ECN2236CAG	AN16KN0C	
575		30	600	50A	ECN2236DA9	AN16KN0D	
		50		100A	ECN2236DAI		
4		200	40	208	150A	ECN2246EAH	AN16NN0E
		230	50	240	150A	ECN2246BAH	AN16NN0B
	460	100	480	150A	ECN2246CAH	AN16NN0C	
	575	100	600	150A	ECN2246DAH	AN16NN0D	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

① Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the eighth character of the listed catalog number.

ECN23—Type 7/9 Combination Reversing Starter—Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage [Ⓢ]	Circuit Breaker Size	Three-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number	
0	200	1	208	7A	ECN2306EAC	AN56BN0EC	
		3		15A	ECN2306EAD		
	230	1	240	7A	ECN2306BAC	AN56BN0BC	
		3		15A	ECN2306BAD		
	460	1	480	3A	ECN2306CAB	AN56BN0CC	
		3		7A	ECN2306CAC		
		5		15A	ECN2306CAD		
	575	1	600	3A	ECN2306DA5	AN56BN0DC	
		3		7A	ECN2306DA6		
		5		15A	ECN2306DA7		
	1	200	1	208	7A	ECN2316EAC	AN56DN0EB
			3		15A	ECN2316EAD	
5			30A		ECN2316EAE		
7-1/2			50A		ECN2316EAF		
230		1	240	7A	ECN2316BAC	AN56DN0BB	
		3		15A	ECN2316BAD		
		5		30A	ECN2316BAE		
		7-1/2		50A	ECN2316BAF		
460		1	480	3A	ECN2316CAB	AN56DN0CB	
		3		7A	ECN2316CAC		
		5		15A	ECN2316CAD		
		10		30A	ECN2316CAE		
575		1	600	3A	ECN2316DA5	AN56DN0DB	
		3		7A	ECN2316DA6		
		5		15A	ECN2316DA7		
		10		30A	ECN2316DA8		
2		200	10	208	50A	ECN2326EAF	AN56GN0EB
		230	10	240	50A	ECN2326BAF	AN56GN0BB
			15		70A	ECN2326BAW	
		460	25	480	50A	ECN2326CAF	AN56GN0CB
		575	15	600	30A	ECN2326DA8	AN56GN0DB
			25		50A	ECN2326DA9	
3		200	20	208	100A	ECN2336EAG	AN56KN0E
			25				ECN2336EAG
	230	25	240	100A	ECN2336BAG	AN56KN0B	
		30				ECN2336BAG	
	460	50	480	100A	ECN2336CAG	AN56KN0C	
	575	30	600	50A	ECN2336DA9	AN56KN0D	
		50			100A	ECN2336DAI	

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

[Ⓢ] Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the eighth character of the listed catalog number.

ECN24—Type 7/9 Combination Non-Reversing Starter with CPT—Circuit Breaker

NEMA Size	Primary Voltage ^①	Maximum hp Rating	Magnet Coil Voltage	Circuit Breaker Size	Three-Pole NEMA 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number	
0	200	1	120	7A	ECN2406EAC	AN16BN0AC	
		3		15A	ECN2406EAD		
	230	1	120	7A	ECN2406BAC	AN16BN0AC	
		3		15A	ECN2406BAD		
	460	1	120	3A	ECN2406CAB	AN16BN0AC	
		3		7A	ECN2406CAC		
		5		15A	ECN2406CAD		
	575	1	120	3A	ECN2406DA5	AN16BN0AC	
		3		7A	ECN2406DA6		
5		15A		ECN2406DA7			
1	200	1	120	7A	ECN2416EAC	AN16DN0AB	
		3		15A	ECN2416EAD		
		5		30A	ECN2416EAE		
		7-1/2		50A	ECN2416EAF		
	230	1	120	7A	ECN2416BAC	AN16DN0AB	
		3		15A	ECN2416BAD		
		5		30A	ECN2416BAE		
		7-1/2		50A	ECN2416BAF		
	460	1	120	3A	ECN2416CAB	AN16DN0AB	
		3		7A	ECN2416CAC		
		5		15A	ECN2416CAD		
		10		30A	ECN2416CAE		
	575	1	120	3A	ECN2416DA5	AN16DN0AB	
		3		7A	ECN2416DA6		
		5		15A	ECN2416DA7		
		10		30A	ECN2416DA8		
	2	200	10	120	50A	ECN2426EAF	AN16GN0AB
		230	10		50A	ECN2426BAF	AN16GN0AB
15			70A		ECN2426BAW		
460		25	120		50A	ECN2426CAF	AN16GN0AB
575		15	120		30A	ECN2426DA8	AN16GN0AB
		25	50A		ECN2426DA9		
3	200	20	120	100A	ECN2436EAG	AN16KN0A	
		25		ECN2436EAG			
	230	25	120	100A	ECN2436BAG	AN16KN0A	
		30		ECN2436BAG			
	460	50	120	100A	ECN2436CAG	AN16KN0A	
	575	30	120	50A	ECN2436DA9	AN16KN0A	
		50		100A	ECN2436DAI		
	4	200	40	120	150A	ECN2446EAH	AN16NN0A
230		50	ECN2446BAH				
460		100	ECN2446CAH				
575		ECN2446DAH					

Notes

Starters do not include heater packs. Select one carton of three heater packs. For heater pack selection, see **Tab 15**.

Starters with electronic overload, see modification codes in **Tab 15**.

^① For other control power transformer primary and/or secondary voltage options, see **Tab 2**.

Other Hazardous Location Control

Product Description

Besides Freedom starters, Eaton offers Type 7/9 cast aluminum enclosures for solid-state reduced voltage starters and lighting contactors.

Freedom Starters

For information on hazardous location versions, please consult your Eaton representative.

Solid-State Reduced Voltage Starters

Type 7/9 versions are listed in **Tab 5**.

The **IT** soft starters are designed to be the smallest, most compact soft starters on the market today. The built-in overload (ranges from 0.25 to 1000A) and run bypass contactor (greatly reducing the amount of heat generated) make installation and setup quick and easy.

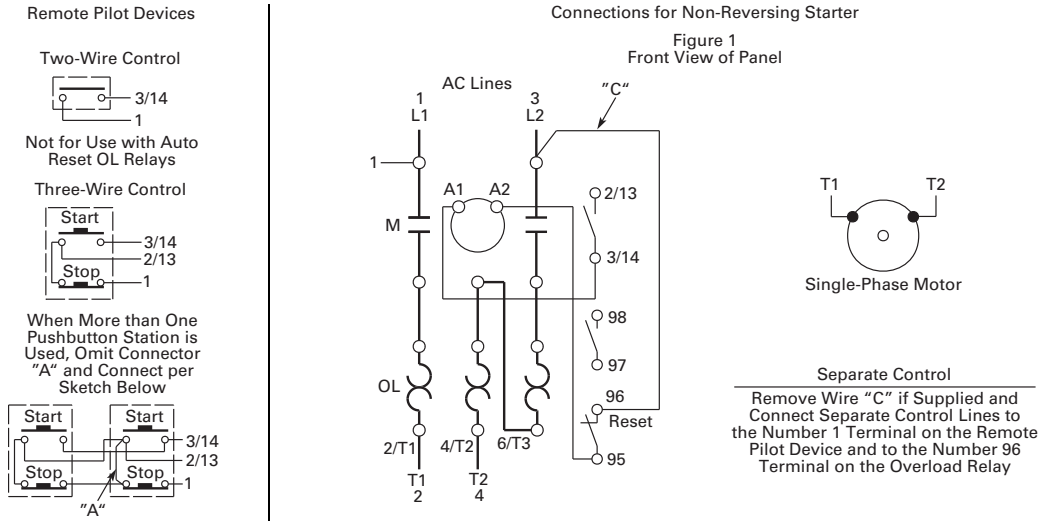
With this small size and low heat dissipation it can easily fit in the place of existing soft starters, Wye-Delta starters or across-the-line starters where others cannot. To make the retrofit more flexible, we also offer soft starters as open components or as a completed kit on a back panel for easy and quick installation into your existing enclosure.

Lighting Contactors

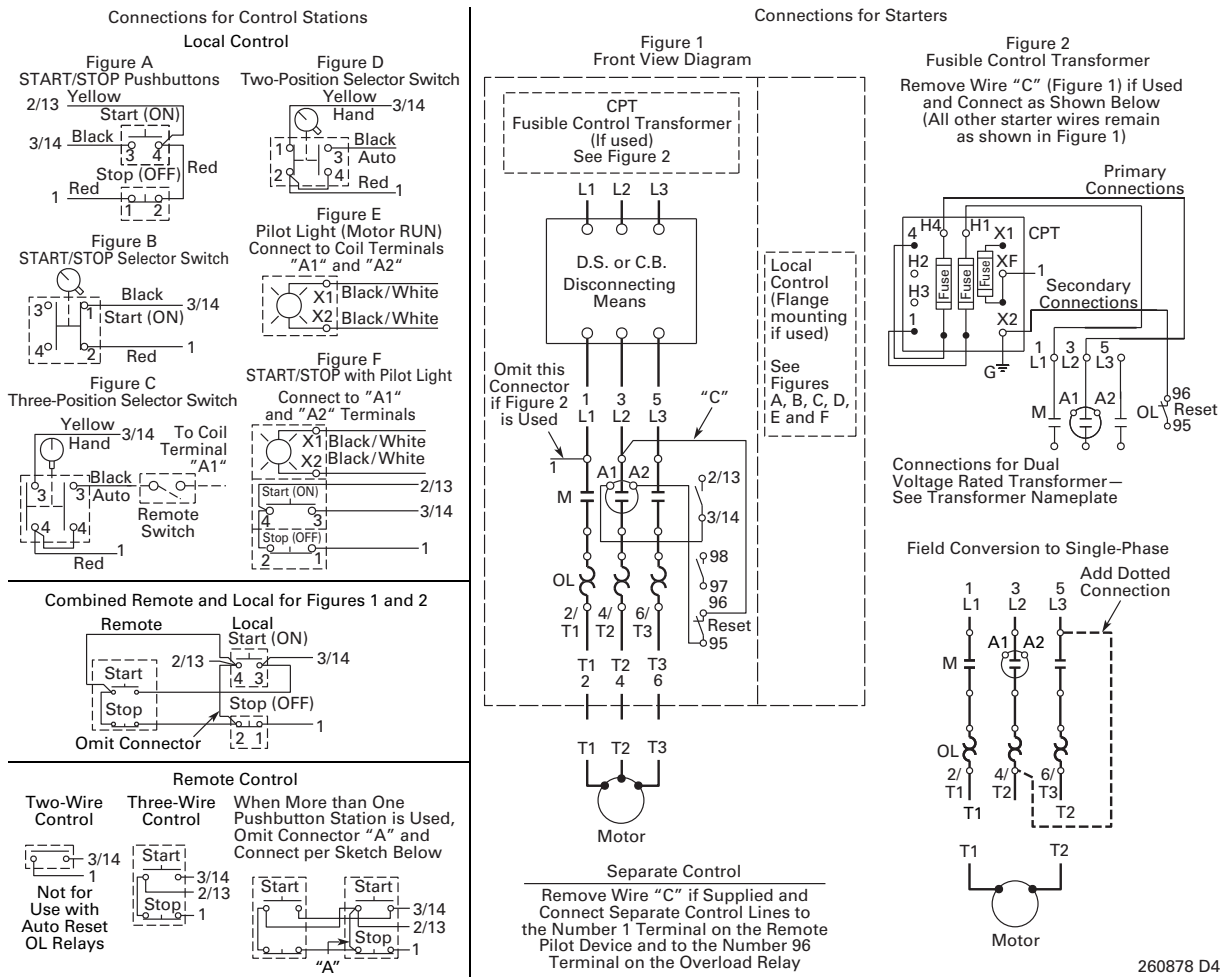
Type 7/9 versions are listed in **Tab 4**.

Wiring Diagrams

Freedom Non-Reversing Starter—Single-Phase Non-Combination



Freedom Non-Reversing Starter—Combination

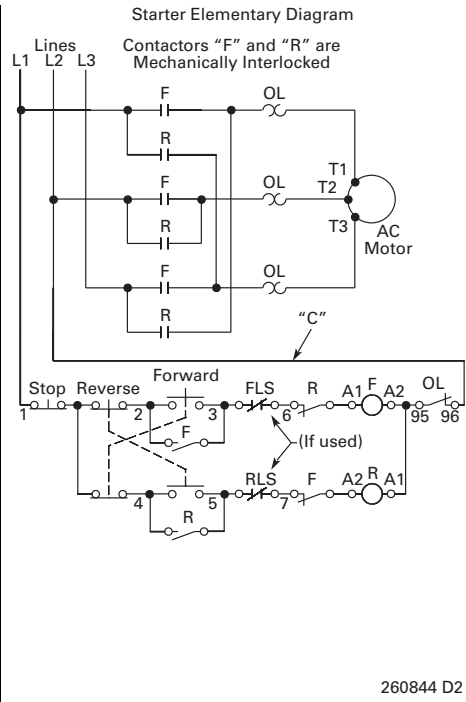
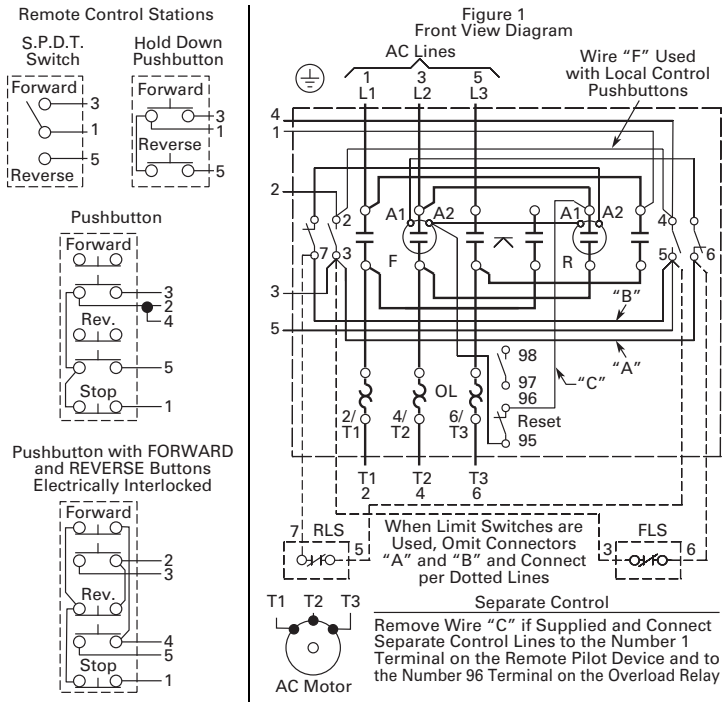


9.1

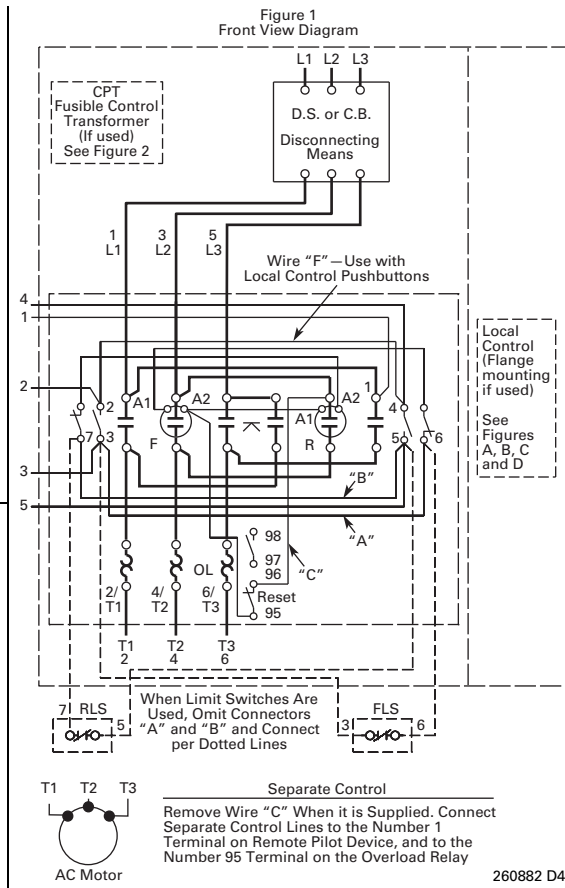
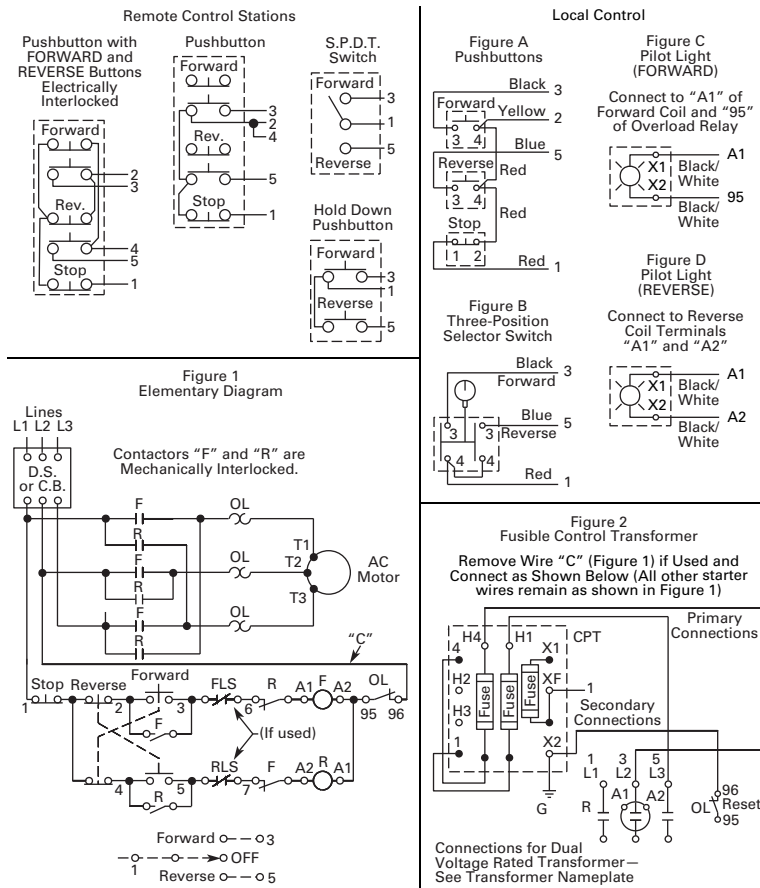
Type 7/9 Hazardous Location Starters

NEMA Cast Aluminum Enclosed Starters

Freedom Reversing Starter—Non-Combination

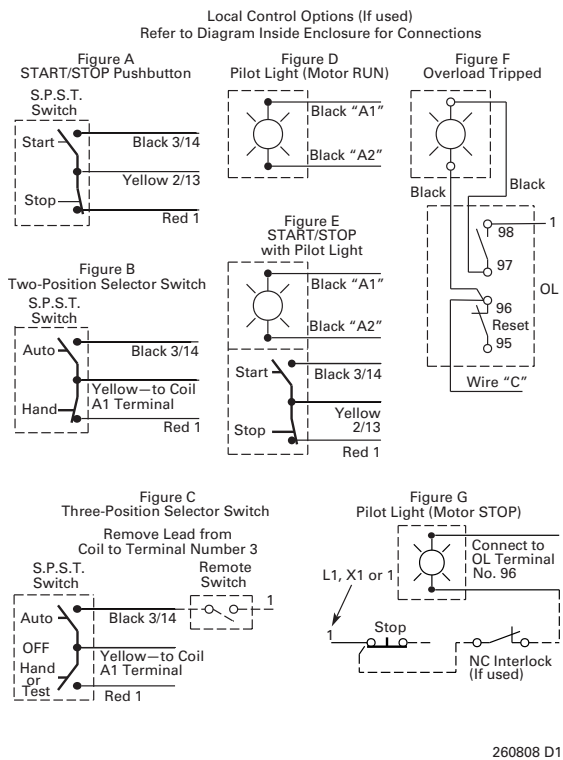


Freedom Reversing Starter—Combination

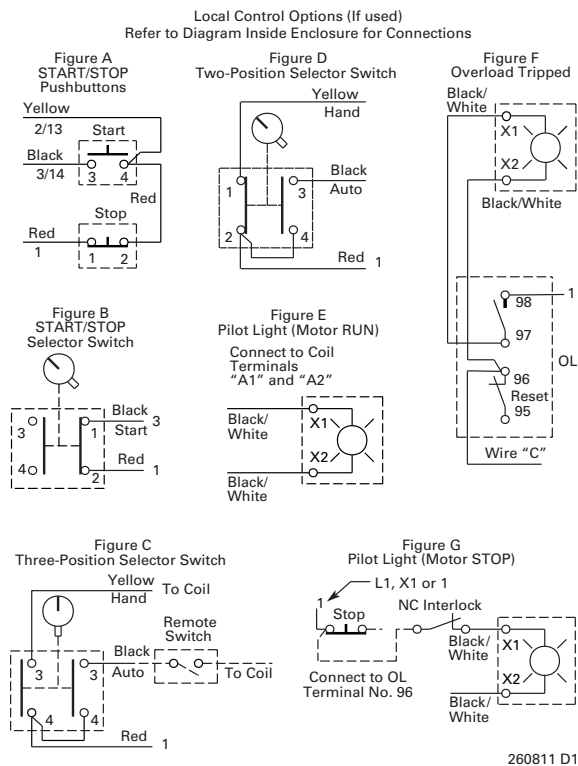


Non-Reversing Cover Control

Type 1 C400GK Control Options

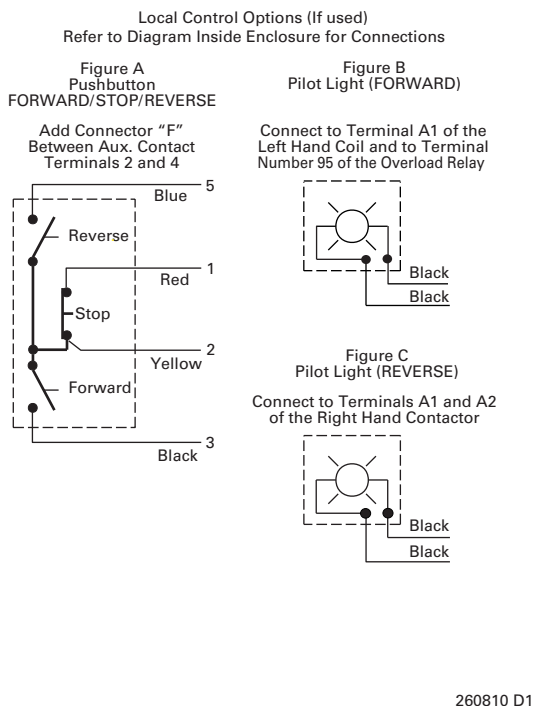


C400T Control Options

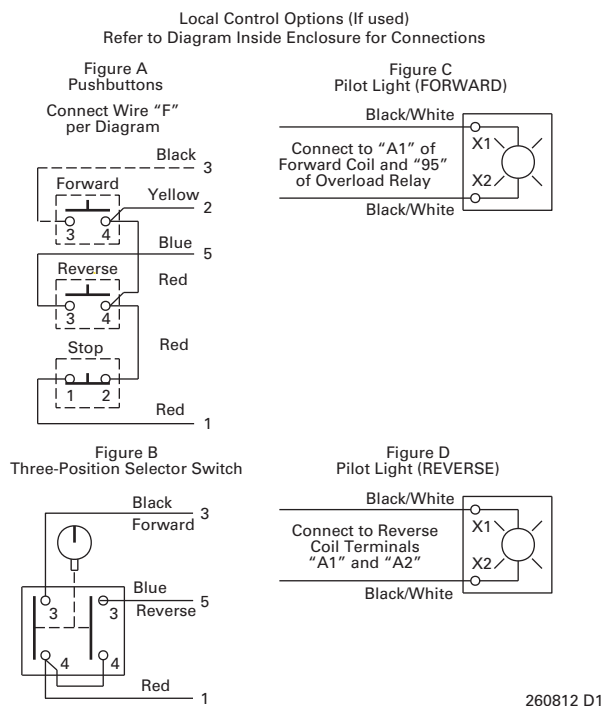


Reversing Cover Control

Type 1 C400GR Control Options



C400T Control Options

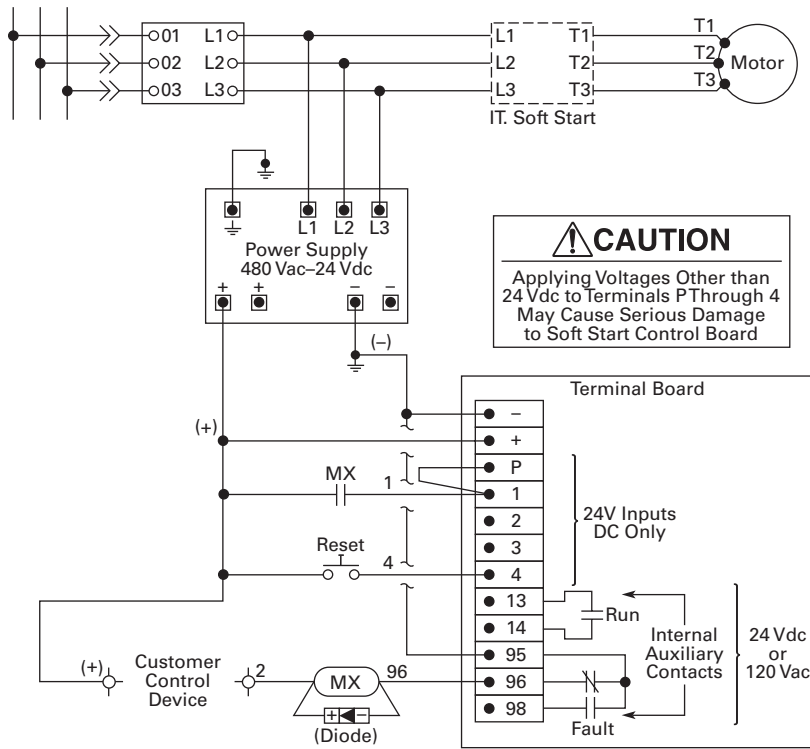


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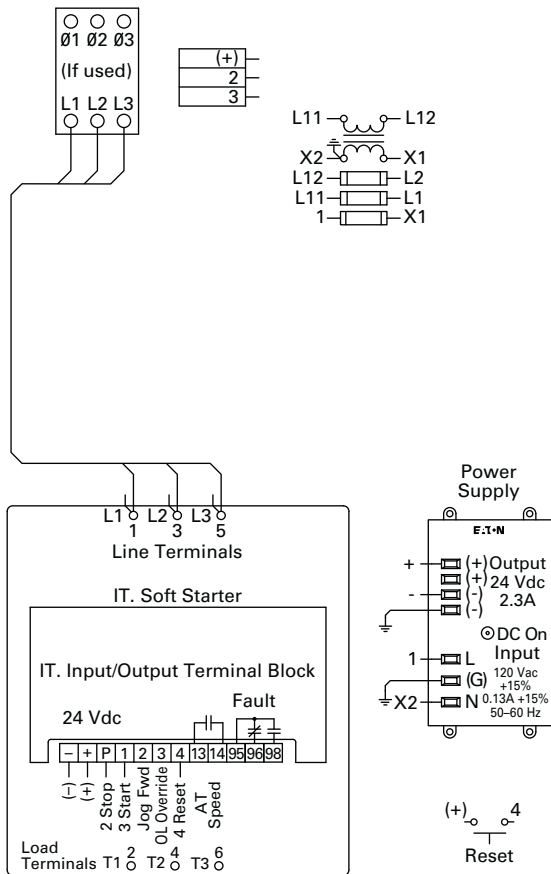
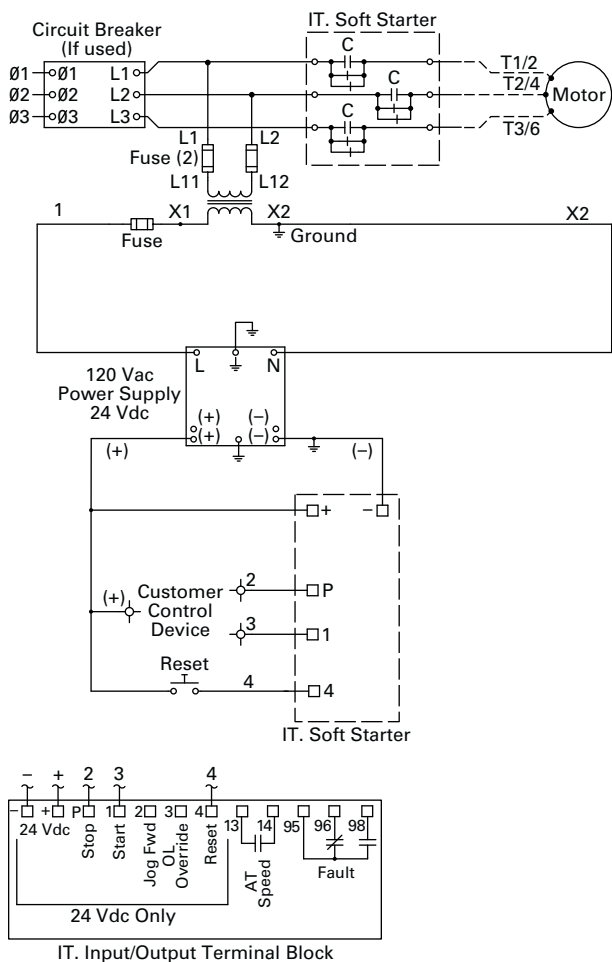
Type 7/9 Hazardous Location Starters

NEMA Cast Aluminum Enclosed Starters

S801+/S811+ Wiring Diagram



S801+/S811+ with External 120 Vac Control



9.1

Type 7/9 Hazardous Location Starters

NEMA Cast Aluminum Enclosed Starters

Dimensions

Approximate Dimensions in Inches

NEMA Size Freedom

Freedom Full Voltage Non-Reversing Starters

Rough Outside Dimensions	Non-Combination Sizes	Standard Conduit	Combination Sizes	Standard Conduit
17 x 14	0, 1, 2	1-1/2	—	—
28 x 14	3	2	0, 1, 2	1-1/2
32 x 18	4	2-1/2	3	2
46 x 16	5	3	4, 5	3

Reduced Voltage Solid-State

9

S801+/S811+ Intelligent Technologies Solid-State Soft Starters

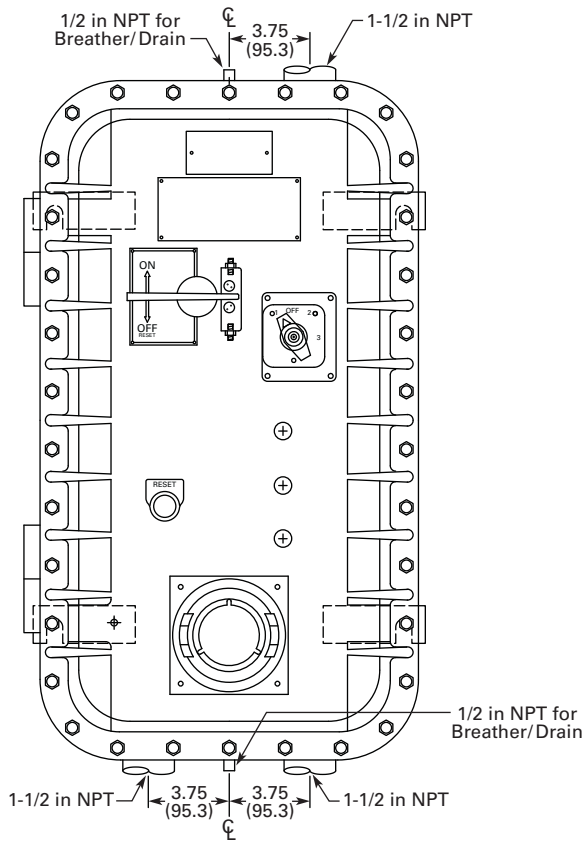
Rough Outside Dimensions	Non-Combination	Standard Conduit	Combination	Standard Conduit
17 x 14	66A	1-1/2	—	—
28 x 14	135A	2	66A	2
32 x 18	—	—	135A	2-1/2
46 x 16	304A	3	304A	3

S752 Intelligent Technologies Solid-State Soft Starters

Rough Outside Dimensions	Non-Combination	Standard Conduit	Combination	Standard Conduit
18 x 15	50A	1-1/2	—	—
28 x 14	—	—	50A	1-1/2

Approximate Dimensions in Inches (mm)

Type 7/9 Freedom Starters



Dimensions	A	B	C	D	E
Height	27.63 (701.8)	31.63 (803.4)	46.00 (1168.4)	16.63 (422.4)	17.50 (444.5)
Width	14.13 (358.9)	18.13 (460.5)	26.19 (665.2)	14.13 (358.9)	15.10 (383.5)
Depth	11.38 (289.1)	12.19 (309.6)	14.94 (379.5)	9.50 (241.3)	10.50 (266.7)
Weight in Lbs (kg)	125 (57)	195 (89)	500 (227)	80 (36)	95 (43)
I.D. Height	24	28	37	11	12
I.D. Width	10	14	17	9	10

Multi-Pak Grouping



Feeder Modules



10.1 Modules and Enclosures

Product Description	V10-T10-2
Application Description	V10-T10-2
Features	
Enclosures	V10-T10-2
Combination Starter Modules	V10-T10-3
Feeder Modules	V10-T10-3
Standards and Certifications	V10-T10-3
Additional Reference	V10-T10-3
Product Selection	
Starter Modules	V10-T10-4
Feeder Switch and Circuit Breaker Modules	V10-T10-5
Enclosures and Blank Doors	V10-T10-6
Heater Selection	V10-T10-7
Accessories	
Transformer Kits	V10-T10-10
Breaker/Switch Modification Kits	V10-T10-10
Modification Codes	V10-T10-11
Dimensions	V10-T10-12

Modules and Enclosures



Product Description

Eaton's Multi-Pak group control provides a convenient and economical method of grouping a number of starters and/or control devices. They are an effective solution for applications where the quantity of equipment required or the floor space available does not permit application of control centers or the use of individual starters. The result is a lower field installation cost and a less cluttered appearance. The Multi-Pak is ideally suited for wall mount installations, requiring only 32 in L x 26 in H space for four compartments or 48 in L x 26 in H for six compartments. Combinations of 4, 6, 8, 10, 12, 14, and so on, compartments can be easily made. Multi-Pak is available in module form or can be completely factory assembled.

Application Description

Multi-Pak starters are designed to save time, space and expense in installing motor control devices—whether for residential, commercial or industrial buildings. The modular assembly allows versatile, on-the-job arrangement of Sizes 1–4 combination starters with ambient compensated relays, incoming or feeder circuit breakers or fusible disconnect switches, pushbuttons, control transformers, timers, relays and fuses. The enclosures and separate, prewired modules are field-stocked and can be ordered individually, permitting field tailoring to suit the application.

Contents

Description	Page
Modules and Enclosures	
Standards and Certifications	V10-T10-3
Additional Reference	V10-T10-3
Product Selection	
Starter Modules	V10-T10-4
Feeder Switch and Circuit Breaker Modules	V10-T10-5
Enclosures and Blank Doors	V10-T10-6
Heater Selection	V10-T10-7
Accessories	
Transformer Kits	V10-T10-10
Breaker/Switch Modification Kits	V10-T10-10
Modification Codes	V10-T10-11
Dimensions	V10-T10-12

Features

Enclosures

The Type 1 enclosures are partitioned into either four or six compartments to hold combination starter modules, incoming or feeder circuit breakers, fusible switches or other auxiliary devices. The barriers can be removed to provide oversized spaces. Each enclosure holds up to four Size 1 or 2 full voltage, non-reversing combination starter modules; up to two Size 3 or 4 starter modules or a combination of both size ranges.

The compartments have hinged doors interlocked to prevent opening when the breaker switch is in the ON position. The disconnect operating mechanism can be padlocked in the OFF position.

In addition to the barriered compartments, the enclosure contains two wiring troughs. The top section is a wireway fitted with three power terminal straps, each having terminals for extension to adjoining enclosures and to all four compartments. The

incoming line and extension terminals are suitable for either copper or aluminum conductors from No. 6 to 350 kcmil. At the bottom of the enclosure is another wiring trough for interconnecting wiring and outgoing cables.

The Multi-Pak enclosure adapts easily to installation requirements. Multiple units can be arranged to suit the space available—horizontally on a single line or two-high. Knockouts are provided at the top, bottom and sides of the enclosures for conduit connection. Conduit can be installed and cables pulled as dictated by the construction schedule. Combination starter modules and incoming or feeder devices can be installed days, months or years later.

Hinged front doors provide easy access to each module. The doors are gasketed with fire retardant material. Knockouts on the doors provide pushbuttons and indicating light mountings.

Combination Starter Modules

Starter modules consist of an A200 magnetic linestarter prewired with a motor circuit protector or a fusible DS disconnect switch on a panel. Full voltage non-reversing and reversing combination starters are available. An external RESET button is mounted on the starter module door. With its versatile modular design, the Multi-Pak starter permits a variety of motor control groupings. One module can contain many different arrangements of devices such as combination linestarters with control transformers, and/or relays, two-feeder circuit breakers or fusible switches.

Feeder Modules

Like combination starter modules, breaker/switch modules are factory assembled on a formed steel panel. They are shipped complete with a door for field mounting. The module and door for feeder breakers through 100A or 30A and 60A fusible switches are normally furnished with a single breaker or switch in the top position with provisions for field mounting a second device in the lower position. A kit contains the operator, spacers, insulation and necessary hardware for adding a second device. Feeder modules for higher ratings are single units only.

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL Listed
- cUL Listed
- ABS Type Approved

Additional Reference

Heater Selection	V10-T10-7
Modifications	V10-T10-11
Dimensions	V10-T10-12

Product Selection

Starter Modules

When Ordering Specify

- Orders for modules, kits, and so on for field assembly should be ordered by catalog number
- Orders for factory assembled units should be placed on the customer support center. All modules, kits, and so on should be ordered by catalog number with a written description of desired modifications. (Use the modification number where possible)
- Provide a sketch or written description to define the desired locations of the modules in each enclosure along with your order

Starter Modules with Fusible Disconnect ^①

NEMA Size	Maximum Horsepower				NEC Fuse Clip Rating		Compartments Required	Coil Voltage			
	208/230 Volts		460–575 Volts		Volts	Amps		120	240	480	550
	NEC Fuses	Dual Element	NEC Fuses	Dual Element				Catalog Number	Catalog Number	Catalog Number	Catalog Number
Class 204 – Three-Phase Non-Reversing Combination Starters											
1	3	7-1/2	5	10	600 ^②	30	1	6263A08G05	6263A08G01 ^③	6263A08G01 ^③	6263A08G09
		7-1/2	—	10	600 ^②	60	1	6263A08G06	6263A08G02 ^③	6263A08G02 ^③	6263A08G10
2	7-1/2	15	15	25	600 ^②	60	1	6263A08G07	6263A08G03 ^③	6263A08G03 ^③	6263A08G11
	15	—	—	—	250	100	1	6263A08G08	6263A08G04 ^③	6263A08G04 ^③	—
3	15	30	—	—	250	100	2	6263A09G01	6263A09G02	—	—
	30	—	—	—	250	200	2	6263A09G03	6263A09G04	—	—
	—	—	30	50	600	100	2	6263A09G05	—	6263A09G06	6263A09G07
	—	—	50	—	600	200	2	6263A09G08	—	6263A09G09	6263A09G10
Class 214 – Three-Phase Reversing Combination Starters											
1	3	7-1/2	—	—	250	30	2	6263A10G01	6263A10G02	—	—
	—	—	5	10	600	30	2	6263A10G03	—	6263A10G04	6263A10G05
	7-1/2	—	—	—	250	60	2	6263A10G06	6263A10G07	—	—
	—	—	10	—	600	60	2	6263A10G08	—	6263A10G09	6263A10G10
2	7-1/2	15	—	—	250	60	2	6263A10G11	6263A10G12	—	—
	—	—	15	25	600	60	2	6263A10G13	—	6263A10G14	6263A10G15
	15	—	—	—	250	100	2	6263A10G16	6263A10G17	—	—

Starter Modules with HMCP Circuit Breaker ^①

NEMA Size	Maximum Horsepower			HMCP Trip Rating in Amperes	Compartments Required	Coil Voltage			
	208/230 Volts	460–575 Volts				120	240	480	550
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	
Class 206 – Three-Phase Non-Reversing Combination Starters									
1	—	1	0.69–2.5	1	6263A01G08	6263A01G07	6263A01G07	6263A01G09	
	1	2	1.5–5.7	1	6263A01G11	6263A01G10	6263A01G10	6263A01G12	
	3	5	3.4–12.6	1	6263A01G14	6263A01G13	6263A01G13	6263A01G15	
	7-1/2	10	6.9–25.2	1	6263A01G03	6263A01G01 ^③	6263A01G01 ^③	6263A01G05	
2	15	25	11.5–42.1	1	6263A01G04	6263A01G02 ^③	6263A01G02 ^③	6263A01G06	
3	30	50	23–84.5	2	6362A02G01	6362A02G02	6362A02G03	6362A02G04	
4	50	100	34.6–126.7	2	6263A03G01	6263A03G02	6263A03G03	6263A03G04	
Class 216 – Three-Phase Reversing Combination Starters									
1	3–7-1/2 ^④	5–10 ^④	3.4–25.2	2	6263A04G01	6263A04G02	6263A04G03	6263A04G04	
2	10–15	15–25	6.9–42.1	2	6263A04G05	6263A04G06	6263A04G07	6263A04G08	

Notes

- ^① Does not include heaters. See **Pages V10-T10-7 to V10-T10-9**.
- ^② 600 volt clips are factory installed. A conversion kit for 250 volt fuses is included with starter modules.
- ^③ Dual voltage coil wired for 480 volts; can be field converted to 240 volts.
- ^④ For smaller hp, order by description for proper selection of MCP.

Feeder Switch and Circuit Breaker Modules

When Ordering Specify

- Orders for modules, kits, and so on for field assembly should be ordered by catalog number
- Orders for factory assembled units should be placed on the customer support center. All modules, kits, and so on should be ordered by style number with a written description of desired modifications. (Use the modification number where possible)
- Provide a sketch or written description to define the desired locations of the modules in each enclosure along with your order

Fusible Main and Feeder Switch Modules (Three-Pole) ^{①②}

Volts	Switch Amperes	Fuse Clip Amperes	Compartments Required	Catalog Number
Fusible Switch with NEC Fuse Clips—Module with One Switch				
250	30	30	1	6263A14G01
600	30	30	1	6263A14G02
250	60	60	1	6263A14G03
600	60	60	1	6263A14G04
250	60	100	1	6263A14G05
250	100	100	2	6263A15G01
600	100	100	2	6263A15G02
250	100	200	2	6263A15G03
600	100	200	2	6263A15G04

Main and Feeder Air Circuit Breaker Modules ^{①③}

Amperes	Poles	Compartments Required	Module with One 600 Volt Thermal/Magnetic Breaker Catalog Number
Type HFD			
15	3	1	6263A16G01
20	3	1	6263A16G02
30	3	1	6263A16G03
40	3	1	6263A16G04
50	3	1	6263A16G05
70	3	1	6263A16G06
90	3	1	6263A16G07
100	3	1	6263A16G08
125	3	2	6263A17G01
150	3	2	6263A17G02
175	3	2	6263A17G03
200	3	2	6263A17G04
225	3	2	6263A17G05

Notes

- ① Includes door.
- ② Two switches 60 amperes and below can be mounted in one compartment. Order by description. If second fusible switch is to be mounted in the field, order modification kit catalog number **6263A18G01**, as shown in table on **Page V10-T10-10**. Doors for fusible switch modules have cutout for second operating handle.
- ③ Two breakers 100 amperes and below can be mounted in one compartment. Order by description. If second breaker is to be mounted in the field, order modification kit catalog number **6263A18G02**, as shown in table on **Page V10-T10-10**. Doors for breaker modules have cutout for second operating handle.

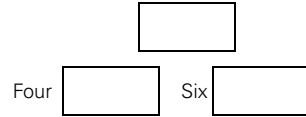
Enclosures and Blank Doors

When Ordering Specify

- Total number of compartments required
- Quantity of four compartment and/or six compartment enclosures required. (Include future space requirements)

Compartments

Compartments



Enclosures and Blank Doors Product Selection

Description	Catalog Number
Type 1 enclosure ①	
With four compartments	6262A70G01
With six compartments	6262A70G02
Dust and weather resistant enclosure to house Type 1 enclosure	
With four compartments	6262A70G05
With six compartments	6262A70G06
Blank door for one compartment	6262A70G03
Blank door for two compartments and blank back pan for two compartments	6262A70G04

Note

① Incoming line and extension terminals included are suitable for either copper or aluminum conductors from 6–350 kcmil.

Heater Selection

The full load current shown on each motor nameplate should be checked with the heater application tables to assure that the heaters chosen with each starter unit agree with this table and with the actual motor protection requirements. Do not rely on code marking on the heater to indicate current rating. In making this check, the following Notes 1–3 regarding special conditions should be considered.

Notes on Overload Heater Application

- The heater application tables provide 115–125% protection for motors rated 40°C having a service factor of 1.15 and 1.25.
- Use one smaller heater when:
 - The motor is rated 50° or 55°C.
 - The motor has a service factor of 1.00.
 - A maximum of 115 protection is desired.
- Overload relays are ambient compensated, therefore base heater selection on motor current, and disregard ambient temperature differences.

The relay will provide protection against abnormal load conditions to current values exceeding normal locked rotor current. The relay should be protected against short-circuits by providing branch circuit protection per National Electric Code, but not to exceed the maximum fuse ratings listed in the heater tables.

Note: To provide continued protection against fire and shock hazard, the complete overload relay must be replaced if burn out of the current element occurs.

Overload Relays, Three-Pole Protection

Heater Selection—Starter Size 1 ^①

Motor Full Load Current in Amperes ^②	Style Number	Maximum Breaker or Fuse	Catalog Number
0.51–0.55	117C524G10	2	FH10
0.56–0.62	117C524G11	2	FH11
0.63–0.68	117C524G12	2.5	FH12
0.69–0.75	117C524G13	3	FH13
0.76–0.83	117C524G14	3	FH14
0.84–0.91	117C524G15	3	FH15
0.92–1.00	117C524G16	3	FH16
1.01–1.11	117C524G17	4	FH17
1.12–1.22	117C524G18	4	FH18
1.23–1.34	117C524G19	5	FH19
1.35–1.47	117C524G20	5	FH20
1.48–1.62	117C524G21	5	FH21
1.63–1.78	117C524G22	6	FH22
1.79–1.95	117C524G23	6	FH23
1.96–2.15	117C524G24	8	FH24

Notes

^① Use in fusible starters only. Do not use with circuit breakers.

^② Ambient compensated.

Heater Selection—Starter Size 1 and 2

Motor Full Load Current in Amperes ^①	Style Number	Maximum Breaker or Fuse	Catalog Number
2.16–2.35 ^②	117C524G25	8	FH25
2.36–2.58 ^②	117C524G26	8	FH26
2.59–2.83 ^②	117C524G27	10	FH27
2.84–3.11 ^②	117C524G28	10	FH28
3.12–3.42 ^②	117C524G29	12	FH29
3.43–3.73 ^②	117C524G30	12	FH30
3.74–4.07	117C524G31	15	FH31
4.08–4.39	117C524G32	15	FH32
4.40–4.87	117C524G33	15	FH33
4.88–5.3	117C524G34	20	FH34
5.4–5.9	117C524G35	20	FH35
6.0–6.4	117C524G36	20	FH36
6.5–7.1	117C524G37	25	FH37
7.2–7.8	117C524G38	25	FH38
7.9–8.5	117C524G39	30	FH39
8.6–9.4	117C524G40	30	FH40
9.5–10.3	117C524G41	35	FH41
10.4–11.3	117C524G42	35	FH42
11.4–12.4	117C524G43	40	FH43
12.5–13.5	117C524G44	45	FH44
13.6–14.9	117C524G45	45	FH45
15.0–16.3	117C524G46	50	FH46
16.4–18.0	117C524G47	60	FH47
18.1–19.8	117C524G48	60	FH48
19.9–21.7	117C524G49	70	FH49
21.8–23.9	117C524G50	80	FH50
24.0–26.2	117C524G51	80	FH51
26.3–28.7	117C524G52	90	FH52

Heater Selection—Starter Size 2

Motor Full Load Current in Amperes ^①	Style Number	Maximum Breaker or Fuse	Catalog Number
28.8–31.4	117C524G53	100	FH53
31.5–34.5	117C524G54	125	FH54
34.6–37.9	117C524G55	125	FH55
38.0–41.5	117C524G56	125	FH56
41.6–45.5	117C524G57	150	FH57

Notes

^① Ambient compensated.

^② Use in fusible starters only. Do not use with circuit breakers.

Heater Selection—Starter Size 3 and 4

Motor Full Load Current in Amperes ①	Style Number	Maximum Breaker or Fuse	Catalog Number
19.0–20.8	179C319G02	80	FH72
20.9–22.9	179C319G03	90	FH73
23.0–25.2	179C319G04	100	FH74
26.3–27.8	179C319G05	100	FH75
27.9–30.6	179C319G06	110	FH76
30.7–33.5	179C319G07	125	FH77
33.6–37.5	179C319G08	150	FH78
37.6–41.5	179C319G09	150	FH79
41.6–46.3	179C319G10	175	FH80
46.4–50.0	179C319G11	200	FH81
51.0–55.0	179C319G12	200	FH82
56.0–61.0	179C319G13	225	FH83
62.0–66.0	179C319G14	250	FH84
67.0–73.0	179C319G15	250	FH85
74.0–79.0	179C319G16	250	FH86
80.0–87.0	179C319G17	300	FH87
88.0–90.0	179C319G18	350	FH88

Heater Selection—Starter Size 4

Motor Full Load Current in Amperes ①	Style Number	Maximum Breaker or Fuse	Catalog Number
88.0–95.0	179C319G18	350	FH88
96.0–105.0	179C319G19	300	FH89
106.0–116.0	179C319G20	300	FH90
117.0–128.0	179C319G21	350	FH91

Note

① Ambient compensated.

Accessories

Transformer Kits

Includes transformer, fuse clip mounting and fuse clip.

Transformer Sizes ^①

Size	VA Capacity		Size	VA Capacity	
	Freedom	Vacuum		Freedom	Vacuum
0	50	—	4	200	100
1, 2	100	—	5	200	150
3	150	—	6	250	350

Control Transformer Kits

Continuous VA	Primary 208/277V Secondary 120V, 60 Hz	Primary 240/480V, 60 Hz 220/440V, 50 Hz Secondary 120V, 60 Hz 110V, 50 Hz	Primary 380V Secondary 110V, 50 Hz	Primary 600V, 60 Hz 550V, 50 Hz Secondary 120V, 60 Hz 110V, 50 Hz	Primary 240/480V, 60 Hz Secondary 24V, 60 Hz
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
50	C341AE	C341AC	C341AL	C341AD	C341AS
75	C341BE	C341BC	C341BL	C341BD	C341BS
100	C341CE	C0100E2AFB	C341CL	C341CD	C341CS
150	C341DE	C341DC	C341DL	C341DD	C341DS
200	C341EE	C341EC	C341EL	C341ED	C341ES
250	C341FE	C341FC	C341FL	C341FD	C341FS
300	C341GE	C341GC	C341GL	C341GD	C341GS
350	C341HE	C341HC	C341HL	C341HD	C341HS
500	C341JE	C341JC	C341JL	C341JD	C341JS

Breaker/Switch Modification Kits

Kit includes all necessary hardware for mounting Type T 30 or 60 ampere Visi-Flex switch or any Type FD or HMCP circuit breaker in the

lower blank location in any of the switch or breaker modules as noted. The switch or breaker is not included with the kit.

Breaker/Switch Kits

Description	Catalog Number
Modification kit for second fusible switch	6263A18G01
Modification kit for second circuit breaker	6263A18G02

Terminal Kits

Terminal Kits

Description	Catalog Number
Neutral or replacement kit	6263A18G08

Note

① Non-reversing, single contactor only.

Modification Codes

Factory Installed Modifications

Description	Modification Number
Pushbutton ^①	
Two-unit	1
Three-unit	1
Two- or three-unit selector switch ^①	2
Indicating light (specify color) ^①	3
Push-to-test indicating light ^①	4
Extra auxiliary contact (per contact)	5
Control relay (D15) ^②	
Two-pole	6
Four-pole	6
Timing relay ^②	7
Substitute mark 75 breaker for standard or feeder unit	8
Control transformer ^③	
Size 1	9
Size 2	9
Size 3	9
Size 4	9

Notes

- ^① Three devices per module maximum.
- ^② Refer to factory for spacing.
- ^③ Primary and secondary fusing supplied.

For more modification codes, see **Tab 15**.

10.1

Multi-Pak Group Control

Modules and Enclosures

Dimensions

Approximate Dimensions in Inches (mm)

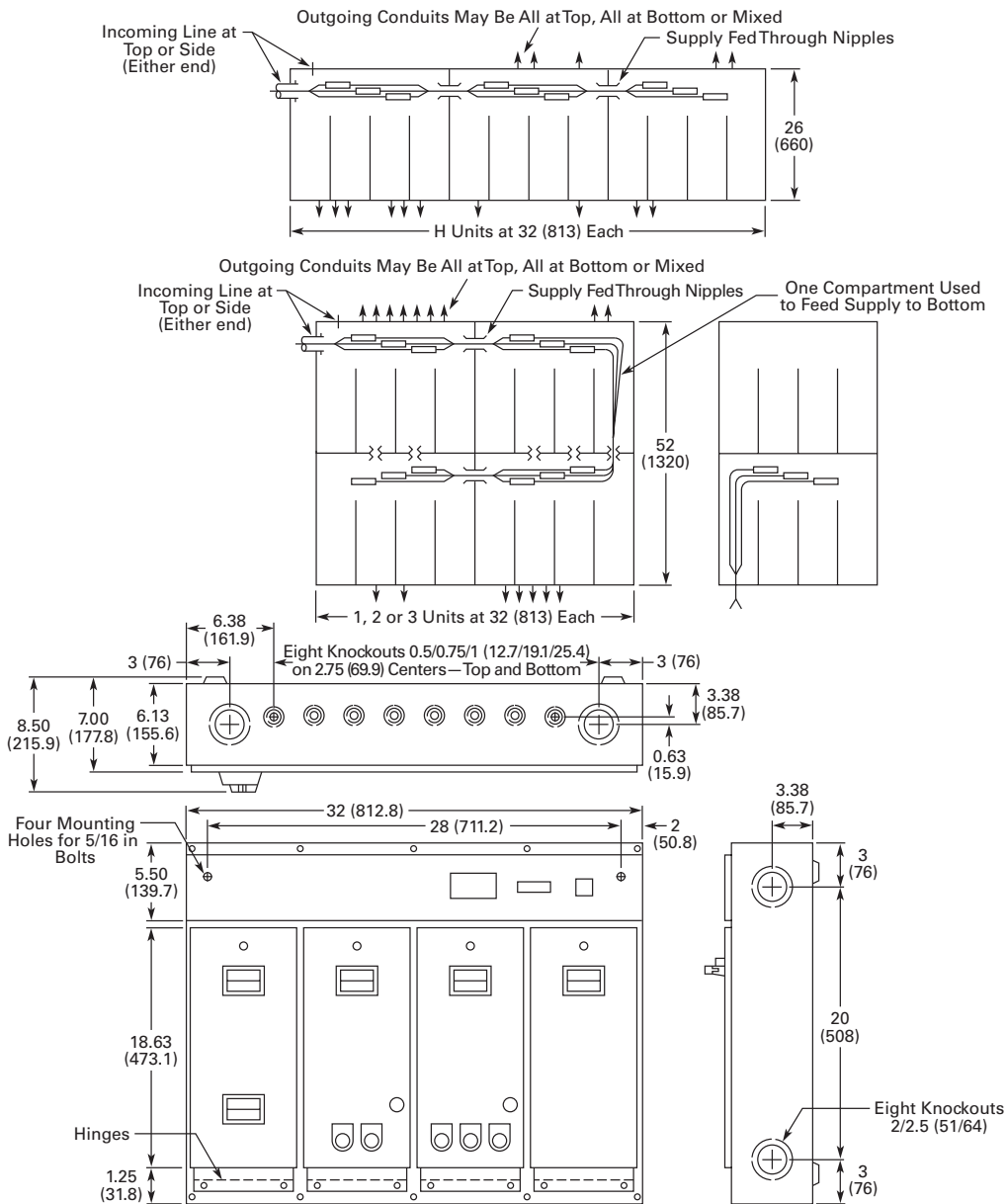
Dimension and Wiring Arrangements

Type 1 enclosures are 32 or 48 in (813 or 1219 mm) wide, 26 in (660 mm) high and 7 in (178 mm) deep, with provisions for four-bolt wall mounting. Enclosures are grouped together by nipling through the knockouts provided.

Load and control conduits may enter at the top or bottom. Instructions for overload heater installation are attached to each starter door.

Dust and weather resistant enclosures for four- or six-module units are available. These enclosures are 34 or 50 in (864 or 1270 mm) wide, 31 in (787 mm) high and 11.75 in (298 mm) deep.

Approximate Dimensions and Wiring Arrangements, Four Module Unit



Note
Six-module units are 48 in wide.

Approximate Dimensions in Inches (mm)

Enclosures and Blank Doors

Description	Width	Height	Depth	Shipping Weight Lbs (kg)
Type 1 enclosure ^①				
With four compartments	32 (813)	26 (660)	7 (178)	50 (23)
With six compartments	48 (1219)	26 (660)	7 (178)	70 (32)
Dust and weather resistant enclosure to house Type 1 enclosure				
With four compartments	34 (864)	31 (787)	11.75 (298)	35 (16)
With six compartments	50 (1270)	31 (787)	11.75 (298)	50 (23)
Blank door for one compartment	—	—	—	3 (1.4)
Blank door for two compartments and blank back pan for two compartments	—	—	—	8 (3.6)

Shipping Weights

Module Weights

Description	Weight Lbs (kg)	Description	Weight Lbs (kg)
Fusible switches		Starters—A204, A206	
30–60 Amperes	10 (4.5)	Sizes 1, 2	15 (6.8)
100 Amperes	15 (6.8)	Sizes 3, 4	25 (11.4)
Circuit breakers		Starters—A214	
15–100 Amperes	10 (4.5)	Sizes 1, 2	15 (6.8)
125–225 Amperes	20 (9.1)	Starters—A216	
		Sizes 1, 2	20 (9.1)

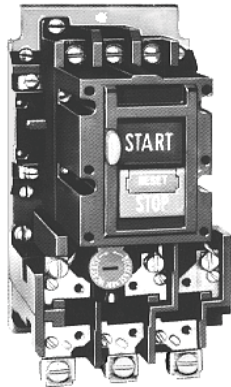
Note

^① Incoming line and extension terminals included are suitable for either copper or aluminum conductors from 6 to 350 kcmil.

Single-Phase Starters



Single- and Three-Phase Starters



11.1 Single-Phase Starters

MS Series

Product Description	V10-T11-2
Application Description	V10-T11-2
Features	V10-T11-2
Instructional Leaflet	V10-T11-2
Standards and Certifications	V10-T11-2
Product Selection	V10-T11-3
Accessories	V10-T11-4
Dimensions	V10-T11-5

11.2 Single- and Three-Phase Starters

Type B100

Product Description	V10-T11-6
Application Description	V10-T11-6
Features	V10-T11-6
Instructional Leaflet	V10-T11-6
Standards and Certifications	V10-T11-6
Product Selection	V10-T11-7
Accessories	V10-T11-9
Options	V10-T11-9
Technical Data	V10-T11-9
Dimensions	V10-T11-10

11.1

Manual Motor Control

Single-Phase Starters

Single-Phase Starters



Contents

Description	Page
Single-Phase Starters	
Product Selection	V10-T11-3
Accessories	V10-T11-4
Dimensions	V10-T11-5

11

MS Series

Product Description

- Eaton's MS motor starter is a compact, versatile unit featuring heavy sliding contacts as well as "quick-make" and "quick-break" mechanism
- Standard with large pressure type terminals, straight-through wiring and a trip-free handle mechanism
- The "plug-in" heater element is keyed to ensure proper positioning and an adjustable knob allows a setting of plus or minus ten percent of the nominal heater rating

Application Description

The MS manual motor starter provides manual control and overload protection to single-phase motors. By utilizing the interchangeable heater elements, the starter can protect motors ranging from 0.40A up to 16.0A. Ideal for HVAC applications.

Features

- Compact size
- Trip-free handle mechanism
- Keyed heater elements to ensure proper installation
- Starters available with red pilot light
- The operating handle of the enclosed units can be locked in the OFF position
- Enclosures are offered in Type 1, 3, 4 and 5
- Hazardous locations cast aluminum enclosures are available rated for Type 7, Class I, Group D (vapors) and Type 9, Class II, Groups E, F and G (dust)

Instructional Leaflet

IL12987G

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL File No. E1922, Category NLRV (for motor controller)
- CSA File No. LR39402-6, Class 3211-05
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)



Product Selection

When Ordering Specify

- Catalog number of manual motor starter
- Heater pack selection
- Any required accessories
- Heater coil selection according to the motor full load current requirements

MS Series Starters—Open Type

Number of Poles	Horsepower	Voltage	Catalog Number ①
1	1	120/240V, 277 Vac	MST01
	1/4	120/240 Vdc	
	1/4	32 Vdc	
2	1	120/240V, 277 Vac	MST02
	1	120/240 Vdc	
	1/4	32 Vdc	

Switch and Pilot Light Mounted on Flush Plate



MS Series Starters—Flush Plate Type (No Enclosure Included)

Number of Poles	Flush Plate Type	Description	Catalog Number ①	
1	General purpose	Switch only	MST01FN	
		Switch with pilot light	MST01FN1P	
		2	Switch only	MST02FN
			Switch with pilot light	MST02FN1P
1	Stainless steel	Switch only	MST01DN	
		Switch with pilot light	MST01DN1P	
		2	Switch only	MST02DN
			Switch with pilot light	MST02DN1P

Switch and Pilot Light Mounted in Type 1 Enclosure



MS Series Starters—Enclosed Type

Number of Poles	Enclosure Type	Description	Catalog Number ①
1	General purpose Type 1	Switch only	MST01SN
		Switch with pilot light	MST01SN1P
2		Switch only	MST02SN
		Switch with pilot light	MST02SN1P

Waterproof Type 3, 4 and 5



1	Waterproof Type 3, 4 and 5	Through hub	MST01AH
2		Through hub	MST02AH

Hazardous Location Type 7D, 9E, 9F and 9G



1	Hazardous location ② Types 7D, 9E, 9F and 9G	Through hub	MST01EH
2		Through hub	MST02EH

Notes

- ① Does not include heater. Select heater from table on **Page V10-T11-4**.
 ② Type 7D = Type 7, Class I, Group D; Type 9E, 9F and 9G = Type 9, Class II, Groups E, F and G.

Typical Heater



Heater Element Installation



Heater Selection for MS Starters

Motor Full Load Current	Catalog Number	Motor Full Load Current	Catalog Number
0.4–0.43	MSH-5A	2.72–2.95	MSH3-4A
0.44–0.48	MSH-55A	2.96–3.27	MSH3-7A
0.49–0.53	MSH-61A	3.28–3.59	MSH4-1A
0.54–0.58	MSH-67A	3.60–3.99	MSH4-5A
0.59–0.64	MSH-74A	4.00–4.39	MSH5-0A
0.65–0.71	MSH-81A	4.40–4.79	MSH5-5A
0.72–0.78	MSH-89A	4.80–5.26	MSH6-0A
0.79–0.87	MSH-98A	5.27–5.83	MSH6-6A
0.88–0.95	MSH1-1A	5.84–6.39	MSH7-3A
0.96–1.03	MSH1-2A	6.40–7.03	MSH8-0A
1.04–1.15	MSH1-3A	7.04–7.74	MSH8-8A
1.16–1.27	MSH1-45A	7.75–8.46	MSH9-7A
1.28–1.35	MSH1-6A	8.47–9.35	MSH10-6A
1.36–1.51	MSH1-7A	9.36–10.30	MSH11-7A
1.52–1.67	MSH1-9A	10.31–11.35	MSH12-9A
1.68–1.83	MSH2-1A	11.36–12.47	MSH14-2A
1.84–1.99	MSH2-3A	12.48–13.67	MSH15-6A
2.00–2.23	MSH2-5A	13.68–15.12	MSH17-1A
2.24–2.47	MSH2-8A	15.13–16.00	MSH18-6A
2.48–2.71	MSH3-1A		

Accessories

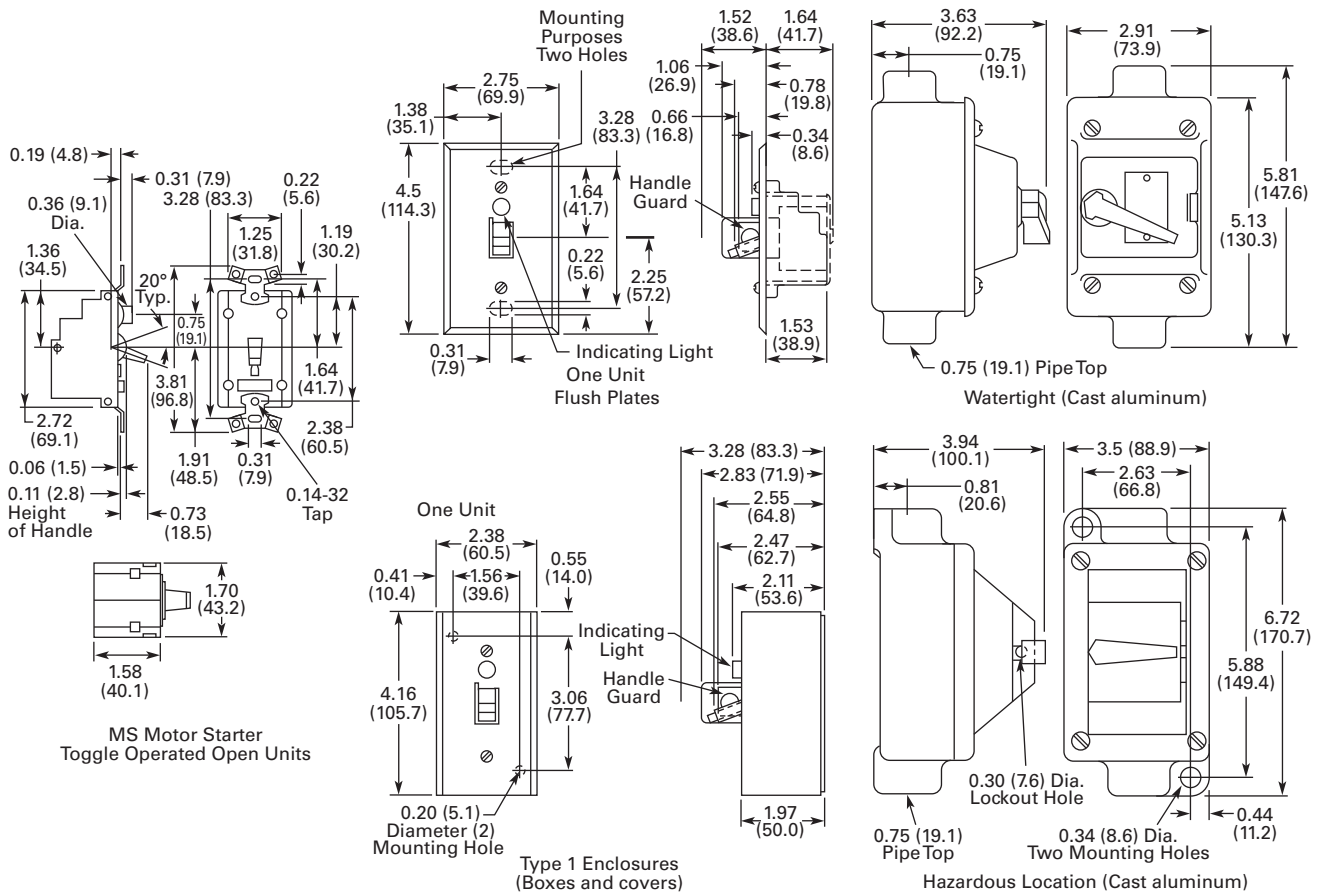
MS Series Accessories

Description	Catalog Number
Pilot light kit (NEMA 1 enclosure and flush plates)	MSPT
Box, 1 unit (NEMA 1 enclosure)	MS1BN
Cover, 1 unit (NEMA 1 enclosure)	MS1CN
Flush plate, 1 unit (steel)	MS1FN
Flush plate, 1 unit (stainless steel)	MS1DN
Handle guard (padlockable for NEMA 1 enclosure and flush plates)	MSLG

Dimensions

Approximate Dimensions in Inches (mm)

MS Series Single-Phase Starters

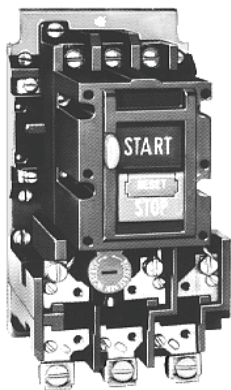


11.2

Manual Motor Control

Single- and Three-Phase Starters

Single- and Three-Phase Starters



Contents

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Technical Data	V10-T11-9
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Type B100

Product Description

Eaton's B100 manual motor starters can be used in single-phase applications rated 3 hp at 240 Vac or 2 hp at 230 Vdc. The starter can also be rated for three-phase applications up to 10 hp at 600 Vac.

There are two methods of operation for the B100 manual starter. It can be ordered with a toggle switch operator or a START/STOP pushbutton operator.

Application Description

The B100 family of manual motor starters provides manual control, as well as overload protection, to both single-phase and three-phase motors. The starter protects motors up to 38.9A single-phase and 26.8A three-phase with the appropriate heater selection.

Features

- Includes three-pole bimetallic overload relay
- Straight-through wiring
- Field mounted auxiliary contacts
- Available in Type 1, 4, 7, 9 and 12 enclosures with toggle operation (Type 1 enclosure for pushbutton operator)
- Standard with a lockout device to lock motor in the OFF position

Instructional Leaflet

IL14890

Standards and Certifications

Note: See **Tab 17** for additional information on standards and certifications that apply to all enclosed control products.

- UL File No. E19222, Category NLRV (for motor controller)
- CSA File No. LR39402-6, Class 3211-05 (open starters)
- CSA File No. LR54517-1, Class 3211-05 (closed starters)
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)



Product Selection

When Ordering Specify

- Catalog number of starter with application modifications
- Heater pack selection—a three-phase starter requires three heaters, and a single-phase starter requires two heaters
- Any required accessories

Toggle Operated



Type 1 Enclosure



Toggle and Pushbutton Operated Starters

NEMA Size	Enclosed				
	Open Type Toggle Handle Catalog Number ^①	Type 1 General Purpose Catalog Number ^①	Type 4 Watertight, Stainless Steel ^② Catalog Number ^①	Type 7D, 9E, 9F and 9G for Hazardous Locations ^{③④} Catalog Number ^①	Type 12 Dust-Tight Catalog Number ^①
Type B100 Non-Reversing Two-Pole (For Single-Phase Motors and DC)					
M-0	B100M0B	B100S0B	B100W0B	B100U0B	B100J0B
M-1	B100M1B	B100S1B	B100W1B	B100U1B	B100J1B
Type B100 Non-Reversing Three-Pole (For Polyphase Motors) ^④					
M-0	B100M0C	B100S0C	B100W0C	B100U0C	B100J0C
M-1	B100M1C	B100S1C	B100W1C	B100U1C	B100J1C

Notes

- ^① Does not include heaters. Select catalog numbers of heaters from table on **Page V10-T11-8**.
- ^② One 1-inch chrome hub supplied on each end.
- ^③ Type 7D = Type 7, Class I, Group D. Type 9E, 9F and 9G = Type 9, Class II, Groups E, F and G.
- ^④ Tapped for 1-inch conduit on each end.

Heater Selection

Motor Full Load Current	Maximum Fuse Amps	Catalog Number	Motor Full Load Current	Maximum Fuse Amps	Catalog Number	Motor Full Load Current	Maximum Fuse Amps	Catalog Number
Single-Phase Enclosed Starters ①								
0.28–0.29	1	FH03	1.90–2.10	7	FH22	9.59–10.40	35	FH40
0.30–0.33	1	FH04	2.11–2.32	8	FH23	10.41–11.30	35	FH41
0.34–0.36	1	FH05	2.33–2.54	8	FH24	11.40–12.20	40	FH42
0.37–0.40	1	FH06	2.55–2.79	9	FH25	12.30–13.50	45	FH43
0.41–0.45	1	FH07	2.80–3.07	10	FH26	13.60–14.90	50	FH44
0.46–0.50	1	FH08	3.08–3.36	10	FH27	15.00–16.00	50	FH45
0.51–0.56	1	FH09	3.37–3.68	10	FH28	16.10–17.10	60	FH46
0.57–0.63	2	FH10	3.69–4.03	10	FH29	17.20–18.30	60	FH47
0.64–0.70	2	FH11	4.04–4.40	15	FH30	18.40–19.70	70	FH48
0.71–0.78	2	FH12	4.41–4.81	15	FH31	19.80–21.20	70	FH49
0.79–0.86	2	FH13	4.82–5.26	15	FH32	21.30–22.80	80	FH50
0.87–0.95	3	FH14	5.27–5.74	15	FH33	22.90–24.50	88	FH51
0.96–1.04	3	FH15	5.75–6.26	20	FH34	24.60–26.40	90	FH52
1.05–1.14	3	FH16	6.27–6.83	20	FH35	26.50–28.50	90	FH53
1.15–1.25	4	FH17	6.84–7.45	25	FH36	28.60–30.80	100	FH54
1.26–1.39	4	FH18	7.46–8.11	25	FH37	30.90–33.30	110	FH55
1.40–1.54	5	FH19	8.12–8.81	30	FH38	33.40–36.00	125	FH56
1.55–1.71	5	FH20	8.82–9.58	30	FH39	36.10–38.90	125	FH57
1.72–1.89	6	FH21						
Three-Phase Enclosed Starters ②								
0.25–0.26	1	FH03	1.51–1.66	5	FH21	7.12–7.73	25	FH38
0.27–0.29	1	FH04	1.67–1.84	5	FH22	7.74–8.40	25	FH39
0.30–0.32	1	FH05	1.85–2.03	7	FH23	8.41–9.12	30	FH40
0.33–0.35	1	FH06	2.04–2.23	7	FH24	9.13–9.89	35	FH41
0.36–0.39	1	FH07	2.24–2.45	8	FH25	9.90–10.70	35	FH42
0.40–0.44	1	FH08	2.46–2.69	9	FH26	10.80–11.80	40	FH43
0.45–0.49	1	FH09	2.70–2.95	10	FH27	11.90–13.00	45	FH44
0.50–0.55	1	FH10	2.96–3.23	10	FH28	13.10–14.00	50	FH45
0.56–0.61	2	FH11	3.24–3.53	10	FH29	14.10–15.00	50	FH46
0.62–0.68	2	FH12	3.54–3.85	10	FH30	15.10–16.10	50	FH47
0.69–0.75	2	FH13	3.86–4.22	10	FH31	16.20–17.30	60	FH48
0.78–0.83	2	FH14	4.23–4.61	15	FH32	17.40–18.60	60	FH49
0.84–0.91	3	FH15	4.62–5.03	15	FH33	18.70–20.00	70	FH50
0.92–1.00	3	FH16	5.04–5.49	15	FH34	20.10–21.50	70	FH51
1.01–1.10	3	FH17	5.50–5.99	20	FH35	21.60–23.20	80	FH52
1.11–1.22	4	FH18	6.00–6.53	20	FH36	23.30–25.00	80	FH53
1.23–1.35	4	FH19	6.54–7.11	25	FH37	25.10–26.80	90	FH54
1.36–1.50	5	FH20						

Notes

① Single-phase starters require two overload heaters.

② Three-phase starters require three overload heaters.

FH series heaters are for type B100 manual motor starters. Heater element selection is based on motor nameplate's listed full load amperes.

Trip rating of this series of elements is 125% of minimum motor full load amperes listed for the element.

When motor and overload relay are in the same ambient and the service factor of the motor is 1.15 to 1.25, select heaters from the heater selection table.

If the service factor is 1.0 or less (including zero), or a maximum of 115% protection is desired, select a heater one size smaller than indicated for the amperage range required.

Accessories

Accessories

Description	Catalog Number
Field Mounting Kits	
Auxiliary contact	
1NO	B1A
1NC	B1B
Red pilot light	
120/60 (Type 1 enclosed only)	LK-21
208-240/6 (Type 1 enclosed only)	LK-22
480-600/60 (Type 1 enclosed only)	LK-26
For Type 4 and 12 Enclosures Only	
Red pilot light	
120V	LK-41
240V	LK-42

Options

Factory Modifications

Description	Catalog Number ^① Suffix
Pushbutton operator (open and Type 1 only)	A
Without lockoff (open only)	X

Technical Data

Specifications

NEMA Size	Maximum hp for AC Ratings ^②			Maximum hp for DC Ratings	
	120 Vac	208–240 Vac	480–600 Vac	115 Vdc	230 Vdc
Two-Pole, Single-Phase					
M-0	1	2	—	1	1-1/2
M-1	2	3	—	1-1/2	2
Three-Pole, Three-Phase					
M-0	2	3	5	—	—
M-1	3	7-1/2	10	—	—

Notes

^① Add suffix letter to starter catalog number. Example: B100MOCA.

^② Ratings up to 3 hp, three-phase are suitable for group fusing.

11.2

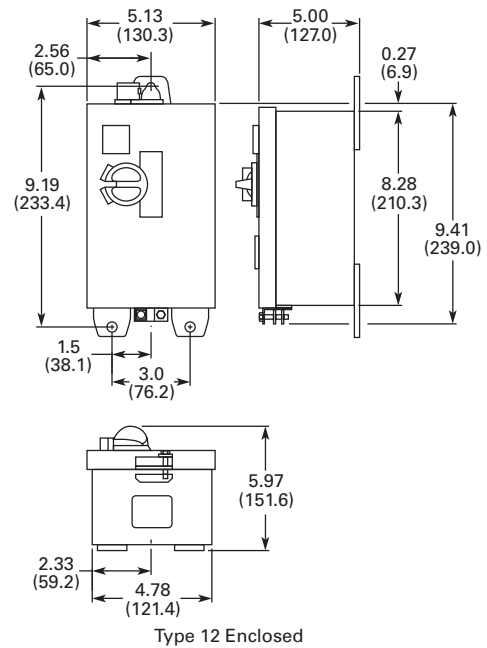
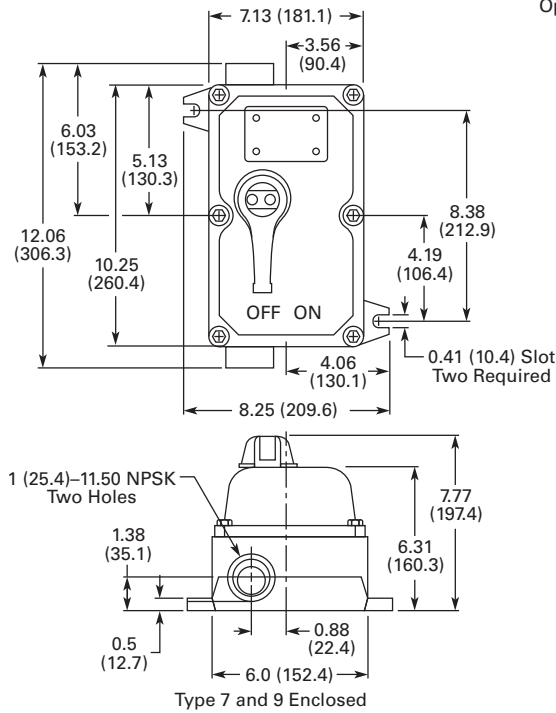
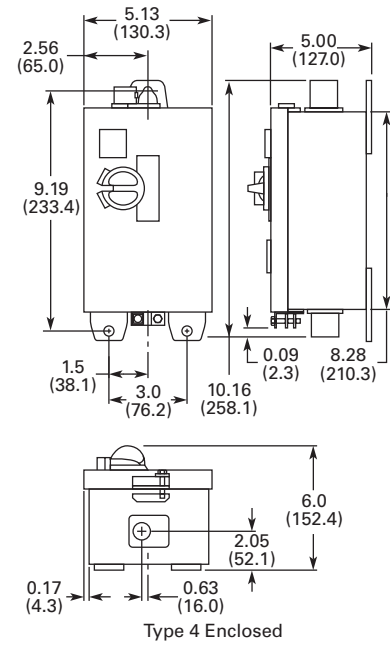
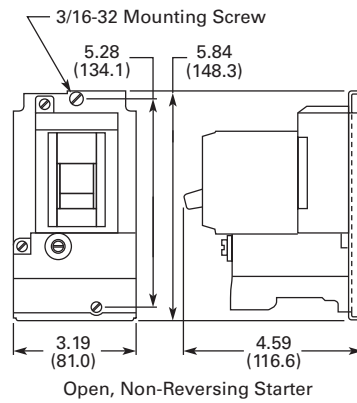
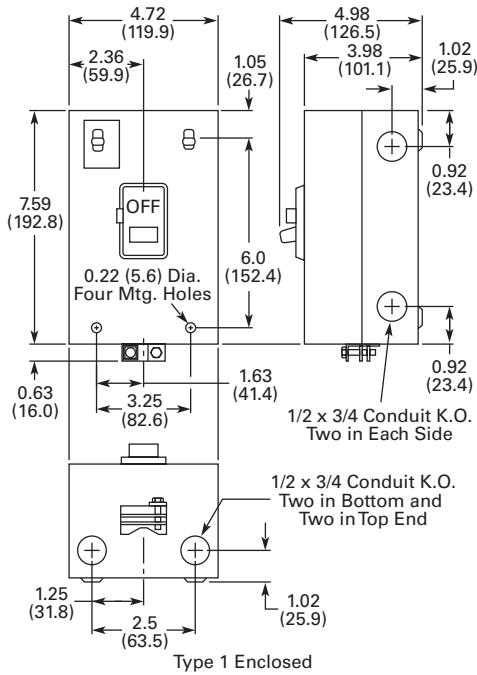
Manual Motor Control

Single- and Three-Phase Starters

Dimensions

Approximate Dimensions in Inches (mm)

Type B100 Single- and Three-Phase Starters



EMS Panels



12.1 EMS Panels

- Product Description V10-T12-2
- Application Description V10-T12-2
- Features and Benefits V10-T12-2
- Standards and Certifications..... V10-T12-2
- Product Selection V10-T12-3

EMS Panels



Contents

Description

EMS Panels

Product Selection

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Product Description

Safety is a top priority in many manufacturing plants. Existing equipment used in manufacturing applications may not have the necessary hardware that minimizes risks associated with operation and maintenance.

The EMS panel provides a simple solution to enhance the safety of existing equipment, minimizing risk to operators and increasing overall safety of the equipment.

Application Description

Most smaller equipment and older equipment are operated by a maintained ON/OFF control switch. A power loss when the control switch in the ON position could result in unprepared or unintended operation when the power is restored. This could put operators at risk.

Additionally, most older or smaller equipment do not include an emergency stop operator, which provides a means to more easily stop the machine operation in the event of an emergency.

Machinery should also be equipped with a disconnect means that can be padlocked in the OFF position during maintenance activities. This prevents operation of the panel while the equipment is being serviced.

The EMS panel is designed to be retrofitted to existing equipment.

Features and Benefits

The EMS panel consists of

- Small control panel
- Pushbutton control station with a whip
- Disconnect means with lock-out capability (provided on primary control panel)
- Motor overload protection (to protect the motor from damage due to overuse or excess heat)
- A pushbutton control station with a four foot whip for easy installation at a location appropriate for the operator's control
 - Pushbutton control station includes a momentary start button (requires equipment to be restarted should a power loss occur)
 - Stop button for normal stopping of the equipment during operation
 - Emergency stop with bold red and yellow colors that is larger than the start/stop operator (allows for increased visibility and access should an emergency occur)

Standards and Certifications

The panel is rated UL508A, and includes a self-protected, combination motor controller.

Additional short-circuit protection (such as fuses or a breaker) is not required.

- UL rated



Need a Similar but More Custom Solution?

Eaton's Control Panel Flex Center can help by designing a specific solution for your needs. For these requests, please contact the Control Panel Flex Center at 216-265-3291.

Product Selection

To select an EMS panel, chose the catalog number from the column of the appropriate circuit voltage and the row with the operational current of the

equipment. The equipment voltage and current is typically found on the equipment electrical label or in the equipment manual.

Note: 480V and 600V EMS panels include a control power transformer that steps down the control voltage to 120 Vac.

EMS with Control Station



EMS Panels with Control Station and Whip

FLA Size	Power Circuit Voltage				
	120 Vac Catalog Number	208 Vac Catalog Number	240 Vac Catalog Number	480 Vac Catalog Number	600 Vac Catalog Number
0.1 to 0.16	EMS03D5ABA	EMS03D5EBA	EMS03D5BBA	EMS03D5CBA	EMS03D5DBA
0.16 to 0.25	EMS03D5ABB	EMS03D5EBB	EMS03D5BBB	EMS03D5CBB	EMS03D5DBB
0.25 to 0.4	EMS03D5ABC	EMS03D5EBC	EMS03D5BBC	EMS03D5CBC	EMS03D5DBC
0.4 to 0.63	EMS03D5ABD	EMS03D5EBD	EMS03D5BBD	EMS03D5CBD	EMS03D5DBD
0.63 to 1	EMS03D5ABE	EMS03D5EBE	EMS03D5BBE	EMS03D5CBE	EMS03D5DBE
1 to 1.6	EMS03D5ABF	EMS03D5EBF	EMS03D5BBF	EMS03D5CBF	EMS03D5DBF
1.6 to 2.5	EMS03D5ABG	EMS03D5EBG	EMS03D5BBG	EMS03D5CBG	EMS03D5DBG
2.5 to 4	EMS03D5ABH	EMS03D5EBH	EMS03D5BBH	EMS03D5CBH	EMS03D5DBH
4 to 6.3	EMS03D5ABJ	EMS03D5EBJ	EMS03D5BBJ	EMS03D5CBJ	EMS03D5DBJ
6.3 to 10	EMS03D5ABK	EMS03D5EBK	EMS03D5BBK	EMS03D5CBK	EMS03D5DBK
8 to 12	EMS03D5ABL	EMS03D5EBL	EMS03D5BBL	EMS03D5CBL	EMS03D5DBL
10 to 16	EMS03H5ABM	EMS03H5EBM	EMS03H5BBM	EMS03H5CBM	EMS03H5DBM
16 to 20	EMS03H5ABN	EMS03H5EBN	EMS03H5BBN	EMS03H5CBN	EMS03H5DBN
20 to 25	EMS03H5ABQ	EMS03H5EBQ	EMS03H5BBQ	EMS03H5CBQ	EMS03H5DBQ
25 to 32	EMS03H5ABR	EMS03H5EBR	EMS03H5BBR	EMS03H5CBR	EMS03H5DBR

EMS "All-in-One"



EMS "All-in-One" Panels

FLA Size	Power Circuit Voltage				
	120 Vac Catalog Number	208 Vac Catalog Number	240 Vac Catalog Number	480 Vac Catalog Number	600 Vac Catalog Number
0.1 to 0.16	EMS02D5ABA	EMS02D5EBA	EMS02D5BBA	EMS02D5CBA	EMS02D5DBA
0.16 to 0.25	EMS02D5ABB	EMS02D5EBB	EMS02D5BBB	EMS02D5CBB	EMS02D5DBB
0.25 to 0.4	EMS02D5ABC	EMS02D5EBC	EMS02D5BBC	EMS02D5CBC	EMS02D5DBC
0.4 to 0.63	EMS02D5ABD	EMS02D5EBD	EMS02D5BBD	EMS02D5CBD	EMS02D5DBD
0.63 to 1	EMS02D5ABE	EMS02D5EBE	EMS02D5BBE	EMS02D5CBE	EMS02D5DBE
1 to 1.6	EMS02D5ABF	EMS02D5EBF	EMS02D5BBF	EMS02D5CBF	EMS02D5DBF
1.6 to 2.5	EMS02D5ABG	EMS02D5EBG	EMS02D5BBG	EMS02D5CBG	EMS02D5DBG
2.5 to 4	EMS02D5ABH	EMS02D5EBH	EMS02D5BBH	EMS02D5CBH	EMS02D5DBH
4 to 6.3	EMS02D5ABJ	EMS02D5EBJ	EMS02D5BBJ	EMS02D5CBJ	EMS02D5DBJ
6.3 to 10	EMS02D5ABK	EMS02D5EBK	EMS02D5BBK	EMS02D5CBK	EMS02D5DBK
8 to 12	EMS02D5ABL	EMS02D5EBL	EMS02D5BBL	EMS02D5CBL	EMS02D5DBL
10 to 16	EMS02H5ABM	EMS02H5EBM	EMS02H5BBM	EMS02H5CBM	EMS02H5DBM
16 to 20	EMS02H5ABN	EMS02H5EBN	EMS02H5BBN	EMS02H5CBN	EMS02H5DBN
20 to 25	EMS02H5ABQ	EMS02H5EBQ	EMS02H5BBQ	EMS02H5CBQ	EMS02H5DBQ
25 to 32	EMS02H5ABR	EMS02H5EBR	EMS02H5BBR	EMS02H5CBR	EMS02H5DBR

Enclosure Options



13.1 Enclosure Options

Overview	V10-T13-2
Non-Metallic Enclosures	V10-T13-2
316 Stainless Steel Enclosures	V10-T13-3
Type 3R Stainless Steel Enclosures	V10-T13-3
Type 7/9 Explosion Proof Enclosures	V10-T13-3
Paint Options	V10-T13-3
OEM Panel Solutions	V10-T13-4
Catalog Number Selection	V10-T13-4

13.1

Alternate Enclosures

Enclosure Options

Enclosure Options



Overview

Eaton's packaged control line offers a full line of enclosure options. Application and environmental requirements can change from location to location, therefore so do the enclosure sizes and types. This section of the catalog discusses some of the capabilities of the packaged control line. For other applications or enclosure options, refer to the product specific sections of this catalog or contact your local distributor.

Non-Metallic Enclosures

Eaton's packaged control product line offers a full line of nonmetallic enclosures for your application needs. This includes the NEMA, lighting, soft starter and custom product lines.

Features

- Designed to meet UL, CSA and CE standards for enclosures
- Type 4X enclosure rating
- Opaque and transparent covers available in most styles
- Available with gasketed tops
- Available with hinged cover options
- Suitable for use in indoor and outdoor applications

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316 Stainless Steel Enclosures	V10-T13-3
Type 3R Stainless Steel Enclosures	V10-T13-3
Type 7/9 Explosion Proof Enclosures	V10-T13-3
Paint Options	V10-T13-3
OEM Panel Solutions	V10-T13-4
Catalog Number Selection	V10-T13-4

Options

- Types of covers: screw-on or hinged
- Transparent or opaque covers in most versions
- DIN rail mounting or panel mounting
- Additional holes/knockouts can be added for easy installation
- Cover control
- Oversized enclosures
- Type 1, 12 and 3R versions

For ordering this option, change the 7th digit in the catalog number to a **5** (that is, ECN222**1**AAF becomes ECN222**5**AAF).

316 Stainless Steel Enclosures

Many people believe that stainless steel is not susceptible to corrosion. While stainless steel greatly improves corrosion resistance, it is still potentially susceptible to corrosion. Certain chemicals, salts, chlorides and acid can corrode stainless steel. Corrosion resistance varies among the different grades of stainless steel due to the chemical composition of the individual grade and is the result of the formation of an oxide film on the surface of the metal. This film can be damaged when used in harsh environments containing chlorides, chemicals and salts, which attack the film and lead to some types of corrosion.

There are many forms of corrosion beyond that of well-known rust. Other common forms of corrosion that may come into play at customer installations include galvanic or two-metal corrosion and pitting corrosion. Galvanic corrosion occurs when two dissimilar metals are placed in contact or are electrically connected. A potential difference produces electron flow between the metals that results in increased corrosion of the less corrosion-resistant metal and a decrease in corrosion of the more

resistant material than would occur if the metals were not in contact. Pitting is typically in the form of localized attack that creates holes in the metal. These holes may be very small and difficult to detect due to accompanying rust. 304-Grade stainless steel is susceptible to this form of corrosion in certain atmospheres.

Fortunately, there are options available for applications where 304-Grade stainless steel is susceptible to corrosion. Enclosures manufactured with 316-Grade stainless steel offer even better corrosion resistance to most chemicals, salts and acids and are better suited for installation in marine atmospheres. In marine atmospheres, 304-Grade stainless steel may develop staining with patches of yellowish-brown film. 316-Grade stainless steel yields improved pitting corrosion resistance versus other grades of stainless (for example, 304-Grade) where brines, highway de-icing salts or chlorides are present.

For ordering this option, change the 7th digit in the catalog number to a **9** (that is, ECN222**1**AAF becomes ECN222**9**AAF).

Type 3R Stainless Steel Enclosures

Often, customers are looking for enclosures to install outdoors where they will be exposed to harsh environmental conditions including salt, acid rain, chemical run offs and mist. In these applications, the unit will not be exposed to high-pressure wash downs. Therefore, the customer does not need a fully rated Type 4 enclosure, but rather a product with a higher resistance to corrosion than standard carbon steel. This product design meets the customers' needs.

Pump panel applications will be the primary use for the Type 3R stainless steel option. It offers customers the opportunity to replace their carbon steel Type 3R enclosures with a stainless steel unit that will help resist rusting. For pump panels (ECN54/55, ECT54/55 and ECP54/55), this option is especially attractive.

For ordering this option, change the 7th digit in the catalog number to an **A** (that is, ECN222**1**AAF becomes ECN222**A**AAF).

Type 7/9 Explosion Proof Enclosures

Some applications are exposed to areas in which hazardous materials are handled or stored. These environments require explosion proof enclosures.

Class I locations require the type of explosion-proof electrical equipment where, in case of explosion, the hazardous flames would be contained. In Class II or III locations, dust, fibers and flyings are the combustible materials and it is only necessary to keep these materials out of the electrical equipment (where an arc may take place) and to maintain safe external temperatures.

Further refinement created for the purpose of testing and approving electrical equipment divides Class I into four separate designations: A, B, C, D and Class II into three separate designations; E, F and G. Underwriters Laboratories test and approve electrical equipment for the specific groups.

For more descriptions on code and class definitions, see **Tab 9**.

For ordering this option, change the 7th digit in the catalog number to a **6** for bolted design, and **7** for threaded design. (that is, ECN222**1**AAF becomes ECN222**7**AAF).

Paint Options



With a full line paint shop, we can offer custom solutions for our customers. In many cases this includes custom colors for your panels. This helps in establishing brand identity for our OEM customers and differentiates them from their competition.

13.1 Alternate Enclosures

Enclosure Options

OEM Panel Solutions

With one of the largest steel fabrication shops available, we are able to quickly design a custom enclosure for your company's particular needs. Also, with our own custom paint facilities, we can customize the look and feel of your control panels to meet your corporate image.



With our large staff of professional engineers, we are able to quickly and efficiently design your panels for you, using the latest technologies.

Our abilities include:

- AutoCAD
- Mechanical Desktop/ Inventor
- Mechanical Engineering
- Electrical Engineering
- UL Test Certification
- Short-Circuit/Thermal Testing
- Prototyping

Due to our focus on control panels, we have become highly efficient and strive to exceed our customer expectations on performance, quality and delivery.



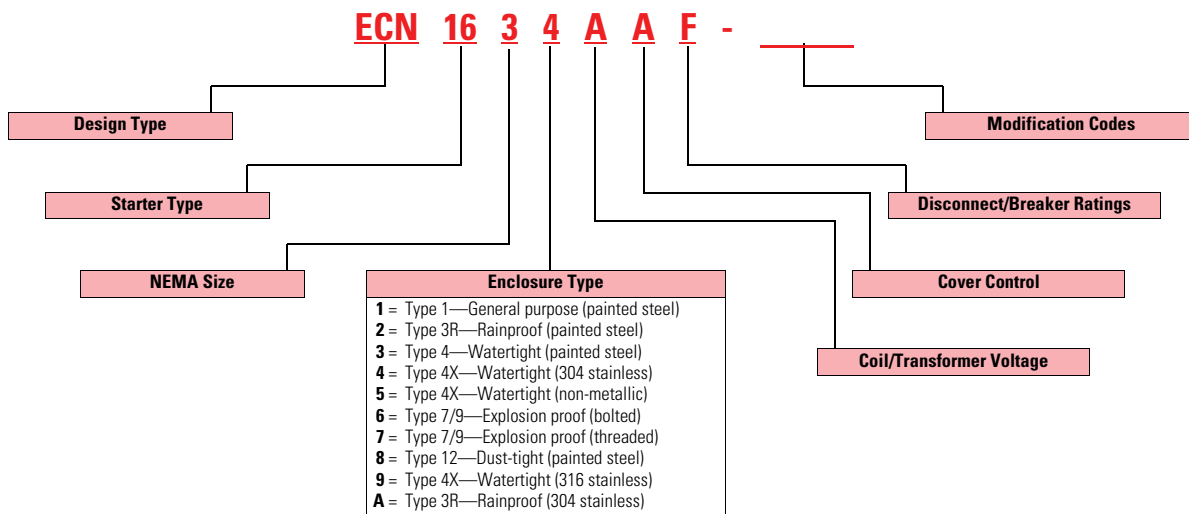
Eaton can offer the OEM a wide range of solutions for your control and production needs, including:

- Agency testing and certifications
- Flexible ordering schedules and volumes
- Wide range of options for value selling by the OEM
- Fast prototyping
- Just-in-time delivery
- Drop-in technology for their systems
- On-site inspections

13

Catalog Number Selection

Enclosures



14.1 Box References

NEMA Full Voltage Control—Freedom	V10-T14-2
Multispeed Starters—Freedom	V10-T14-5
IEC Control— XT	V10-T14-6
Lighting Contactors	V10-T14-7
Solid-State Reduced Voltage Starters	V10-T14-9
Reduced Voltage Starters—Freedom	V10-T14-10
Pump Panels	V10-T14-11
Duplex Pump Panels	V10-T14-11
HVAC Control	V10-T14-11
Vacuum Break	V10-T14-12

14.2 Box Dimensions

Box Dimensions	V10-T14-13
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Locating dimensions for an enclosed control device is simple:

1. Find the device's NEMA Size/IEC Frame Size/Lighting Poles within the Box References pages and read across to its Box No.
2. Find that Box No. (numeral or letter) in the Box Dimension pages.

NEMA Full Voltage Control—Freedom

Contactors

Type 1 Freedom Contactors

Non-Reversing Contactors—without Control Power Transformers

NEMA Size (Poles)	Box No.	Shipping Weight Lbs (kg)
00 (2P, 3P, 4P)	1	5.25 (2.4)
0 (2P, 3P)	1	5.25 (2.4)
1 (2P, 3P, 4P, 5P)	1	7.93 (3.6)
2 (2P, 3P, 4P, 5P)	1	8.5 (3.9)
3 (2P, 3P)	4	35 (16)
4 (2P, 3P)	4	47 (21)
5	10	113 (51)
6	F1E	325 (148)
7	F1E	①
8	F1E	①
9	F1E	①

Non-Reversing Contactors—with Control Power Transformers

NEMA Size (Poles)	Box No.	Shipping Weight Lbs (kg)
00 (2P, 3P, 4P)	2	12 (5.4)
0 (2P, 3P)	2	12 (5.4)
1 (2P, 3P, 4P, 5P)	2	12.2 (5.5)
2 (2P, 3P, 4P, 5P)	2	12.8 (5.8)
3 (2P, 3P)	4	40 (18)
4 (2P, 3P)	4	52 (24)
5	10	120 (54)
6	F1E	335 (152)
7	F1E	①
8	F1E	①
9	F1E	①

Three-Pole Reversing Contactors—without Control Power Transformers

NEMA Size (Poles)	Box No.	Shipping Weight Lbs (kg)
00	1	7.8 (3.5)
0	1	8 (3.6)
1	3	11 (5.0)
2	3	12 (5.4)
3	4	67 (30)
4	4	154 (70)
5	10	170 (77)
6	F1E	425 (193)
7	F1E	①
8	F1E	①
9	F2E	①

Type 3R, 4/4X, 12 Freedom Contactors

Non-Reversing Contactors—without Control Power Transformers

NEMA Size (Poles)	Box No.	Shipping Weight Lbs (kg)
00	5	14 (6.4)
0 (2P, 3P, 4P)	5	14 (6.4)
1 (2P, 3P, 4P, 5P)	5	15 (6.8)
2 (2P, 3P, 4P, 5P)	5	15.5 (7.0)
3 (2P, 3P)	8	45 (20)
4 (2P, 3P)	8	56 (25)
5	10	140 (64)
6	F1E	385 (175)
7	F1E	①
8	F1E	①
9	F1E	①

Non-Reversing Contactors—with Control Power Transformers

NEMA Size (Poles)	Box No.	Shipping Weight Lbs (kg)
00	5	18 (8.2)
0 (2P, 3P, 4P)	5	18 (8.2)
1 (2P, 3P, 4P, 5P)	6	19 (8.6)
2 (2P, 3P, 4P, 5P)	6	19.5 (8.9)
3 (2P, 3P)	8	52 (24)
4 (2P, 3P)	8	63 (29)
5	10	147 (67)
6	F1E	405 (184)
7	F1E	①
8	F1E	①
9	F1E	①

Three-Pole Reversing Contactors—with or without Control Power Transformers

NEMA Size (Poles)	Box No.	Shipping Weight Lbs (kg)
00	6	18 (8.2)
0	6	18 (8.2)
1	6	19 (8.6)
2	6	19 (8.6)
3	8	47 (21)
4	9	69 (31)
5	10	170 (77)
6	F1E	495 (225)
7	F1E	①
8	F1E	①
9	F2E	①

Notes

All Type 7 and 9, see **Tab 9**.

① Consult factory.

Non-Combination Starters

Type 1 Freedom Non-Combination Starters

Non-Reversing Starters—without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
00	1	7 (3.2)
0	1	7.1 (3.2)
1	1	7.9 (3.6)
2 (AN19)	1	11.5 (5.2)
2 (AN16)	2	8.5 (3.9)
3	4	35 (16)
4	4	47 (21)
5	10	139 (63)
6	F1E	360 (163)
7	F1E	⓪
8	F1E	⓪
9	F1E	⓪

Non-Reversing Starters—with Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
00	3	15 (6.8)
0	3	15 (6.8)
1	3	16 (7.3)
2	3	16.2 (7.4)
3	4	42 (19)
4	4	54 (25)
5	10	146 (66)
6	F1E	385 (175)
7	F1E	⓪
8	F1E	⓪
9	F1E	⓪

Reversing Starters—without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
00	2	8 (3.6)
0	2	8 (3.6)
1	3	13 (5.9)
1 with top adders	3	13.4 (6.1)
2	3	15 (6.8)
3	4	43 (20)
4	9	65 (30)
5	10	165 (75)
6	F1E	450 (204)
7	F1E	⓪
8	F2E	⓪
9	F2E	⓪

Reversing Starters—with Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
00 with top adders	3	15 (6.8)
0	3	15 (6.8)
1 with top adders	3	17 (7.7)
2	3	19 (8.6)
3	4	50 (23)
4	9	72 (33)
5	10	172 (78)
6	F1E	495 (225)
7	F1E	⓪
8	F2E	⓪
9	F2E	⓪

Type 3R, 4/4X, 12 Freedom Non-Combination Starters

Non-Reversing Starters—without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0	5	14.3 (6.5)
1	5	15.3 (6.9)
2	6	16 (7.3)
3	8	46 (21)
4	8	60 (27)
5	10	150 (68)
6	F1E	415 (188)
7	F1E	⓪
8	F1E	⓪
9	F1E	⓪

Non-Reversing Starters—with Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0	6	18 (8.2)
1	6	19 (8.6)
2	6	20 (9)
3	8	53 (24)
4	8	67 (30)
5	10	157 (71)
6	F1E	⓪
7	F1E	⓪
8	F1E	⓪
9	F1E	⓪

Reversing Starters—with or without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0	7	18.5 (8.4)
1	7	19.5 (8.9)
2	7	21 (10)
3	8	48 (22)
4	9	72 (33)
5	10	175 (79)
6	F1E	525 (238)
7	F1E	⓪
8	F2E	⓪
9	F2E	⓪

Notes

All Type 7 and 9, see **Tab 9**.

⓪ Consult factory.

Combination Starters—NEMA Size**Type 1 Freedom and A200 Combination Starters****Non-Reversing—with and without Control Power Transformers**

NEMA Size (Device)	Box No.	Shipping Weight Lbs (kg)
0	A	37 (17)
1	A	38 (17)
2	A	39 (18)
3	C	72 (33)
4 (HMCP)	C	90 (41)
4 (disconnect switch)	D	150 (68)
5	E	180 (82)
6	F1E	435 (197)
7	F2E	①
8	F2E	①
9	F2E	①

Reversing—with and without Control Power Transformers

NEMA Size (Device)	Box No.	Shipping Weight Lbs (kg)
0	B	42 (19)
1	B	43 (20)
2	B	44 (20)
3	C	84 (38)
4	D	173 (79)
5	F1E	①
6	F1E	550 (250)
7	F2E	①
8	F2E	①
9	①	①

Non-Reversing—Oversized

NEMA Size (Device)	Box No.	Shipping Weight Lbs (kg)
0-1-2	B	44 (20)

Type 1 Freedom Non-Reversing Combination Starters—Narrow Enclosure**NEMA 1 Enclosed**

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0-1-2	I	35 (16)

NEMA 12 Enclosed

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0-1-2	I	36 (16)

NEMA 12 Enclosed with Safety Door Interlock

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0-1-2	I	37 (17)

Type 3R, 4/4X, 12 Freedom Combination Starters**Non-Reversing—with and without Control Power Transformers**

NEMA Size (Device)	Box No.	Shipping Weight Lbs (kg)
0	A	37 (17)
1	A	38 (17)
2	A	39 (18)
3	C	72 (33)
4 (HMCP)	C	90 (41)
4 (disconnect switch)	D	150 (68)
5	E	180 (82)
6	F1E	435 (197)
7	F2E	①
8	F2E	①
9	F2E	①

Reversing—with and without Control Power Transformers

NEMA Size (Device)	Box No.	Shipping Weight Lbs (kg)
0	B	42 (19)
1	B	43 (20)
2	B	44 (20)
3	C	84 (38)
4	D	173 (79)
5	E	550 (250)
6	F1E	①
7	F2E	①
8	F2E	①
9	②	①

Non-Reversing—Oversized

NEMA Size (Device)	Box No.	Shipping Weight Lbs (kg)
0-1-2	B	44 (20)

NotesAll Type 7 and 9, see **Tab 9**.

① Consult factory.

Multispeed Starters—Freedom**Non-Combination Multispeed Starters****Class 33: Two-Speed Two-Winding**

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
0	2	8 (3.6)
1–2	3	11 (5.0)
3	4	67 (30)
4	9	154 (70)
5	E	170 (77)
6	F1E	335 (152)
Type 3R, 4X, 12		
0	6	18 (8.2)
1–2	7	18 (8.2)
3	8	75 (34)
4	9	170 (77)
5	E	190 (86)
6	F1E	375 (170)

Class 34: Two-Speed One-Winding, Constant or Variable Torque

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
0–2	3	19 (8.6)
3	9	50 (23)
4	E	270 (123)
5	F1E	360 (163)
6	F1E	①
Type 3R, 4X, 12		
0–2	7	28 (13)
3	9	58 (26)
4	E	278 (126)
5	F1E	370 (168)
6	F1E	①

Class 35: Two-Speed One-Winding, Constant Horsepower

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
0–2	3	19 (8.6)
3	9	50 (23)
4	E	270 (123)
5	F1E	360 (163)
6	F1E	①
Type 3R, 4X, 12		
0–2	7	28 (13)
3	9	58 (26)
4	E	278 (126)
5	F1E	370 (168)
6	F1E	①

Combination Multispeed Starters**Class 36: Two-Speed Two-Winding—with Disconnect Switch**

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
0–2	B	15 (6.8)
3	C	82 (37)
4	D	174 (79)
5	F1E	190 (86)
6	F1E	355 (161)
Type 3R, 4X, 12		
0–2	B	22 (10)
3	C	90 (41)
4	D	190 (86)
5	F1E	210 (95)
6	F1E	375 (170)

Class 39: Two-Speed Two-Winding—with HMCP

Same as Class 36 table.

Class 37: Two-Speed One-Winding, Constant or Variable Torque—with Disconnect

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
0–2	B	27 (12)
3	C	102 (46)
4	E	320 (145)
5	F1E	428 (194)
6	F1E	①
Type 3R, 4X, 12		
0–2	B	35 (16)
3	C	110 (50)
4	E	327 (148)
5	F1E	438 (199)
6	F1E	①

Class 38: Two-Speed One-Winding, Constant Horsepower—with Disconnect

Same as Class 37 table.

Class 40: Two-Speed One-Winding, Constant or Variable Torque—with Disconnect

Same as Class 37 table.

Class 41: Two-Speed One-Winding, Constant Horsepower—with HMCP

Same as Class 37 table.

NotesAll Type 7 and 9, see **Tab 9**.

① Consult factory.

IEC Control—XT

Note: Contact Eaton for Box Dimensions not shown on **Pages V10-T14-13 to V10-T14-31.**

Type 1, 3R, 4, 4X, 12 XT Non-Combination Starters

Class 09: FVNR Starters (Non-Combination)

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/7-32 A	1	3.2 (7)
B-H/7-32 A	5A	6.4 (14)
B-H/7-32 A	5P	4.5 (10)
J-L/40-65 A	5A	18.6 (41)
J-L/40-65 A	5P	17.7 (39)
M-Q/80-150 A	8	15.9 (35)

Class 10: FVR Starters (Non-Combination)

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/7-32 A	1	5.9 (13)
B-H/7-32 A	5A	6.8 (15)
B-H/7-32 A	5P	5.0 (11)
J-L/40-65 A	2	18.2 (40)
J-L/40-65 A	6A	24.5 (45)
J-L/40-65 A	6P	19.1 (42)
M-Q/80-125 A	4	22.7 (50)
M-Q/80-150 A	8	18.6 (41)

Class 11: FVNR Starters (Non-Combination with CPT)

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/7-32 A	2	6.4 (14)
B-H/7-32 A	5A	8.4 (19)
B-H/7-32 A	5P	6.6 (15)
J-L/40-65 A	2	19.5 (43)
J-L/40-65 A	6A	23.2 (51)
J-L/40-65 A	6P	21.8 (48)
M-Q/80-125 A	4	23.6 (52)
M-Q/80-150 A	8	24.1 (53)

Type 1, 3R, 4, 4X, 12 XT Fusible/Non-Fusible Starters

Class 19: FVNR Combination with Disconnect Switch

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-J/7-40 A	7A	8.6 (19)
B-J/7-40 A	7P	6.8 (15)
K-N/50-105 A	8	24.1 (53)
K-N/50-105 A	8P	22.2 (49)

Class 19: FVNR Combination with Disconnect Switch and Fuseblock

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-J/7-40 A	7A	13.6 (30)
B-J/7-40 A	7P	11.8 (26)
K-M/65-85 A	8	25 (55)
K-M/65-85 A	8P	23.2 (51)

Class 20: FVR Combination with Disconnect Switch

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-J/7-40 A	7A	9.1 (20)
B-J/7-40 A	7P	7.3 (16)
K-N/50-105 A	8	26.3 (58)
K-N/50-105 A	8P	25 (55)

Class 20: FVR Combination with Disconnect Switch and Fuseblock

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-J/7-40 A	7A	14.1 (31)
B-J/7-40 A	7P	12.3 (27)
K-M/65-85 A	8	25.4 (56)
K-M/65-85 A	8P	23.6 (52)

Type 1, 3R, 4, 4X, 12 XT HMCP Combination Starters

Class 25: FVNR Combination with HMCP

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/7-32 A	7A	10 (23)
B-H/7-32 A	7P	8.2 (18)
J-L/40-65 A	7A	11 (24)
J-L/40-65 A	7P	8.9 (20)
M-Q/80-125 A	8	31.8 (70)

Class 26: FVR Combination with HMCP

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/7-32 A	7A	12 (26)
B-H/7-32 A	7P	10 (22)
J-L/40-65 A	7A	13 (29)
J-L/40-65 A	7P	11 (25)
M-Q/80-125 A	8	31.8 (70)

Type 1, 3R, 4, 4X, 12 XT Combination Motor Controllers (CMCs)

Class 76: Self Protected Starter (CMC)

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/up to 32 A	K	6.8 (15)
B-H/up to 32 A	5P	5.4 (12)

Class 77: Self Protected Starter (CMC) with CPT

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/up to 32 A	K	9.5 (21)
B-H/up to 32 A	6P	7.0 (17)

Class 78: Reversing Self Protected Starter (CMC)

IEC Size (Frame/Amps)	Box No.	Shipping Weight kg (Lbs)
B-H/7-32 A	K	7.0 (16)
B-H/7-32 A	5P	5.2 (12)

Lighting Contactors

Non-Combination

Type 1 Non-Combination Lighting Contactors—Electrically Held—CN35

Non-Reversing Contactors—without Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
10 A (2P, 3P, 4P)	1	5 (2.3)
20 A (2P, 3P, 4P)	1	5.2 (2.4)
20 A (6P, 9P, 10P, 12P, 20P)	3	9 (4.1)
30 A (2P, 3P)	1	5.3 (2.4)
30 A (4P, 5P, 6P, 9P, 10P, 12P, 20P)	3	9.5 (4.3)
30 A (9P, 12P) with top adders	3	9.7 (4.4)
60 A (2P, 3P, 4P)	1	7 (3.2)
60 A (5P, 6P, 9P, 10P, 12P)	3	9.5 (4.3)
60 A (4P, 5P) with top adders	3	10 (4.5)
100 A (2P, 3P)	4	35 (16)
100 A (4P, 5P, 6P, 9P)	4	60 (27)
200 A (2P, 3P)	4	70 (32)
200 A (4P, 5P, 6P)	10	133 (60)
300 A (2P, 3P)	10	113 (51)
300 A (4P, 5P, 6P)	10	136 (62)
400 A (2P, 3P)	10	125 (57)

Non-Reversing Contactors—with Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
10 A (2P, 3P, 4P) with top adders	2	11 (5.0)
20 A (2P, 3P, 4P, 5P, 6P) with top adders	2	13.1 (5.9)
20 A (9P, 10P, 12P, 20P)	3	13.5 (6.1)
20 A (9P, 12P) with top adders	3	13.5 (6.1)
30 A (2P, 3P, 4P, 5P, 6P) with top adders	2	13.1 (5.9)
30 A (9P, 10P, 12P, 20P)	3	13.9 (6.3)
30 A (9P, 12P) with top adders	3	14.1 (6.4)
60 A (2P, 3P) with top adders	3	14 (6.4)
60 A (6P, 9P, 10P, 12P)	3	14 (6.4)
100 A (2P, 3P)	4	39 (18)
100 A (4P, 5P, 6P, 9P)	4	67 (30)
200 A (2P, 3P)	10	117 (53)
200 A (4P, 5P, 6P)	10	140 (64)
300 A (2P, 3P)	10	120 (54)
300 A (4P, 5P, 6P)	10	143 (65)
400 A (2P, 3P)	10	132 (60)

Type 1 Non-Combination Lighting Contactors—Magnetically Latched—A202

Non-Reversing Contactors—without Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2P, 3P, 4P, 5P)	2	8.5 (3.9)
30 A (6P, 8P, 10P, 12P)	3	13 (5.9)
30 A (20P)	4	35 (16)
60 A (2P, 3P, 4P, 5P)	2	8.7 (3.9)
60 A (6P, 8P, 10P, 12P)	3	13.5 (6.1)
60 A (20P)	4	40 (18)
100 A (2P, 3P, 4P, 5P)	4	40 (18)
100 A (6P, 8P, 10P, 12P)	9	85 (39)
100 A (20P)	9	100 (45)
200 A (2P, 3P, 4P, 5P)	4	46 (21)
200 A (6P, 8P, 10P, 12P)	9	95 (43)
200 A (20P)	9	110 (50)
300 A (2P, 3P)	10	115 (52)
400 A (2P, 3P)	10	125 (57)

Non-Reversing Contactors—with Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2P, 3P, 4P, 5P) with top adders	2	12.5 (5.7)
30 A (6P, 8P, 10P, 12P)	3	17 (7.7)
30 A (20P)	4	39 (18)
60 A (2P, 3P, 4P, 5P) with top adders	2	12.7 (5.8)
60 A (6P, 8P, 10P)	3	17.5 (7.9)
60 A (12P)	9	87 (39)
60 A (20P)	4	44 (20)
100 A (2P, 3P, 4P, 5P)	4	47 (21)
100 A (6P, 8P, 10P, 12P)	9	92 (42)
100 A (20P)	9	107 (49)
200 A (2P, 3P, 4P, 5P)	4	53 (24)
200 A (6P, 8P, 10P, 12P)	9	102 (46)
200 A (20P)	9	117 (53)
300 A (2P, 3P)	10	122 (55)
400 A (2P, 3P)	10	132 (60)

Type 1 Non-Combination Lighting Contactors—C30CN^①

Lighting Contactors—without Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2–12P)	2	9 (4.1)

Lighting Contactors—with Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2–12P)	2	13.5 (5.9)

Type 3R, 4X and 12 Non-Combination Lighting Contactors—C30CN^①

Lighting Contactors—without Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2–12)	6	14 (6.4)

Lighting Contactors—with Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2–12)	7	20 (9.1)

Type 3R, 4/4X, 12 Non-Combination Lighting Contactors—Electrically Held—CN35

Non-Reversing Contactors—without Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
10 A (2P, 3P, 4P, 5P, 6P)	5	12 (5.4)
10 A (9P, 10P, 12P, 20P)	7	20 (9.1)
20 A (2P, 3P, 4P, 5P)	5	12 (5.4)
20 A (6P)	5	14 (6.4)
20 A (9P, 10P, 12P, 20P)	7	20 (9.1)
30 A (2P, 3P, 4P)	5	13 (5.9)
30 A (5P, 6P)	6	14 (6.4)
30 A (9P, 10P, 12P, 20P)	7	20 (9.1)
60 A (2P, 3P, 4P)	5	13 (5.9)
60 A (5P, 6P)	6	16 (7.3)
60 A (9P, 10P, 12P)	7	22 (10)
100 A (2P, 3P)	8	49 (22)
100 A (4P, 5P, 6P, 9P)	8	57 (26)
200 A (2P, 3P)	8	110 (50)
300 A (2P, 3P)	10	113 (51)
400 A (2P, 3P)	10	125 (57)

Non-Reversing Contactors—with Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
10 A (2P, 3P, 4P, 5P, 6P)	5	16 (7.3)
10 A (9P, 10P, 12P, 20P)	7	20 (9)
20 A (2P, 3P, 4P, 5P)	5	16 (7.3)
20 A (6P, 9P, 10P, 12P, 20P)	7	24 (11)
30 A (2P, 3P, 4P)	6	18 (8.2)
30 A (5P, 6P)	6	18 (8.2)
30 A (9P, 10P, 12P, 20P)	7	24 (11)
60 A (2P, 3P)	6	21 (10)
60 A (4P, 5P, 6P)	6	23 (10)
60 A (9P, 10P, 12P)	7	22 (10)
100 A (2P, 3P)	8	56 (25)
100 A (4P, 5P, 6P, 9P)	8	64 (29)
200 A (2P, 3P)	8	117 (53)
300 A (2P, 3P)	10	120 (54)
400 A (2P, 3P)	10	132 (60)

Type 3R, 4/4X, 12 Non-Combination Lighting Contactors—Magnetically Latched—A202

Non-Reversing Contactors—without Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2P, 3P, 4P, 5P)	5	13 (5.9)
30 A (6P, 8P, 10P, 12P)	7	21 (10)
30 A (20P)	8	46 (21)
60 A (2P, 3P, 4P, 5P)	5	14 (6.4)
60 A (6P, 8P, 10P, 12P)	7	22 (10)
60 A (20P)	8	48 (22)
100 A (2P, 3P, 4P, 5P)	8	50 (23)
100 A (6P, 8P, 10P, 12P)	9	58 (26)
100 A (20P)	10	100 (45)
200 A (2P, 3P, 4P, 5P)	8	52 (24)
200 A (20P)	10	105 (48)
300 A (2P, 3P)	10	113 (51)
400 A (2P, 3P)	10	125 (57)

Notes

All Type 7 and 9, see **Tab 9**.

^① Consult factory for combination enclosures.

Non-Reversing Contactors—with Control Power Transformers

Ampere Size (Poles)	Box No.	Shipping Weight Lbs (kg)
30 A (2P, 3P, 4P, 5P) w/top adder	6	12.5 (5.7)
30 A (6P, 8P, 10P, 12P)	7	17 (7.7)
30 A (20P)	8	39 (18)
60 A (2P, 3P, 4P, 5P) w/top adder	6	12.7 (5.8)
60 A (6P, 8P, 10P)	7	17.5 (7.9)
60 A (12P)	9	87 (39)
60 A (20P)	8	44 (20)
100 A (2P, 3P, 4P, 5P)	8	47 (21)
100 A (6P, 8P, 10P, 12P)	9	92 (42)
100 A (20P)	9	107 (49)
200 A (2P, 3P, 4P, 5P)	8	53 (24)
200 A (6P, 8P, 10P, 12P)	9	102 (46)
200 A (20P)	9	117 (53)
300 A (2P, 3P)	10	122 (55)
400 A (2P, 3P)	10	132 (60)

Combination**Type 1 Combination Lighting Contactors****Electrically Held—Non-Reversing (3P Only)—with or without Control Power Transformers**

Ampere Size	Box No.	Shipping Weight Lbs (kg)
30 A	A	35 (16)
60 A	A	36 (16)
100 A	C	65 (30)
200 A with disconnect switch	D	110 (50)
200 A with thermal magnetic breaker	E	150 (68)
300 A	E	160 (73)
400 A	E	170 (77)

Type 3R, 4/4X, 12 Combination Lighting Contactors**Electrically Held—Non-Reversing (3P only)—with or without Control Power Transformers**

Ampere Size (Device)	Box No.	Shipping Weight Lbs (kg)
30 A	A	35 (16)
60 A	A	36 (16)
100 A	C	65 (30)
200 A with disconnect switch	D	110 (50)
200 A with thermal magnetic breaker	E	150 (68)
300 A	E	160 (73)
400 A	E	170 (77)

Solid-State Reduced Voltage Starters**Non-Combination Solid-State Reduced Voltage**

Rating	SSRV	Non-Combination Box No. ①
37 A	S801+/S811+	7A
66 A	S801+/S811+	7A
105 A	S801+/S811+	7A
135 A	S801+/S811+	B1
180 A	S801+/S811+	C
240 A	S801+/S811+	②
304 A	S801+/S811+	②
360 A	S801+/S811+	②
420 A	S801+/S811+	E
500 A	S801+/S811+	E
650 A	S801+/S811+	E
720 A	S801+/S811+	E
850 A	S801+/S811+	E
1000 A	S801+/S811+	F2E

Magnetically Latched—Non-Reversing (3P Only)—with or without Control Power Transformers

Ampere Size	Box No.	Shipping Weight Lbs (kg)
30 A	A	35 (16)
60 A	A	36 (16)
100 A	C	65 (30)
200 A with disconnect switch	D	110 (50)
200 A with thermal magnetic breaker	E	150 (68)
300 A	E	140 (64)
400 A	E	190 (86)

Magnetically Latched—Non-Reversing (3P Only)—with or without Control Power Transformers

Ampere Size (Device)	Box No.	Shipping Weight Lbs (kg)
30 A	A	35 (16)
60 A	A	36 (16)
100 A	C	65 (30)
200 A with disconnect switch	D	110 (50)
200 A with thermal magnetic breaker	E	150 (68)
300 A with disconnect switch	72 in	375 (170)
300 A with thermal magnetic breaker	E	160 (73)
400 A with disconnect switch	72 in	425 (193)
400 A with thermal magnetic breaker	E	210 (95)

Combination Solid-State Reduced Voltage

Rating	SSRV	Combination with Fuses Box No. ①	Combination with HMCP Box No. ①
37 A	S801+/S811+	B1	A1 ③
66 A	S801+/S811+	C	A1
105 A	S801+/S811+	D	B1
135 A	S801+/S811+	D	C
180 A	S801+/S811+	E	E
240 A	S801+/S811+	F1E	E
304 A	S801+/S811+	F1E	E
360 A	S801+/S811+	F1E	E
420 A	S801+/S811+	F1E	E
500 A	S801+/S811+	F1E	E
650 A	S801+/S811+	F1E	F1E
720 A	S801+/S811+	F1E	F1E
850 A	S801+/S811+	F1E	F1E
1000 A	S801+/S811+	F2E	F2E

Notes

All Type 7 and 9, see **Tab 9**.

① Enclosure space will also accommodate for an **IT** Power Supply, 2 four-pole relays, CPT, and terminal blocks. Also includes space for a DNA module or MOV.

② Contact Eaton for box dimensions not shown on **Pages V10-T14-13 to V10-T14-31**.

③ Same as footnote ①, but CPT is not included. Upsize to B1 enclosure to include space for a CPT and a full voltage bypass contactor.

Reduced Voltage Starters—Freedom**Type 1, 3R, 4/4X, 12 Freedom Reduced Voltage Enclosures****Class 42: Autotransformer—
Non-Combination**

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
2-4	E2	124 (56)
5	F1E	885 (402)
6 ^①	F1E	1220 (554)
6 ^②	F2E	1400 (636)
7	F2E	③
8	F2E	③
9	③	③
Type 3R, 4X, 12		
2-4	E2	149 (68)
5	F1E	1010 (459)
6 ^①	F1E	1345 (611)
6 ^②	F2E	1525 (692)
7	F2E	③
8	F2E	③
9	③	③

**Class 43: Autotransformer
with Disconnect**

Same as Class 42 table.

**Class 44: Autotransformer
with HMCP**

Same as Class 42 table.

**Class 45: Part Winding—
Non-Combination**

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
2PW	3	25 (11)
3PW-4PW	9	47 (21)
5PW	E	125 (47)
6PW	F1E	780 (354)
7PW	F2E	③
8PW	F2E	③
Type 3R, 4X, 12		
2PW	7	75 (34)
3PW-4PW	9	95 (43)
5PW	E	180 (82)
6PW	F1E	880 (400)
7PW	F2E	③
8PW	F2E	③

**Class 46: Part Winding—
with Disconnect**

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
2PW	C	68 (31)
3PW	D	162 (74)
4PW	E	230 (104)
5PW ^①	F1E	440 (200)
6PW ^②	F1E	440 (200)
6PW	F2E	515 (234)
7PW	F2E	③
8PW	F2E	③
Type 3R, 4X, 12		
2PW	C	88 (40)
3PW	D	190 (86)
4PW	E	270 (123)
5PW ^①	F1E	530 (241)
6PW ^②	F1E	620 (281)
6PW	F2E	③
7PW	F2E	③
8PW	F2E	③

**Class 47: Part Winding—
with Thermal Magnetic Trip
Circuit Breaker**

Same as Class 46 table.

**Classes 48 and 51: Wye
Delta— Non-Combination**

Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
2YD-4YD	E	185 (84)
5YD ^①	F1E	605 (275)
6YD ^②	F1E	635 (288)
6YD	F2E	715 (325)
7YD	F2E	③
8YD	F2E	③
Type 3R, 4X, 12		
2YD-4YD	E	225 (102)
5YD ^①	F1E	705 (320)
6YD ^②	F1E	735 (334)
6YD	F2E	830 (377)
7YD	F2E	③
8YD	F2E	③

**Classes 49 and 52: Wye
Delta— with Disconnect**

Same as Classes 48 and 51 table.

**Classes 50 and 53: Wye
Delta— with Thermal
Magnetic Trip Circuit
Breaker**

Same as Classes 48 and 51 table.

Notes

- ① Non-combination and breaker.
- ② Fusible.
- ③ Consult factory.

Pump Panels

Freedom Type 3R—Pump Panels

NEMA Size	Box No.	Shipping Weight Lbs (kg)
1 Narrow	P1	35 (16)
2 Narrow	P1	35 (16)
1	P3	75 (34)
2	P3	75 (34)
3	P3	75 (34)
4	P5	120 (54)
5	P7	150 (68)
6	F1E	350 (159)
7	F2E	425 (193)

Irrigation Pump Panels—Top Entry

Size	HMCPE/ BKR		Fused C362
	Box No.	Box No.	Box No.
1	8	8	8
2	8	8	8
2-1/2	8	8	8
3	8	8	9
3-1/2	8	8	9
4	9	—	—
SSOL Option			
1	8	8	8
2	8	8	8
2-1/2	8	8	8
3	8 ^①	8 ^①	9
3-1/2	8 ^①	8 ^①	9
4	9	—	—

Irrigation Pump Panels—Bottom Entry

Size	HMCPE/ BKR		Fused C362
	Box No.	Box No.	Box No.
1	8	8	8
2	8	8	8
2-1/2	8	8	8
3	8	8	9
3-1/2	8	8	9
4	9	—	—
SSOL Option			
1	8	8	8
2	8	8	8
2-1/2	8	8	8
3	8 ^①	8 ^①	9
3-1/2	8 ^①	8 ^①	9
4	9	—	—

Duplex Pump Panels

Type 1, 3R, 4X, 12 Duplex Pump Panels Non-Combination

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0-2	G	44 (20)
3-4	G1	120 (54)
5-6	F1E	405 (184)

Type 1, 3R, 4X, 12 Duplex Pump Panels Combination

NEMA Size	Box No.	Shipping Weight Lbs (kg)
0-2	H	75 (34)
3-4	H1 ^②	180 (82)
5-6	F1E	425 (193)

HVAC Control

Type 1 HVAC Starters

NEMA Size	Box No.	Shipping Weight Lbs (kg)
Type 1		
0-2	7	18 (8.2)
Type 3R, 12		
0-2	7	18.5 (8.4)
Type 1		
3	8	46 (21)
Type 3R, 12		
3	8	48 (22)

Notes

All Type 7 and 9, see **Tab 9**.

^① Irrigation pump panels with a Generation 2 solid-state overload are sized in a Box 8. Those with the Generation 1 overload are sized in a Box 9.

^② Contact Eaton for box dimensions not shown on **Pages V10-T14-13 to V10-T14-31**.

Vacuum Break**Non-Combination****Type 1 Enclosed—Non-Combination Vacuum Contactors and Starters****Non-Reversing Contactors and Starters— with or without Control Power Transformers**

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	4	47 (21)
5	10	135 (61)
6	E	235 (107)

Reversing Contactors— with or without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	9	54 (25)
5	10	145 (66)
6	E	245 (111)

Type 3R, 4/4X, 12 Enclosed—Non-Combination Vacuum Contactors and Starters**Non-Reversing Contactors and Starters— with or without Control Power Transformers**

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	8	67 (30)
5	10	150 (68)
6	E	250 (114)

Reversing Contactors— with or without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	9	72 (33)
5	10	175 (79)
6	E	275 (125)

Combination**Type 1 Enclosed—Combination Vacuum Starters****Non-Reversing Starters: Fusible or Non-Fusible Disconnect— with or without Control Power Transformers**

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	D	150 (68)
5	E	180 (82)
6	F1E	280 (127)

Non-Reversing Starters: HMCP or Circuit Breaker— with or without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	C	90 (41)
5	E	180 (82)
6	F1E	280 (127)

Type 3R, 4/4X, 12 Enclosed—Combination Vacuum Starters**Non-Reversing Starters: Fusible or Non-Fusible Disconnect— with or without Control Power Transformers**

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	D	150 (68)
5	E	180 (82)
6	F1E	280 (127)

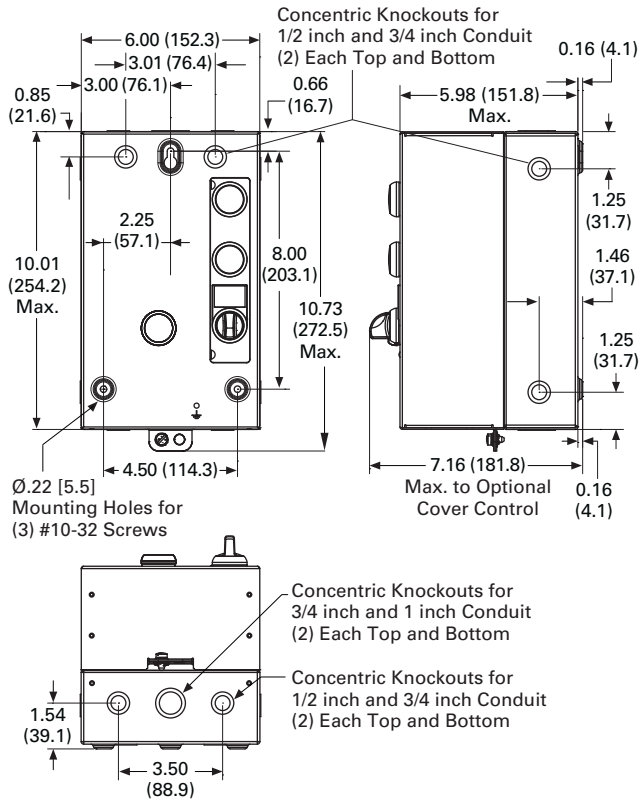
Non-Reversing Starters: HMCP or Circuit Breaker— with or without Control Power Transformers

NEMA Size	Box No.	Shipping Weight Lbs (kg)
4	C	90 (41)
5	E	180 (82)
6	F1E	280 (127)

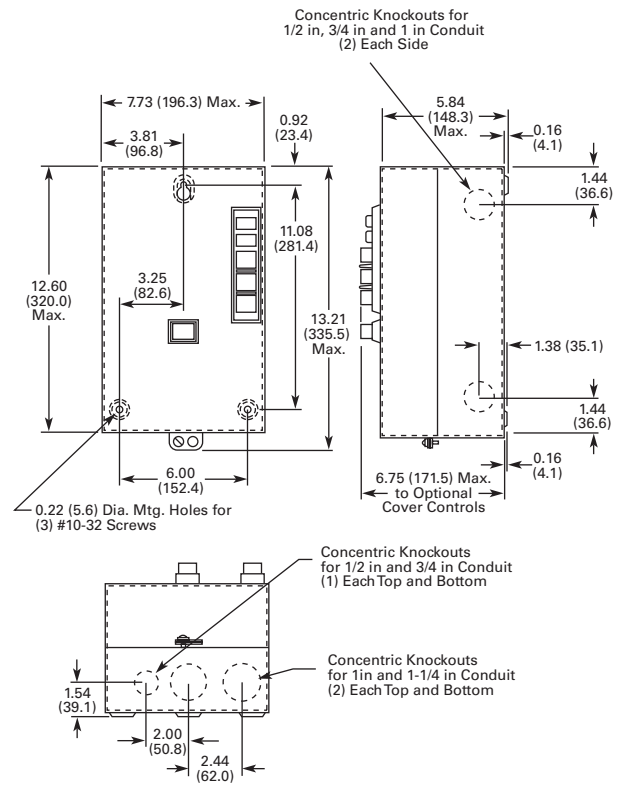
NoteAll Type 7 and 9, see **Tab 9**.

Approximate Dimensions are in Inches (mm)

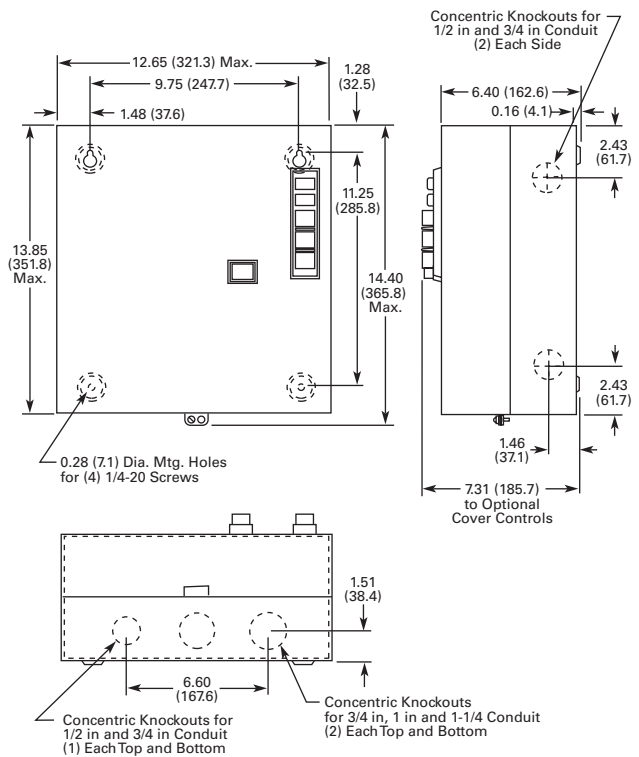
Box 1, Type 1—6.00W x 10.01H x 5.98D



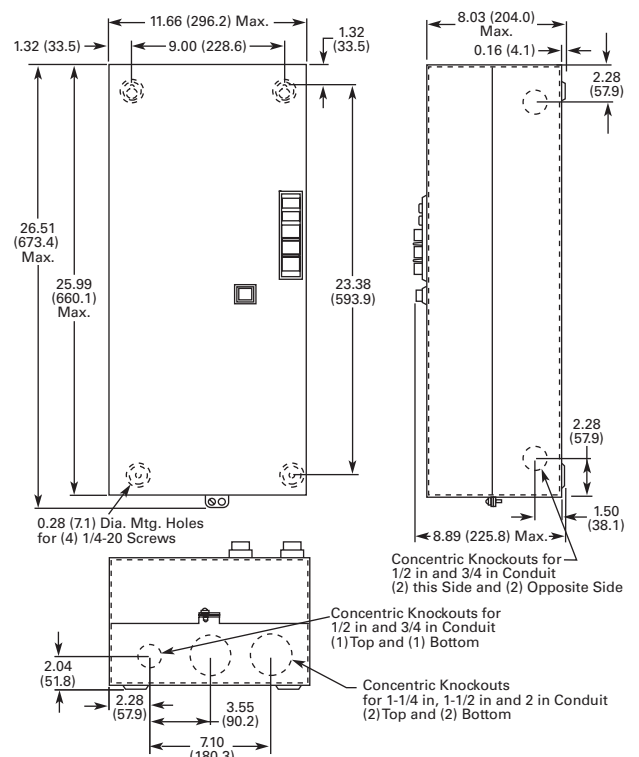
Box 2, Type 1—7.73W x 12.60H x 5.84D



Box 3, Type 1—12.65W x 13.85H x 6.40D



Box 4, Type 1—11.66W x 25.99H x 8.03D

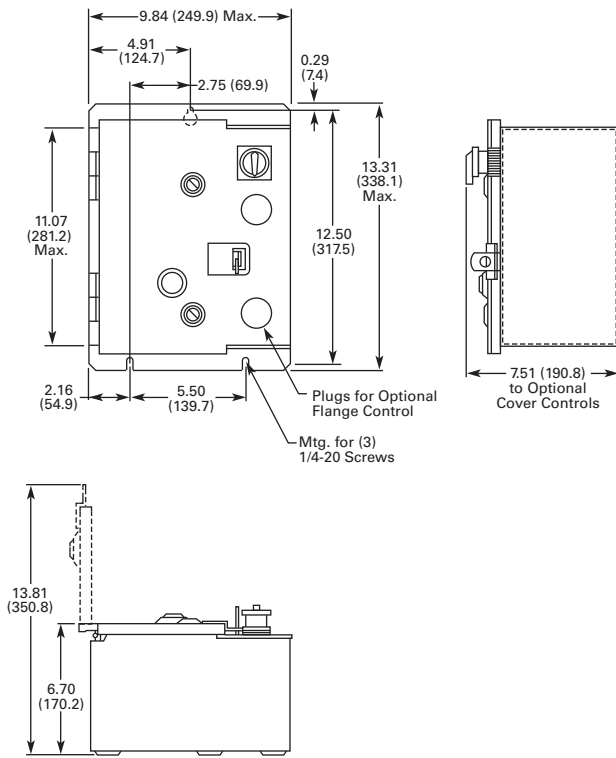


14.2 Enclosed Dimensions

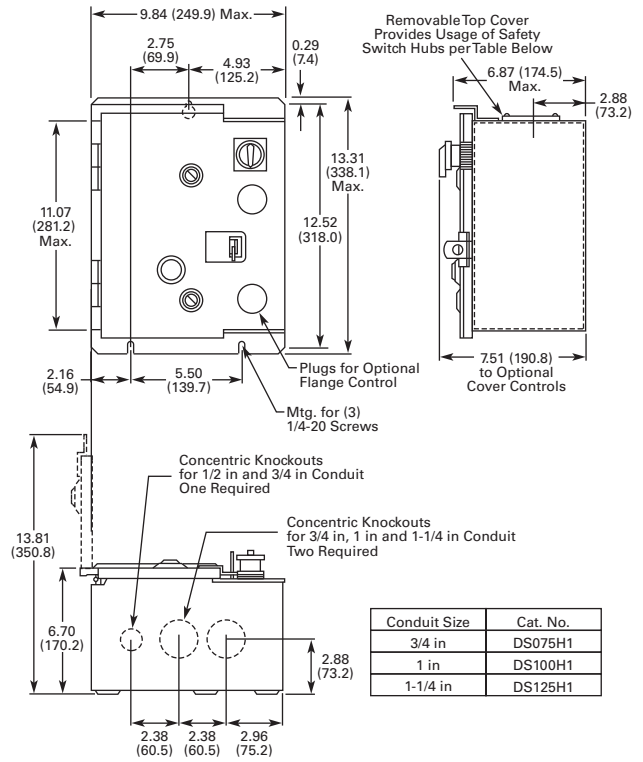
Box Dimensions

Approximate Dimensions are in Inches (mm)

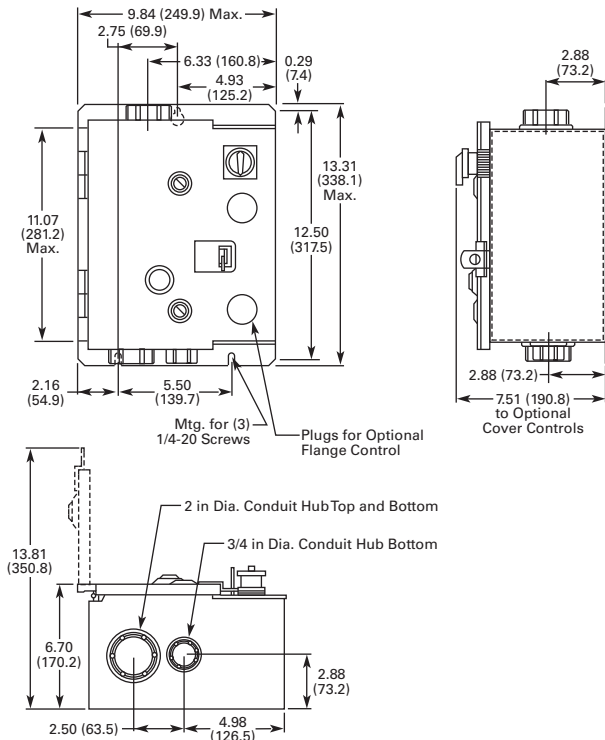
Box 5, Type 12—9.84W x 13.31H x 6.70D



Box 5, Type 3R—9.84W x 13.31H x 6.70D

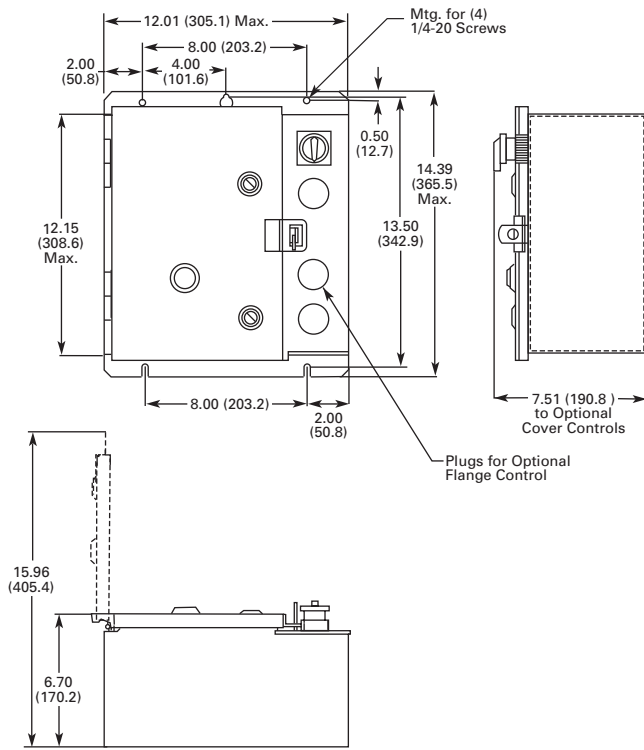


Box 5, Type 4X—9.84W x 13.31H x 6.70D

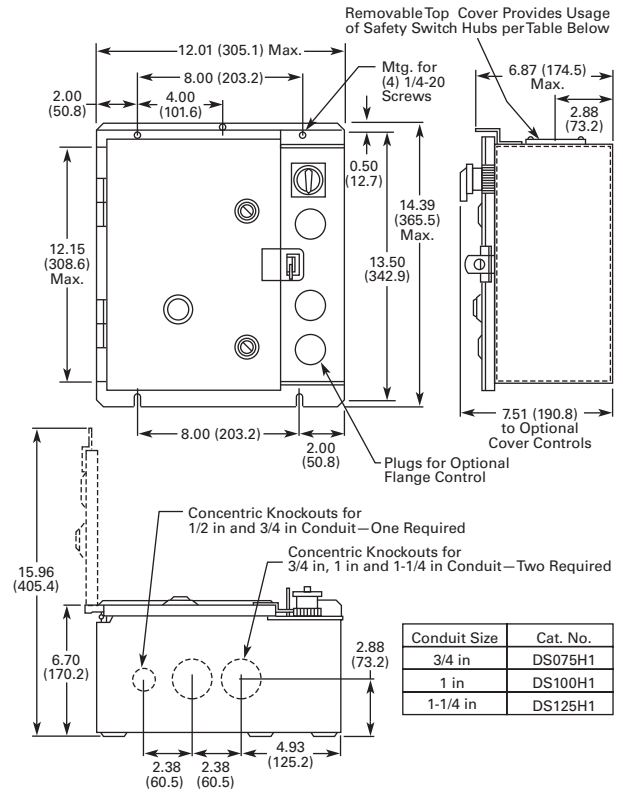


Approximate Dimensions are in Inches (mm)

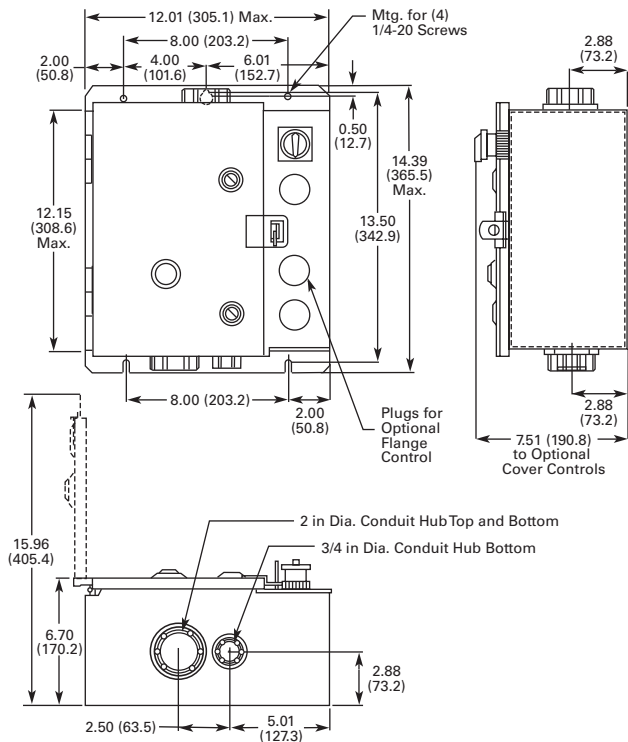
Box 6, Type 12—12.01W x 14.39H x 6.70D



Box 6, Type 3R—12.01W x 14.39H x 6.70D



Box 6, Type 4X—12.01W x 14.39H x 6.70D

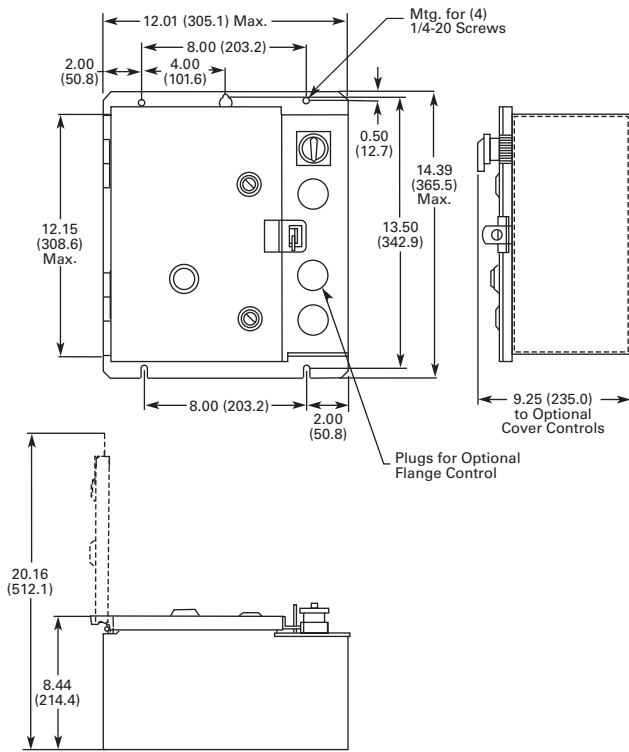


14.2 Enclosed Dimensions

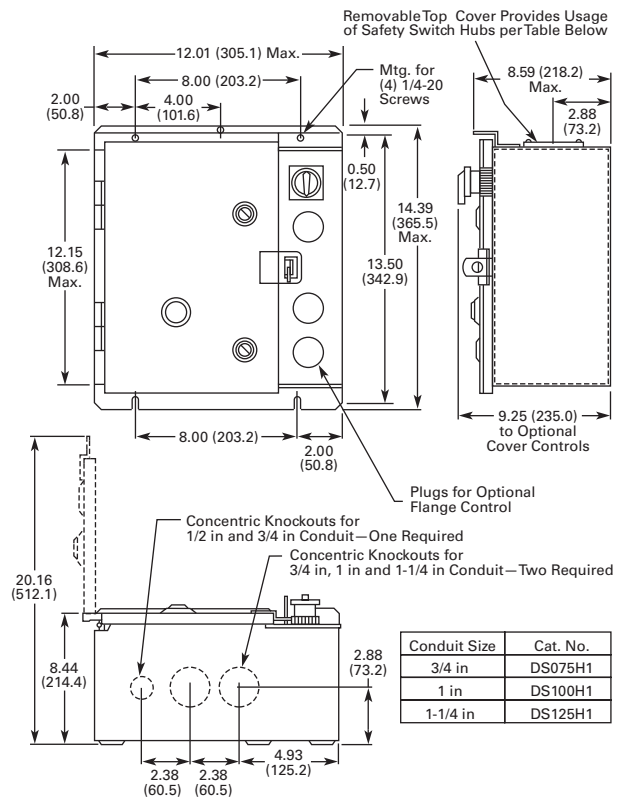
Box Dimensions

Approximate Dimensions are in Inches (mm)

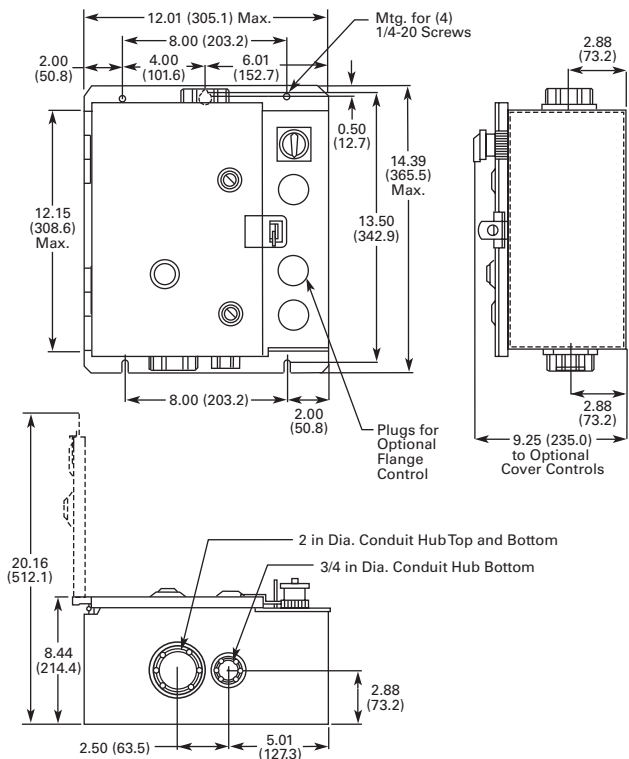
Box 6A, Type 12—12.01W x 14.39H x 8.44D



Box 6A, Type 3R—12.01W x 14.39H x 8.44D

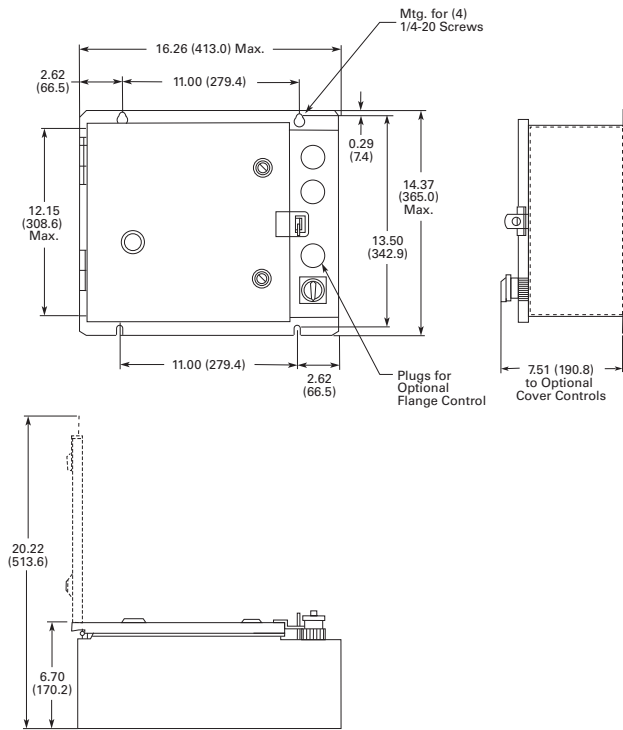


Box 6A, Type 4X—12.01W x 14.39H x 8.44D

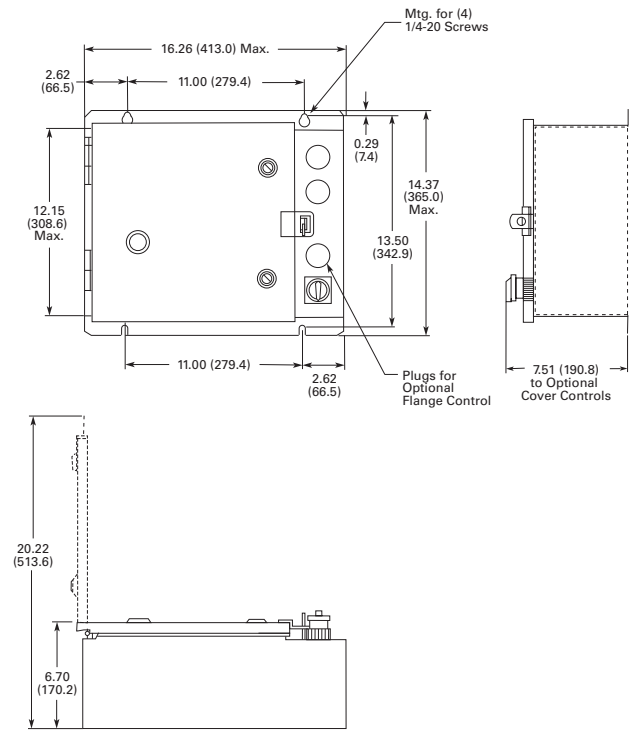


Approximate Dimensions are in Inches (mm)

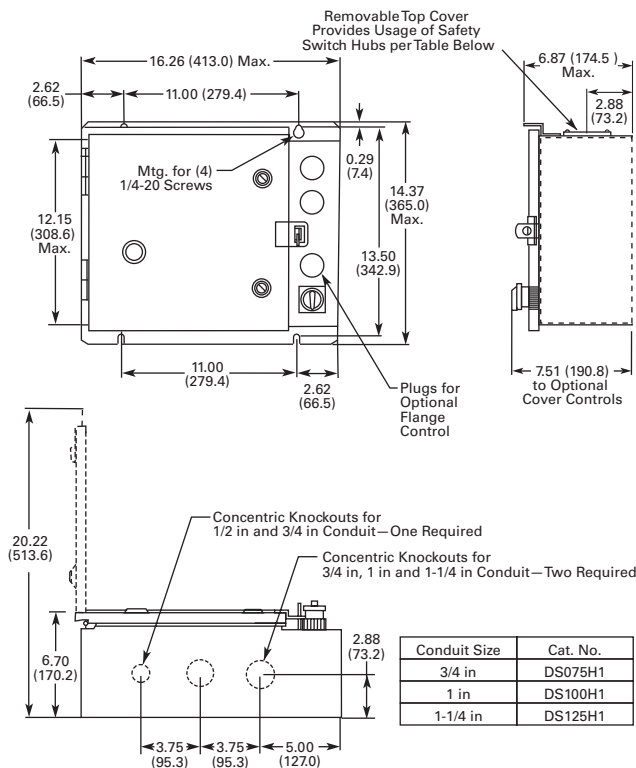
Box 7, Type 1—16.26W x 14.37H x 6.70D



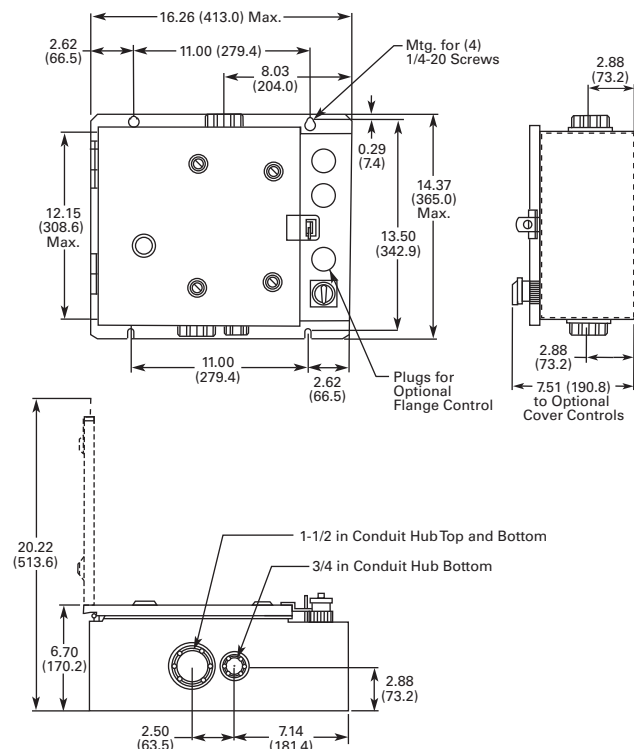
Box 7, Type 12—16.26W x 14.37H x 6.70D



Box 7, Type 3R—16.26W x 14.37H x 6.70D



Box 7, Type 4X—16.26W x 14.37H x 6.70D



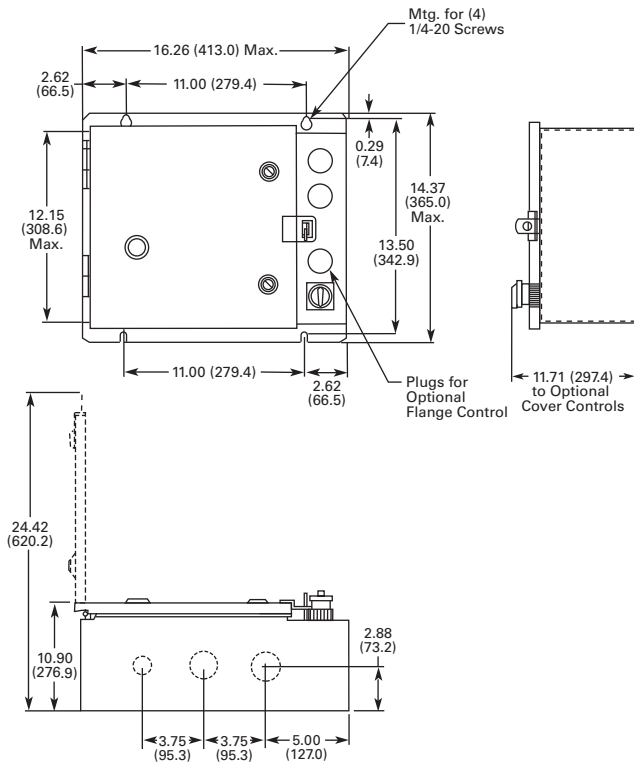
14.2

Enclosed Dimensions

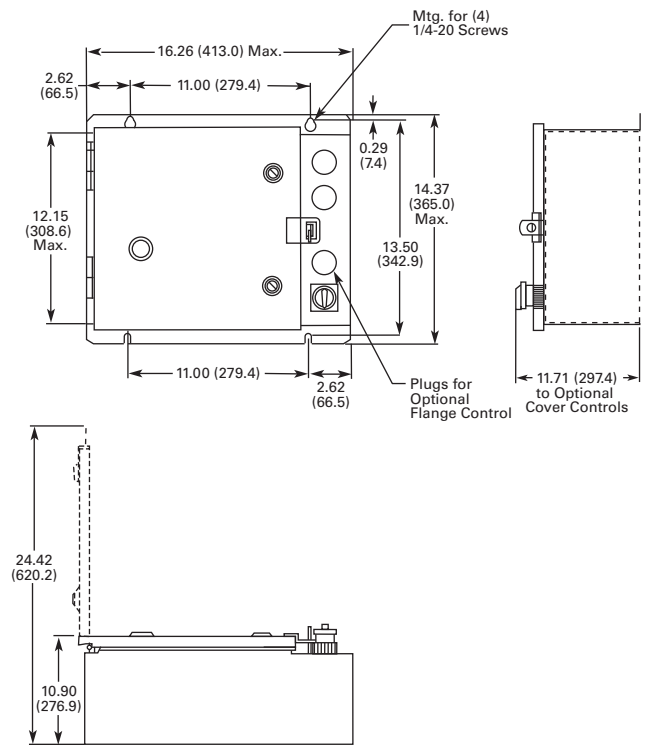
Box Dimensions

Approximate Dimensions are in Inches (mm)

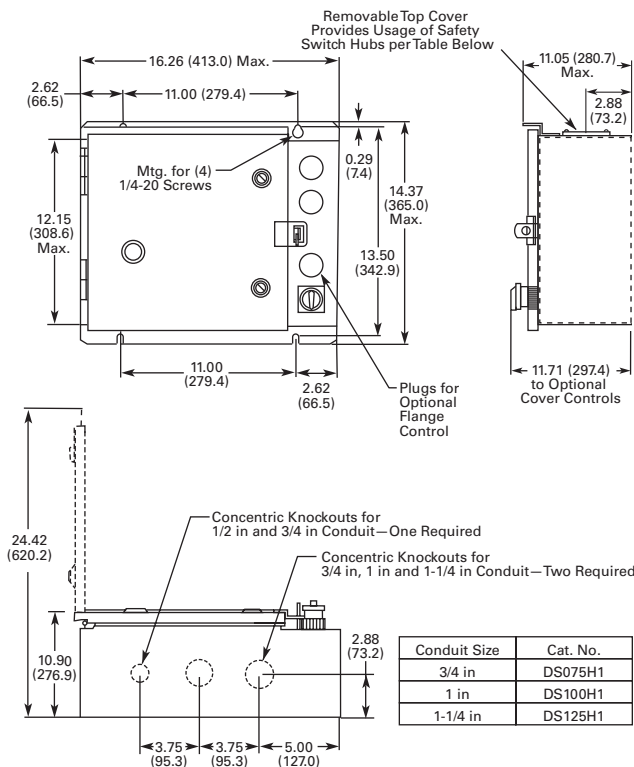
Box 7A, Type 1—16.26W x 14.37H x 10.90D



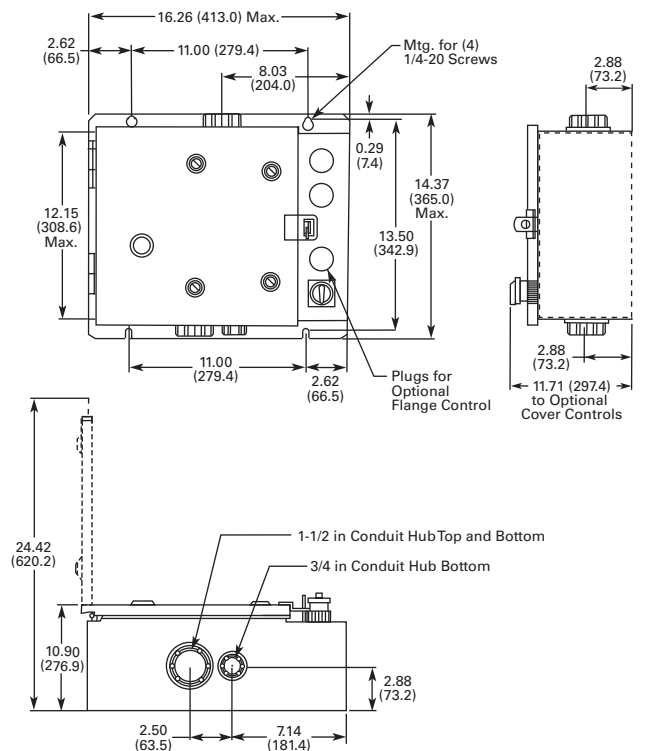
Box 7A, Type 12—16.26W x 14.37H x 10.90D



Box 7A, Type 3R—16.26W x 14.37H x 10.90D

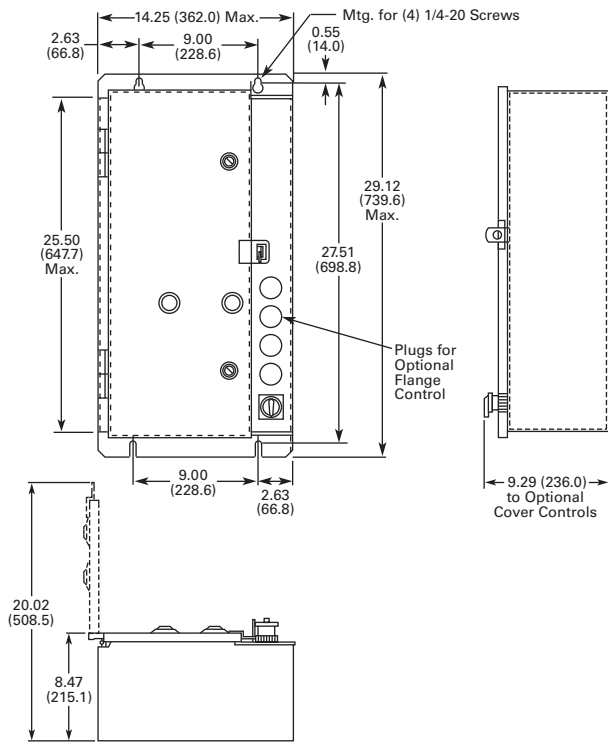


Box 7A, Type 4X—16.26W x 14.37H x 10.90D

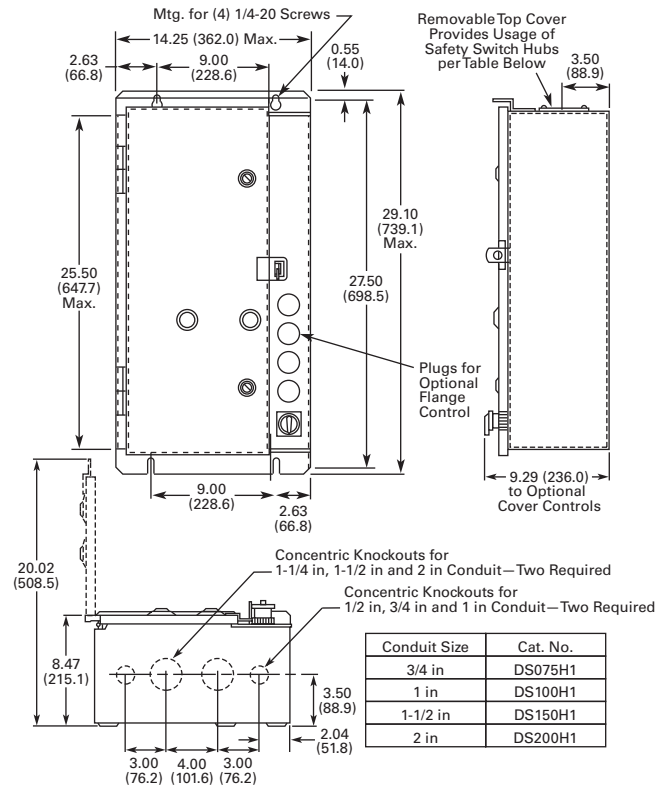


Approximate Dimensions are in Inches (mm)

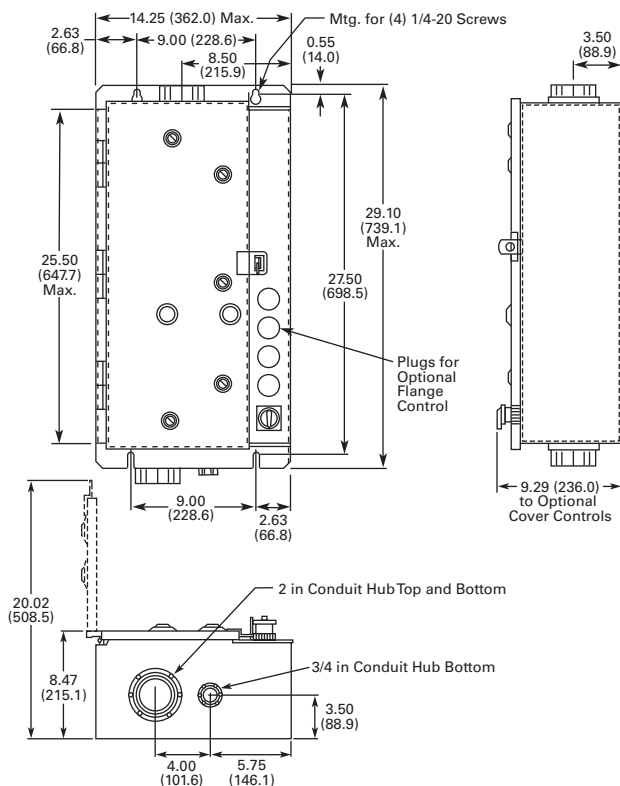
Box 8, Type 12—14.25W x 29.12H x 8.47D



Box 8, Type 3R—14.25W x 29.10H x 8.47D



Box 8, Type 4X—14.25W x 29.10H x 8.47D

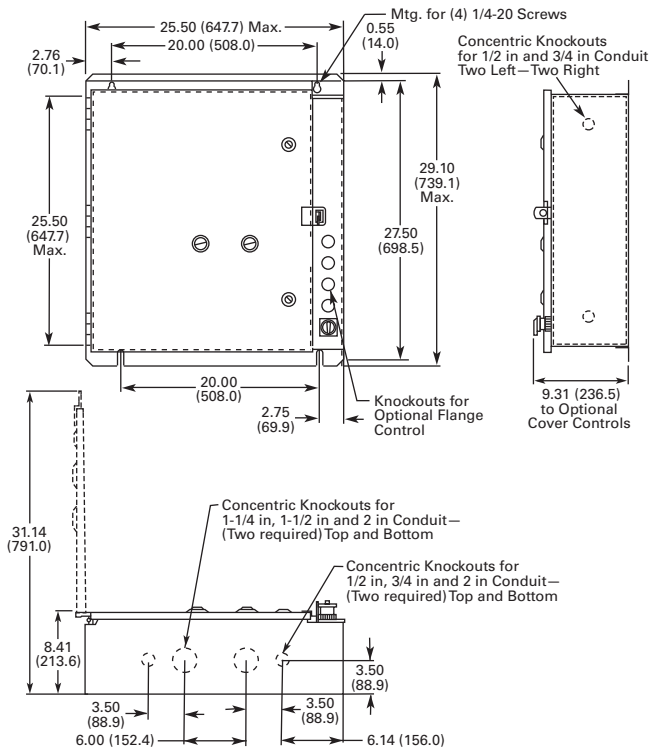


14.2 Enclosed Dimensions

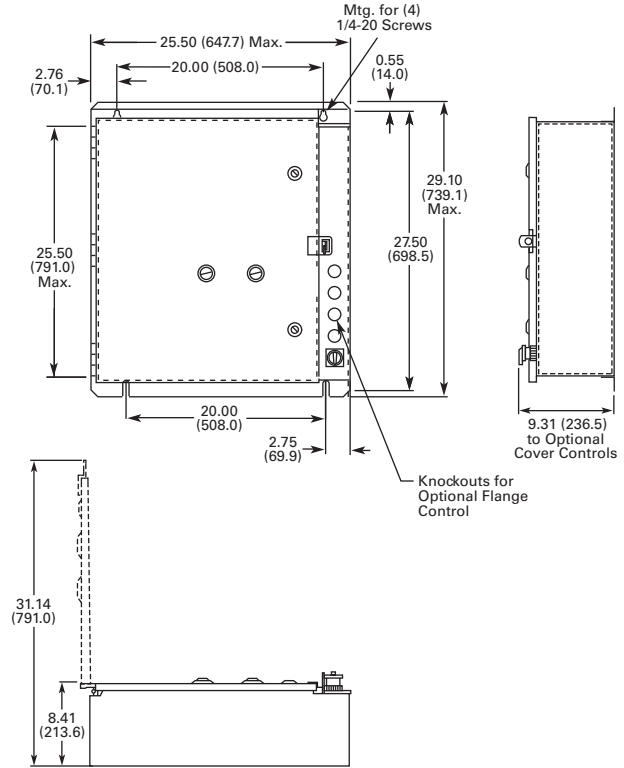
Box Dimensions

Approximate Dimensions are in Inches (mm)

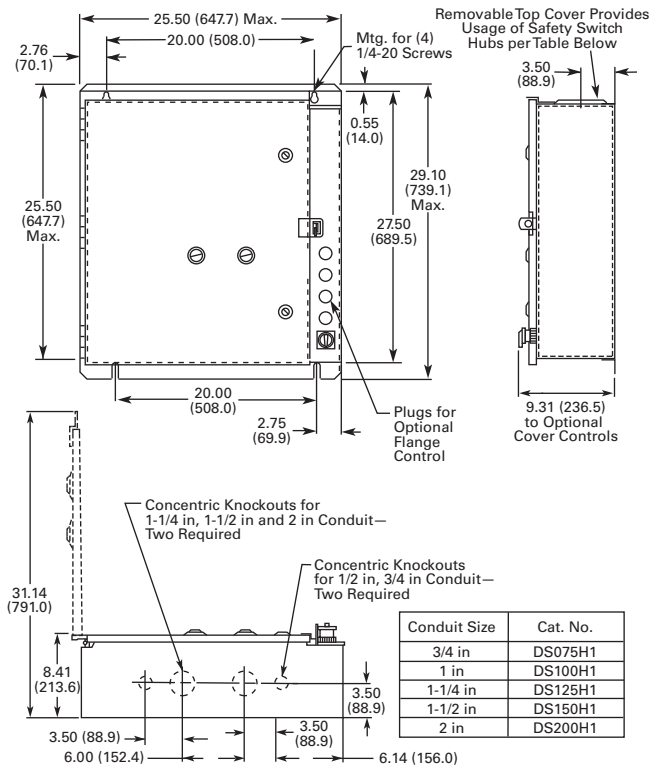
Box 9, Type 1—25.50W x 29.10H x 8.41D



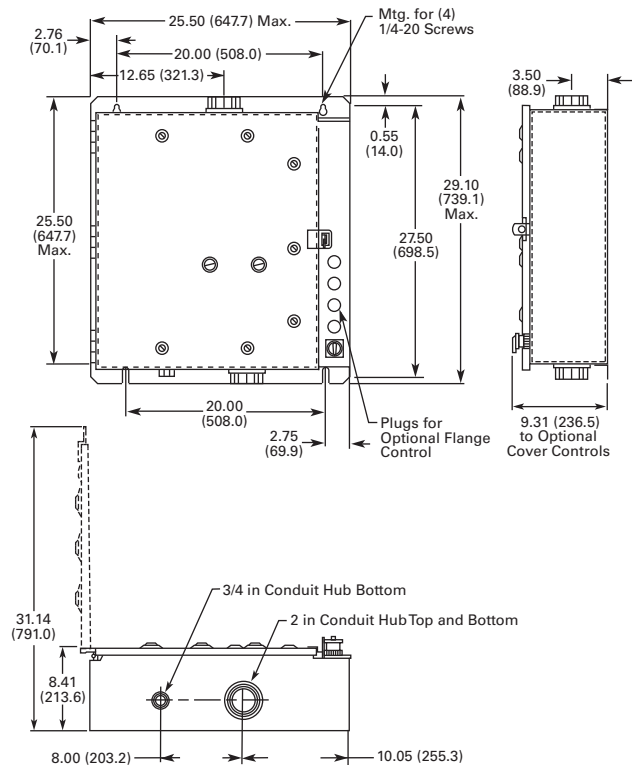
Box 9, Type 12—25.50W x 29.10H x 8.41D



Box 9, Type 3R—25.50W x 29.10H x 8.41D

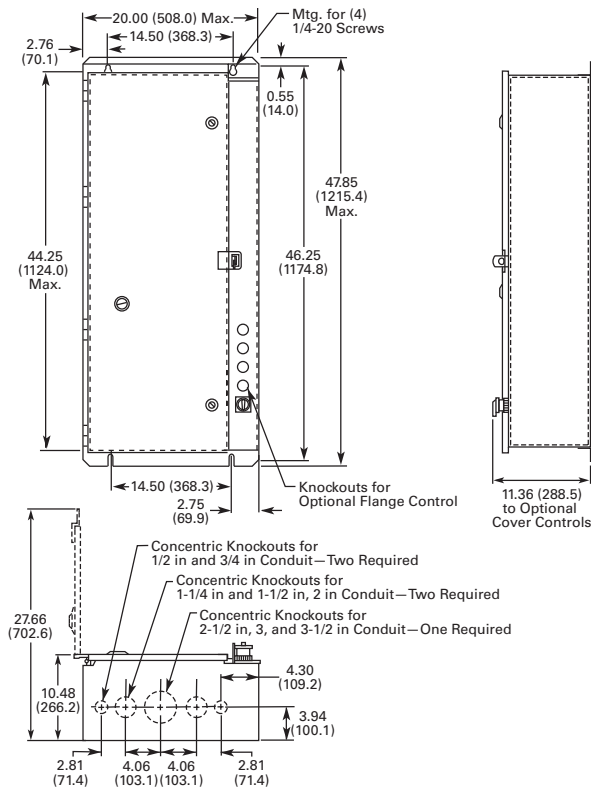


Box 9, Type 4X—25.50W x 29.10H x 8.41D

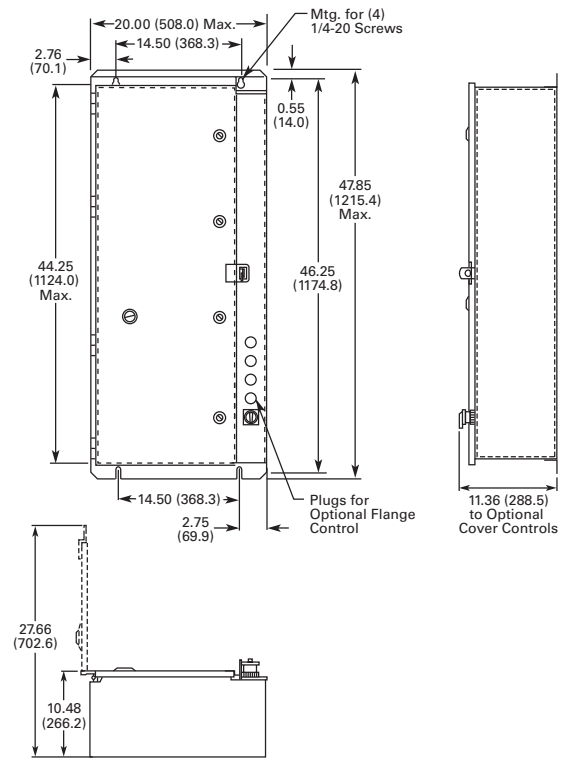


Approximate Dimensions are in Inches (mm)

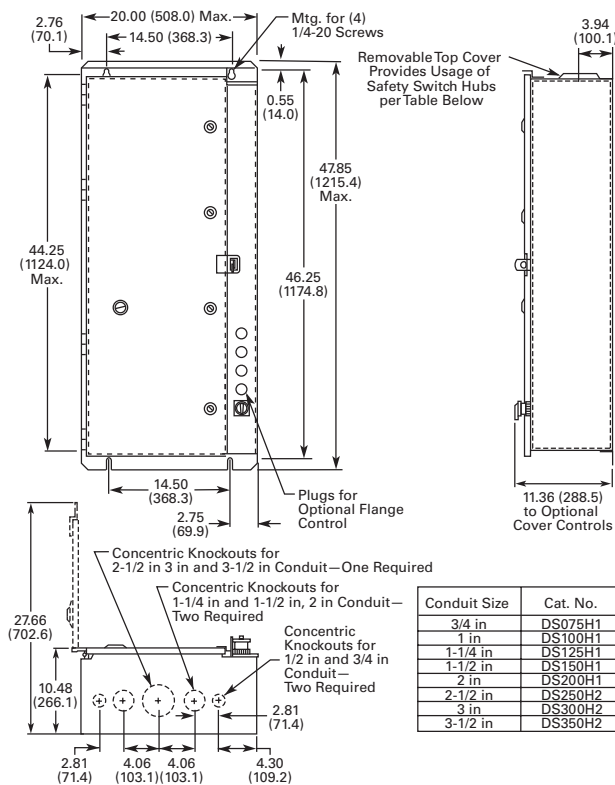
Box 10, Type 1—20.00W x 47.85H x 10.48D



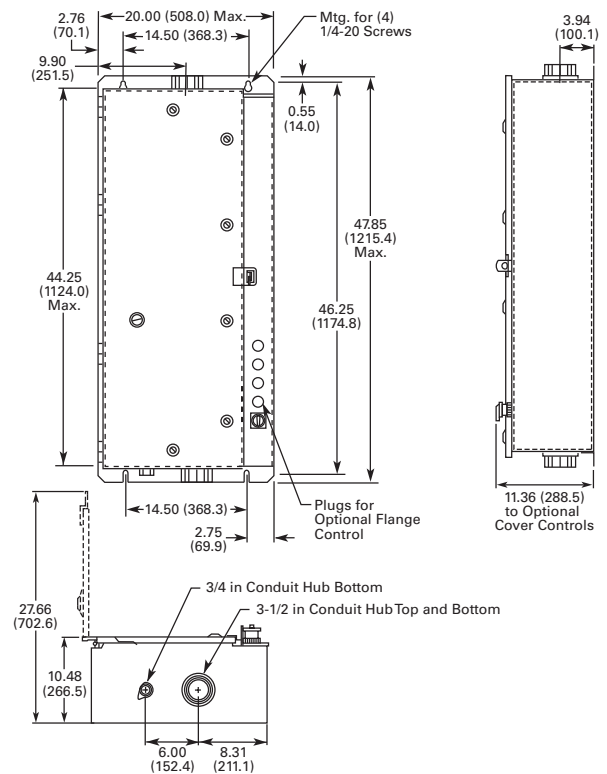
Box 10, Type 12—20.00W x 47.85H x 10.48D



Box 10, Type 3R—20.00W x 47.85H x 10.48D



Box 10, Type 4X—20.00W x 47.85H x 10.48D

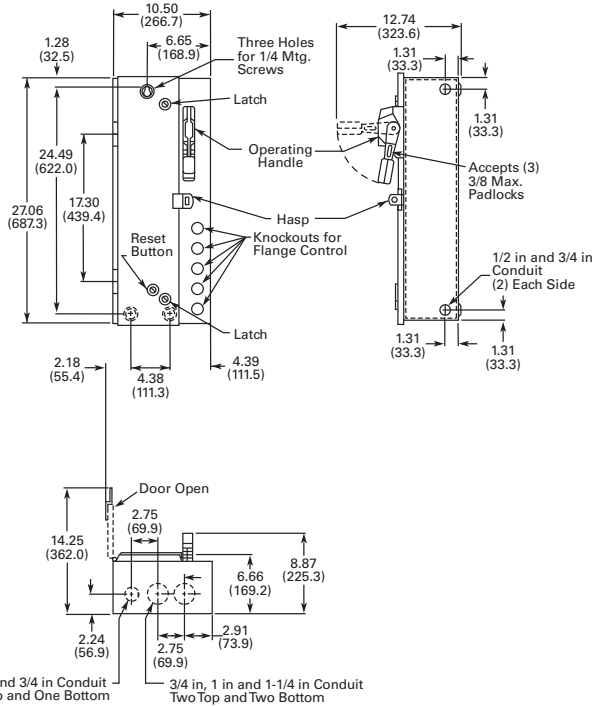


14.2 Enclosed Dimensions

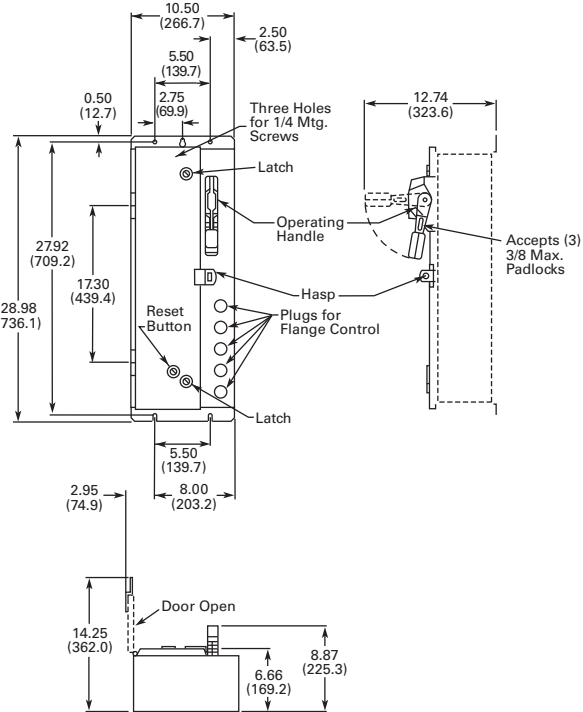
Box Dimensions

Approximate Dimensions are in Inches (mm)

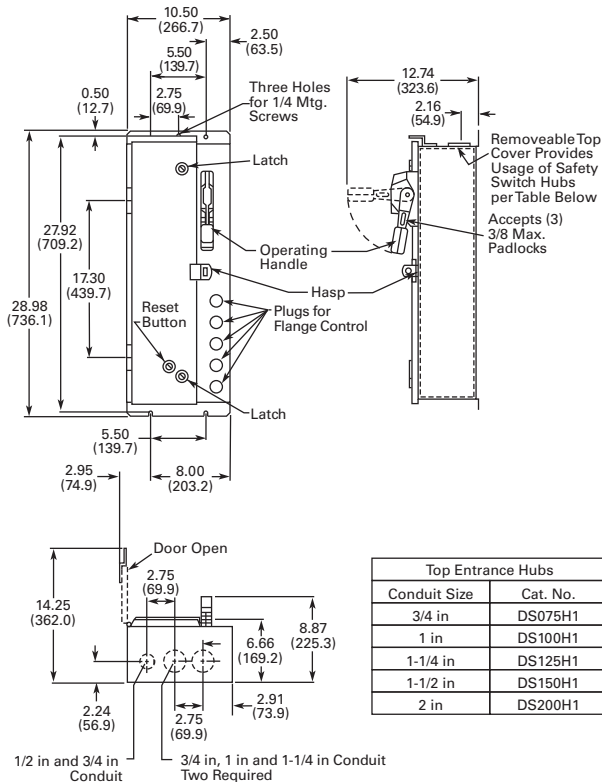
Box A, Type 1—10.50W x 27.06H x 6.66D



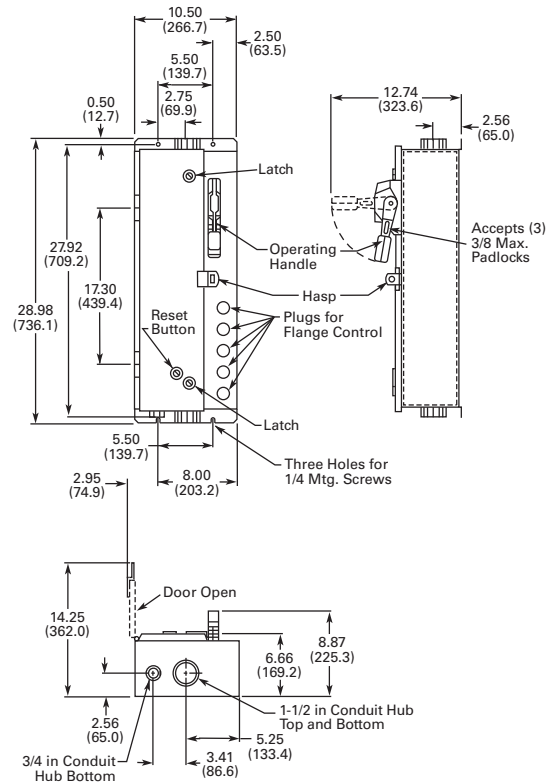
Box A, Type 12—10.50W x 28.98H x 6.66D



Box A, Type 3R—10.50W x 28.98H x 6.66D

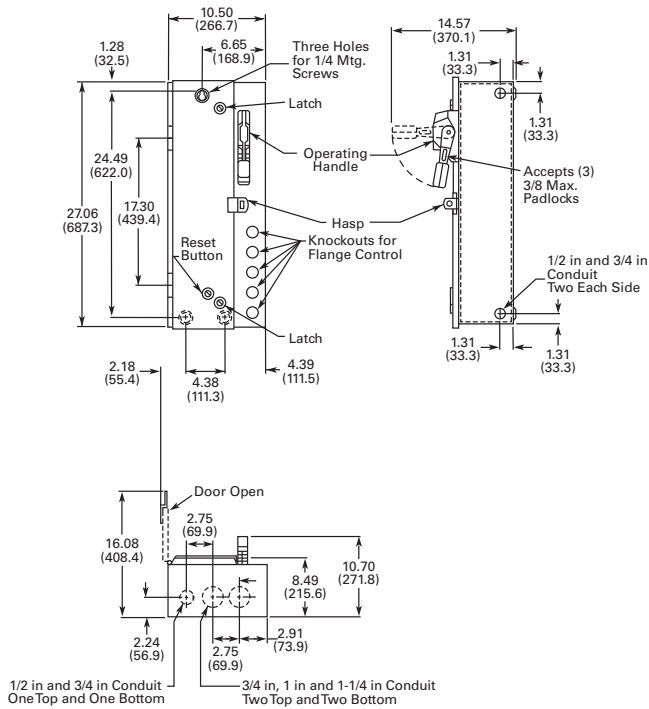


Box A, Type 4X—10.50W x 28.98H x 6.66D

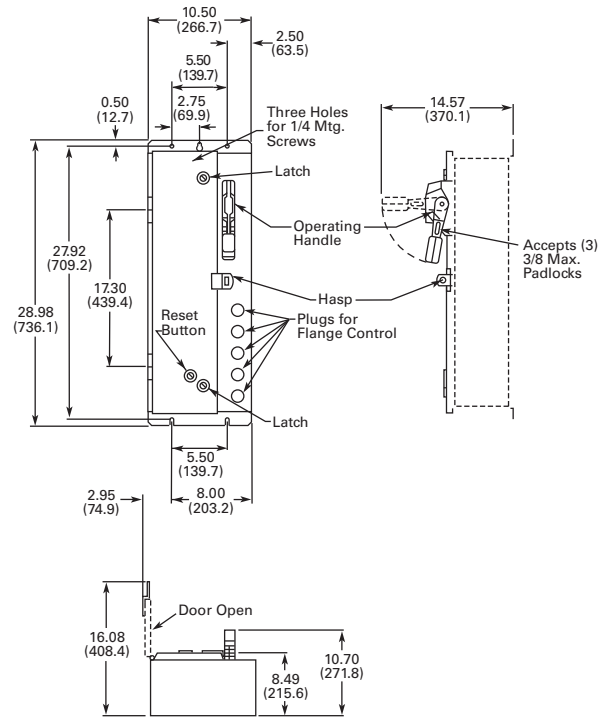


Approximate Dimensions are in Inches (mm)

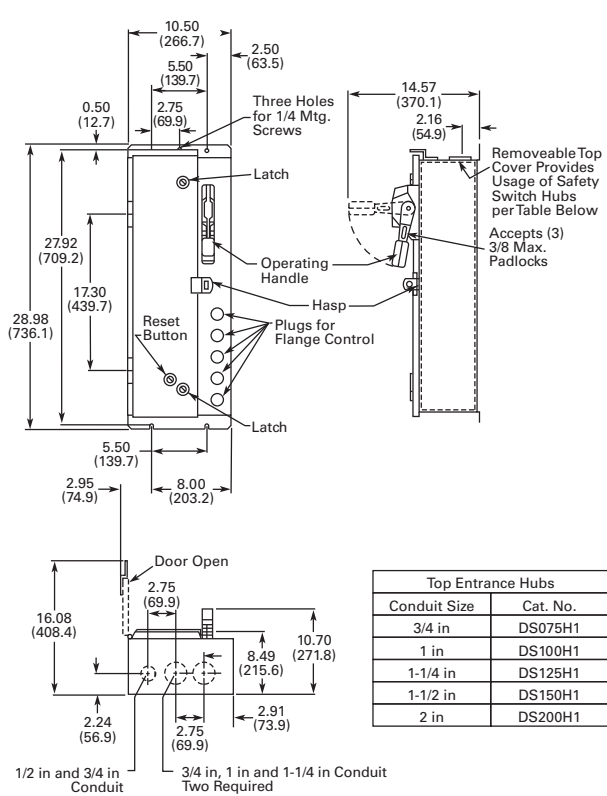
Box A1, Type 1—10.50W x 27.06H x 8.49D



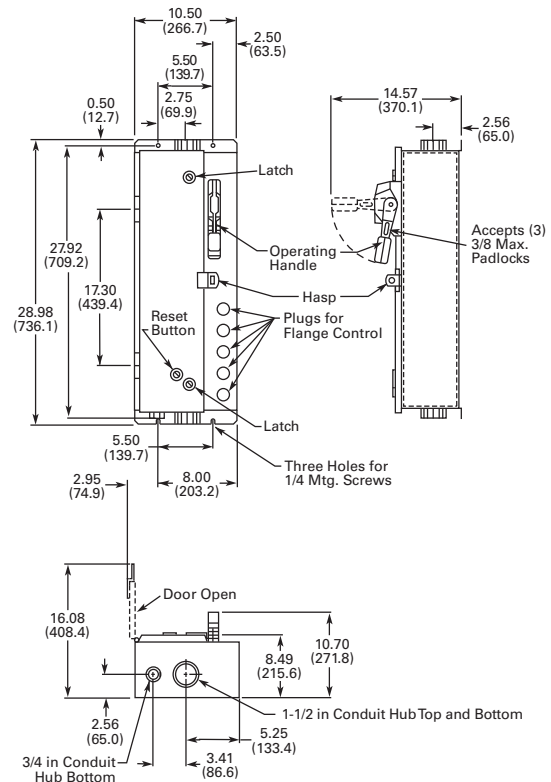
Box A1, Type 12—10.50W x 28.98H x 8.49D



Box A1, Type 3R—10.50W x 28.98H x 8.49D



Box A1, Type 4X—10.50W x 28.98H x 8.49D

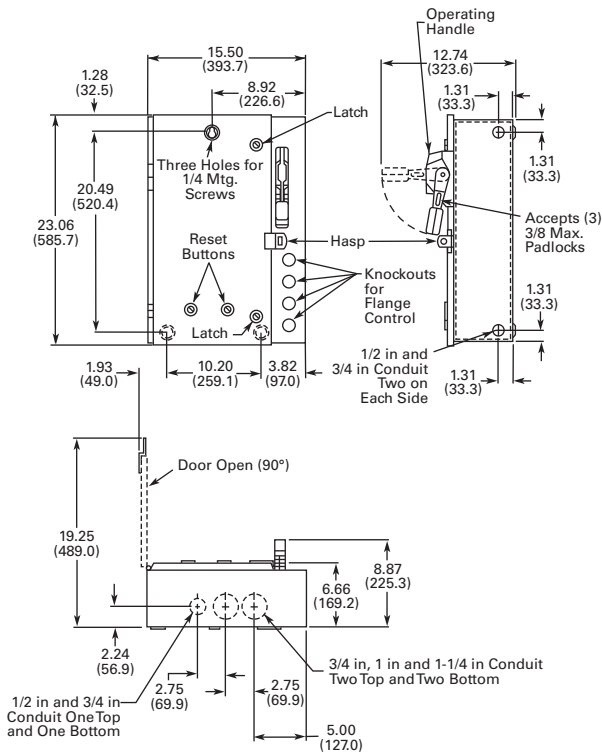


14.2 Enclosed Dimensions

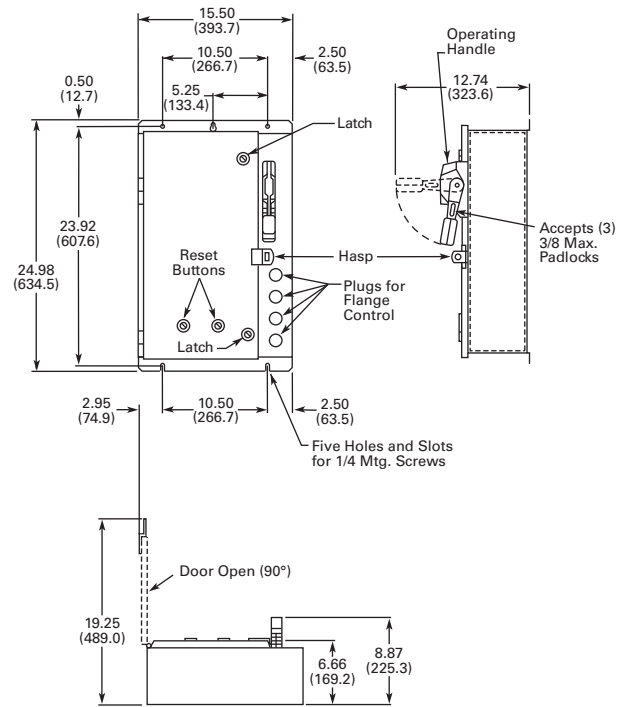
Box Dimensions

Approximate Dimensions are in Inches (mm)

Box B, Type 1—15.50W x 23.06H x 6.66D

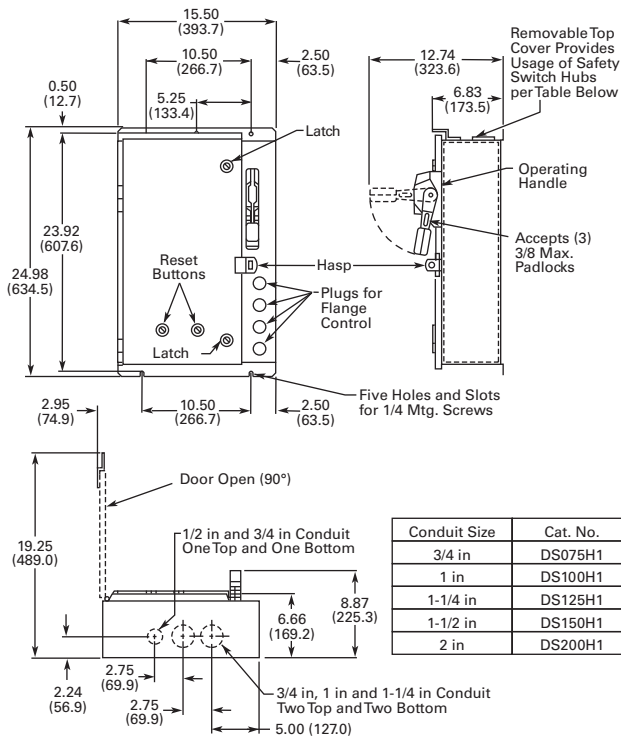


Box B, Type 12—15.50W x 24.98H x 6.66D

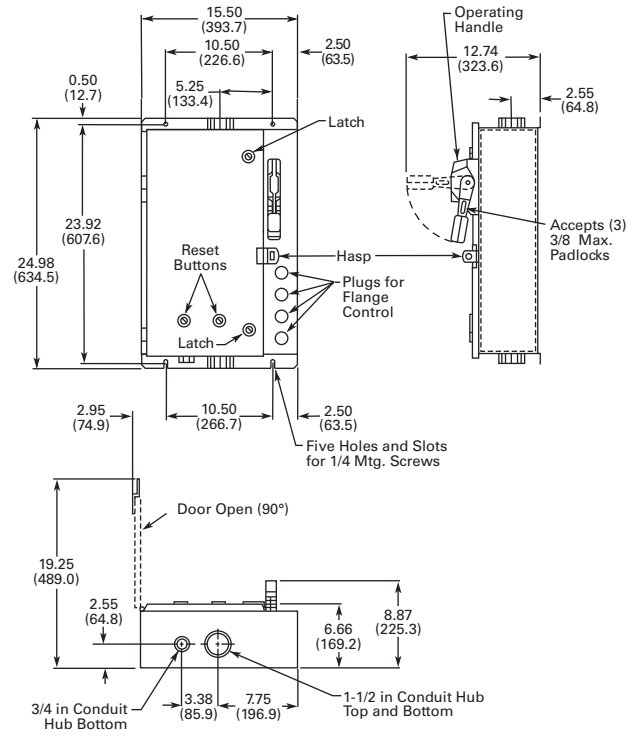


14

Box B, Type 3R—15.50W x 24.98H x 6.66D

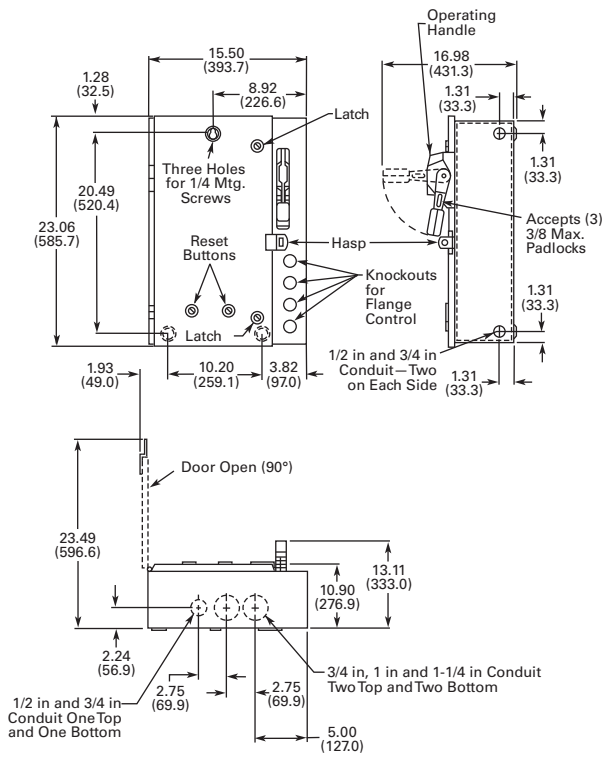


Box B, Type 4X—15.50W x 24.98H x 6.66D

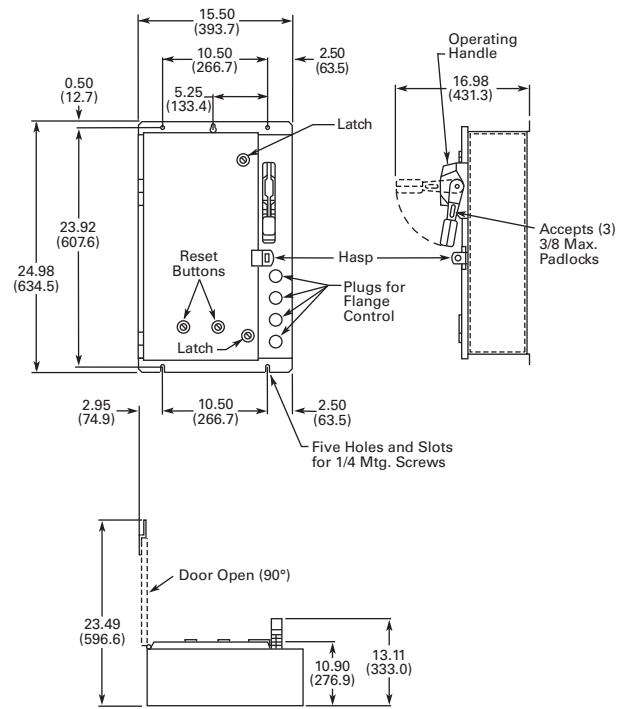


Approximate Dimensions are in Inches (mm)

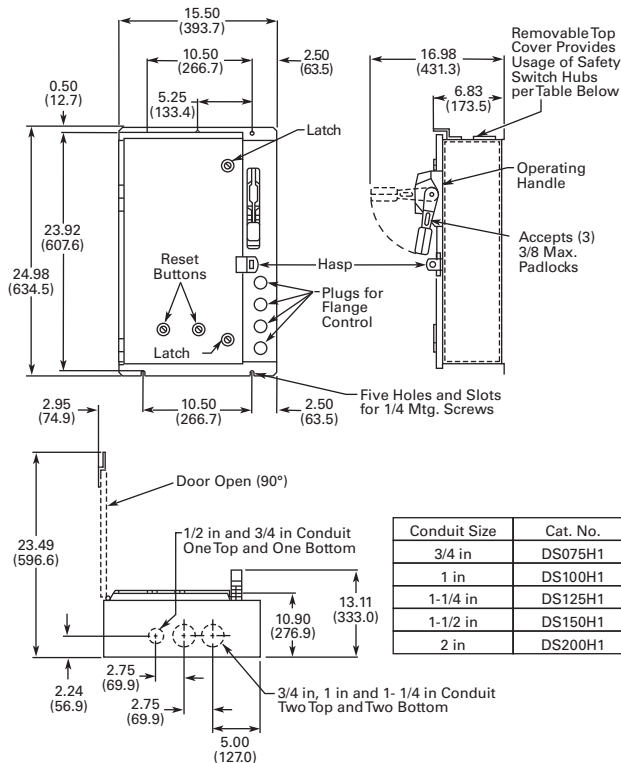
Box B1, Type 1—15.50W x 23.06H x 10.90D



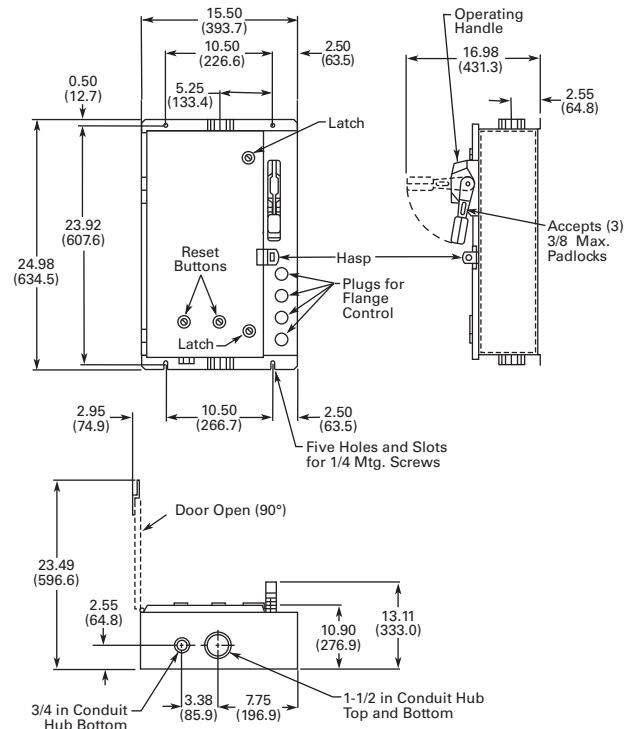
Box B1, Type 12—15.50W x 24.98H x 10.90D



Box B1, Type 3R—15.50W x 24.98H x 10.90D



Box B1, Type 4X—15.50W x 24.98H x 10.90D

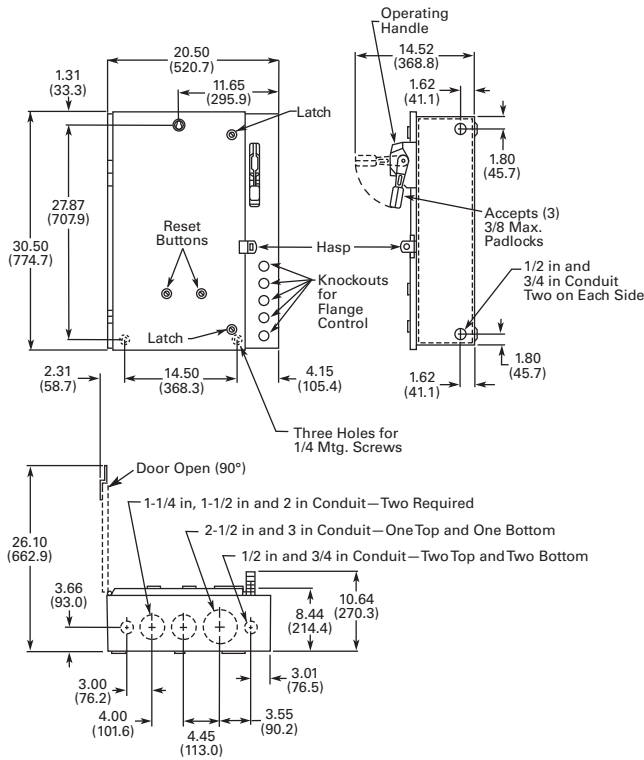


14.2 Enclosed Dimensions

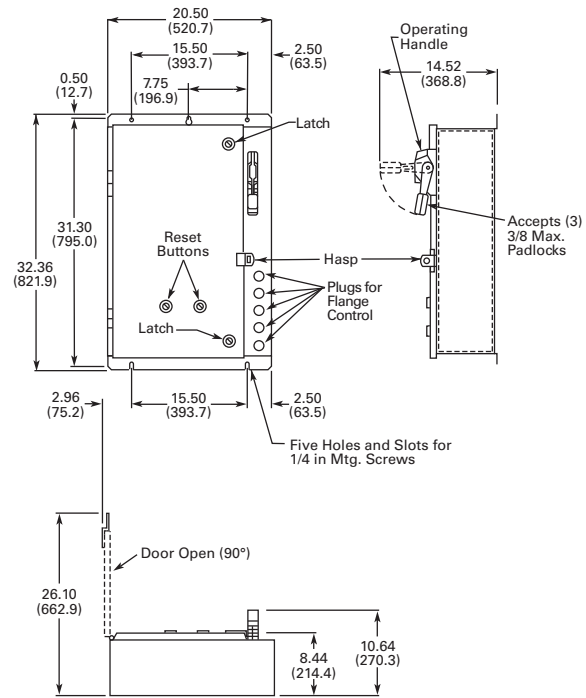
Box Dimensions

Approximate Dimensions are in Inches (mm)

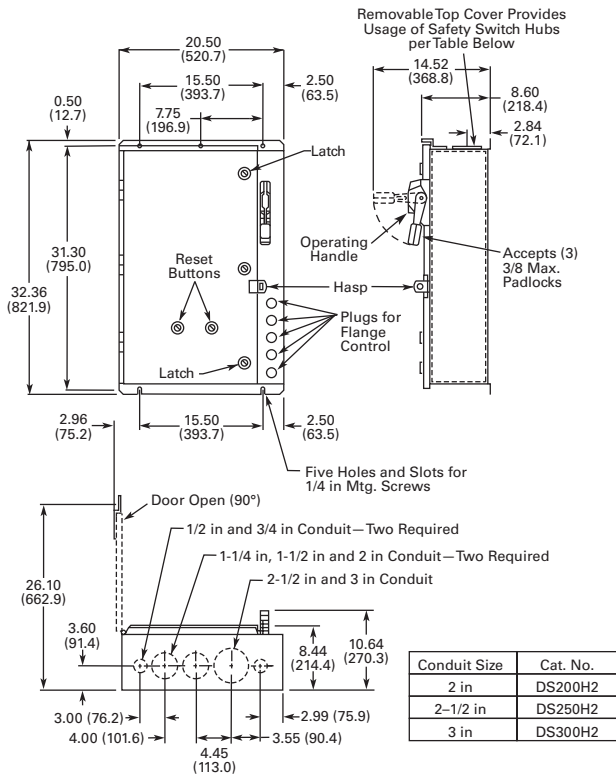
Box C, Type 1—20.50W x 30.50H x 8.44D



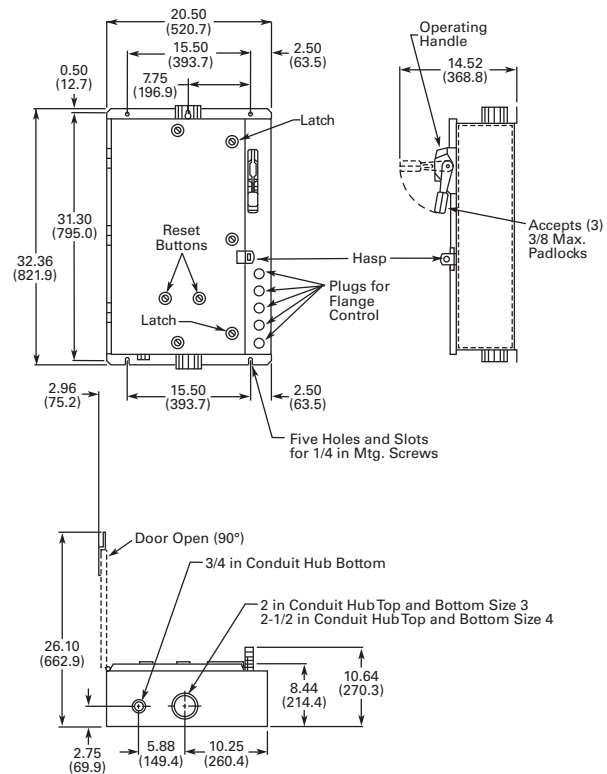
Box C, Type 12—20.50W x 32.36H x 8.44D



Box C, Type 3R—20.50W x 32.36H x 8.44D

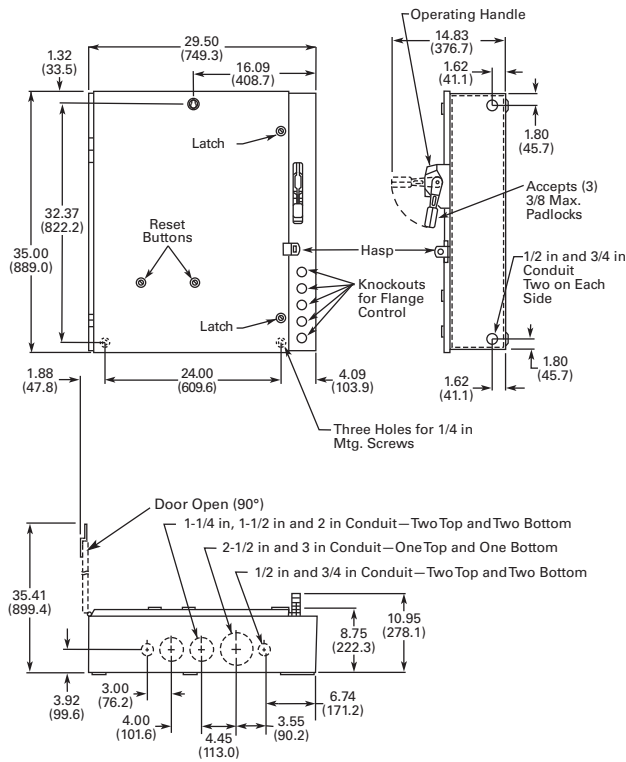


Box C, Type 4X—20.50W x 32.36H x 8.44D

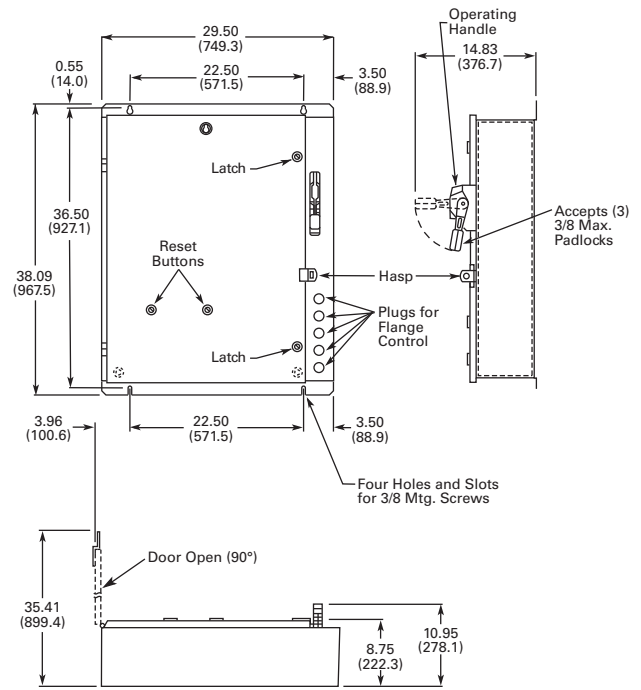


Approximate Dimensions are in Inches (mm)

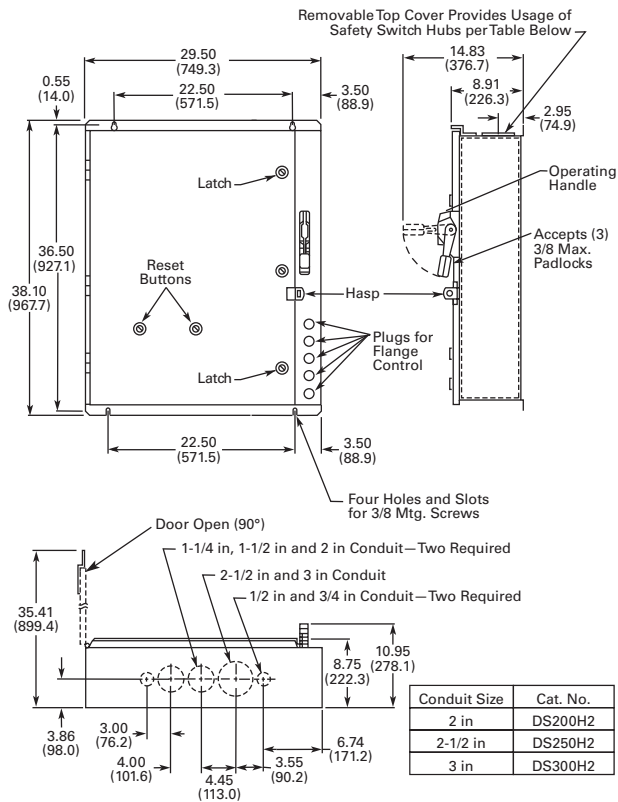
Box D, Type 1—29.50W x 35.00H x 8.75D



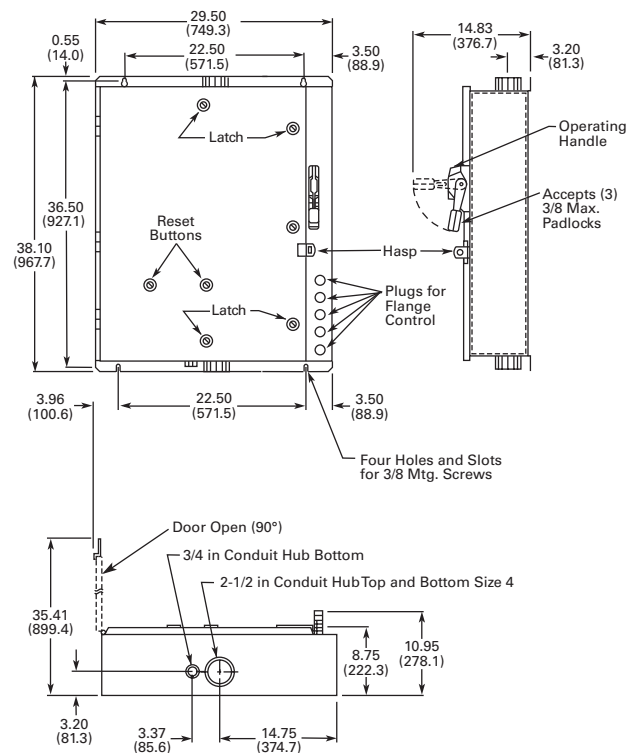
Box D, Type 12—29.50W x 38.09H x 8.75D



Box D, Type 3R—29.50W x 38.10H x 8.75D



Box D, Type 4X—29.50W x 38.10H x 8.75D

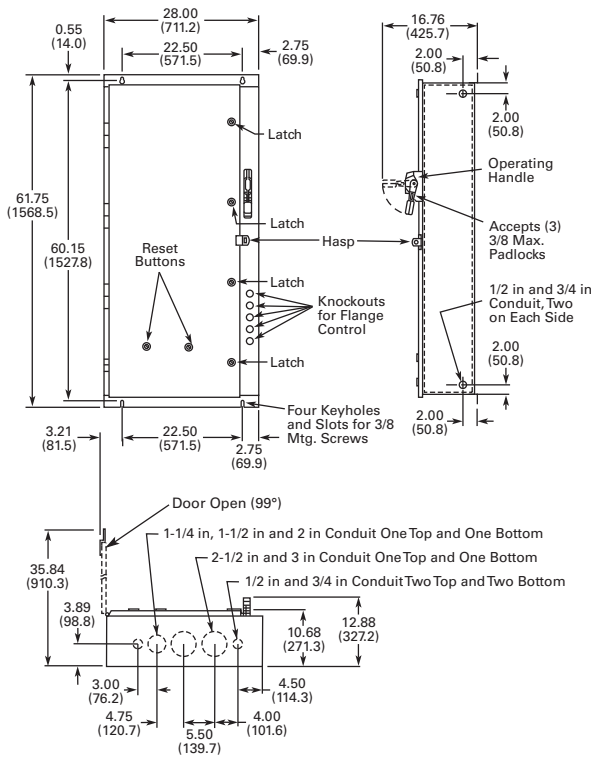


14.2 Enclosed Dimensions

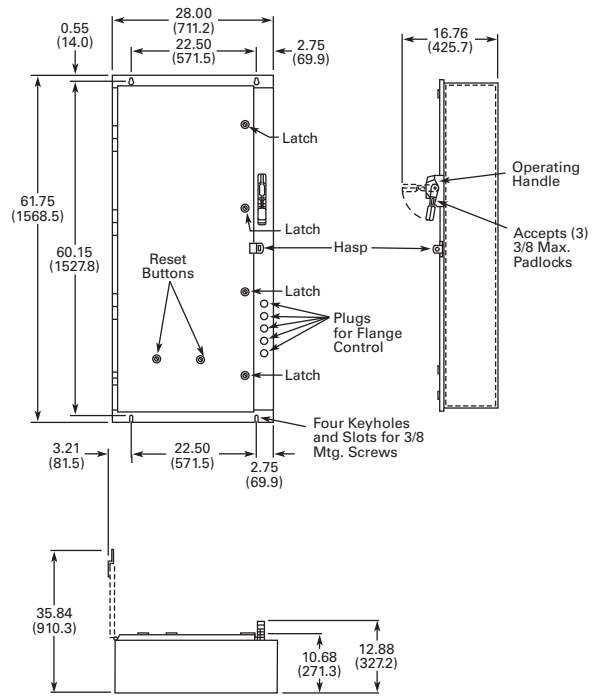
Box Dimensions

Approximate Dimensions are in Inches (mm)

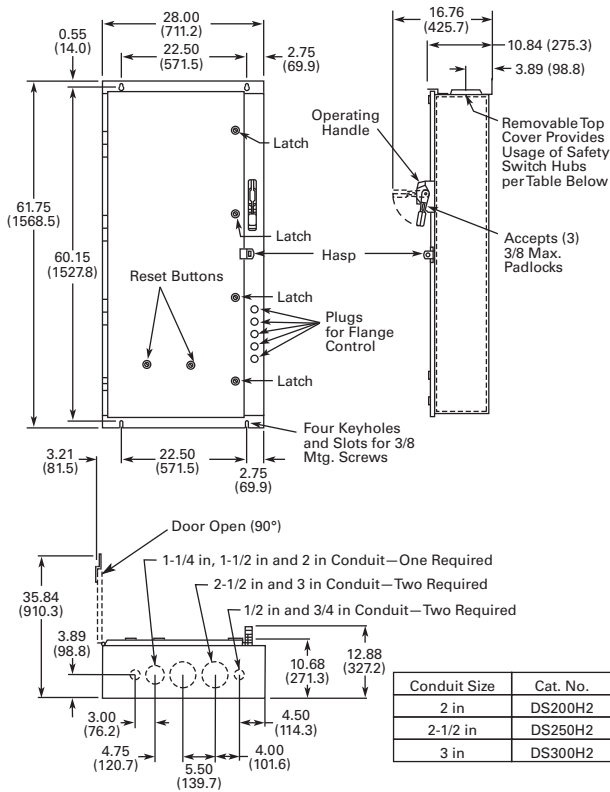
Box E, Type 1—28.00W x 61.75H x 10.68D



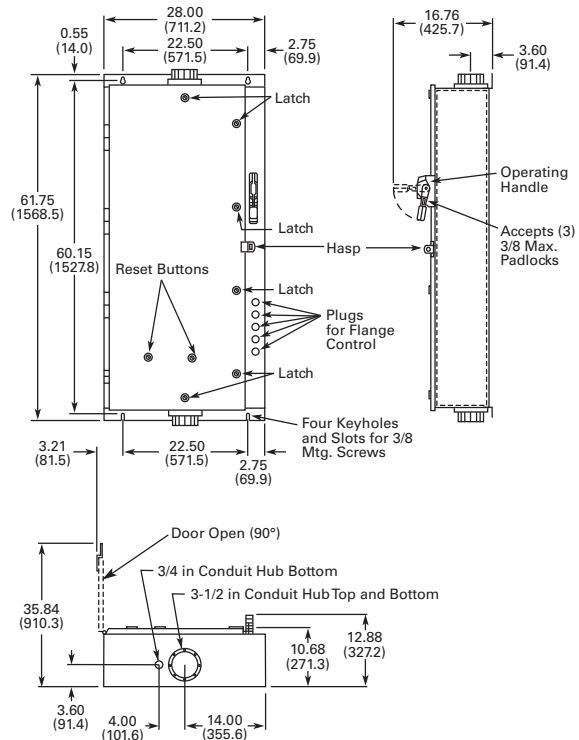
Box E, Type 12—28.00W x 61.75H x 10.68D



Box E, Type 3R—28.00W x 61.75H x 10.68D

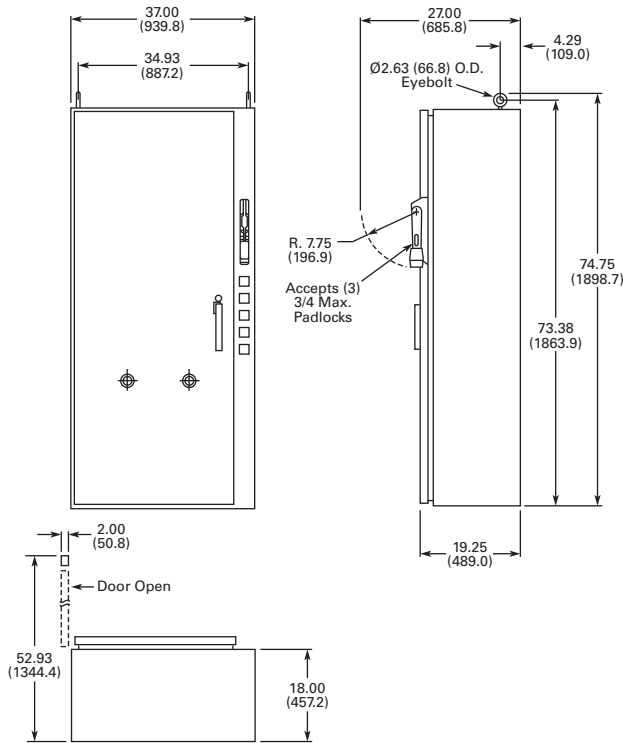


Box E, Type 4X—28.00W x 61.75H x 10.68D

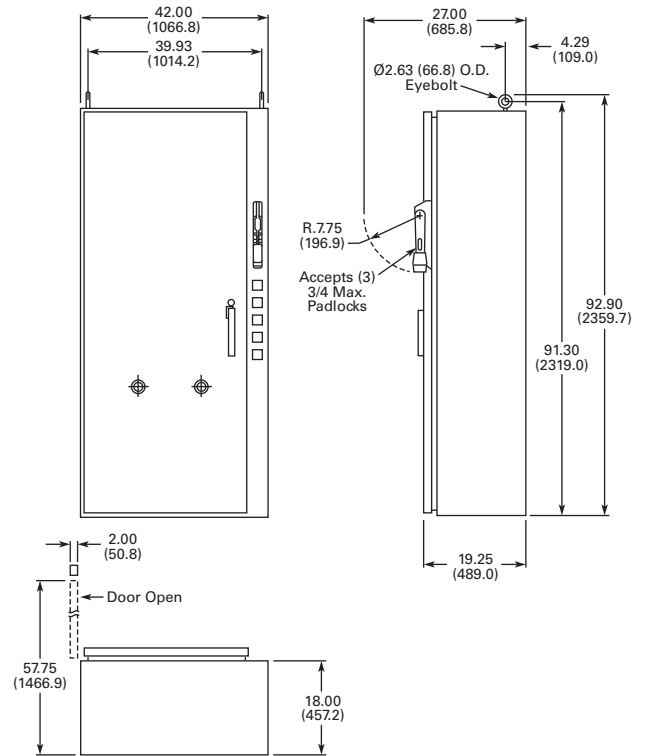


Approximate Dimensions are in Inches (mm)

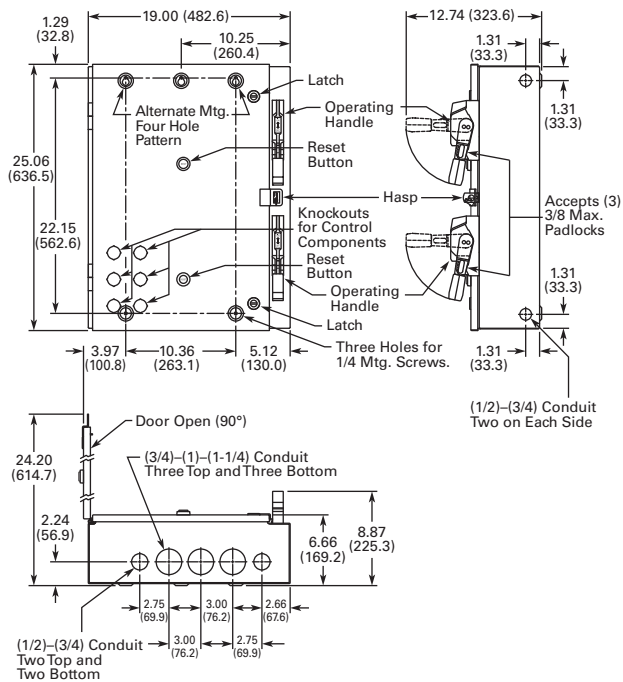
Box F1E, Type 1/3R/4/12—37.00W x 74.75H x 19.25D



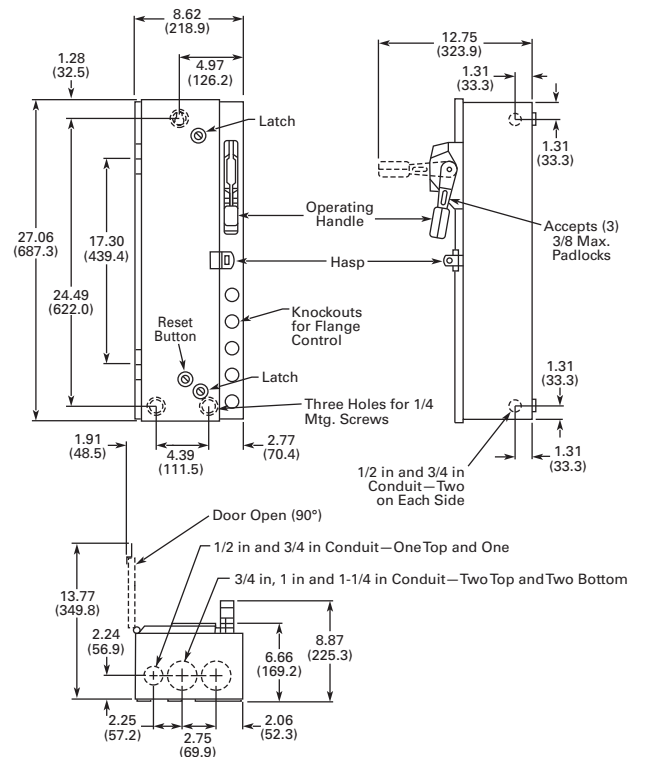
Box F2E, Type 1/3R/4/12—42.00W x 92.90H x 19.25D



Box H, Type 1—19.00W x 25.06H x 6.66D



Box I, Type 1—8.62W x 27.06H x 6.66D ①



Note

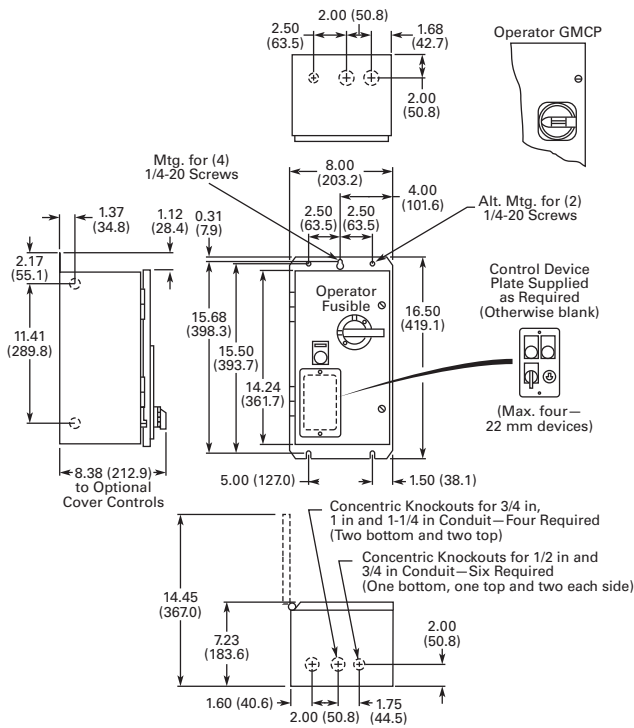
① Knockouts are not supplied for Type 12; all other dimensions apply.

14.2 Enclosed Dimensions

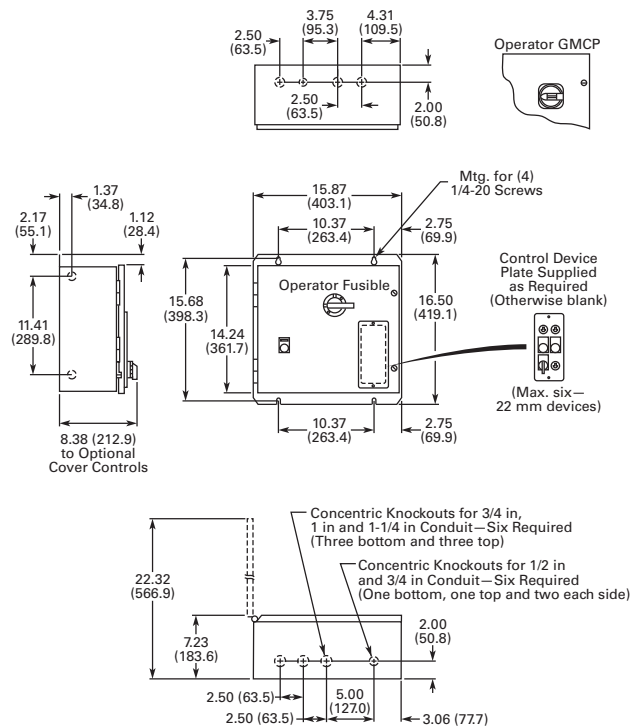
Box Dimensions

Approximate Dimensions are in Inches (mm)

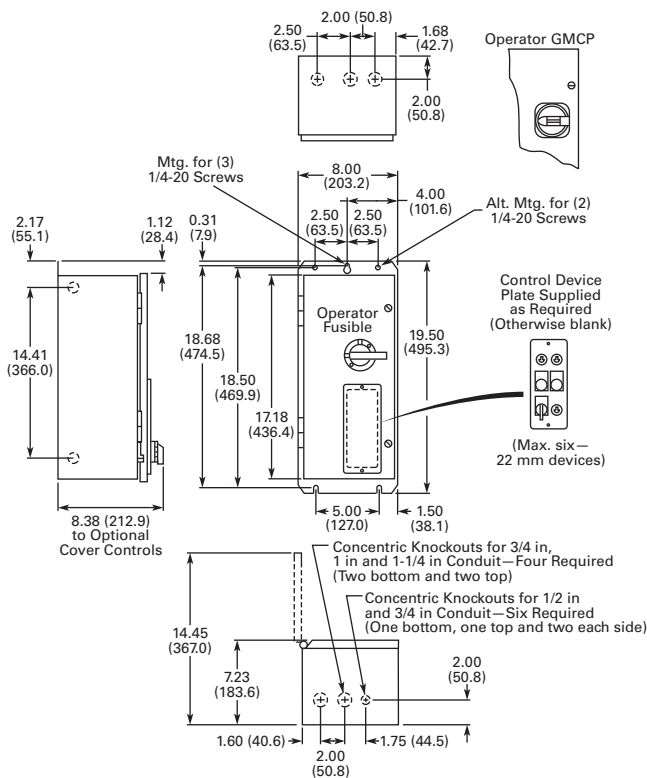
Box J—8.00W x 16.50H x 7.23D ①



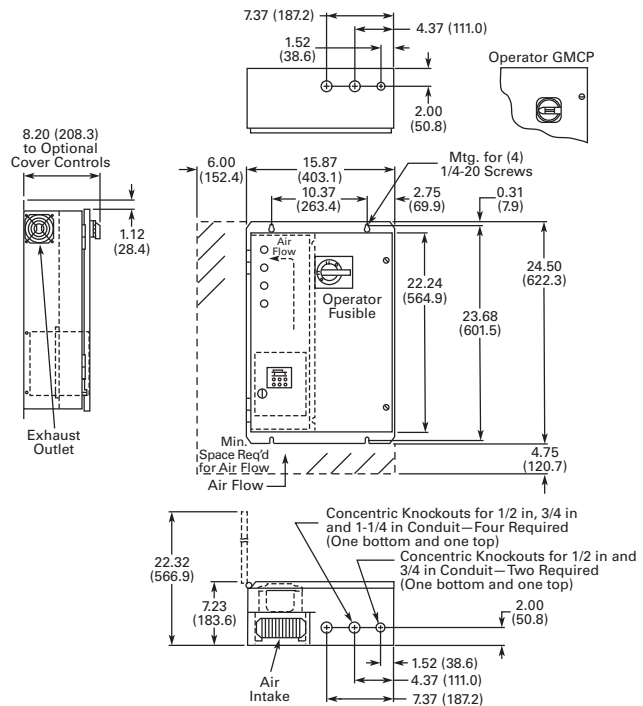
Box L—15.87W x 16.50H x 7.23D ①



Box K—8.00W x 19.50H x 7.23D ①



Box M, Type 1/12—15.87W x 24.50H x 7.23D ②③

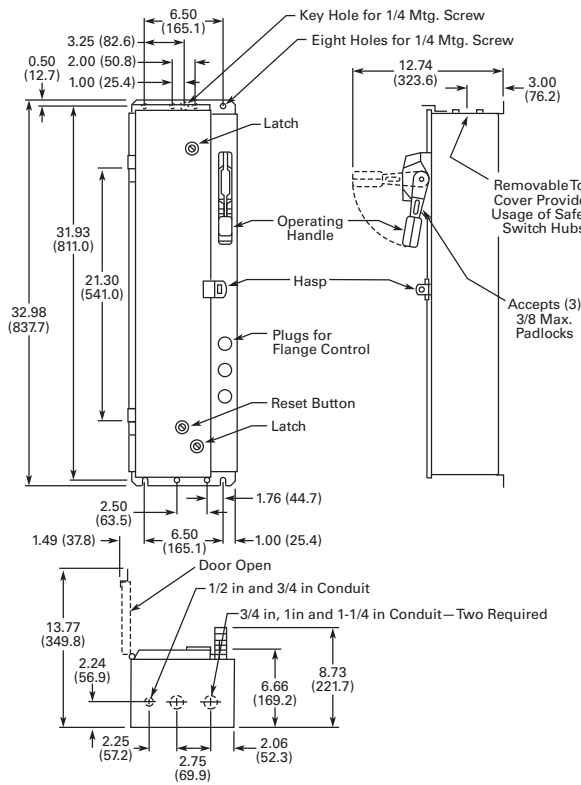


Notes

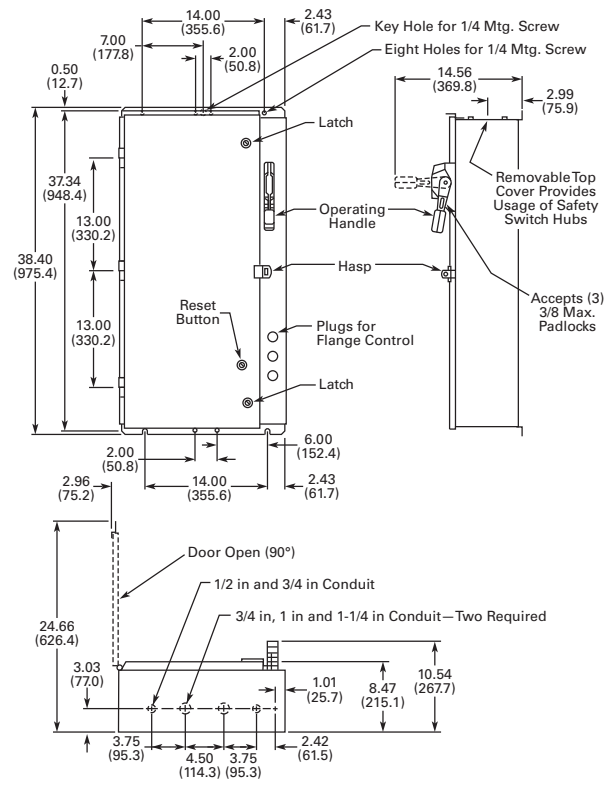
- ① Knockouts are not supplied for Type 12 or 3R types; all other dimensions apply. Consult factory for Type 4X.
- ② Knockouts are not supplied for Type 12; all other dimensions apply.
- ③ For Type 12, clear lens provided.

Approximate Dimensions are in Inches (mm)

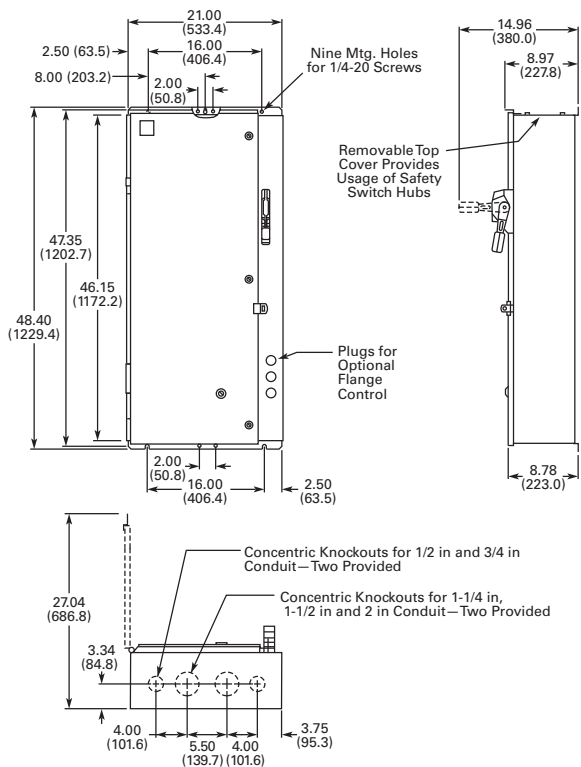
Box P1—8.50W x 32.98H x 6.66D



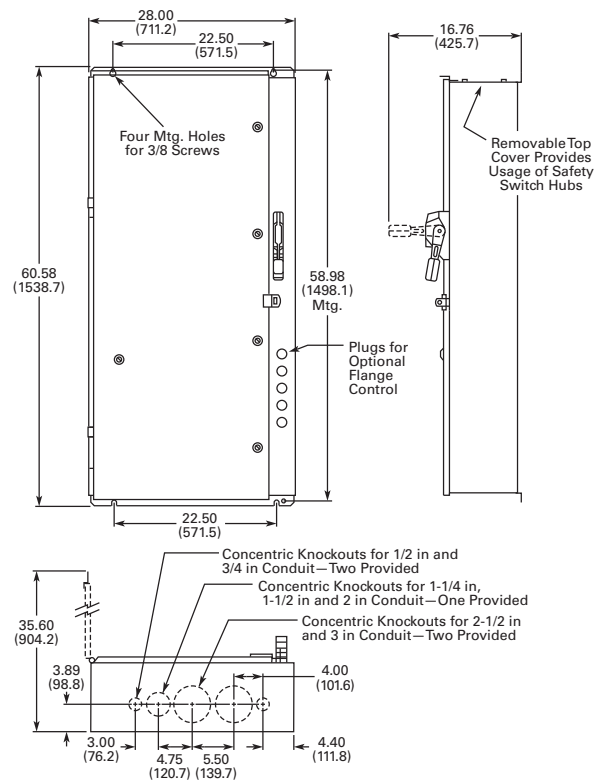
Box P3—18.86W x 38.40H x 8.47D



Box P5—21.00W x 48.40H x 8.97D



Box P7—28.00W x 60.58H x 10.68D



Accessories and Modification Codes

Side-Mounted Auxiliary Contact



Auxiliary Contact



Type 1 Enclosure



Electrically Held Base Contactor



Surge Suppressor



15.1 Accessories

Freedom NEMA	V10-T15-2
A200 NEMA	V10-T15-18
XT IEC	V10-T15-23
Enclosures	V10-T15-28
Lighting Contactors	V10-T15-30
IT Solid-State Soft Starters	V10-T15-36

15.2 Modification Codes

Modification Codes	V10-T15-39
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Freedom NEMA

Auxiliary Contacts

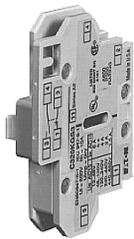
NEMA Sizes 00–2

The auxiliary contacts listed below are designed for installation on Freedom Series starters and contactors. Snap-on design facilitates quick, easy installation.

These bifurcated design contact blocks, featuring silver cadmium alloy contacts, are well suited for use in very low energy (logic level) circuits.

Product Selection

Side-Mounted



Top-Mounted



Description	Contact Configuration Code ^①	Catalog Number
Side-Mounted		
1NO	10	C320KGS1
1NC	01	C320KGS2
1NO-1NC	11	C320KGS3
2NO	20	C320KGS4
2NC	02	C320KGS5
1NO-1NCI	N/A	C320KGS6
1NO (EC)-1NC (LO)	N/A	C320KGS7
1NCI	N/A	C320KGS8
Top-Mounted		
1NO	10	C320KGT1
1NC	01	C320KGT2
1NO-1NC	11	C320KGT3
2NO	20	C320KGT4
2NC	02	C320KGT5
1NO-1NCI	N/A	C320KGT6
1NO (EC)-1NC (LO)	N/A	C320KGT7
1NCI	N/A	C320KGT8
3NO	30	C320KGT9
2NO-1NC	21	C320KGT10
1NO-2NC	12	C320KGT11
3NC	03	C320KGT12
4NO	40	C320KGT13
3NO-1NC	31	C320KGT14
2NO-2NC	22	C320KGT15
1NO-3NC	13	C320KGT16
4NC	04	C320KGT17
3NO-1NCI	N/A	C320KGT18
2NO-1NCI-1NC	N/A	C320KGT19
2NO-1NO (EC)-1NC (LO)	N/A	C320KGT20
1NO-1NC-1NO (EC)-1NC (LO)	N/A	C320KGT21

Notes

NCI = Normally Closed early opening designed for use in reversing applications. EC = Early Closing. LO = Late Opening.

^① For reference only—not part of catalog number. See **Page V10-T15-3**.

Contact Configuration Code

This two-digit code is found on the auxiliary contact to assist in identifying the specific contact configuration.

The first digit indicates the quantity of NO contacts and the second indicates the quantity of NC contacts.

NEMA Sizes 3–8

Product Selection

Circuit	Contact Configuration Code ^①	NEMA Size	Catalog Number
Base Auxiliary Contact			
Base Auxiliary Contacts—NEMA Sizes 3–5			
NO	10	3	C320KGS31
NO-NC	11	3	C320KGS32
NO	10	4–5	C320KGS42
NO-NC	11	4–5	C320KGS42
Auxiliary Contact			
Auxiliary Contacts—NEMA Sizes 3–5			
NO	10	3–5	C320KGS20
NC	01	3–5	C320KGS21
NO-NC ^②	11	3–5	C320KGS22
Auxiliary Contacts—NEMA Sizes 6–8			
NO-NC	11	8	C320KA5
2NO-2NC	22	6–7	C320KA6

Auxiliary Contact Ratings (Amperes)

Ratings—NEMA A600

Current	AC Volts			
	120V	240V	480V	600V
Make and interrupting	60	30	15	12
Break	6	3	1.5	1
Continuous	10	10	10	10

Ratings—NEMA P300

DC Volts	Make/Break Amperes
Continuous Thermal Rating: 5A	
125	1.10
250	0.55

Ratings—Logic Level

Current	Rating
Minimum Ratings for Logic Level and Hostile Atmosphere Application	
Minimum amperes	20 mA
Minimum volts	24 Vac/Vdc

Ratings—C320KGS20L, C320KGS21L, C320KGS22L

DC-12		AC-12	
U _e	I _e	U _e	I _e
80	0.1	250	0.1

Notes

- ^① For reference only—not part of catalog number. See above.
- ^② NO-NC occupies two positions—L2 and L3, or R2 and R3. See **Page V10-T15-5**.

15.1

Accessories and Modification Codes

Accessories

Auxiliary Contact Location

NEMA Sizes 00–2

The sketches below illustrate the maximum number of auxiliary contacts that can be

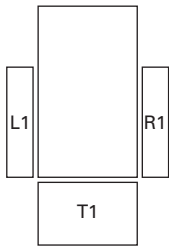
assembled to a contactor or starter and their locations.

Auxiliary Contacts

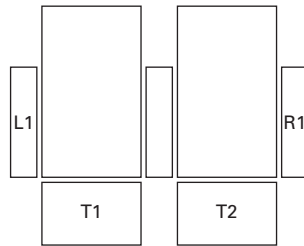
Size	Poles	Available Mounting Positions ①②		Catalog Number
		Open Type	Enclosed	
00	3	T1, L1, R1	L1	AN16
0–2	3	T1, L1	L1	
00–2	3	T1, T2	—	AN56
00	2–4	T1, L1, R1	L1	CN15
0–2	2–3	T1, L1	L1	
1, 2	4	T1, L1	—	
1, 2	5	T1, L1	—	
10A	2–4	T1, L1, R1	L1	CN35
20–60A	2–3	T1, L1	L1	
60A	4	T1, L1	—	
60A	5	T1, L1	—	
00–2	3	T1, T2	—	CN55

Auxiliary Contact Location

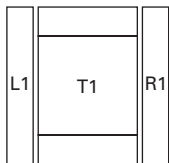
15



Top View

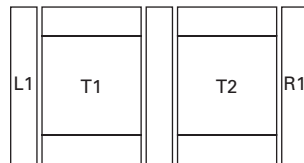


Top View



Front View

Non-Reversing
Contactors and Starters



Front View

Reversing
Contactors and Starters

Notes

- ① Available positions on contactors or starters other than what is factory installed.
- ② When a pneumatic timer is mounted on contactor, only side-mounted auxiliary contact positions are available. The solid-state timer, when added, takes up side-mounted auxiliary contact position.

NEMA Sizes 3–8

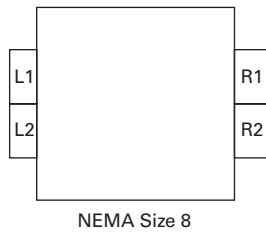
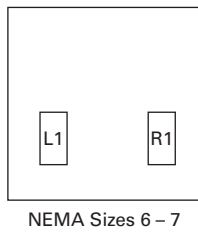
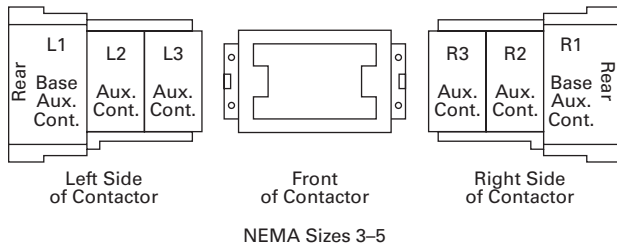
The sketches below illustrate the maximum number of auxiliary contacts that can be assembled to a contactor and their locations.

Note: A base auxiliary contact must be added in position R1 before additional auxiliary contacts can be mounted on NEMA Size 3 or in L1 on NEMA Sizes 4–5.

Mounting Positions

Size	Available Mounting Positions ^①
NEMA Size 3	R2, R3, L1, L2, L3
NEMA Sizes 4–5	L2, L3, R1, R2, R3
NEMA Sizes 6–7	R1
NEMA Size 8	L2, R2

Auxiliary Contact Location



Note

① Available positions on contactors or starters other than what is factory installed.

Heater Pack Selection

Heater packs H2001B to H2017B and H2101B to H2117B are to be used only with Series B overload relays Catalog Numbers C306DN3B (Part No. 10-7016) and C306GN3B (Part No. 10-7020). The load lugs are built into the overload relay base to allow load wiring prior to heater pack installation. The

previous heater design had integral load lugs. The Series B heater packs are electrically equivalent to the previous heater design. Heaters H2018-3 to H2024-3 have not changed.

Note: The series of a starter is the last digit of the listed catalog number. Example: AN16DN0A**B**.

Starters with Series B Overload Relays

Size	Series
NEMA—AN Type	
00–0	C
1–2	B
5	B
6	C
7–8	B

Fast Trip—Class 10 Heater Selection

Overload Relay Size	Motor Full Load Ampere Rating Dial Position				Catalog Number (Includes Three Heater Packs) ①
	A	B	C	D	
For Use with NEMA Sizes 00–0 Series C, NEMA Sizes 1–2 Series B					
32A or 75A	0.260	0.313	0.367	0.420	H2101B-3
	0.384	0.464	0.543	0.623	H2102B-3
	0.570	0.688	0.806	0.924	H2103B-3
	0.846	1.02	1.20	1.37	H2104B-3
	1.28	1.55	1.83	2.10	H2105B-3
	1.92	2.33	2.74	3.15	H2106B-3
	2.30	2.79	3.28	3.77	H2107B-3
	3.38	4.10	4.82	5.54	H2108B-3
	7.07	6.03	7.09	8.16	H2109B-3
	7.07	8.58	10.1	11.6	H2110B-3
	9.60	11.2	12.8	14.4	H2111B-3
	14.4	17.5	20.7	23.8	H2112B-3
	18.7	21.8	25.0	28.1	H2113B-3
	23.5	27.3	31.0	34.8	H2114B-3
For Use with NEMA Size 2—Series B					
75A	28.3	32.6	37.0	41.3	H2115B-3
	36.6	42.3	48.1	53.8	H2116B-3
	53.8	60.8	67.9	74.9	H2117B-3
For Use with Size 5 Starters Only—Series B					
32A ②	51	61	72	82	H2104B-3
	77	93	110	126	H2105B-3
	115	140	164	189	H2106B-3
	138	167	197	226	H2107B-3
	203	246	289	—	H2108B-3
For Use with Size 6 Starters Only—Series B					
32A ②	154	186	220	252	H2105B-3
	230	280	329	378	H2106B-3
	276	335	394	452	H2107B-3
	406	492	578	—	H2108B-3
For Use with Size 7 Starters Only—Series B					
32A ②	169	204	240	274	H2104B-3
	256	310	366	420	H2105B-3
	384	466	543	630	H2106B-3
	460	558	656	754	H2107B-3
	676	820	—	—	H2108B-3
For Use with Size 8 Starters Only—Series B					
32A ②	254	306	360	411	H2104B-3
	384	465	549	630	H2105B-3
	576	699	822	945	H2106B-3
	690	837	984	1131	H2107B-3
	1014	1230	—	—	H2108B-3

Notes

- ① Heater packs are shipped three to a carton. Catalog numbers are for three heater packs.
 ② Sizes 5–8 use the 32A overload relay with current transformers.

Standard Trip—Class 20 Heater Selection

Overload Relay Size	Motor Full Load Ampere Rating Dial Position				Catalog Number (Includes Three Heater Packs) ①
	A	B	C	D	
For Use with NEMA Sizes 00–0 Series C, NEMA Sizes 1–2 Series B					
32A or 75A	0.254	0.306	0.359	0.411	H2001B-3
	0.375	0.452	0.530	0.607	H2002B-3
	0.560	0.676	0.791	0.907	H2003B-3
	0.814	0.983	1.15	1.32	H2004B-3
	1.20	1.45	1.71	1.96	H2005B-3
	1.79	2.16	2.53	2.90	H2006B-3
	2.15	2.60	3.04	3.49	H2007B-3
	3.23	3.90	4.56	5.23	H2008B-3
	4.55	5.50	6.45	7.40	H2009B-3
	6.75	8.17	9.58	11.0	H2010B-3
	9.14	10.8	12.4	14.0	H2011B-3
	14.0	16.9	19.9	22.8	H2012B-3
	18.7	22.7	26.7	30.7	H2013B-3
	23.5	28.5	33.5	38.5	H2014B-3
For Use with NEMA Size 2—Series B					
75A	29.0	34.0	39.1	44.1	H2015B-3
	39.6	45.5	51.5	57.4	H2016B-3
	53.9	60.9	67.9	74.9	H2017B-3
For Use with NEMA Sizes 3–4—Series A					
105A or 144A	8.0	9.2	10.3	11.5	H2025-3
	11.4	12.8	14.3	15.7	H2026-3
	14.3	15.7	17.4	19.0	H2027-3
	18.0	20.2	22.3	24.5	H2018-3
	24.6	27.6	30.5	33.4	H2019-3
	33.5	37.5	41.5	45.6	H2020-3
	45.7	51.2	56.7	62.1	H2021-3
	62.2	69.7	77.1	84.6	H2022-3
	84.7	95.0	105.0	115.0	H2023-3
	106.0	118.0	131.0	144.0	H2024-3
For Use with Size 5 Starters—Series B					
32A ②	49	59	69	79	H2004B-3
	72	87	103	118	H2005B-3
	107	130	152	174	H2006B-3
	129	156	182	209	H2007B-3
	194	234	274	—	H2008B-3
For Use with Size 6 Starters Only—Series B					
32A ②	144	174	205	235	H2005B-3
	215	259	304	348	H2006B-3
	258	312	365	419	H2007B-3
	388	468	547	627	H2008B-3
For Use with Size 7 Starters Only—Series B					
32A ②	163	197	230	264	H2004B-3
	240	290	342	392	H2005B-3
	358	432	506	580	H2006B-3
	430	520	608	698	H2007B-3
	646	780	912	—	H2008B-3
For Use with Size 8 Starters Only—Series B					
32A ②	244	295	345	396	H2004B-3
	360	435	513	588	H2005B-3
	537	648	759	870	H2006B-3
	645	780	912	1047	H2007B-3
	969	1170	1368	—	H2008B-3

Notes

① Heater packs are shipped three to a carton. Catalog numbers are for three heater packs.

② Sizes 5–8 use the 32A overload relay with current transformers.

DC Magnet Coils

When Ordering Specify

Conversion Kit for Field Assembly

- Catalog number

Factory Installed DC Coil

- For factory installed DC magnet coil on AC contactors or non-combination starters (open type only), substitute the code suffix from table below for the magnet coil identifier in the device catalog number.

Example: For Size 0 AC contactor with a 24 Vdc coil, change CN15BN3AC to CN15BN3T1C

Application

- Connect for separate control
- Not for use with cover control switch operators
- Use twin break, heavy-duty pilot devices
- Designed for +10%, -20% rated voltage, continuous duty operation

Non-Reversing Kit Consists of:

- One encapsulated DC magnet coil
 - One NCI or NO/NCI side-mounted auxiliary contact
- Note:** These kits are supplied with a NO/NCI side-mounted auxiliary contact in place of the NCI contact.
- Two blue colored connection wires
 - One instruction publication

Operation

These DC coil kits have separate pickup and seal windings. A **special** (side-mounted) early-break NCI auxiliary contact is used to either disconnect the pickup winding or insert the seal winding in series with the pickup winding, depending on the frame size of the contactor. DC coil kits come in two styles, a suffix **1** and a suffix **4**. The 1 suffix contains only the **special** (side-mounted) early break NCI auxiliary contact. The 4 suffix contains a NO contact in the same package as the **special** (side-mounted) early-break NCI auxiliary contact.

Note: NEMA Sizes 00 and 0 contactors may use either suffix 1 or 4 DC coil kits; starters

may use suffix 4 DC coil kits only. For NEMA Sizes 1 and 2, both contactors and starters may use a suffix 4 DC coil kit only.

On the above sizes only, when the **special** auxiliary package is mounted on the side of a contactor or starter, **no** standard auxiliary contact may be mounted on the same side.

Note: For NEMA Sizes 3–5, the special coil NCI clearing contact is an add-on auxiliary (**must** mount on a base mount auxiliary contact; normally a 1NO). This arrangement will normally account for two of the three contact positions on the side of each contactor or starter.

See figure on **Page V10-T15-9**.

Product Selection

Contactor or Starter Size	Conversion Data				NCI Interlock Number	Factory Installed Code Suffix	Complete Conversion Kit	
	Volts	Magnet Coil Coil Number	Amps P.U./Seal	Watts P.U./Seal			Ship Wt. Lbs (kg)	Catalog Number
NEMA								
Non-Reversing — Kit includes NCI Side-Mounted Auxiliary Contact								
00 and 0 CN35-A, B, D D15 relays	12	9-2988-11	6.4/0.28	76.8/3.36	C320KGD1	R1	1.0 (0.5)	C335KD3R1
	24	9-2988-12	3.2/0.14	76.8/3.36	C320KGD1	T1		C335KD3T1
	48	9-2988-13	1.6/0.07	76.8/3.36	C320KGD1	W1		C335KD3W1
	120	9-2988-14	0.64/0.028	76.8/3.36	C320KGD1	A1		C335KD3A1
① 00 and 0 CN35-A, B, D D15 relays	12	9-2988-11	6.4/0.28	76.8/3.36	C320KGD2 ①	R4	1.0 (0.5)	C335KD3R4
	24	9-2988-12	3.2/0.14	76.8/3.36	C320KGD2 ①	T4		C335KD3T4
	48	9-2988-13	1.6/0.07	76.8/3.36	C320KGD2 ①	W4		C335KD3W4
	120	9-2988-14	0.64/0.028	76.8/3.36	C320KGD2 ①	A4		C335KD3A4
1 and 2 CN35-G	12	9-2990-1	15.4/0.42	185/4.98	C320KGD5	R4	1.0 (0.5)	C335KD4R4
	24	9-2990-2	7.7/0.21	185/4.96	C320KGD5	T4		C335KD4T4
	48	9-2990-3	3.9/0.11	185/5.04	C320KGD5	W4		C335KD4W4
	120	9-2990-4	1.5/0.041	185/4.87	C320KGD5	A4		C335KD4A4
3 CN35-K	12	9-3002-1	24/0.40	293/4.84	C320KGD3	R1	2.0 (0.9)	C335KD5R1
	24	9-3002-2	12/0.20	288/4.75	C320KGD3	T1		C335KD5T1
	48	9-3002-3	6.1/0.097	295/4.67	C320KGD3	W1		C335KD5W1
	120	9-3002-4	2.5/0.038	298/4.57	C320KGD3	A1		C335KD5A1
4 and 5 CN35-N, S	24	9-2026-4	18/0.22	400/5.3	C320KGD3	T1B	2.5 (1.1)	C335KA3T1
	48	9-2026-3	9/0.11	400/5.2	C320KGD3	W1B		C335KA3W1
	120	9-2026-2	3.3/0.05	450/5.4	C320KGD3	A1B		C335KA3A1
	240	9-2026-1	1.7/0.02	440/4.9	C320KGD3	B1B		C335KA3B1

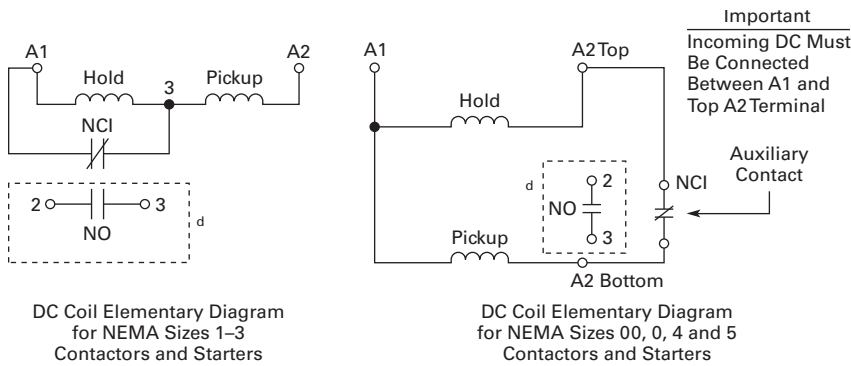
Note

① These kits are supplied with a NO/NCI side-mounted auxiliary contact in place of the NCI contact.

Product Selection, continued

Contactor or Starter Size	Conversion Data				NCI Interlock Number	Factory Installed Code Suffix	Complete Conversion Kit	
	Volts	Magnet Coil Coil Number	Amps P.U./Seal	Watts P.U./Seal			Ship Wt. Lbs (kg)	Catalog Number
NEMA	Volts	Coil Number	Amps P.U./Seal	Watts P.U./Seal	NCI Interlock Number	Factory Installed Code Suffix	Ship Wt. Lbs (kg)	Catalog Number
Reversing								
00 and 0 CN35-A, B, D D15 relays	12	9-2988-1	6.4/0.28	76.8/3.36	C320KGD1	R1 ①	1.0 (0.9)	C335KD3R1 ②
	24	9-2988-2	3.2/0.14	76.8/3.36	C320KGD1	T1 ①		C335KD3T1 ②
	48	9-2988-3	1.6/0.07	76.8/3.36	C320KGD1	W1 ①		C335KD3W1 ②
	120	9-2988-4	0.64/0.028	76.8/3.36	C320KGD1	A1 ①		C335KD3A1 ②
1 and 2 CN35-G	12	9-2990-1	15.4/0.42	185/4.98	C320KGD3	R1 ①	—	③
	24	9-2990-2	7.7/0.21	185/4.96	C320KGD3	T1 ①		③
	48	9-2990-3	3.9/0.11	185/5.04	C320KGD3	W1 ①		③
	120	9-2990-4	1.5/0.041	185/4.87	C320KGD3	A1 ①		③

Elementary Diagrams



Notes

- ① Factory installed DC coils on NEMA contactors and starters include a NO/NC top-mounted auxiliary contact on each contactor for electrical interlocking.
- ② Kit does not include mechanical interlock or crossover wiring. Two NO/NCI top-mounted auxiliary contacts are supplied for electrical interlocking.
- ③ Available factory assembled only.
- ④ 1NO available in suffix 4 kits only.

15.1 Accessories and Modification Codes

Accessories

Remote Reset Module (32A Overload Relay)

The C316RR remote reset module for the C316F, C316S and C316U overload relays allows remote resetting of tripped (32A) overload relays by means of an electrical solenoid attachment that mounts on the side of the overload relay.

Product Selection

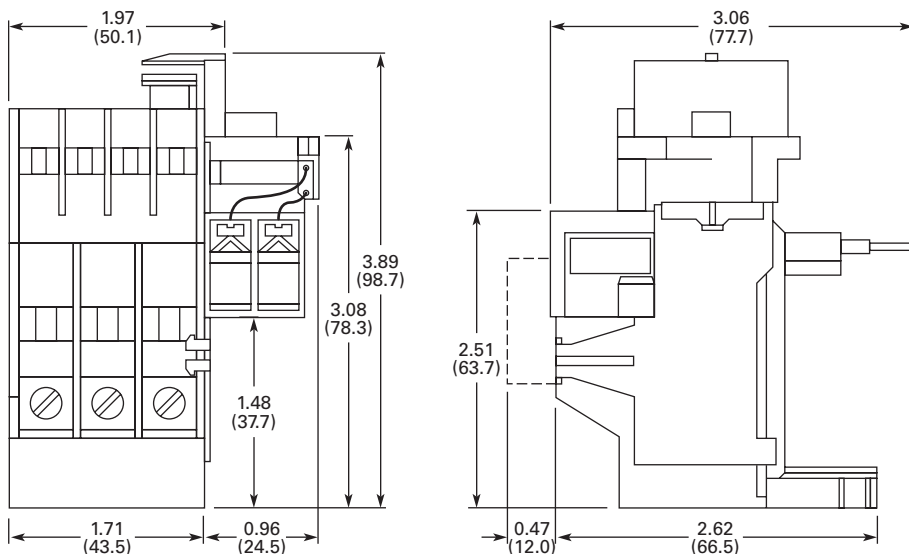
Remote Reset Module Operating Voltage	Catalog Number
24V 50/60 Hz	C316RR1U
110V 50/60 Hz	C316RR1A

Dimensions

Approximate Dimensions in Inches (mm)

Note: The operating coil is not suitable for a continuous duty. Recommended impulse duration 0.2–0.35 seconds with 15 operations maximum per hour.

Remote Reset Module



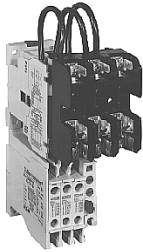
Three-Pole Top-Mounted Fuse Block Kit

NEMA Sizes 00–2

Field mount to Freedom Series starters and contactors. Designed to save space and reduce installation costs. They provide short-circuit protection for branch circuits.

Mounted Fuse Block Kit

Fuse Block Kit



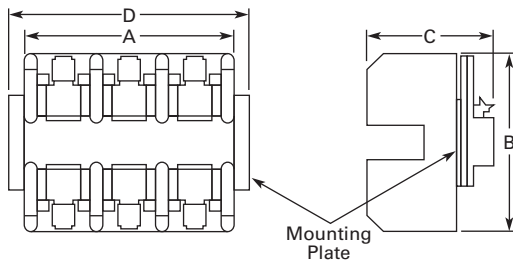
Fuse Block Kits

Fuse Type	Catalog Number	Fuse Type	Catalog Number
Class H — 30A 250V	C350KH21	Class T — 60A 300V	C350KT32
Class R — 30A 250V	C350KR21	Class J — 30A 600V	C350KJ61
Class G — 15A 300V	C350KG37	Class J — 60A 600V	C350KJ62
Class G — 20A 300V	C350KG38	Type M — 30A 600V ①	C350KM61
Class G — 30A 300V	C350KG31	Class CC — 30A 600V	C350KC63
Class G — 60A 300V	C350KG32	Class T — 30A 600V	C350KT61
Class T — 30A 300V	C350KT31	Class T — 60A 600V	C350KT62

Dimensions

Approximate Dimensions in Inches (mm)

Mounted Fuse Block



Fuse Block

Class	Amperes	Volts	Wide A	High B	Deep C	D
G	15, 20, 30	300	2.40 (61.0)	3.00 (76.2)	2.04 (51.8)	—
	60	300	2.62 (66.5)	4.25 (108.0)	2.08 (52.8)	—
H	30	250	3.00 (76.2)	3.10 (78.7)	2.23 (56.6)	3.62 (91.9)
J	30, 60	600	4.81 (122.2)	4.12 (104.6)	2.82 (71.6)	—
M, CC	30	600	2.40 (61.0)	3.00 (76.2)	2.04 (51.8)	—
R	30	250	3.00 (76.2)	3.10 (78.7)	2.23 (56.6)	3.62 (91.9)
T	30, 60	300	3.44 (87.4)	3.00 (76.2)	2.33 (59.2)	—
	30	600	3.75 (95.3)	3.31 (84.1)	2.26 (57.4)	—
	60	600	4.87 (123.7)	3.00 (76.2)	2.58 (65.5)	—

Note

① Type M fuse block not approved for branch circuit protection.

Mechanical Interlock and Reversing Kits

Mechanical interlocks and reversing kits are designed for field assembly of reversing contactors or starters from Freedom Series components. The reversing kits include a mechanical

interlock, stabilizer bar and a pre-cut, trimmed and formed wire set. Auxiliary contacts, if required, must be ordered separately. See **Page V10-T15-2**.

Mechanical Interlock



Mechanical Interlock Only ①②

Application

NEMA Size	Contactors Mounting	Catalog Number
00-2	Horizontal	C321KM60B
3	Horizontal	C321KM30
3 to 4	Horizontal	C321KM43
4	Horizontal	C321KM40
4 to 5	Horizontal	C321KM45
4 to 6	Horizontal	C321KM80
5	Horizontal	C321KM50
5 to 6	Horizontal	C321KM56
6	Horizontal	C321KM70
6 to 7	Horizontal	C321KM90
7	Horizontal	C321KM34
4 or 5 to 6	Vertical	C321KM55
5 to 6	Vertical	C321KM65
6	Vertical	C321KM66
6 to 7	Vertical	C321KM67

Reversing Kits (Horizontal Contactor Mounting Only)

Application NEMA Size	Catalog Number	Application NEMA Size	Catalog Number
00	C321KM60K14B	—	C321KM60K21 ③
0	C321KM60K13B	—	C321KM60K18 ③
1	C321KM60K15B	4	C321KM60K19 ③
2	C321KM60K16B	5	C321KM60K20 ③
3	C321KM60K17 ③	—	C321KM60K44 ③

Solid-State Timers

Solid-State ON DELAY Timer—Side-Mounted on Freedom Series NEMA 00-2 and C25D, C25E and C25F Frame

This timer is designed to be **wired in series with the load** (typically a coil). When the START button is pushed (power applied to timer), the

ON DELAY timing function starts. At the completion of the set timing period, timer and series wired load will both be energized.

Solid-State Timer



Mounted Timer Product Selection

Timing Range	Catalog Number ④⑤⑥
0.1-1.0 seconds	C320TDN1_
1-30 seconds	C320TDN30_
30-300 seconds	C320TDN300_
5-30 minutes	C320TDN2000_

Pneumatic Timers—Top-Mounted

Attachment mounts on top of any NEMA Size 00-2 Freedom Series starter or contactor (top-mounted auxiliary contacts can not be installed on device when timer

is used). Timer unit has 1NO-1NC isolated timed contacts—circuits in each pole must be the same polarity. Units are convertible from OFF to ON DELAY or vice-versa.

Pneumatic Timer



Product Selection

Timing Range	Catalog Number
0.1-30 seconds	C320TP1
10-180 seconds	C320TP2

Maximum Ampere Ratings

Description	Volts AC			
	120	240	480	600
Make	30	15	7.5	6
Break	3	1.5	0.75	0.6

Notes

- ① Without cross-wiring.
- ② For use with latest series product.
- ③ Kit includes two NC auxiliary contacts.
- ④ Add operating voltage suffix to catalog number. **A** = 120V, **B** = 240V, **E** = 208V.
- ⑤ Rated 0.5A pilot duty—not to be used on larger contactors.
- ⑥ Terminal connections are quick connects only. Two per side.

Locking Cover for Overload Relay—C306 Only

Snap-on transparent or opaque plastic panel for covering access port to the overload relay trip setting

dial—helps prevent accidental or unauthorized changes to trip and reset setting.

Locking Cover



Product Selection

Description	Minimum Ordering Qty. (Std. Pkg.)	Catalog Number
Clear cover, no accessibility	50	C320PC3
Gray cover, no accessibility, with auto only nib	50	C320PC4
Gray cover, no accessibility, with manual only nib	50	C320PC5
Gray cover with FLA dial accessibility, A, B, C, D positions and auto only nib	50	C320PC6
Gray cover with FLA dial accessibility, A, B, C, D positions and manual only nib	50	C320PC7

Control Circuit Fuse Block

These panel mounted fuse holders, designed for control circuit protection or other similar low current requirements, have extractor type fuse caps. The Class CC rejection type fuses (KTK-R) used in these holders are intended for use with

equipment designated as being suitable for use on systems having high available fault currents. If branch circuit protective device is 45A or greater, C320FBR fuse kit may be required for control circuit protection per NEC 430-72.

Control Circuit Fuse Block



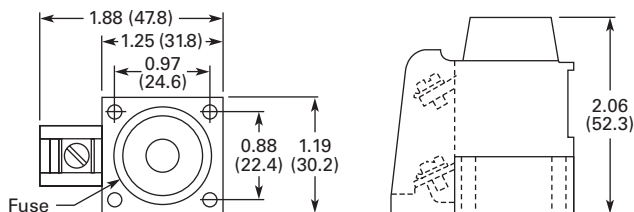
Product Selection

Type	Maximum Amperes	Catalog Number
Fuse holder only	15	C320FB ①
	30	C320FBR ②

Dimensions

Approximate Dimensions in Inches (mm)

Control Circuit Fuse Block



Transient Suppressor Kits

NEMA Sizes 00–2

These kits limit high voltage transients produced in the control circuit when power is removed from the contactor or starter coil. There are three separate suppressors for use on 24–120V, 208–240V or 277–480V coils respectively.

These devices mount directly to the coil terminals of Freedom Series contactors or starters NEMA Sizes 00–2 and lighting contactors 10–60A. Reversing devices will require two.

Transient Suppressor NEMA Sizes 00–2



Product Selection

Description	Coil Voltage 50/60 Hz ③	Catalog Number
Transient suppressor	24–120V	C320TS1
	208–240V	C320TS2
	277–480V	C320TS3

NEMA Sizes 3–5

This device mounts on top of any side-mounted auxiliary contact on Freedom Series NEMA Sizes 3–5 and lighting contactors 100–300A. It connects across coil terminals on any 120V contactor or starter magnet

coil (reversing starters or contactors require 2).

Limits high voltage transients produced in the circuit when power is removed from the coil.

Transient Suppressor NEMA Sizes 3–5



Product Selection

Description	Coil Voltage	Catalog Number
Transient suppressor	120V	C320AS1

Shorting Bar Kits

These kits provide phase-to-phase power connections of contactors for field assembly. The kits include bus

connections and mounting hardware. The shorting bars connect all three phases of a single contactor.

Product Selection

Description	Catalog Number	Description	Catalog Number
NEMA Size 3	C321SB18	NEMA Size 5	C321SB21
NEMA Size 4	C321SB19	NEMA Size 6	C321SB22

Notes

- ① A fuse is not supplied, but holder will accept a Bussman Type KTK or KTK-R (13/32 in x 1-1/2 in) fuse, 600V maximum.
- ② Includes a 5A, 600V KTK-R fuse.
- ③ Suppressor is compatible with coil voltages/ranges as shown, 50 and 60 Hz.

15.1 Accessories and Modification Codes

Accessories

DC/AC Interface Module

The catalog number C320DC Interface Module is an optically isolated solid-state switch which provides a means of operating AC coils with 5–48 Vdc control signal. It acts as a space saving interposing relay which can switch a specified 50/60 Hz AC source to the contactor or starter coil.

The module may be directly attached to the coil terminals of any Freedom Series contactor or starter—NEMA Sizes 00–3 and lighting contactors 10–100A. It also has provisions for DIN rail mounting.

The module will operate coils within the voltage ranges shown in the table below.

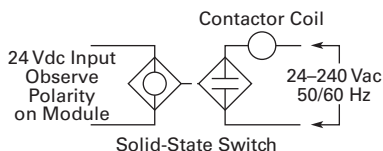
Design Characteristics

- DC Input: 5–48 Vdc at mA nominal
- AC operating voltage: 240 Vac (360 VA) $\pm 10\%$ 50/60 Hz
- DC operating voltage: 30 Vdc maximum (0.5A)
- AC current rating
 - 10A make (inrush)
 - 1A break (sealed)

Controller Coil Voltage Ranges

Controller Catalog Number Prefix	Controller Size or Rating	Coil Range Volts AC
AN16, AN56, CN15, CN55	00–0	24–240
	1–2	48–240
	3	110–240
CN35	10–30A	24–240
	60A	48–240
	100A	110–240

Typical Application



DC/AC Interface Module



Product Selection

Coil Voltage	Catalog Number
5 Vdc	C320DC2V5
6 Vdc	C320DC2V6
9 Vdc	C320DC2V9
12 Vdc	C320DC2V12
48 Vdc	C320DC2V48

Finger Protection Shields

Snap-on shields for both contactors and starters provide Type IP20 finger

protection. Prevents accidental contact with line/load terminals.

Product Selection

Application	Catalog Number
NEMA Size 00	C320LS1
NEMA Size 0	C320LS2
NEMA Sizes 1–2 Contactors	C320LS3
	C320LS4
NEMA Size 1 Starters	C320LS5
	C320LS6
NEMA Size 2 Starters	C320LS7
	C320LS8

Adapter to DIN Rail Mount

NEMA 1–2 Contactors

Designed to allow DIN rail mounting of NEMA 1–2 contactors. Includes all hardware required to convert contactors from panel mounting to 35 mm DIN rail mounting.

Product Selection

Description	Catalog Number
Adapter to DIN rail mount	C320DN65

Adhesive Dust Cover

NEMA Sizes 00–2

These adhesive stickers come 25 to a package and provide extra protection from contaminants when applied to the sides of Freedom NEMA Sizes 00–2.

Adhesive covers are easily applied to side opening where auxiliaries are not installed and provide extra protection from metal filings and other debris.

Product Selection

Description	Catalog Number
25 to a package	C320DSTCVR

Add-On Power Pole Kit

NEMA Sizes 00–2

This device mounts on the side of Freedom NEMA Size 00–2 contactors. One unit can be mounted on each side and carries UL, cUL and IEC ratings. The device is rated for resistive, inductive and lighting applications.

Product Selection—Add-On Power Pole Kit

UL Ampere Rating				IEC 947 Ampere Rating					
Inductive 600V	Resistive 600V	hp Single-Phase		Locked Rotor 240V	Lighting Ballast Tungsten 480V	AC-1 600V	AC-3 600V	AC-5a AC-5b 480V	1NO Power Pole Catalog Number
		115V	230V						
15	20	1/2	2	96	20	20	12	18	C320PPD10

Fuse Clips

C351 Fuse Clip Kit



C351—Fuse Clip Selection—Three Poles

Starter Size	Motor Voltage	Maximum hp (Three-Phase) Dual Element Fuses	Fuse Clip Rating		Fuse Clip Kit Factory Installed Position 10 Alpha ①	Fuse Clip Kit for Field Installation in Non-Fusible Starter For Non-Rejection Type Fuses		For Use with "R" Rejection Type Fuses	
			Amperes	Volts		Catalog Number	Catalog Number		
Non-Fusible—without Fuse Clips Installed						A			
0	200/230	3	30	250	B	C351KC21	C351KC21R		
	460/575	5	30	600	C	C351KD22-61	C351KD22-61R		
1	200/230	7-1/2	30	250	B	C351KC21	C351KC21R		
	460/575	10	30	600	C	C351KD22-61	C351KD22-61R		
2	200	10	60	250	D	C351KD22-61	C351KD22-61R		
	230	15	60	250	D	C351KD22-61	C351KD22-61R		
	460/575	25	60	600	E	C351KD62	C351KD62R		
3	200	25	100	250	F	C351KE23-63 ②	C351KE23-63 ②		
	230	30	100	250	F	C351KE23-63 ②	C351KE23-63 ②		
	460/575	50	100	600	G	C351KE23-63 ②	C351KE23-63 ②		
4	200	40	200	250	H	C351KF24-64 ②	C351KF24-64 ②		
	230	50	200	250	H	C351KF24-64 ②	C351KF24-64 ②		
	460/575	100	200	600	J	C351KF24-64 ②	C351KF24-64 ②		
5	200	75	400	250	K	Not available in kit form	Not available in kit form		
	230	100	400	250	K				
	460/575	200	400	600	L				

Notes

- ① These fuse clips are for Class R fuses.
 - ② Fuse clip "R" rejection members for use with Class R fuses are supplied loose in the fuse clip kits.
- Kits do not include fuses.

Control Power Transformer Kits

These control transformer kits provide a convenient on-the-job addition of control transformers to the following Type 1, 3R, 4/4X and 12 enclosed starters. Adding or changing these kits does not affect the UL listing in most instances.

The transformer kit consists of:

- Control transformer
- Two primary and one secondary fuse
- Wires
- Mounting instruction publication

For Non-Combination Starters

These kits may be used for transformer voltage conversion on Freedom NEMA starters furnished from the factory with control transformers installed. Non-combination starters with CPTs factory installed are Class ECN07, ECA07, ECE07 and ECE11. These kits may also be installed in oversize enclosures that have been designed to accept transformers.

Combination Starters

Most combination starters have space for standard size (and 100 VA extra capacity) control power transformers. The panels are pre-drilled for mounting.

UL/CSA

UL Listed—File Number E10156, Guide XPTO.

When Ordering Specify

- Catalog number

Standard Transformer Sizes ^①

Size	VA Capacity	
	Freedom	Vacuum
0	50	—
1, 2	100	—
3	150	—
4	200	100
5	200	150
6	250	350

Control Transformer Kits

Control Transformer Kit



Continuous VA	Primary 208/277V Secondary 120V, 60 Hz	Primary 240/480V, 60 Hz 220/440V, 50 Hz Secondary 120V, 60 Hz 110V, 50 Hz	Primary 380V Secondary 110V, 50 Hz	Primary 600V, 60 Hz 550V, 50 Hz Secondary 120V, 60 Hz 110V, 50 Hz	Primary 240/480V Secondary 24V, 60 Hz
	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
50	C341AE	C341AC	C341AL	C341AD	C341AS
75	C341BE	C341BC	C341BL	C341BD	C341BS
100	C341CE	C341CC	C341CL	C341CD	C341CS
150	C341DE	C341DC	C341DL	C341DD	C341DS
200	C341EE	C341EC	C341EL	C341ED	C341ES
250	C341FE	C341FC	C341FL	C341FD	C341FS
300	C341GE	C341GC	C341GL	C341GD	C341GS
350	C341HE	C341HC	C341HL	C341HD	C341HS
500	C341JE	C341JC	C341JL	C341JD	C341JS

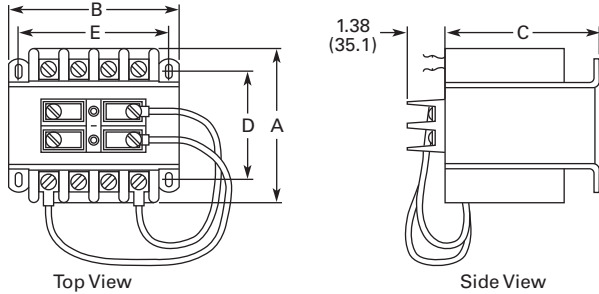
Note

^① Non-reversing, single contactor only.

Dimensions

Approximate Dimensions in Inches (mm)

Open Type—50–500 VA with Fuse Block



Continuous VA	Wide A	High B	Deep C	Mounting D	E	Slots	Ship Wt. Lbs (kg)
50	3.00 (76.2)	3.00 (76.2)	2.56 (65.0)	2.00 (50.8)	2.50 (63.5)	0.203 x 0.375 (5.2 x 9.5)	3.0 (1.4)
75	3.50 (88.9)	3.00 (76.2)	2.56 (65.0)	2.50 (63.5)	2.50 (63.5)	0.203 x 0.375 (5.2 x 9.5)	4.3 (2.0)
100	3.38 (85.9)	3.38 (85.9)	2.88 (73.2)	2.38 (60.5)	2.81 (71.4)	0.203 x 0.375 (5.2 x 9.5)	4.6 (2.1)
150	4.00 (101.6)	3.75 (95.3)	3.18 (80.8)	2.88 (73.2)	3.12 (79.2)	0.203 x 0.375 (5.2 x 9.5)	7.0 (3.2)
200	4.00 (101.6)	4.50 (114.3)	3.81 (96.8)	2.50 (63.5)	3.75 (95.3)	0.203 x 0.375 (5.2 x 9.5)	7.7 (3.5)
250	4.38 (111.3)	4.50 (114.3)	3.81 (96.8)	2.88 (73.2)	3.75 (95.3)	0.203 x 0.375 (5.2 x 9.5)	10.0 (4.5)
300	4.75 (120.7)	4.50 (114.3)	3.81 (96.8)	3.25 (82.6)	3.75 (95.3)	0.203 x 0.375 (5.2 x 9.5)	13.0 (5.9)
350	5.25 (133.4)	4.50 (114.3)	3.81 (96.8)	3.75 (95.3)	3.75 (95.3)	0.203 x 0.375 (5.2 x 9.5)	14.0 (6.4)
500	5.50 (139.7)	5.25 (133.4)	4.75 (120.7)	4.25 (108.0)	4.38 (111.3)	0.312 x 0.688 (7.9 x 17.5)	18.0 (8.2)

A200 NEMA

Factory Modifications

A200 Factory Modifications

Modification	Description	NEMA Size									Catalog Number Suffix	
		00-1	2	3	4	5	6	7	8	9		
Control circuit	1 Extra auxiliary contact (1NO-1NC)											J1
	Non-reversing, reversing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Two-speed unwired	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	2 Extra auxiliary contact											J2
	Non-reversing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Reversing, two-speed unwired	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	3 Extra auxiliary contact											J3
Non-reversing, unwired	✓	✓	✓	✓	—	—	—	—	—	—		
4 Extra auxiliary contact											J4	
Non-reversing, unwired	✓	✓	✓	✓	—	—	—	—	—	—		
	Wired for separate control (NC)	—	—	—	—	—	—	—	—	—	C	
	Omit control wiring (NC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	
Overload relays (substitutions)	Ambient compensated with auto reset (NC)	—	—	—	—	—	—	—	—	—	D	
	Fast trip—ambient compensated (specify motor FLA)	✓	✓	✓	✓	✓	✓	—	—	—	D7	
	Overload relay alarm contact (NO) per overload	✓	✓	✓	✓	✓	✓	—	—	—	E	

Type J Auxiliary Contact

- Capable of being field mounted in a contactor or starter (Classes A200, A900 Sizes 00-6, V200, V201 vacuum and definite purpose controllers)
- Provides two separate electrical contact sets which wire vertically and are color coded; black designates NC and silver designates NO. Please note that the vertical wiring is contrary to the horizontal wiring of the L-56 auxiliary contacts
- Designed to fit within dimensions of starter; no additional panel space is required
- Provides circuit isolation (no polarity restrictions) and single break bifurcated contacts

Auxiliary Contact Ratings

Voltage	Make	Break
NEMA A600		
120-600 Vac	7200 VA	720 VA
72-120 Vac	60A	720 VA
28-72 Vac	60 VA	10A
NEMA R300		
28-300 Vdc	28 VA	28 VA

Auxiliary Contact



Auxiliary Contact Types

Contact Type	Maximum	Catalog Number
1NO and 1NC	4	J11
2NC	4	J02
2NO	4	J20
1 coil clearing NC and 1NO	4	J1C

Heater Selection

General Information on Heater Coil Selection

For maximum motor protection and compliance with Article 430-32 of the National Electrical Code, select heater coils from the tables in this section on the basis of motor nameplate full load current.

When the full load current is unknown, selection may be made on the basis of average full load currents. **Caution—The average ratings could be high or low for a specific motor and therefore**

selection on this basis always involves risk. For fully reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.

Heater coils are rated to protect 40°C rise motors, and open and drip-proof motors having a **service factor of 1.15** where the motor and the controller are at the same ambient temperature.

For other conditions:

1. For 50°C, 55°C, 75°C rise motors and **enclosed motors having a service factor of 1.0, select one size smaller coil.**
2. Ambient temperature of controller lower than motor by 26°C (47°F), use one size smaller coil.
3. Ambient temperature of controller higher than motor by 26°C (47°F), use one size larger coil.

Ultimate tripping current of heater coils is approximately 1.25 times the minimum current rating listed in the tables.

Heater Selection—Type A and B Overload Relays, Sizes 3 and 4

Size Starter	Ambient Compensated Enclosed Starters	Non-Compensating Enclosed Starters	Heater (One Heater per Catalog Number)
	All Applications	Full Load Current of Motor Amps	Catalog Number
For Size 4 Starters	12.8–14.1	11.9–13.0	FH68
	14.2–15.5	13.1–14.3	FH69
	15.6–17.1	14.4–15.9	FH70
	17.2–18.9	16.0–17.4	FH71
	19.0–20.8	17.5–19.1	FH72
	20.9–22.9	19.2–21.1	FH73
	23.0–25.2	21.2–23.2	FH74
	25.3–27.8	23.3–25.6	FH75
	27.9–30.6	25.7–28.1	FH76
	30.7–33.5	28.2–30.8	FH77
For Size 3 Starters	33.6–37.5	30.9–34.5	FH78
	37.6–41.5	34.6–38.2	FH79
	41.6–56.3	38.3–42.6	FH80
	46.4–50	42.7–46	FH81

Size Starter	Ambient Compensated Enclosed Starters	Non-Compensating Enclosed Starters	Heater (One Heater per Catalog Number)
	All Applications	Full Load Current of Motor Amps	Catalog Number
For Size 4 Starters	51–55	47–51	FH82
	56–61	52–56	FH83
	62–66	57–61	FH84
	67–73	62–67	FH85
	74–78	68–72	FH86
	79–84	73–77	FH87
	85–92	78–84	FH88
	93–101	85–91	FH89
	102–110	92–99	FH90
	111–122	100–110	FH91
For Size 3 Starters	123–129	111–122	FH92
	130–133	123–128	FH93
	—	129–133	FH94

Heater Selection—Type A and B Overload Relays, Sizes 5 and 6

Compensated Overload Relay		Heater (One Heater per Catalog Number)
Open Starter	Enclosed Starter	
Full Load Current of Motor (Amps)		Catalog Number
Size 5 (with 300/5 Current Transformers)		
—	—	FH23
118–129	118–129	FH24
130–141	130–141	FH25
142–155	142–155	FH26
156–170	156–170	FH27
171–187	171–187	FH28
188–205	188–205	FH29
206–224	206–224	FH30
225–244	225–244	FH31
245–263	245–263	FH32
264–292	264–292	FH33
293–300	—	FH34

Compensated Overload Relay		Heater (One Heater per Catalog Number)
Open Starter	Enclosed Starter	
Full Load Current of Motor (Amps)		Catalog Number
Size 6 (with 600/5 Current Transformers)		
—	—	FH23
236–259	236–259	FH24
260–283	260–283	FH25
284–310	284–310	FH26
311–340	311–340	FH27
341–374	341–374	FH28
375–411	375–411	FH29
412–448	412–448	FH30
449–489	449–489	FH31
490–527	490–527	FH32
528–585	528–540	FH33
586–600	—	FH34

Note

Size 7 and larger—advise full load current.

15.1

Accessories and Modification Codes

Accessories

Heater Selection—Type A and B Overload Relays, Sizes 0, 1 and 2

Size Starter	Non-Compensated Open Starters and Ambient Comp. Open and Enclosed Starters Block Type Overload Using Three Heaters Full Load Current of Motor (Amps)	Single-Pole Type Overload	Heater (One Heater per Catalog Number) Catalog Number	Non-Compensating Enclosed Starters Block Type Overload Using Three Heaters Full Load Current of Motor (Amps)	Single-Pole Type Overload	Heater Catalog Number
	0.25–0.27	0.29–0.31	FH03	0.24–0.25	0.28–0.30	FH03
	0.28–0.31	0.32–0.35	FH04	0.26–0.28	0.31–0.34	FH04
	0.32–0.34	0.36–0.39	FH05	0.29–0.31	0.35–0.37	FH05
	0.35–0.38	0.44–0.48	FH06	0.32–0.35	0.38–0.42	FH06
	0.39–0.42	0.44–0.48	FH07	0.36–0.39	0.43–0.47	FH07
	0.43–0.46	0.49–0.53	FH08	0.40–0.43	0.48–0.52	FH08
	0.47–0.50	0.54–0.58	FH09	0.44–0.47	0.53–0.56	FH09
	0.51–0.55	0.59–0.64	FH10	0.48–0.51	0.57–0.63	FH10
	0.56–0.62	0.65–0.71	FH11	0.52–0.57	0.64–0.70	FH11
	0.63–0.68	0.72–0.79	FH12	0.58–0.63	0.71–0.77	FH12
	0.69–0.75	0.80–0.87	FH13	0.64–0.70	0.78–0.85	FH13
	0.76–0.83	0.88–0.96	FH14	0.71–0.77	0.86–0.94	FH14
	0.84–0.91	0.97–1.06	FH15	0.78–0.85	0.95–1.03	FH15
	0.92–1.00	1.07–1.16	FH16	0.86–0.93	1.04–1.13	FH16
	1.01–1.11	1.17–1.28	FH17	0.94–1.03	1.14–1.25	FH17
	1.12–1.22	1.29–1.41	FH18	1.04–1.13	1.26–1.38	FH18
	1.23–1.34	1.42–1.55	FH19	1.14–1.25	1.39–1.52	FH19
	1.35–1.47	1.56–1.71	FH20	1.26–1.37	1.53–1.67	FH20
	1.48–1.62	1.72–1.87	FH21	1.38–1.51	1.68–1.83	FH21
	1.63–1.78	1.88–2.06	FH22	1.52–1.65	1.84–2.01	FH22
	1.79–1.95	2.07–2.26	FH23	1.66–1.81	2.02–2.21	FH23
	1.96–2.15	2.27–2.48	FH24	1.82–1.99	2.22–2.43	FH24
	2.16–2.35	2.49–2.72	FH25	2.00–2.19	2.44–2.66	FH25
	2.36–2.58	2.73–2.99	FH26	2.20–2.39	2.67–2.92	FH26
	2.59–2.83	3.00–3.28	FH27	2.40–2.63	2.93–3.21	FH27
	2.84–3.11	3.29–3.60	FH28	2.64–2.89	3.22–3.53	FH28
	3.12–3.42	3.61–3.95	FH29	2.90–3.17	3.54–3.87	FH29
	3.43–3.73	3.96–4.31	FH30	3.18–3.47	3.88–4.22	FH30
	3.74–4.07	4.32–4.71	FH31	3.48–3.79	4.23–4.61	FH31
	4.08–4.39	4.72–5.14	FH32	3.80–4.11	4.62–4.9	FH32
	4.40–4.87	5.15–5.6	FH33	4.12–4.55	5.0–5.5	FH33
	4.88–5.3	5.7–6.2	FH34	4.56–5.0	5.6–6.0	FH34
	5.4–5.9	6.3–6.8	FH35	5.1–5.5	6.1–6.6	FH35
	6.0–6.4	6.9–7.5	FH36	5.6–5.9	6.7–7.3	FH36
	6.5–7.1	7.6–8.2	FH37	6.0–6.6	7.4–8.0	FH37
	7.2–7.8	8.3–9.0	FH38	6.7–7.2	8.1–8.7	FH38
	7.9–8.5	9.1–9.9	FH39	7.3–7.9	8.8–9.7	FH39
	8.6–9.4	10.0–10.8	FH40	8.0–8.7	9.8–10.5	FH40
	9.5–10.3	10.9–11.9	FH41	8.8–9.5	10.6–11.7	FH41
	10.4–11.3	12.0–13.1	FH42	9.6–10.5	11.8–12.7	FH42
	11.4–12.4	13.2–14.3	FH43	10.6–11.5	12.8–14.0	FH43
	12.5–13.5	14.4–15.7	FH44	11.6–12.6	14.1–15.3	FH44
	13.6–14.9	15.8–17.2	FH45	12.7–13.8	15.4–16.6	FH45
	15.0–16.3	17.3–18.9	FH46	13.9–15.1	16.7–18.3	FH46
	16.4–18.0	19.0–20.8	FH47	15.2–16.7	18.4–20.0	FH47
	18.1–19.8	20.9–22.9	FH48	16.8–18.3	20.1–21.9	FH48
	19.9–21.7	23.0–25.2	FH49	18.4–20.2	22.0–23.9	FH49
	21.8–23.9	25.3–27.6	FH50	20.3–22.2	24.0–26.2	FH50
	24.0–26.2	27.7–30.3	FH51	22.3–24.3	26.3–28.8	FH51
	26.3–28.7	30.4–33.3	FH52	24.4–26.6	28.9–31.4	FH52
	28.8–31.4	33.4–36.4	FH53	26.7–29.1	31.5–34.5	FH53
	31.5–34.5	36.5–39.9	FH54	29.2–32.0	34.6–37.9	FH54
	34.6–37.9	40.0–43.9	FH55	32.1–35.2	38.0–41.9	FH55
	38.0–41.5		FH56	35.3–38.5	42.0–45.0	FH56
	41.6–45.0		FH57	38.6–42.3		FH57

SS-56 Surge Suppressor

- Designed to be used with magnetic motor controllers through Size 4 in 120V, 60 Hz control circuit applications where electronic equipment is used
- Steady state coil volts: 120, 60 Hz, rms
- Peak input volts: 169.6, 60 Hz, maximum amplitude
- Maximum ambient temperature: 65°C
- Nominal limiting volts: 270 peak
- Nominal rate of volt rise: 0.5 per ms

SS-56 Surge Suppressor



Surge Suppressor ①

Type Mounting	Kit Catalog Number
Starter	SS-56

F-56 Fuse Block

- Facilitates installation of fuses (15A, 600V max.) in control circuits
- Utilizes Bussman type KTK fuses, or equivalent
- Mounts in same cavity as Type J auxiliary contact
- No tools or mounting hardware needed
- Fuse not included

Fuse Block

Mounting	Kit Catalog Number
Starter	F56
Panel	F56-P

R-56 Interposing Relay

The R-56AA interposing relay is a low energy solid-state device with a single NO solid-state contact. It can be used as a 120 Vac control relay, and will operate on as little as 40 Vac input. Is useful in

applications requiring long control wiring runs where excessive voltage drop would prevent the contactor or relay from energizing. Will operate a Size 4 contactor from 10,000 ft using 18 AWG wire.

Interposing Relay

Type Mounting	Kit Catalog Number
Starter or panel	R56-AA

Mechanical Interlock

- Prevents closing of one member of a reversing or multi-speed contactor until the opposite member is completely open
- Lever type mechanism assures positive action
- Can be factory assembled or field mounted on A200 and A900 starters and contactors

Mechanical Interlock

Contact Arrangement (Number of Poles, Horizontal or Vertical)	Continuous Size	Interlock Catalog Number
3 x 3 horizontal	0, 1	M-33-1B
4 x 4 horizontal	0, 1	M-33-1B
5 x 3 horizontal	0, 1	M-33-1B
All pole combination, vertical	0, 1	M-34-1A
3 x 3 horizontal reversing	2	M-33-2B
3 x 3 vertical reversing	2	M-34-2A
5 x 3 horizontal	2	M-35-2A
4 x 4 horizontal	2	M-36-2A
All pole combination horizontal	3, 4	M-33-3B
All pole combination vertical	3, 4	M-34-3

B3NO Bell Alarm Contact

- Isolated normally open bell alarm contact
- Mounts in Type B block-type overload relay

Bell Alarm Contact

Kit Catalog Number
B3NO-2
B3NO-4 ②

Control Contact Ratings (B600)

AC Volts	Maximum Amperes	
	Make	Break
24–120	30	3.00
121–600	3600 VA	360 VA

Continuous current rating: 5A

Overload Relay Reset Extension

- Used to adjust overload reset rod depth of Class A200 Model J starters and current design overload relays to same dimensions as obsolete B200 starters and overloads identified by suffix **B**, that is **BA13B**

When replacing obsolete B200 device with Class A200 starter and Type B overload, order Style 6710C11H03. No charge.

When replacing obsolete B200 device with Class A200 starter and Type A overload, order Style 1490C15H10. No charge.

Notes

- ① Can be used on Sizes 5 and 6 with 120V coil. Mounting bracket required—order separately. Mounting bracket 177C043G04.
- ② For Size 3 and 4.

15.1

Accessories and Modification Codes

Accessories

Power Pole Kit

- Adds 1NO or 1NC power pole to Size 00–1 A201 Class contactors
- Factory installed or field mountable in load side auxiliary cavities
- 600 Vac
- Continuous current rating of 18A for Size 0, 27A for Size 1

Power Pole Kit ①

Continuous Current Rating	Kit Size	Kit Catalog Number
Normally Open		
18	0	PN0-0
27	1	PN0-1
Normally Closed		
18	0	PNC-0
27	1	PNC-1

Replacement Auxiliary Contacts

Replacement Auxiliary Contacts

Contactor Size	Contact Arrangement	Aux. Elect. Contact	
		Catalog Number	Style Number
5, 6	1NO + 1NC	J11	9084A17G01
	2NO	J20	9084A17G02
	2NC	J02	9084A17G03
7, 8	1NO	—	578D461G01
	1NC	—	578D461G03
9	1NO + 1NC	—	843D943G04
	2NO	—	843D943G05
	2NC	—	843D943G06

Extra Auxiliary Contact Kits

All starters include an auxiliary contact with 1NO and 1NC contact. These kits include an auxiliary contact

with contacts as shown, plus operating arm and mounting bracket when required.

Extra Auxiliary Contact Kits

Contactor Size	Contact Arrangement	Style Number
5, 6	1NO + 1NC	3463D94G18
	2NO	3463D94G04
	2NC	3463D94G19
7, 8 ②	2NO	818D498G06
	1NO	818D498G04

DC Coil Conversion Kits

Kits listed below include all necessary parts to convert from AC to DC control including the DC coil with

built-in diode, rectifier, auxiliary interlock and all mounting hardware.

DC Coil Conversion Kits

Size	Voltage	Kit Style Number
5	110-120	7864A28G01
	220-240	7864A28G02
	440-480	7864A28G03
6	110-120	7864A29G01
	220-240	7864A29G02
	440-480	7864A29G03

Mechanical Interlocks

Mechanical Interlocks

Contactor Sizes	Style Numbers	
	Horizontal	Vertical
3, 4 and 5	2050A11G75	2050A11G65
5 and 5	2050A11G25	2050A11G15
5 and 6	2050A11G27	2050A11G17
6 and 6	2050A11G26	2050A11G16
6 and 7, 8	—	2050A11G55
7, 8 and 7, 8	No (rear conn.)	567D624G01
7, 8 and 9	No (rear conn.)	9944D56G06
9 and 9	No (rear conn.)	9944D56G01

Overload Protection

Overload Protection Size 5 Starters

Type B overload protection is a three-pole, block type, thermal ambient compensated device with manual reset mounted integrally. Current transformers

are enclosed in a protective case and integrally mounted to save panel space. Standard ratio is 300:5.

Overload Protection Size 6 Starters

Overload protection assembly consists of three current transformers, Type B three-pole block overload relay and an optional interposing relay. These parts are mounted on a panel which connects directly to the load terminal of the

contactor. Current transformers are 600:5 ratio as standard.

If automatic reset is required, the Type A, three-pole block, ambient compensated relay is available upon request.

Notes

- ① Do not use with DC operated contactors.
- ② Size 7 and larger use DC coils as standard.

Overload Relay Kits

Each kit includes three current transformers (standard ratio) and one Type B, three-pole block overload relay, ambient compensated with manual reset.

Overload Relay Kits

Kit Size	Kit Part Number
5	2057A34G01
6	6379D80G10

Replacement Terminal Lugs ①

Contactor Size	Cable Size	Terminals		Kit Style Number
		Qty. in Kit	Qty. Req'd. per Pole	
5	1-500 kcmil	6	2	2119A76G01
6	2-500 kcmil	6	2	7858A96G01
7	4-500 kcmil	12	4	7858A96G02
8	4-500 kcmil	12	4	7858A96G03

XTIEC

Auxiliary Contacts

Front mounted snap-on auxiliary contacts for **XT** contactors are available with screw or spring cage terminals in a variety of contact configurations.

The 7–32A XTCE contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

The 40–65A XTCE contactors have positively driven contacts within the auxiliary contact module. Six auxiliary contacts are possible with a combination of side-mounted and front-mount auxiliary contacts.

Frame B–C contactors with 1NC built-in auxiliary are mirror contacts (XTCE...B01_–XTCE...C01_).

XTCE and XTCS Auxiliary Contact Overview

Frame	A	B	C	D	F	G	L–R
Catalog numbers	XTMC6A_– XTMC9A_	XTCE007B_– XTCE015B_	XTCE018C_– XTCE032C_	XTCE040D00_– XTCE065D00_	XTCE080F00_– XTCE095F00_	XTCE115G00_– XTCE150G00_	XTCE185L22_– XTCEC20R22_ ②
Contactor width	45 mm	45 mm	45 mm	55 mm	90 mm	90 mm	Various
Built-in auxiliary	1NO or 1NC	1NO or 1NC	1NO or 1NC	—	—	—	2NO-2NC
Contact sequence							
Front- (top) mount auxiliary	Two- and four-pole (screw or spring cage): 	Standard two- and four-pole versions (screw or spring cage): 		Two-pole (screw only): 			N/A
		Tall version (screw only): 		Four-pole (screw or spring cage): 			
Side-mount auxiliary	N/A	N/A	Two-pole (screw only): 	Two-pole (screw or spring cage): 			

Notes

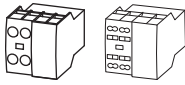




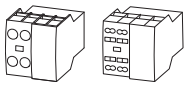


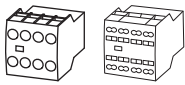











- ① All mounting hardware is included in kit.
- ② Frame L–R auxiliary contacts also apply to XTCS185_–XTCS500M_ contactors.

15.1

Accessories and Modification Codes

Accessories



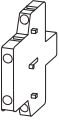






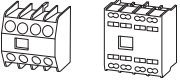







Auxiliary Contacts

		Conventional Thermal Current, Open at 60°C $I_{th} = I_e$ AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number
Frame B-C—Front- (Top) Mount								
	16		2	2NO		5	XTCEXFAC20	XTCEXFACC20
	16		2	1NO-1NC		5	XTCEXFAC11	XTCEXFACC11
	16		2	2NC		5	XTCEXFAC02	XTCEXFACC02
	16		2	1NO _E -1NC _L		5	XTCEXFALC11 ①	XTCEXFALCC11 ①
	16		2	1NO-1NC		5	XTCEXFDC11 ②	XTCEXFDC11 ②
	16		2	2NC		5	XTCEXFCC02 ②	XTCEXFCC02 ②
	16		4	4NO		5	XTCEXFAC40	XTCEXFACC40
	16		4	3NO-1NC		5	XTCEXFAC31	XTCEXFACC31
	16		4	2NO-2NC		5	XTCEXFAC22	XTCEXFACC22
	16		4	1NO-3NC		5	XTCEXFAC13	XTCEXFACC13
	16		4	4NC		5	XTCEXFAC04	XTCEXFACC04
	16		4	1NO _E -1NC _L		5	XTCEXFCLC22 ①	XTCEXFCLCC22 ①
	16		4	2NO-2NC		5	XTCEXFCC22 ②	XTCEXFCC22 ②
Frame B-C—Front- (Top) Mount—Tall Version ③								
	16		2	2NO		5	XTCEXFATC20	—
	16		2	1NO-1NC		5	XTCEXFATC11	—
	16		2	2NC		5	XTCEXFATC02	—

Notes

- ① One early-make contact (1NO_E), one late-break contact (1NC_L).
- ② To avoid duplicate terminal numbers in contact sequence, these auxiliary contacts should only be used with contactors having a built-in 1NO contact (XTCE...B10_, XTCE...C10_).
- ③ Front- (top) mount tall version is for use with Frame B electrical wire bridges and link kits and toolless plug combination connection kits: XTCEXRLB, XTCEXSDLB, XTPAXTPCB, XTPAXTPCRB, XTPAX.

Auxiliary Contacts, continued

	Conventional Thermal Current, Open at 60°C I _{th} = I _e , AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number
Frame B-C—Front- (Top) Mount—Tall Version, continued ①							
	16	4	2NO-2NC		5	XTCEXFATC22	—
Frame C—Side-Mount							
	10	2	1NO-1NC		1	XTCEXSCC11 ②	—
Frame D-G							
	16	2	2NO		5	XTCEXFBG20	—
	16	2	1NO-1NC		5	XTCEXFAG11	—
	16	2	1NO-1NC		5	XTCEXFBG11	—
	16	2	2NC		5	XTCEXFBG02	—
	16	4	4NO-0NC		5	XTCEXFBG40	XTCEXFBGC40
	16	4	3NO-1NC		5	XTCEXFBG31	XTCEXFBGC31
	16	4	2NO-2NC		5	XTCEXFBG22	XTCEXFBGC22
	16	4	2NO-2NC		5	XTCEXFAG22	XTCEXFAGC22
	16	4	1NO-3NC		5	XTCEXFBG13	XTCEXFBGC13
	16	4	0NO-4NC		5	XTCEXFBG04	XTCEXFBGC04
	16	4	1NO _E -1NC _L		5	XTCEXFBG22 ③	XTCEXFBGC22 ③

Notes

- ① Front- (top) mount tall version is for use with Frame B electrical wire bridges and link kits and toolless plug combination connection kits: XTCEXRLB, XTCEXSDLB, XTPAXTPCB, XTPAXTPCRB, XTPAX.
- ② Can be mounted to the left side of contactor only. Cannot be used in combination with front- (top) mount auxiliary contacts or mechanical interlocks.
- ③ One early-make contact (1NO_E), one late-break contact (1NC_L).

Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO [early make] and NC [late break] contacts) and for the built-in auxiliary contacts of the XTCE007B_–XTCE032C_.

Auxiliary break contact can be used as mirror contact to IEC/EN 60947-4-1 Annex F (not NC [late break] contact).

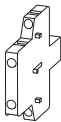



No auxiliary contacts can be fitted between two contactors.

15.1











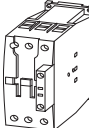



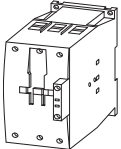



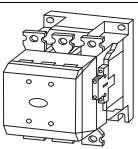

Accessories and Modification Codes

Accessories

Side-Mount Auxiliary Contacts for Frame D–R, 40–2000A

	Conventional Free Air Thermal Current, $I_{th} = I_e$, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminal Catalog Number	Spring Cage Terminal Catalog Number
	10	2	1NO-1NC		1	XTCEXSBN11	XTCEXSBN11
	10	2	1NO _E -1NC _L		1	XTCEXSBLN11 ①	—
	10	2	1NO-1NC		1	XTCEXSCN11 ②	XTCEXSCN11 ②

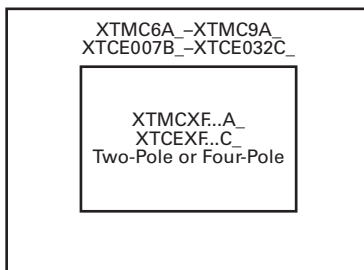
Auxiliary Contacts Possible Combinations

Frame Size	Contactor	Built-In Auxiliary	Front- (Top) Mount		Side-Mount Two-Pole	Total Auxiliary Contacts Available	Catalog Number
			Two-Pole	Four-Pole			
A		1NO or 1NC	1	—	—	3	XTMC6A_
			—	1	—	5	XTMC9A_
					—	—	—
B		1NO or 1NC	1	—	—	3	XTCE007B_
			—	1	—	5	XTCE015B_
					—	—	—
C		1NO or 1NC	1	—	—	3	XTCE018C_
			—	1	—	5	XTCE032C_
			—	—	1	3	—
						—	—
D		—	1	—	2	6	XTCE040D00_
			—	1	1	6	XTCE065D00_
						—	—
F–G		—	1	—	2	6	XTCE080F00_
			—	1	2	8	XTCE150G00_
			—	—	4	8	—
						—	—
L–R		2NO-2NC	—	—	2	8	XTCE185L22_
			—	—	—	—	XTCEC20R22_
			—	—		—	—

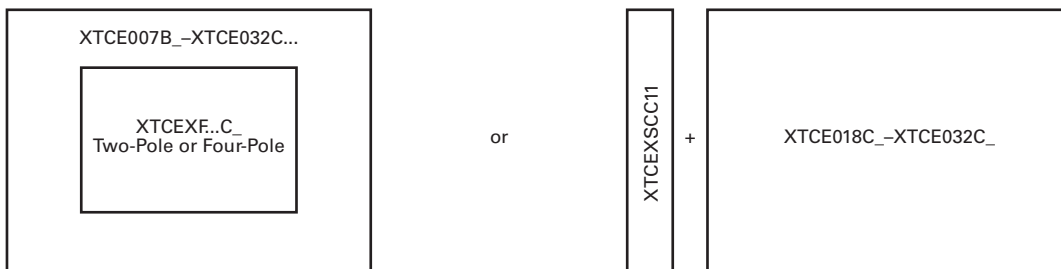
Notes

- ① One early-make contact (1NO_E), one late-break contact (1NC_L).
 - ② To maintain proper terminal marking, XTCEXSCN_ should not be used with Frame D contactors and only used with Frame F–G contactors in combination with XTCEXSBN_.
- Forced operation contact to IEC/EN 60947-5-1 Appendix L (positively driven), inside the auxiliary contact unit (not early close and late opening).
 Auxiliary normally closed contact can be used as mirror contact to IEC/EN 60947-4-1 Appendix F (not late opening).
 No auxiliary contacts can be fitted between two contactors.

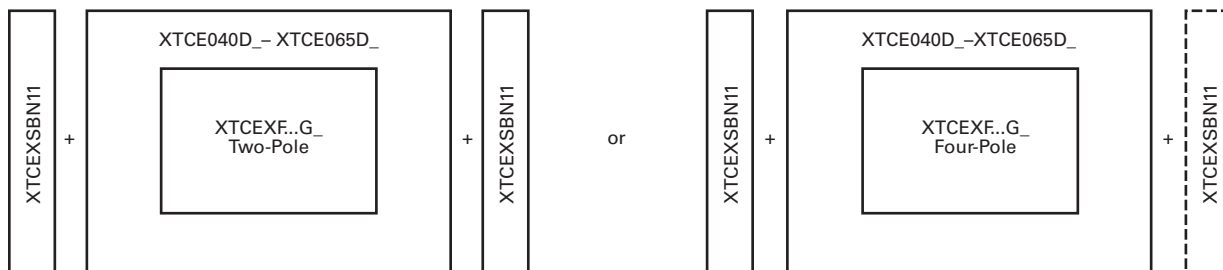
Auxiliary Contact Combinations



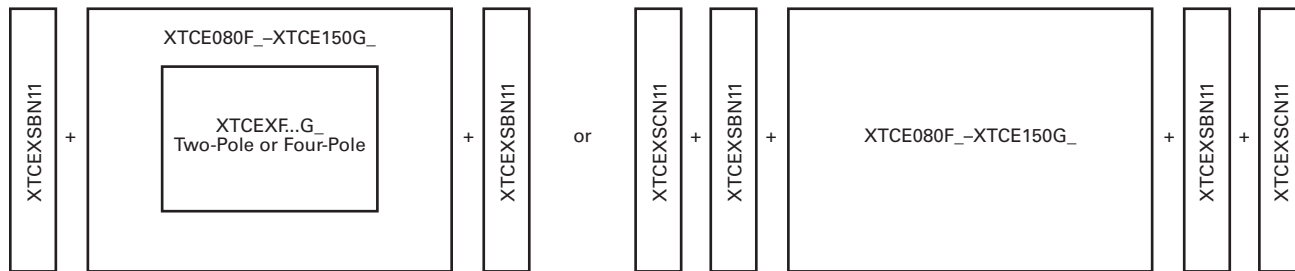
Frame A–B



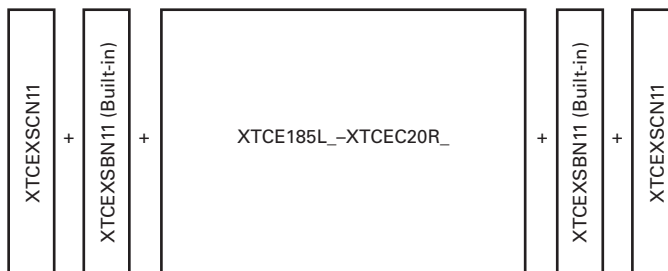
Frame C



Frame D



Frame F–G



Frame L–R

Enclosures

Type 1 Enclosures

C899 Type 1 Enclosure



Type 1 Enclosures—NEMA (Freedom)

Starter Type	Box Number	NEMA Size	Catalog Number
Non-reversing starter	1	00-1 AN16	C899B001 ^①
	1	00-2 AN19	C899B001 ^①
	2	2 AN16	C799B13
	4	3-4	C799B15
	10	5	C799B17
Non-reversing starter with space for CPT	3	00-2	C799B14 ^②
	4	3-4	C799B15 ^③
Reversing starter	2	00-0	C799B13
	3	1-2	C799B14
	4	3	C799B15
	9	4	C799B16
	10	5	C799B17

Notes

- ① C899B001 is a universal enclosure that requires a specific reset rod length based on starter size. See Volume 10 Tab 2.
- ② Sub panel drilled for 50-200 VA CPTs.
- ③ Enclosure drilled for 150-300 VA CPTs.

Type 3R, 4X and 12 Enclosures

Type 3R Enclosure



Type 3R, 4X and 12 Enclosures—NEMA (Freedom)

Starter Type	Box Number	NEMA Size AN16	Type 3R Catalog Number	Type 12 Catalog Number	Type 4X Catalog Number
Non-reversing starter	5	00-1	C799B21	C799B81	C799B41
	6	2	C799B24	C799B84	C799B43
	6	—	C799B25	C799B85	C799B44
	8	3	C799B210	C799B810	C799B47
	8	—	C799B212	C799B812	C799B49
	8	4	C799B211	C799B811	C799B48
	10	5	C799B218	C799B818	C799B413
Non-reversing starter with space for CPT	6	00-2	C799B24	C799B84	C799B43
	6	—	C799B25	C799B85	C799B44
	8	3	C799B210	C799B810	C799B47
	8	—	C799B212	C799B812	C799B49
	8	4	C799B211	C799B811	C799B48
	10	5	C799B218	C799B818	C799B413
	Reversing starter	6	00-2	C799B24	C799B84
6		—	C799B25	C799B85	C799B44
8		3	C799B210	C799B810	C799B47
8		—	C799B212	C799B812	C799B49
9		4	C799B215	C799B815	C799B411
10		5	C799B218	C799B818	C799B413
Multispeed	7 ^①	0-2	C799B223	C799B823	C799B417

C899 Type 1 Enclosure



Enclosures—IEC (XT Type)

Starter Type	Box Number	IEC Size	Catalog Number
XT starters, SSOL	1	B-C	C899B001 ^②
XT starters, bi-metallic	1	B	C899B001 ^②
XT contactors/starters, bi-metallic	1	C	C899B001 ^②
XT contactors/starters without reset	2	D	C799B34
XT contactors/starters with resets	2	D	C799B35

Notes

① Blank cover provided.

② C899B001 is a universal enclosure that requires a specific reset rod length based on starter size. See Volume 10 Tab 3.

Lighting Contactors

Electrically Held Base Contactor for C30CN/ECC

The C30CNE20_0 electrically held base contactor contains a 2NO power pole as standard and will allow the addition of power poles to build an electrically held contactor up to 12 poles

maximum. A mechanically held module kit can also be added to convert the electrically held contactor into a mechanically held contactor in the field.

Electrically Held Base Contactor



Electrically Held Base Contactor

Power Poles	Catalog Number ^①
2NO	C30CNE20_0

Coil Base Voltage (Digit 9)

Voltage (Digit 9)	Code Suffix	Voltage (Digit 9)	Code Suffix
115–120V 60 Hz/110V 50 Hz	A	265–277V 60 Hz/240V 50 Hz	H
230–240V 60 Hz/220V 50 Hz	B	24V 60 Hz/20V 50 Hz	T
460–480V 60 Hz/440V 50 Hz	C	28V 60 Hz/24V 50 Hz	V
575–600V 60 Hz/550V 50 Hz	D	347V 60 Hz	X
200–208V 60 Hz	E		

Power Poles for C30CNM/ECC

The C30CNM contactor accepts up to a maximum six single- or two-pole (or combinations) power poles. These can be used to form up to:

- 12 NO poles maximum when 6 two-poles are used in NO positions (1–6) or
- 8 NC poles maximum with 4 two-poles in the NC position (1–4) and 4 NO poles with 2 two-poles in the 2 NO positions (5–6)

Power Poles



Power Poles

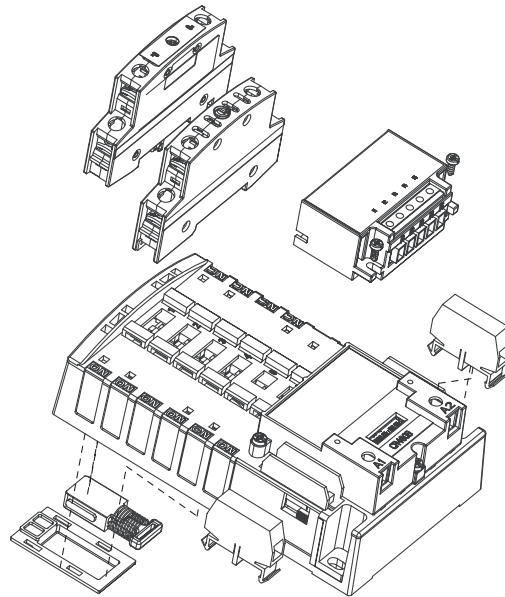
Power Poles	Catalog Number
Single-pole	C320PRP1
Two-pole	C320PRP2

Mechanically Held Module Kits for C30CN/ECC

These kits are for converting electrically held contactors to mechanically held units. Kits include control module, latch, latch cover and auxiliary

contacts plus installation instructions. Conversion kits are suitable for coil voltages of 277V and below.

C30CNM Components—Exploded View



Conversion Kit



Mechanically Held Module Kits

Coil Volts	Control Volts	Catalog Number
Two-Wire		
24–277 Vac	110–120 Vac	C320MH2WA0
	200–277 Vac	C320MH2WH0
	24 Vac	C320MH2WT0
	12–24 Vdc	C320MH2WT1
Three-Wire		
24–277 Vac	110–120 Vac	C320MH3WA0
	200–277 Vac	C320MH3WH0
	24 Vac	C320MH3WT0
	12–24 Vdc	C320MH3WT1

Note

- ^① When ordering, select required contactor by catalog number and replace the magnet coil alpha designation in the catalog number () with the proper code suffix from the Coil Base Voltage table above.

Auxiliary Contacts for C30CN/ECC

A mechanically held contactor with a two-wire control module uses 1NC auxiliary contact as standard for the control wiring circuit. The mechanically held contactor with a three-wire control

module uses 1NO-1NC auxiliary contacts as standard for the control wiring circuit. See the table below for possible additional auxiliary contact configurations.

Auxiliary Contact Configurations

Two-Wire	Three-Wire
None	1NC (two-pole)
1NO (single-pole)	1NO (two-pole)
2NO (two-pole)	1NO-1NC (two-pole)
1NC (two-pole)	
1NO-1NC (NO single-pole, NC two-pole)	
2NO-1NC (two-pole)	

Auxiliary Contacts



Auxiliary Contacts

Auxiliary Block	Catalog Number
Single-pole	C320AMH1
Two-pole	C320AMH2

Transient Suppressor Kits for CN35/ECL

10–60A Contactors

These kits limit high voltage transients produced in the control circuit when power is removed from the contactor or starter coil. There are three separate suppressors for use

on 24–120V, 240V or 480V coils respectively.

These devices mount directly to the coil terminals of lighting contactors 10–60A.

C320TS2



Kits for 10–60A

Description	Coil Voltage	Catalog Number
Transient suppressor	24–120V	C320TS1
	240V	C320TS2
	480V	C320TS3

100–300A Contactors

This device mounts on top of any side-mounted auxiliary contact on lighting contactors 100–300A. It connects across coil terminals on any 120V contactor magnet coil.

Limits high voltage transients produced in the circuit when power is removed from the coil.

C320AS1



Kits for 100–300A

Description	Coil Voltage	Catalog Number
Transient suppressor	120V	C320AS1

Auxiliary Contacts for CN35/ECL

CN35 lighting contactors include a 1NO maintaining auxiliary contact mounted on right hand side (on 10A, two- and three-pole devices, auxiliary contact occupies fourth power pole position—no increase in width). The 10–60A devices will accept additional auxiliary contacts on the top and/or sides.

Auxiliary contact blocks are designed for snap-on installation—fast, easy installation (no tools required up to 60A). All auxiliary

contacts are of the bifurcated design with parallel circuit paths. This redundant path provides very high reliability. Auxiliary contacts can be snapped on the side (up to two circuits—per auxiliary contact) and on the top (up to four circuits). Auxiliary contacts for larger contactors, 100–400A sizes, will accept side-mounted auxiliaries only and easily attach to the side of the contactor with two screws.

Contact Configuration Code

This two-digit code is found on the auxiliary contact to assist in identifying the specific contact configuration.

The first digit indicates the quantity of NO contacts and the second indicates the quantity of NC contacts.

Auxiliary Contacts—10–60A Contactors

Description	Contact Configuration Code ^①	Catalog Number
Side-Mounted		
1NO	10	C320KGS1
1NC	01	C320KGS2
1NO-1NC	11	C320KGS3
2NO	20	C320KGS4
2NC	02	C320KGS5
Top-Mounted ^②		
1NO	10	C320KGT1
1NC	01	C320KGT2
1NO-1NC	11	C320KGT3
2NO	20	C320KGT4
2NC	02	C320KGT5
3NO	30	C320KGT9
2NO-1NC	21	C320KGT10
1NO-2NC	12	C320KGT11
3NC	03	C320KGT12
4NO	40	C320KGT13
3NO-1NC	31	C320KGT14
2NO-2NC	22	C320KGT15
1NO-3NC	13	C320KGT16
4NC	04	C320KGT17

Side-Mounted



Top-Mounted



Notes

- ① For reference only—not part of catalog number.
- ② Cannot be added to contactors or starters mounted in Box 1 (Type 1).

Base Auxiliary Contact



Base Auxiliary Contacts—100–400A Contactors

Circuit	Contact Configuration Code ^①	100A Contactors Catalog Number	200 and 300A Contactors Catalog Number
NO	10	C320KGS31	C320KGS41
NO-NC	11	C320KGS32	C320KGS42

Auxiliary Contact



Auxiliary Contacts—100–400A Contactors

Circuit	Contact Configuration Code ^①	Catalog Number
NO	10	C320KGS20
NC	01	C320KGS21
NO-NC ^②	11	C320KGS22

Auxiliary Contact Ratings (Amperes)—NEMA A600

Current	AC Volts			
	120V	240V	480V	600V
Make and interrupting	60.0	30.0	15.0	12.0
Break	6.0	3.0	1.5	1.0
Continuous	10.0	10.0	10.0	10.0

Auxiliary Contact 5A Continuous Thermal Rating—NEMA P300

DC Volts	Make/Break Amperes
125	1.10
250	0.55

Notes

- ^① For reference only—not part of catalog number.
- ^② NO-NC occupies two positions—L2 and L3 or R2 and R3. See table on [Page V10-T15-33](#).

Auxiliary Contact Location for CN35/ECL

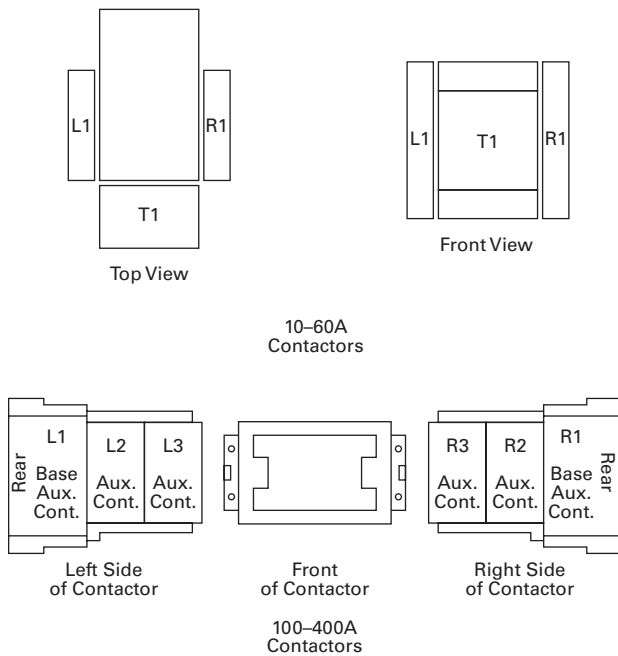
Auxiliary Contacts—Mounting Positions

The sketches below illustrate the maximum number of auxiliary contacts that can be assembled to a contactor and their locations in standard enclosures.

Auxiliary Contact Mounting Positions

Size	Poles	Available Mounting Positions ①②③		
		Open Type	Type 1	Type 3R, 4X, 12
10A	2–4	T1, L1, R1	L1	L1, T1
20–60A	2–3	T1, L1	L1	L1, T1
60A	4	T1, L1	—	L1, T1
60A	5	T1, L1	—	L1, T1
100A	2–3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3
200A	2–3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3
300A	2–3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3
400A	2–3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3

Auxiliary Contact Location



Pneumatic Timers—Top-Mounted for CN35/ECL

Attachment mounts on top of 10–60A lighting contactors (top-mounted auxiliary contacts cannot be installed on device when timer is used). Timer unit has DPST

timed contacts—circuits in each pole must be the same polarity. Units are convertible from OFF to ON delay or vice-versa.

Pneumatic Timer



Pneumatic Timers

Timing Range	Catalog Number
0.1–30 seconds	C320TP1
10–180 seconds	C320TP2

Maximum Ampere Ratings

Description	Volts AC			
	120	240	480	600
Make	30.0	15.0	7.5	6.0
Break	3.0	1.5	0.75	0.6

Solid-State Timers for CN35/ECL

Solid-State ON DELAY Timer—Side-Mounted on CN35 Freedom Series Lighting Contactors Through 60A

This timer is designed to be **wired in SERIES with the load** (typically a coil). When the START button is pushed (power applied to timer), the

ON DELAY timing function starts. At the completion of the set timing period, timer and series wired load will both be energized.

Solid-State Timer



Product Selection—Mounted Timer

Timing Range	Catalog Number ④⑤⑥
0.1–1.0 seconds	C320TDN1_
1–30 seconds	C320TDN30_
30–300 seconds	C320TDN300_
5–30 minutes	C320TDN3000_

Notes

- ① Available positions on contactors or starters other than what is factory installed.
- ② When a pneumatic timer is mounted on contactor, only side-mounted auxiliary contact positions are available. The solid-state timer, when added, takes up side-mounted auxiliary contact position.
- ③ For 100–400A contactors, a base auxiliary contact must be added in position L1 before additional contacts can be mounted.
- ④ Add operating voltage suffix to catalog number. **A** = 120V, **B** = 240V, **E** = 208V.
- ⑤ Rated 0.5A pilot duty—not to be used on larger contactors.
- ⑥ Terminal connections are quick connects only. Two per side.

15.1

Accessories and Modification Codes

Accessories

Type J Auxiliary Contact for A202/ECL

- Capable of being field mounted in a contactor or starter (Classes A200, A900 Sizes 00–6, V200, V201 vacuum and definite purpose controllers)
- Provides two separate electrical contact sets which wire vertically and are color coded; black designates NC and silver designates NO. Please note that the vertical wiring is contrary to the horizontal wiring of the L-56 auxiliary contacts
- Designed to fit within dimensions of starter; no additional panel space is required
- Provides circuit isolation (no polarity restrictions) and single break bifurcated contacts

Auxiliary Contact Ratings

Voltage	Make	Break
NEMA A600		
120–600 Vac	7200 VA	720 VA
72–120 Vac	60A	720 VA
28–72 Vac	60 VA	10A
NEMA R300		
28–300 Vdc	28 VA	28 VA

Type J Auxiliary Contact



Auxiliary Contact Types

Contact Type	Max.	Catalog Number
1NO and 1NC	4	J11
2NC	4	J02
2NO	4	J20
1 coil clearing NC and 1NO	4	J1C

SS-56 Surge Suppressor for A202/ECL

- Designed to be used with magnetic motor controllers through Size 4 in 120V, 60 Hz control circuit applications where electronic equipment is used
- Steady state coil volts: 120, 60 Hz, rms
- Peak input volts: 169.6, 60 Hz, max. amplitude
- Max. ambient temperature: 65°C
- Nominal limiting volts: 270 peak
- Nominal rate of volt rise: 0.5 per ms

SS-56 Surge Suppressor



Surge Suppressor ①

Type Mounting	Kit Catalog Number
Starter	SS-56

F-56 Fuse Block for A202/ECL

- Facilitates installation of fuses (15A, 600V maximum) in control circuits
- Uses Bussman type KTK fuses, or equivalent
- Mounts in same cavity as Type J auxiliary contact
- No tools or mounting hardware needed
- Fuse not included

Fuse Block

Mounting	Kit Catalog Number
Starter	F56
Panel	F56-P

R-56 Interposing Relay for A202/ECL

The R-56AA interposing relay is a low energy solid-state device with a single NO solid-state contact. It can be used as a 120 Vac control relay, and will operate on as little as 40 Vac input. Is useful in

applications requiring long control wiring runs where excessive voltage drop would prevent the contactor or relay from energizing. Will operate a Size 4 contactor from 10,000 ft using 18 AWG wire.

Interposing Relay

Type Mounting	Kit Catalog Number
Starter or panel	R56-AA

Power Pole Kit for A202/ECL

- Adds 1NO or 1NC power pole to Size 00–1 A201 Class contactors
- Factory installed or field mountable in load side auxiliary cavities
- 600 Vac
- Continuous current rating of 18A for Size 0, 27A for Size 1

Power Pole Kit ②

Continuous Current Rating	Kit Size	Kit Catalog Number
Normally Open		
18	0	PNO-0
27	1	PNO-1
Normally Closed		
18	0	PNC-0
27	1	PNC-1

Notes

- Can be used on Sizes 5 and 6 with 120V coil. Mounting bracket required—order separately. Mounting bracket 177C043G04.
- Do not use with DC operated contactors.

Replacement Auxiliary Contacts for A202/ECL**Replacement Auxiliary Contacts**

Contactor Size	Contact Arrangement	Aux. Elect. Contact Catalog Number	Style Number
5, 6	1NO + 1NC	J11	9084A17G01
	2NO	J20	9084A17G02
	2NC	J02	9084A17G03
7, 8	1NO	—	578D461G01
	1NC	—	578D461G03
9	1NO + 1NC	—	843D943G04
	2NO	—	843D943G05
	2NC	—	843D943G06

Extra Auxiliary Contact Kits for A202/ECL

All starters include an auxiliary contact with 1NO and 1NC contact. These kits include an auxiliary contact

with contacts as shown, plus operating arm and mounting bracket when required.

Extra Auxiliary Contact Kits

Contactor Size	Contact Arrangement	Style Number
5, 6	1NO + 1NC	3463D94G18
	2NO	3463D94G04
	2NC	3463D94G19
7, 8 ^①	2NO	818D498G06
	1NO	818D498G04

DC Coil Conversion Kits for A202/ECL

Kits listed below include all necessary parts to convert from AC to DC control including the DC coil with

built-in diode, rectifier, auxiliary interlock and all mounting hardware.

DC Coil Conversion Kits

Size	Voltage	Kit Style Number
5	110-120	7864A28G01
	220-240	7864A28G02
	440-480	7864A28G03
6	110-120	7864A29G01
	220-240	7864A29G02
	440-480	7864A29G03

Note

① Size 7 and larger use DC coils as standard.

IT Solid-State Soft Starters

Surge Suppressors for S801+/S811+

The surge suppressor can mount on either the line or load side of the IT soft

starter. It is designed to clip the line voltage (or load side induced voltage).

Surge Suppressor



Surge Suppressors

Description	Catalog Number
600V MOV for IT soft starters	EMS39
690V MOV for IT soft starters	EMS41

Lug Kits for S801+/S811+

The 200 mm and 290 mm soft starters do not include lugs.

The 200 mm and 290 mm soft starters each have different lug options based on

your wiring needs. Each lug kit contains three lugs which can be mounted on either the load or line side.

Lug Kits



Lug Kits

Frame Size	Frame Designation	Description	Catalog Number
200 mm SSRV	T, U	2 cable connections, 4 AWG to 1/0 cable	EML22
		1 cable connection, 4/0 to 500 kcmil cable	EML23
		2 cable connections, 4/0 to 500 kcmil cable	EML24
		1 cable connection, 2/0 to 300 kcmil cable	EML25
		2 cable connections, 2/0 to 300 kcmil cable	EML26
		290 mm SSRV	V
4 cable connections, 4/0 to 500 kcmil cable	EML30		
6 cable connections, 4/0 to 500 kcmil cable	EML32		
4 cable connections, 2/0 to 300 kcmil cable	EML33 ①		

Lug Cover Kits for S801+/S811+

Replacement covers for the T and V Frame are available in case of damage to the existing covers.

Lug Cover Kits

Description	Catalog Number
Lug cover T, U Frame	EML27
Lug cover V Frame	EML34

Digital Interface Module and Control Interface Module

The Digital Interface Module (DIM) and control interface module are available as replacement parts.

DIM and CIM

Description	Catalog Number
Blank cover (filler)	EMA68
DIM for S811+	EMA91
CIM for S801+	EMA71
CIM for S801+ pump control option	EMA72
Panel mounting kit	
3 ft cable	EMA69A
5 ft cable	EMA69B
8 ft cable	EMA69C
10 ft cable	EMA69D

Control Wire Connector

Control Wire Connector

Description	Catalog Number
12-pin, 5 mm pitch connector for control wiring	EMA75L

User Manual for S811+

A comprehensive user manual is available and can be downloaded free of charge

from www.eaton.com by performing a document search for MN03902002E.

Mounting Plates for S801+/S811+

The mounting plates are designed to help make it easy to install or retrofit the soft starter into enclosures and MCCs. The soft starter can

be mounted onto the plate prior to installation. The mounting plate is designed with tear drop mounting holes for easier installation.

Mounting Plates

Description	Catalog Number
Mounting plate N Frame	EMM13N
Mounting plate R Frame	EMM13R
Mounting plate T, U Frame	EMM13T
Mounting plate V Frame	EMM13V
Fan/hood accessory	EMM18

Note

① The EML33 does not have a CSA Listing.

Adapter Plates

The adapter plate allows customers to retrofit a V Frame 290 mm soft starter with the U Frame 200 mm soft starter.

Adapter Plates

Description	Catalog Number
Adapter Plates ①	EMM13U

Vibration Plates for S801+/S811+

The vibration plates allow the soft starter to be applied in high shock and vibration applications. The vibration plate allows vibration up to 5g

and shock in up to 40g. The soft starter is mounted onto the vibration plate prior to installation in the panel.

Vibration Plates

Description	Catalog Number
Vibration plate N Frame	EMM14N
Vibration plate R Frame	EMM14R
Vibration plate T, U Frame	EMM14T
Vibration plate V Frame	EMM14V

Power Supplies

24 Vdc power supply that can be used with the S801+ or S811+ SSRV or as a standalone device.

Power Supplies

Description	SSRV	Catalog Number
115 Vac input	S801+/S811+	PSG240E
230 Vac input	S801+/S811+	PSG240E
380–480 Vac input	S801+/S811+	PSG240F

DIN Rail Power Supply Mounting Kit (35 mm)

DIN Rail Mounting Kit

Description	Catalog Number
DIN rail mounting kit (35 mm)	PSSDIN

NEMA Vacuum Break Control

Lug Sizes

- Size 4—12–4/0
- NEMA Size 5 and 6 and 320A, 540A and 610A—supplied without line or load lugs

Lug Kits—Consist of 6 Lugs

Size	Description	Catalog Number
5 and 320A	1/0–500 kcmil	C325KAL8
6, 540A and 610A	1/0–500 kcmil double barrel	C325KAL9
610A	1/0–600 kcmil double barrel	80-19825-2

Field Modification Kits

Auxiliary Electrical Contacts

Size 4—Three Type J auxiliary contacts may be mounted on the top of Size 4 contactors to provide six auxiliary, isolated 600V, 10A contacts for use in control circuits.

Sizes 5–6—Two Type J auxiliary contacts may be mounted on each side of Size 5 and 6 contactors to provide four auxiliary, isolated 600V, 10A contacts for use in control circuits.

Auxiliary Electrical Contacts

Contact Arrangement	Catalog Number
1NO, 1NC	J11
2NO	J20
2NC	J02

Horizontal Mechanical Interlock

Size	Catalog Number
4	180C113G04
5	180C113G16
6	180C113G17

Note

① For more information see Pub51719.

Heater Coils

Heater Coil Selection for Type B Overload Relay

Motor Full Load Current in Amperes for Use with 3 Heaters Only
Open Starter

Ambient Compensated Overload Relay	Heater Catalog Number ①
Size 4 and 160A	
12.8–14.1	FH68
14.2–15.5	FH69
15.6–17.1	FH70
17.2–18.9	FH71
19.0–20.8	FH72
20.9–22.9	FH73
23.0–25.2	FH74
25.3–27.8	FH75
27.9–30.6	FH76
30.7–33.5	FH77
33.6–37.5	FH78
37.6–41.5	FH79
41.6–46.3	FH80
46.4–50	FH81
51–55	FH82
56–61	FH83
62–66	FH84
67–73	FH85
74–78	FH86
79–84	FH87
85–92	FH88
93–101	FH89
102–110	FH90
111–122	FH91
123–129	FH92
130–133	FH93
—	FH94

Motor Full Load Current in Amperes for Use with 3 Heaters Only
Open Starter

Ambient Compensated Overload Relay	Heater Catalog Number ①
Size 5 and 320A with 300/5 Current Transformers	
107–117	FH23
118–129	FH24
130–141	FH25
142–155	FH26
156–170	FH27
171–187	FH28
188–205	FH29
206–224	FH30
225–244	FH31
245–263	FH32
264–292	FH33
293–318	FH34
319–350	FH35
Size 6 and 540A with 600/5 Current Transformers	
236–259	FH24
260–283	FH25
284–310	FH26
311–340	FH27
341–374	FH28
375–411	FH29
412–448	FH30
449–489	FH31
490–527	FH32
528–585	FH33
586–600	FH34

Notes

① Three are required per overload relay.

For information on H2001 heaters, see **Page V10-T15-6**.

Modification Codes

A—Ammeters, Auxiliary Contacts, Accelerating Relays, Autotransformers

Modification	Description	Catalog Number Suffix
Ammeter	Panel type wired to current transformer in Line 1, Type 1, 12	A1
	Panel type wired to current transformer in Line 1, Type 3R, 4X	
	Panel type, selector switch and three current transformers wired to ammeter via switch, Type 1, 12	A2
	Panel type, selector switch and three current transformers wired to ammeter via switch, Type 3R, 4X	
	Miniature (single-phase), Type 1, 12	A3
	Miniature with selector switch, Type 1, 12	A4
	Switchboard (single-phase), Type 1, 12	A5
	Switchboard (single-phase), Type 3R, 4X	
	Switchboard with selector switch, Type 1, 12	A6
	Switchboard with selector switch, Type 3R, 4X	
	Three-panel type (single-phase), Type 1, 12	A7
	Three-panel type (single-phase), Type 3R, 4X	
	Three miniature (single-phase), Type 1, 3R, 4X, 12	A10
	Three switchboard type (single-phase), Type 1, 12	A11
Three switchboard type (single-phase), Type 3R, 4X		
Ammeter order by description, Type 1, 3R, 4X, 12	A12	
Auto-transformers	Hp rating selection, see Tab 5	A8
	Order by description	A9
Top-mounted auxiliary contacts ^① (unwired)	1NO	A13
	1NC	A14
NEMA Sizes 00–2 only (unwired)	1NO-1NC	A15
	2NO	A16
IEC Sizes B–L only (unwired) XT Series	2NC	A17
	2NO-1NC	A18
	1NO-2NC	A19
	3NO	A20
	3NC	A21
	3NO-1NC	A22
	2NO-2NC	A23
	1NO-3NC	A24
	4NO	A25
	4NC	A26

Note

^① Top-mounted auxiliary contacts cannot be added to contactors in Box 1 (Type 1).

A—Ammeters, Auxiliary Contacts, Accelerating Relays, Autotransformers, continued

Modification	Description	Catalog Number Suffix
Side-mounted auxiliary contacts ^①	1NO	A27
	1NC	A28
	1NO-1NC	A29
	2NO	A30
	2NC	A31
	2NO-1NC	A32
	1NO-2NC	A33
	3NO	A34
	3NC	A35
	3NO-1NC	A36
	2NO-2NC	A37
	1NO-3NC	A38
	4NO	A39
	4NC	A40
Auxiliary contacts	Contacts mounted on operating mechanism of disconnect switch, 1NO-1NC	A42
	Contacts mounted on operating mechanism of disconnect switch, 2NO-2NC	A43
	With auxiliary contact omitted	A44
Accelerating relay	For two-speed	A46
	2NO/2NC 24 Vdc auxiliary relay— IT only	A47

B—Breaker Modifications, Backspin Timer, Undervoltage Release, Bell Alarm, Bus Choke

Modification	Description	Catalog Number Suffix
Breaker	1NO-1NC auxiliary contact on breaker	B1
	2NO-2NC auxiliary contacts on breaker	B2
	Shunt trip on circuit breaker—48–127 Vac or Vdc	B3
	Shunt trip on circuit breaker—9–24 Vac or Vdc	B4
	Shunt trip on circuit breaker—208–380 Vac	B5
	Shunt trip on circuit breaker—415–600 Vac or 220–250 Vdc	B6
	Undervoltage release for breaker	B8
	Current limiter mounted to breaker	B9
	Breaker—order by description	B10
	Thermal magnetic breaker	B11
	Backspin timer	180 seconds
Undervoltage release	Undervoltage release for circuit breaker—208–240 Vac	B13
	Undervoltage release for circuit breaker—380–480 Vac	B14
	Undervoltage release for circuit breaker—525–600 Vac	B15
Bell alarm	Bell alarm for circuit breaker	B16

Note

^① Available on **XT** starters for 40A and greater only.

C—Control Power Transformer, Power Supplies, Control Relays, Cover Control (not elsewhere defined), Current Transformers, Compelling Relay, Control Wiring, Control Circuit Breaker, Separate Control, Customer-Supplied Components, Contactors, Counter, E-Stop Relay, DC/AC Interface, Separate Source Disconnect, Bypass Contactors

Modification	Description	Catalog Number Suffix
Control power transformers	Standard size control transformer, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C1
Make sure eighth character specifies primary/secondary voltage	Standard size control transformer, 24V/60 Hz secondary with two primary and one secondary fuse	C2
	50 VA extra capacity CPT 120V/60 Hz, 110V/50 Hz with two primary and one secondary	C42
	100 VA extra capacity CPT, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C3
	100 VA extra capacity CPT, 24V/60 Hz secondary with two primary and one secondary fuse	C4
	200 VA extra capacity CPT, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C5
	200 VA extra capacity CPT, 24V/60 Hz secondary with two primary and one secondary fuse	C6
	300 VA extra capacity CPT, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C7
	400 VA extra capacity CPT, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C8
	1 kVA extra capacity CPT, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C9
	2 kVA extra capacity CPT, 120V/60 Hz, 110V/50 Hz secondary with two primary and one secondary fuse	C10
	Control transformer—order by description	C11
	CPT with power supply for XT	C34
	Power supplies (XT only)	Separate control 120 Vac to 24 Vdc
Power supply with extra capacity—order by description		C28
Control relays	Four-pole interposing relay, 600V (2NO/2NC)	C12
	Four-pole, unwired, A600 rtg.—2NO-2NC	C14
	Eight-pole, unwired, A600 rtg.—4NO-4NC	C15
	Control relay—order by description	C16
	Three-wire control module (C30 lighting)	C18 ①
	Two-wire control relay for mechanical/magnetic lighting contactors	C20 ①
Cover control	Convert position seven to E30 type cover control	C17
	Lock-off attachment added on cover control	C19
	Change to M22 (22 mm) cover controls	C29
Current transformer(s)	In phase 1	C21
	In phases 1 and 2	C22
	In 3 phases	C23
Compelling relay	—	C25
Control wiring	Omit control wiring	C26
	With separate control wiring and two 250V fuses in holder	C30
	With common control wiring and two 600V (Class C) fuses in holder	C31
	Control wiring type—order by description	C33
Control circuit breaker	Order by description	C32
Separate control	Wired for separate control (reduced voltage)	C35
Customer supplied components	Customer supplied components to be installed	C36
	Customer supplied wiring diagram to use	C37

Note

① Not available for **XT** starters.

Modification Codes

C—Control Power Transformer, IT Power Supplies, Control Relays, Cover Control (not elsewhere defined), Current Transformers, Compelling Relay, Control Wiring, Control Circuit Breaker, Separate Control, Customer-Supplied Components, Contactors, Counter, E-Stop Relay, DC/AC Interface, Separate Source Disconnect, Bypass Contactors, continued

Modification	Description	Catalog Number Suffix
Contactors/starter	Contactors/starter—order by description	C40
Counter	Operations counter	C41
E-stop relay	E-stop relay (DeviceNet)	C43
DC/AC interface	DC/AC interface module	C44 ①
Separate source disconnect	IEC separate source disconnect for control circuitry	C45
Bypass contactors for IT RVSS	Isolation contactor	C46/J1
	Output contactor	C46/J2
	Bypass contactor	C46/J3
	Isolation/output/bypass contactor	C46/J4

D—Device Labels, Deceleration Relay, Drain and Breather, Duplex Modifications

Modification	Description	Catalog Number Suffix
Device labels	(Each label)	D1
Decel. relay ①	Two-speed	D2
Drain and breather (Type 7/9 enclosure) ①	Drain and breather	D5
	Drain only	D6
	Breather only	D7
Duplex modifications	Alternator omitted (deduct price)	D12
	START/STOP pushbuttons—supplied for each motor	D14
	HAND/OFF/AUTO selector switch—supplied for each motor	D15
	No. 1 lead—No. 2 lead selector switch for manual selection of lead pump (alternator is omitted)	D16
	Red RUN pilot light—supplied for each motor	D17
	Push-to-test red RUN pilot light—supplied for each motor	D18
	TEST pushbutton for each motor	D19
	CPT, 120V secondary, two primary fuses and one secondary fuse—supplied for each motor	D20
	CPT with 100VA extra capacity, 120V secondary, two primary fuses and one secondary fuse—supplied for each motor	D21
	CPT with 200VA extra capacity, 120V secondary, two primary fuses and one secondary fuse—supplied for each motor	D22
	CPT for duplex—order by description	D23
	Add two relays to modify controller to operate with single-pole pilot devices	D24
	Add three relays to modify controller to operate with single-pole pilot devices	D25
	Green—OFF for each starter	D26
	Green—push-to-test OFF for each starter	D27
	Green—RUN light (duplex pump)	D28
Red—STOP light (duplex pump)	D29	
P-T—green RUN light (duplex pump)	D30	
P-T—red STOP light (duplex pump)	D31	
Elapsed time meter (duplex pump)	D32	

Note

① Not available for **XT** starters.

E—Enclosure Modifications, Elapsed Time Meter, Duplex Outlet, Enclosure for Starter, Enclosure Clear Cover, Enclosure Material

Modification	Description	Catalog Number Suffix
Enclosure modifications	Oversize enclosure	E3
	Enclosure—order by description	E4
	Enclosure with pole mounting hardware	E5
	Removable end plates	E6
	Service entrance rating (ground/neutral banding SE labels)	E7
	Service entrance rating with ground bar	E8
	Safety door interlock	E11
Elapsed time meter	Wired across coil, Type 1, 12	E9
	Wired across coil, Type 3R, 4X	
	Elapsed time meter—order by description	E10
Duplex outlet	Convenience duplex outlet mounted in side of enclosure	E12
Enclosure for starter ^①	Horizontal combination starter, Size 0–2	E13
	Narrow combination starter, Size 0–2	E14
Enclosure clear cover for XT	Clear cover for Halyester enclosure non-metallic	E19
Enclosure material	Convert to 316 stainless steel	E16
	Convert from Type 3R to stainless steel	E21
Irrigation pump panel	Bottom entry	E17

F—Fuse Clips, Fuse Blocks, Fungus Protection, Fingerproof Covers, EMI Filter

Modification	Description	Catalog Number Suffix
Fuse clips ^①	Change fuse clips in position eight to Class J	F1
	Change fuse clips in position eight to Class H and K (30A and 60A only)	F2
Fuse blocks	Power fuses included—order by description	F4
	30A control circuit fuseholder (KTK) mounted on panel (unwired), fuse not supplied	F5
	30A control circuit fuseholder mounted on panel (unwired), FNQR fuse supplied	F6
	Three-pole power fuseholder mounted on front contactor	F7
	Separate fusing of control power supply— IT .	F8
	Blown fuse indicator (not for PFC)	F10
	Class CC fuses	F21

G—Ground Fault Relay, Grounding

Modification	Description	Catalog Number Suffix
Ground fault relay	Ground fault relay (wired)	G1
	Ground fault relay (unwired)	G3
Grounding	Special grounding—order by description	G5
	Ground fault protection and monitoring panel	G7

Note

^① Not available for **XT** starters.

15.2

Accessories and Modification Codes

Modification Codes

H—Heater (Space), Heater Packs Installed

Modification	Description	Catalog Number Suffix
Space heater	Space heater and thermostat	H1
	Space heater and NC interlock	H2
Install heater packs (Freedom Series)	Class 20	Class 10
	/D1 H2001B-3	/D25 H2101B-3
	/D2 H2002B-3	/D26 H2102B-3
	/D3 H2003B-3	/D27 H2103B-3
	/D4 H2004B-3	/D28 H2104B-3
	/D5 H2005B-3	/D29 H2105B-3
	/D6 H2006B-3	/D30 H2106B-3
	/D7 H2007B-3	/D31 H2107B-3
	/D8 H2008B-3	/D32 H2108B-3
	/D9 H2009B-3	/D33 H2109B-3
	/D10 H2010B-3	/D34 H2110B-3
	/D11 H2011B-3	/D35 H2111B-3
	/D12 H2012B-3	/D36 H2112B-3
	/D13 H2013B-3	/D37 H2113B-3
	/D14 H2014B-3	/D38 H2114B-3
	/D15 H2015B-3	/D39 H2115-3
	/D16 H2016B-3	/D40 H2116-3
	/D17 H2017B-3	/D41 H2117-3
	/D18 H2018-3	
	/D19 H2019-3	
	/D20 H2020-3	
	/D21 H2021-3	
	/D22 H2022-3	
	/D23 H2023-3	
	/D24 H2024-3	

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K—Keypad

Modification	Description	Catalog Number Suffix
Keypad	Door mounted keypad (RVSS)	K5

L—Labels and Lighting Contactors

Modification	Description	Catalog Number Suffix
Lighting arrestor	Lighting arrestor installed in enclosure on panel	L3
Lugs	Special lugs (order by description)	L9
Carton label	Customer marking—specify	L10
Lighting contactors	1 NC pole	L21
	2 NC pole	L22
	3 NC pole	L23
	4 NC pole	L24
	5 NC pole	L25
	6 NC pole	L26
	7 NC pole	L27
	8 NC pole	L28
	Three-wire 120 Vac	L29A
	Three-wire 240 Vac	L29B
	Three-wire 24 Vac	L29C
	Three-wire 24 Vdc	L29D
	Two-wire 120 Vac	L29E
	Two-wire 240 Vac	L29F
Two-wire 24 Vac	L29G	

N—Nameplates

Modification	Description	Catalog Number Suffix
Nameplates	Enclosure nameplates	N1

15.2

Accessories and Modification Codes

Modification Codes

P—Pilot Lights, Pushbuttons, Phase Relays, Potential Transformers, Power Factor Correction Capacitors, Program Timer, Percentage Timer, Photocell

Modification	Description	Catalog Number Suffix
Push-to-test pilot lights	Push-to-test pilot light (red RUN) wired to coil	P1
	Push-to-test pilot light (green OFF) wired in series with auxiliary contact	P2
	Combination of P1 and P2 above	P3
	Push-to-test pilot light (amber RUN) wired to coil	P4
	Push-to-test pilot light—green RUN	P49
	Push-to-test pilot light—green STOP	P57
Pushbuttons	EMERGENCY STOP—mushroom head	P5
	Pushbutton omitted	P6
	START/STOP	P7
	ON/OFF	P8
	START	P9
	ON	P10
	OFF	P11
	FORWARD/REVERSE/STOP	P12
	FAST/SLOW/STOP	P13
	FAST/OFF/SLOW	P14
	HIGH/LOW/STOP	P15
	HIGH/LOW	P16
	SLOW/FAST	P17
	Pushbutton with legend plate	P18
	UP/STOP/DOWN	P52
	OPEN/STOP/CLOSE	P53
	Red STOP pushbutton	P72
	START/STOP pushbuttons (located in top two holes)	P73
Green START pushbutton	P74	
Pilot lights	With one amber pilot light marked POWER AVAILABLE wired to load side of two fuses or circuit breaker	P19
	Pilot light (amber RUN) wired to coil	P20
	With one red pilot light marked RUN wired thru NO auxiliary contact	P21
	With one push-to-test red light marked RUN Wired thru NO auxiliary contact	P22
	Pilot light—red RUN	P23
	Pilot light—red ON	P24
	Pilot light—green OFF	P25
	Pilot light—order by description	P26
	Pilot light—red STOP	P29
	Pilot light—green STOP	P61
	FORWARD/REVERSE red pilot lights	P62
	UP/DOWN red pilot lights	P63
	OPEN/CLOSE red pilot lights	P64
	HIGH/LOW red pilot lights	P65
	FAST/SLOW red pilot lights	P66
	Green RUN light	P67
	LED bulbs	P68
	Blue OVERLOAD light	P69
	Amber fault pilot light	P71

P—Pilot Lights, Pushbuttons, Phase Relays, Potential Transformers, Power Factor Correction Capacitors, Program Timer, Percentage Timer, Photocell, continued

Modification	Description	Catalog Number Suffix
Illuminated pushbutton	Illuminated pushbutton—order by description	P27
Phase loss relay	Phase loss relay	P28
Phase reversal relay	Phase reversal relay	P30
Phase unbalance relay	Phase unbalance relay	P32
Phase monitoring relay	Phase monitoring relay	P34
Power factor correction capacitors	/F1 20 kVar /F9 70 kVar /F17 200 kVar	P38
	/F2 25 kVar /F10 75 kVar /F18 225 kVar	
	/F3 30 kVar /F11 80 kVar /F19 250 kVar	
	/F4 35 kVar /F12 90 kVar /F20 300 kVar	
	/F5 40 kVar /F13 100 kVar /F21 350 kVar	
	/F6 45 kVar /F14 125 kVar /F22 400 kVar	
	/F7 50 kVar /F15 150 kVar	
	/F8 60 kVar /F16 175 kVar	
Potential transformers	Potential transformer—wired L1–L2	P39
	Potential transformer—wired L1– L2 and L2–L3	P40
	Potential transformer—three phases	P41
Pump controller	Pump controller for <i>IT</i> .	P42
Program timers	15-minute program timer	P43
	24-hour program timer	P44
	7-day program timer with day omission feature	P45
Percentage timers	15-minute percentage timer	P47
	60-minute percentage timer	P48
Photocell	Photoelectric receptacle with photocell	P70

Q—IQ Products, DN50

Modification	Description	Catalog Number Suffix
IQ products	IQ 500	Q1
	IQ100	Q2
	IQ 1000	Q3
	IQ 4000	Q5
IQ data metering module	IQ data metering module	Q12
	IQ 220 with cable	Q14
DN50	DeviceNet input/output module	Q13

R—Ramp, Relays, Solid-State Electronic Overload Relays, Resets, Overload Relay Modifications, Reversing, DeviceNet Interface

Modification	Description	Catalog Number Suffix
Ramp	Extended ramp of <i>IT</i> .	R1
Relay	Overvoltage relay	R2
	Omit overload relay	R4

R—Ramp, Relays, Solid-State Electronic Overload Relays, Resets, Overload Relay Modifications, Reversing, DeviceNet Interface, continued

Modification	IEC Size	NEMA Size	Full Load Current Adjustment Range (A)	Three-Phase without Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30	Three-Phase with Ground Fault Auto/Manual Reset Overload Selectable Class 10/20/30
Solid-state electronic overload relay ^①	B and C	00	0.33–1.65 ^②	R63/A	R64/A
			1–5	R63/B	R64/B
			4–20	R63/C	R64/C
	C and D	0 and 1	0.33–1.65 ^②	R63/A	R64/A
			1–5	R63/B	R64/B
			4–20	R63/C	R64/C
			9–45	R63/D	R64/D
	D	2	9–45	R63/D	R64/D
	D, F and G	3	20–100	R63/E	R64/E
	G	4	28–140	R63/F	R64/F
	N/A	5	60–300 ^③	R63/G	R64/G
	N/A	6	120–600 ^④	R63/H	R64/H

Modification	Description	Catalog Number Suffix
Resets ^⑤	Change external reset to internal reset—hole covered with plug	R5
	Internal reset—no hole plug	R6
	Overload reset (order by description)	R7
	Manual reset only on overload relay	R44
	Auto reset only on overload relay	R45
	Internal trip indicator—no external reset	R47
	External reset with external trip indicator	R48
	External reset with bell alarm	R49
	N3R reset boot added (Type 1/12 only)	R71
Reversing ^⑥	Reversing contactor/starter	R54
Overload relay mods	Anti plug-in	R53
DeviceNet interface	DeviceNet interface	R69
	Standard reset for DeviceNet	R65
	Lighted reset for DeviceNet	R66
	Trip indicator for DeviceNet	R67

Notes

^① Features:

- Self-powered
- Phase loss protection
- Current adjustment knob
- ±1% repeat accuracy
- 1NO and 1NC isolated contacts

^② Not UL Listed.

^③ NEMA Size 5 starter available with 60–300A panel mounted CTs. Starter as an assembled unit with 1–5A C440 overload relay (C440A1A005SELAX or C440A2A005SELAX).

^④ NEMA Size 6 starter available with 120–600A panel mounted CTs. Starter as an assembled unit with 1–5A C440 overload relay (C440A1A005SELAX or C440A2A005SELAX).

^⑤ Not available for **XT** starters.

S—System Voltage, Selector Switches, Suppressor, Incomplete Sequence Protection, Single-Phase Jumper, Surge Capacitor, Speed Potentiometer

Modification	Description	Catalog Number Suffix
System voltage selection	System voltage selection for internal components	S1
	/H1 208V 60 Hz	
	/H2 240V 60 Hz	
	/H3 277V 60 Hz, single-phase	
	/H4 480V 60 Hz	
	/H5 600V 60 Hz	
	/H6 796V 60 Hz	
	/H7 220V 50 Hz	
	/H8 380V 50 Hz	
	/H9 415V 50 Hz	
	/H10 550V 50 Hz	
	/H11 660V 50 Hz	
	/H12 380V 60 Hz	
	/H13 1500V 60 Hz	
	System voltage selection—specify on order	S2
Selector switches ^①	HAND/OFF/AUTO	S3
	HAND/AUTO	S4
	HAND/OFF/AUTO selector switch with one red RUN pilot light	S5
	RUN/OFF/AUTO	S6
	AUTO/OFF/TEST	S7
	AUTO/OFF/TEST selector switch with one red RUN pilot light	S8
	AUTO/OFF/TEST selector switch with one red RUN pilot light and one green pilot light	S9
	OFF/AUTO	S10
	START/STOP	S11
	OFF/ON	S12
	HIGH/LOW	S13
	FAST/OFF/SLOW	S14
	SLOW/FAST	S15
	FORWARD/REVERSE	S16
	HIGH/OFF/LOW	S17
	HIGH/LOW/OFF/AUTO	S18
	Selector switch omitted (pumps only)	S19
	HAND/OFF/AUTO spring return from left	S21
	OPEN/OFF/CLOSE	S41
	FORWARD/OFF/REVERSE	S42
FAST/OFF/SLOW/AUTO	S43	
Selector switch omitted (pump panels only)	S19	
Selector switch—order by description	S40	
RVSS/BYPASS (soft starters only)	S44	
LOCAL/REMOTE selector switch	S45	
RUN/OFF selector switch	S46	
Suppressor	Transient suppressor mounted on magnet coil	S24
Surge suppression	MOV (IT)	S20
Sequence timer	Sequence timer (pump panels)	S26
Sequence protection	Incomplete sequence protection	S27
Pump	480V BP9000 pump	S28
Single-phase	Convert contactor or starter from three-phase to single-phase—install jumper	S29
	Single-phase rev. 120V	S30
	Single-phase rev. 240V	S31
Surge capacitor	Surge capacitor wired to disconnect line side	S37

Note

^① When using three-position selector switch with magnetic lighting contactor, mod **C20** must also be used (ECL04, ECL13, ECL15).

15.2

Accessories and Modification Codes

Modification Codes

T—Timers, Time Delay Relays, Terminal Blocks, Terminal Points, Ring Lug Connections

Modification	Description	Catalog Number Suffix
Timers	Pneumatic timer installed on contactor, unwired, 30 seconds maximum	T1
	Pneumatic timer installed on contactor, unwired, 180 seconds maximum	T2
	Pneumatic timer mounted in enclosure, unwired, 180 seconds maximum	T3
	Solid-state ON delay timer (1–30 seconds)	T4
	Solid-state ON delay timer (30–300 seconds)	T5
	Timer—order by description	T25
Time delay relays	Time delay relay, 3 minutes maximum, unwired, ON DELAY	T6
	Time delay relay, 3 minutes maximum, unwired, OFF DELAY	T7
	Time delay low voltage release relay	T8
Terminal blocks	With one single circuit terminal block, unwired	T9
	With two single circuit terminal block, unwired	T10
Terminal points	With 6 terminal points, unwired	T11
	With 12 terminal points, unwired	T12
	With 18 terminal points, unwired	T13
	Terminal point per customer specification, unwired (price each)	T14
	Terminal point per customer specification, wired (unwired without customer diagram)	T15
	Three terminals mounted between contactor and overload for power factor capacitors—Sizes 0–2	T21
	Three terminals mounted between contactor and overload for power factor capacitors—Sizes 3–4	T22
Ring lug connections	Quick-connect terminals added to DP contactor/starter	T23
	Ring lug connections on power wires	T16 ^①
	Ring lug connections on control wires	T17

15 U—Undervoltage Relay, Time Delay Undervoltage Relay

Modification	Description	Catalog Number Suffix
Undervoltage relays	Undervoltage relay, non-adjustable	U1
	Undervoltage relay, adjustable	U2
Time delay undervoltage relays	Time delay undervoltage relay, non-adjustable	U4
	Time delay undervoltage relay, adjustable	U5
Under- and overvoltage relay	Under- and overvoltage relay	U7

Note

① Not available for **XT** starters.

V— Voltmeter, Varmeter, Vacuum Starter

Modification	Description	Catalog Number Suffix
Voltmeters	One panel type voltmeter wired L1–L2	V1
	Panel type voltmeter and selector switch wired to read three-line voltages	V2
	Miniature voltmeter wired L1–L2	V3 ①
	Miniature voltmeter and selector switch wired to read three-line voltages	V4 ①
	Switchboard type voltmeter wired L1 – L2	V5
	Switchboard type voltmeter and selector switch wired to read three-line voltage	V6 ①
	Three panel type voltmeters wired in each phase	V7
	Three miniature voltmeters wired in each phase	V8 ①
	Three switchboard type voltmeters wired in each phase	V9 ①
	Voltmeter—order by description	V10
Varmeter ②	Varmeter	V11
	Varmeter—order by description	V12
Vacuum starter ②	Vacuum starter—1500V rating	V13

W— Wattmeter, Watt-Hour Meter, Wiremarkers, Wiring Diagram

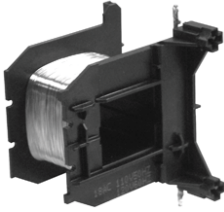
Modification	Description	Catalog Number Suffix
Wattmeter ①	Wattmeter	W1
Watt-hour meter ①	Watt-hour meter	W3
	Watt-hour meter with demand attachment	W5
Wiremarkers	Wiremarkers	W7
	Wiremarkers—order per customer diagram or specifications	W8
	Wiremarkers—order by description	W9
WYE-Delta hp	See Tab 5	W10 ②
Windows in enclosure	Enclosure windows	W11
Wiring diagram	Reduced copy of custom wiring diagram laminated on inside of door	W12

Notes

① Type 1/12 only.

② Not available for **XT** starters.

X7 Line Replacement Coils



Lighting Contactor Magnetic Coil



16.1 NEMA Contactors and Starters

Freedom Line	V10-T16-2
A200 Line	V10-T16-7

16.2 IEC Contactors and Starters

X7 Line	V10-T16-13
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16.3 Lighting Contactors

C30CN Lighting Contactors	V10-T16-15
CN35 Lighting Contactors	V10-T16-15
A202 Lighting Contactors	V10-T16-16

16.4 NEMA Vacuum Break Contactors and Starters

Replacement Coils	V10-T16-17
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Freedom Line**NEMA Sizes 00, 0, 1, 2 and 3**

For a complete listing of parts, refer to the Renewal Parts Publication Number referenced below.

For Catalog Numbers AN16, AN30, AN40, AN56, AN70, AN80, AN800, CN15, CN35^① and CN55 Contactors and Starters (Size 00, 0)

Description	NEMA Size 00		NEMA Size 0	
	Series B1 Part No.	Series C1 Part No.	Series B1 Part No.	Series C1 Part No.
Renewal Parts Publication Number	22177	22177	22177	22177
Contact Kits				
Two-pole	②	②	②	②
Three-pole	②	②	②	②
Four-pole	②	②	②	②
Five-pole	②	②	②	②
Magnet Coils				
	Coil Suffix			
120V 60 Hz or 110V 50 Hz	A	9-2875-1	9-2875-1	9-2876-1
240V 60 Hz or 220V 50 Hz	B	9-2875-2	9-2875-2	9-2876-2
480V 60 Hz or 440V 50 Hz	C	9-2875-3	9-2875-3	9-2876-3
600V 60 Hz or 550V 50 Hz	D	9-2875-4	9-2875-4	9-2876-4
208V 60 Hz	E	9-2875-5	9-2875-5	9-2876-5
277V 60 Hz	H	9-2875-12	9-2875-12	9-2876-12
208/240V 60 Hz	J	9-2875-37	9-2875-37	9-2876-17
240V 50 Hz	K	9-2875-11	9-2875-11	9-2876-11
380–415V 50 Hz	L	9-2875-6	9-2875-6	9-2876-6
380V 50 Hz	L	—	—	—
415V 50 Hz	M	—	—	—
550V 50 Hz	N	—	—	—
24V 60 Hz–24V 50 Hz	T	9-2875-36	9-2875-36	9-2876-36
24V 60 Hz	T	—	—	—
24V 50 Hz	U	9-2875-36	9-2875-36	9-2876-36
32V 50 Hz	V	9-2875-16	9-2875-16	9-2876-16
48V 60 Hz	W	9-2875-8	9-2875-8	9-2876-8
48V 50 Hz	Y	9-2875-9	9-2875-9	9-2876-9
Magnet Frame Armature				
Lower magnet frame	②	②	②	②
Upper magnet frame	②	②	②	②

Notes

① CN35A = Size 00, CN35B and CN35D = Size 0, CN35G = Size 2, CN35K = Size 3, CN35N = Size 4, and CN35S = Size 5.

② Replace with complete contactor.

For a complete listing of parts, refer to the Renewal Parts Publication Number referenced below.

For Catalog Numbers AN16, AN30, AN40, AN56, AN70, AN80, AN800, CN15, CN35^① and CN55 Contactors and Starters (Size 1, 2)

Description	NEMA Size 1		NEMA Size 2		NEMA Size 3
	Series A1 Part No.	Series B1 Part No.	Series A1 Part No.	Series B1 Part No.	
Renewal Parts Publication Number	20861	22177	20861	22177	20426
Contact Kits					
Two-pole	6-65	6-65	6-65-7	6-65-7	6-43-5
Three-pole	6-65-2	6-65-2	6-65-8	6-65-8	6-43-6
Four-pole	6-65-9	6-65-9	6-65-15	6-65-15	—
Five-pole	6-65-10	6-65-10	6-65-16	6-65-16	—
Magnet Coils					
	Coil Suffix				
120V 60 Hz or 110V 50 Hz	A	9-3285-1	9-3285-1	9-3285-1	9-2756-1 KIT
240V 60 Hz or 220V 50 Hz	B	9-2703-2 KIT	9-2703-2 KIT	9-2703-2 KIT	9-2756-2 KIT
480V 60 Hz or 440V 50 Hz	C	9-2703-3 KIT	9-2703-3 KIT	9-2703-3 KIT	9-2756-3 KIT
600V 60 Hz or 550V 50 Hz	D	9-2703-4 KIT	9-2703-4 KIT	9-2703-4 KIT	9-2756-4 KIT
208V 60 Hz	E	9-2703-9 KIT	9-2703-9 KIT	9-2703-9 KIT	9-2756-5 KIT
277V 60 Hz	H	9-2703-7 KIT	9-2703-7 KIT	9-2703-7 KIT	9-2756-9 KIT
208/240V 60 Hz	J	—	—	—	—
240V 50 Hz	K	9-2703-14 KIT	9-2703-14 KIT	9-2703-14 KIT	9-2756-13 KIT
380–415V 50 Hz	L	9-2703-8 KIT	9-2703-8 KIT	9-2703-8 KIT	—
380V 50 Hz	L	—	—	—	9-2756-12 KIT
415V 50 Hz	M	—	—	—	9-2756-8 KIT
550V 50 Hz	N	—	—	—	9-2756-14 KIT
24V 60 Hz–24V 50 Hz	T	—	—	—	—
24V 60 Hz	T	9-2703-6 KIT	9-2703-6 KIT	9-2703-6 KIT	9-2756-6 KIT
24V 50 Hz	U	9-2703-12 KIT	9-2703-12 KIT	9-2703-12 KIT	9-2756-11 KIT
32V 50 Hz	V	9-2703-10 KIT	9-2703-10 KIT	9-2703-10 KIT	9-2756-10 KIT
48V 60 Hz	W	9-2703-11 KIT	9-2703-11 KIT	9-2703-11 KIT	9-2756-15 KIT
48V 50 Hz	Y	9-2703-13 KIT	9-2703-13 KIT	9-2703-13 KIT	9-2756-7 KIT
Magnet Frame Armature					
Lower magnet frame		17-18200	17-18200	17-18200 KIT	17-8955-2 KIT
Upper magnet frame		48-1936	48-1936	48-1936 KIT	48-1902 KIT

Note

^① CN35A = Size 00, CN35B and CN35D = Size 0, CN35G = Size 2, CN35K = Size 3, CN35N = Size 4, and CN35S = Size 5.

NEMA Sizes 4, 5 and 6

For a complete listing of parts, refer to the Renewal Parts Publication Number referenced below.

For Catalog Numbers AN16, AN30, AN40, AN56, AN70, AN80, AN800, CN15, CN35^① and CN55 Contactors and Starters (Size 4, 5, 6)

Description	NEMA Size 4		NEMA Size 5		NEMA Size 6		
	Series A1 Part No.	Series B1 Part No.	Series A1 Part No.	Series B1 Part No.	Contactor and Starter Series A1, Starter Series B1 Part No.	Contactor and Starter Series B1, Starter Series C1 Part No.	
Renewal Parts Publication Number	20428	20428	20429	20429	20146	23349	
Contact Kits							
Two-pole	6-44	6-26	6-45	6-45	6-601-2	—	
Three-pole	6-44-2	6-26-2	6-45-2	6-45-2	6-601	6-648	
Magnet Coils	Coil Suffix						
120V 60 Hz or 110V 50 Hz	A	9-1891-1 KIT	9-1891-1 KIT	9-1891-1 KIT	9-1891-1 KIT	9-2698	9-3006
240V 60 Hz or 220V 50 Hz	B	9-1891-2 KIT	9-1891-2 KIT	9-1891-2 KIT	9-1891-2 KIT	9-2698-2	9-3006-2
480V 60 Hz or 440V 50 Hz	C	9-1891-3 KIT	9-1891-3 KIT	9-1891-3 KIT	9-1891-3 KIT	9-2698-3	9-3006-3
600V 60 Hz or 550V 50 Hz	D	9-1891-4 KIT	9-1891-4 KIT	9-1891-4 KIT	9-1891-4 KIT	9-2698-4	9-3006-4
208V 60 Hz	E	9-1891-13 KIT	9-1891-13 KIT	9-1891-13 KIT	9-1891-13 KIT	9-2698-5	—
277V 60 Hz	H	9-1891-26 KIT	9-1891-26 KIT	9-1891-26 KIT	9-1891-26 KIT	—	—
208/240V 60 Hz	J	—	—	—	—	—	—
240V 50 Hz	K	9-1891-20 KIT	9-1891-20 KIT	9-1891-20 KIT	9-1891-20 KIT	—	—
380–415V 50 Hz	L	—	—	—	—	9-2698-6	9-3006-7
380V 50 Hz	L	9-1891-14 KIT	9-1891-14 KIT	9-1891-14 KIT	9-1891-14 KIT	—	—
415V 50 Hz	M	9-1891-21 KIT	9-1891-21 KIT	9-1891-21 KIT	9-1891-21 KIT	—	—
550V 50 Hz	N	9-1891-8 KIT	9-1891-8 KIT	9-1891-8 KIT	9-1891-8 KIT	—	—
24V 60 Hz–24V 50 Hz	T	—	—	—	—	—	9-3006-8
24V 60 Hz	T	9-1891-15 KIT	9-1891-15 KIT	9-1891-15 KIT	9-1891-15 KIT	—	—
24V 50 Hz	U	9-1891-16 KIT	9-1891-16 KIT	9-1891-16 KIT	9-1891-16 KIT	—	—
48V 60 Hz	W	—	—	—	—	9-2698-8	9-3006-9
48V 50 Hz	Y	9-1891-18 KIT	9-1891-18 KIT	9-1891-18 KIT	9-1891-18 KIT	—	—
Overload Relays							
For replacement on existing starters three-pole— ambient compensated bimetallic	10-6530-4	10-6530-4	C306DN3B	C306DN3B	C306DN3B	C306DN3B	C306DN3B
Current Transformer	—	—	42-3564	42-3564	42-3598	42-3598	42-3598
Magnet Frame Armature^②							
Lower Magnet Frame	48-1030-2	48-1030-2	48-1030-2	48-1030-2	—	—	—
Upper Magnet Frame	48-1029-4	48-1029-4	48-1029-4	48-1029-4	—	—	—

Notes

① CN35A = Size 00, CN35B and CN35D = Size 0, CN35G = Size 2, CN35K = Size 3, CN35N = Size 4, and CN35S = Size 5.

② Consult factory.

NEMA Sizes 7 and 8

NEMA Sizes 7 and 8—See Contactor/Starter Nameplate to Determine Series A1 or B1

Description Renewal Parts Publication Number	NEMA Size 7		NEMA Size 8	
	Series A1 Part Number	Series B1 Part Number	Series A1 Part Number	Series B1 Part Number
	20848	20848	20849	20849
Contact Kits				
Two-pole	—	—	—	—
Three-pole	6-613	6-613	6-571	6-571
Magnet Coils				
	Coil Suffix			
120V 60 Hz or 110V 50 Hz	A	9-2698	9-2698	9-2654
240V 60 Hz or 220V 50 Hz	B	9-2698-2	9-2698-2	9-2654-2
480V 60 Hz or 440V 50 Hz	C	9-2698-3	9-2698-3	9-2654-3
600V 60 Hz or 550V 50 Hz	D	9-2698-4	9-2698-4	9-2654-4
208V 60 Hz	E	9-2698-5	9-2698-5	9-2654-6
277V 60 Hz	H	—	—	—
208/240V 60 Hz	J	—	—	—
240V 50 Hz	K	—	—	—
380–415V 50 Hz	L	—	—	—
380V 50 Hz	L	9-2698-6	9-2698-6	9-2654-5
415V 50 Hz	M	—	—	—
550V 50 Hz	N	—	—	—
24V 60 Hz–24V 50 Hz	T	—	—	—
24V 60 Hz	T	—	—	—
24V 50 Hz	U	—	—	—
32V 50 Hz	V	—	—	—
48V 60 Hz	W	—	—	—
48V 50 Hz	Y	—	—	—
Overload Relays				
For replacement on existing starters				
Three-pole—ambient compensated bimetallic	C306DN3B	C306DN3B	C306DN3B	C306DN3B
Current Transformer				
—	42-3598-2	42-3598-2	42-3598-3	42-3598-3
Magnet Frame Armature ^①				
Lower magnet frame	—	—	—	—
Upper magnet frame	—	—	—	—

Note

① Consult factory.

NEMA Sizes 7 and 8—See Contactor/Starter Nameplate to Determine Series A1 or B1, continued

Volts	Hertz	NEMA Size 7	Series B1	NEMA Size 8	Series B1
		Series A1	Part Number	Series A1	Part Number
Renewal Parts Publication Number	Number	Part Number	Part Number	Part Number	Part Number
Feeder Group Renewal ^①					
110–120	50/60	9-2705	9-2705	—	—
220–240	50/60	9-2705-2	9-2705-2	—	—
440–480	50/60	9-2705-3	9-2705-3	—	—
550–600	50/60	9-2705-4	9-2705-4	—	—
208	50/60	9-2705-5	9-2705-5	—	—
380–415	50/60	9-2705-6	9-2705-6	—	—
48–52	50/60	9-2705-8	9-2705-8	—	—
120	50/60	—	—	9-2664	9-2664
240	50/60	—	—	9-2664-2	9-2664-2
480	50/60	—	—	9-2664-3	9-2664-3
600	50/60	—	—	9-2664-4	9-2664-4
380	50/60	—	—	9-2664-5	9-2664-5
208	50/60	—	—	9-2664-6	9-2664-6
416	50/60	—	—	9-2664-7	9-2664-7
110	50/60	—	—	9-2664-8	9-2664-8
220	50/60	—	—	9-2664-9	9-2664-9
550	50/60	—	—	9-2664-10	9-2664-10
440	50/60	—	—	9-2664-11	9-2664-11

Note

^① Voltage ratings of the main coils must match those of the feeder group for proper operation of the starter/contactator.

A200 Line

When Ordering Specify

- Use this renewal parts data to identify device by style number, catalog number and/or description
- Select style number of replacement part from the following pages
- For clarification of ordering procedure, pricing and discounts, contact the customer support center

General Information

This renewal parts data will provide the proper identification of standard parts which may be required for maintenance of Eaton's components.

It is the intent of this catalog section to make it possible to quickly select the parts needed.

An investment in renewal parts and a regular maintenance program will protect against downtime and ensure a proper duty cycle for your equipment.

To maintain maximum operating efficiency and dependability of your equipment, only genuine

Eaton replacement parts should be used.

This section identifies the replacements parts which are available. Order by style number.

Note: Kits contain a complete set of moving contacts, stationary contacts and springs.

JF Autostarters

JF Autostarter Kits

Frame Size	Start Contacts		Run Contacts		Grid Stack Kit	
	Required	Style Number	Required	Style Number	Required	Style Number
2-3	1	38A7018G12	1	38A7018G13	1	3354D90G10
4-5.5L	1	550D409G18	1	550D409G19	1	3354D90G10
5M-5MM	1	3354D90G08	1	3354D90G09	2	3354D90G10

Solenoid Assembly with Coil (All Sizes) ^①

Volt	Hz	Style Number ^②	Volt	Hz	Style Number ^②
115	60	5264C05H01	460	60	5264C05H03
230	60	5264C05H02	575	60	5264C05H04

Notes

- ^① When replacing solenoid assembly series 416C160 use adapter plate style 9917D02H01—one required.
- ^② These styles replace coil style 296B892G_. When ordering new style as replacement, customer must order adapter plate 9917D02H01, one required.

AC Starters, Contactors A200, A201

AC Contactors Model J Sizes 00, 0, 1, 2 Kits ①

Part	Poles	Size 00 Style Number	Size 0 Style Number	Size 1 Style Number	Size 2 Style Number
Contact kit	2	373B331G17	373B331G02	373B331G07	373B331G11
	3	373B331G18	373B331G04	373B331G09	373B331G12
	4	373B331G18	373B331G04	373B331G09	373B331G13 ②
	5	373B331G19	373B331G05	373B331G10	—
Arc box ③	2, 3, 4	6714C74G01	6714C74G02	6714C74G03	6714C74G07 ④
	5	6714C74G04	6714C74G05	6714C74G06	6714C74G08 ⑤
Cross bar	2, 3	N/A	N/A	N/A	672B788G32
	4, 5	N/A	N/A	N/A	672B788G34
Upper base (for single rated coils only)	2, 3	N/A	N/A	N/A	672B788G33
	4, 5	N/A	N/A	N/A	672B788G35
Lower base	2, 3	N/A	N/A	N/A	1250C33G09
	4, 5	N/A	N/A	N/A	1250C33G05
K.O. spring (package of 10)	All	N/A	N/A	N/A	503C796G01
Terminal line/load (package of 3)	All	N/A	N/A	N/A	371B870G03

AC Coils

Voltage	Hz	Size 00, 0, 1	Five-Pole Style Number	Size 2	Four- and Five-Pole Style Number
		Two-, Three- and Four-Pole Style Number		Two- and Three-Pole Style Number	
120/110	60/50	505C806G01	505C808G01	505C806G01	505C818G01
208	60	505C806G02	505C808G02	505C806G02	505C818G02
600/550	60/50	505C806G05	505C808G05	505C806G05	505C818G05
380	50	505C806G07	505C808G07	505C806G07	505C818G07
240/220	60/50	505C806G12	505C808G12	505C806G12	505C818G12
480/440	60/50	505C806G13	505C808G13	505C806G13	505C818G13
24	60	505C806G16	N/A	505C806G16	505C818G15
277	60	505C806G18	505C808G16	505C806G18	505C818G16
240/480 ⑥	60/60	505C806G03	505C808G03	505C806G03	505C818G03
120/240 ⑦	60/60	505C806G10	505C808G10	505C806G10	505C818G10

DC Coil ⑦

Voltage	Size 0, 1	Size 2
	Single-, Two-, Three- and Four Pole Style Number	Single-, Two- and Three-Pole Style Number
12	1268C86G07	1268C86G07
24	1268C86G04	1268C86G04
48	1268C86G05	1268C86G05
125	1268C86G02	1268C86G02
250	1268C86G01	1268C86G01
125/250 ⑥	1268C86G03	1268C86G03

Notes

- ① Model C contact tips and coils 00-4, two-, three-, four- and five-pole contactors are same as Model J. All other parts are unavailable.
 ② Use one each of 373B331G11 and 373B331G12.
 ③ Mounting hardware included.
 ④ Two- and three-pole.
 ⑤ Four- and five-pole.
 ⑥ Dual voltage coils. Use only on contactors or starters originally supplied with a dual voltage coil.
 ⑦ Use only on contactors originally supplied with a DC coil.

Accessories for Size 5–9 AC Contactors

Note: A rectifier circuit converts the AC supply to DC supply. This conversion provides pick up and drop out characteristics. All necessary parts are included in the kit.

AC-DC Coil Conversion Kits

Voltage	Size 5	Size 6
	Style Number	Style Number
120 Vac	7864A28G01	7864A29G01
240 Vac	7864A28G02	7864A29G02
480 Vac	7864A28G03	7864A29G03

Replacement Coils for Above

Voltage	Size 5	Size 6
	Style Number	Style Number
120 Vac	7856A15G05	7856A16G05
240 Vac	7856A15G10	7856A16G10
480 Vac	7856A15G15	7856A16G15

Auxiliary Electrical Interlocks Size 7–9 AC and All DC Units

Type	Circuits	Application	Style Number
L63	NO	Size 7–8	578D461G01
L63	NC	Size 7–8	578D461G03
L64	NO-NC	Size 9	843D943G04
L64	2NO	Size 9	843D943G05
L64	2NC	Size 9	843D943G06

Accessories for Size 00–6 AC Contactors**Auxiliary Electrical Interlocks**

Catalog Number (Obsolete)	Style Number (Obsolete)	Circuits	Catalog Number Current	Style Number Current
(L-56)	(2609D01G01)	1NO and 1NC	J11	9084A17G01
(L-56D)	(2609D01G02)	2NO	J20	9084A17G02
(L-56E)	(2609D01G03)	1NO and 1NC	J11	9084A17G01
(L-56B)	(2609D01G04)	2NO	J20	9084A17G02
(L-56H)	(2609D01G05)	2NO	J20	9084A17G02
(L-56J)	(2609D01G06)	1NO and 1NC DB	J1C	9084A17G04
(L-56A)	(2609D01G07)	N/A	N/A	N/A
(L-56B)	(2609D01G08)	N/A	N/A	N/A
(L-56F)	(2609D01G09)	N/A	N/A	N/A
(L-56G)	(2609D01G10)	1NO and 1NC DB	J1C	9084A17G04
(L-56C)	(2609D01G11)	2NC	J02	9084A17G03
(L-56M)	(2609D01G12)	N/A	N/A	N/A
(L-56P)	(2609D01G17)	1NO and 1NC	J11	9084A17G01
(L-56R)	(2609D01G18)	2NC	J02	9084A17G03
(L-56S)	(2609D01G19)	1NO and 1NC	J11	9084A17G01

Model J–K, Sizes 3 and 4**Model J–K Series 3, 4 Kits** ①

Part	Poles	Size 3—Model J Style Number	Size 4—Model J ② Style Number	Size 4—Model K ③ Style Number
Contact kit	2	626B187G12	626B187G16	5250C81G16
	3	626B187G13	626B187G17	5250C81G17
	4	④	⑤	5250C81G18
	5	⑥	⑦	5250C81G19
Arc box	2, 3	6714C74G09	6714C74G11	6714C74G11
	4, 5	6714C74G10	6714C74G12	6714C74G12
Cross bar	2, 3	672B788G36	672B788G36	672B788G40
	4, 5	672B788G38	672B788G38	—
Upper base	2, 3	672B788G37	672B788G37	672B788G52
	4, 5	672B788G39	672B788G39	—
Lower base	2, 3	1250C33G03	1250C33G03	1250C33G10
	4, 5	1250C33G06	1250C33G06	—
K.O. spring (package of 10)	All	503C796G02	503C796G02	672B788G50
Terminal line/load (package of 3)	All	372B357G12	372B357G18	372B357G18

Accessories for Model J–K, Series 3, 4**DC Coils** ⑧

Voltage	Model J Size 3, 4 Two- and Three-Pole Style Number	Voltage	Model J Size 3, 4 Two- and Three-Pole Style Number
24	1255C68G04	250	1255C68G02
48	1255C68G05	125/250 ⑨	1255C68G03
125	1255C68G01		

Notes

- ① Model C contact tips and coils 00-4, two-, three-, four- and five-pole contactors are same as Model J. All other parts are unavailable.
- ② For 200A A202 magnetically latched lighting contactors order three-pole contact kit style 672B788G07.
- ③ Model K replaces Model J, offering superior design life characteristics. Renewal parts are different. Use parts for proper model only.
- ④ Use quantity 2 of 626B187G12.
- ⑤ Use quantity 2 of 626B187G16.
- ⑥ Use quantity 1 each of 626B187G12 and 626B187G13.
- ⑦ Use quantity 1 each of 626B187G16 and 626B187G17.
- ⑧ Use only on units originally supplied with DC coil.
- ⑨ Dual voltage coils. Use only on contactors or starters originally supplied with dual voltage coil.

AC Coils

Voltage	Hz	Model J Size 3, 4		Model K Size 4 ①	
		Two- and Three-Pole Style Number	Four- and Five-Pole Style Number	Two- and Three-Pole Style Number	Four- and Five-Pole Style Number
120/110	60/50	505C633G01	505C635G01	5250C79G01	5250C80G01
208	60	505C633G02	505C635G02	5250C79G02	5250C80G02
600/550	60/50	505C633G05	505C635G05	5250C79G05	5250C80G05
380	50	505C633G07	505C635G07	5250C79G07	5250C80G07
240/220	60/50	505C633G12	505C635G12	5250C79G12	5250C80G12
480/440	60/50	505C633G13	505C635G13	5250C79G13	5250C80G13
24	60	505C633G34	N/A	5250C79G34	N/A
277	60	505C633G14	N/A	5250C79G14	N/A
240/480 ②	60/60	505C633G03	505C635G03	5250C79G03	5250C80G03
120/244 ②	60/60	505C633G10	505C635G10	5250C79G10	5250C80G10

A201 Contactors—Size 5–9

GCA 530/630—GPD 7, 8, 9 Kits ③

Part	Size 5 Style Number	Size 6 Style Number	Size 7 Style Number	Size 8 Style Number	Size 9 Style Number
Contact kit (1 per pole)	477B477G05 ④	2066A10G11	461A757G17	646C829G05	5264C42G01 ⑤
	—	—	—	—	5264C42G02 ⑥
Arc box	2050A15G45	2066A10G45	831D580G01	831D580G01	9917D69G02
Magnet assembly	2050A15G46	2050A15G46	N/A	N/A	N/A
Magnet spring kit	2050A15G47	2050A15G47	N/A	N/A	N/A
Acr cup kit	2050A15G48	N/A	N/A	N/A	N/A
Load conn. kit	2050A15G49	2066A10G49	N/A	N/A	N/A
Line conn. kit	2050A15G50	2066A10G50	N/A	N/A	N/A
K.O. spring–6	2050A15G51	2066A10G46	N/A	N/A	N/A
C.T. 300/5	655C285H03	N/A	N/A	N/A	N/A
C.T. 400/5	655C285H04	N/A	N/A	N/A	N/A
C.T. 600/5 ⑦	N/A	2066A10G18	N/A	N/A	N/A
C.T. 800/5 ⑦	N/A	2066A10G19	N/A	N/A	N/A
Phase barrier	N/A	N/A	640C441G01	640C441G01	5264C35G03 ⑧
Cross bar	2050A15G12	2066A10G15	N/A	N/A	N/A
Shunt	N/A	2066A10G48	650C129G01	646C831G02 ⑨	5264C39G02 ⑩

Notes

- ① Model K replaces Model J, offering superior design life characteristics. Renewal parts are different. Use parts for proper model only.
- ② Dual voltage coils. Use only on contactors or starters originally supplied with dual voltage coil.
- ③ Catalog number A201/A200 series replaces GCA/GPD series. Renewal parts are the same.
- ④ Use 477B477G06 for silver tungsten applications.
- ⑤ R.C.
- ⑥ F.C.
- ⑦ C.T. kit which replaces the single molded 1 C.T. assembly used on the old size 6 airbreak. The kit includes a single molded 3 C.T. assembly, 2 bus bar and hardware. This C.T. kit also replaces the single molded 3 C.T. assembly used on the present size 6 airbreak and size vacuum.
- ⑧ Set of three.
- ⑩ Set of four.

Accessories for A201 Contactors—Size 5–9

Coils**Sizes 5 and 6**

Voltage	Hz	Size 5 Style Number	Size 6 Style Number
110/120	60	2050A14G05	2050A12G05
110/120	50	2050A14G06	2050A12G06
200/208	50	2050A14G07	2050A12G07
220/240	50	2050A14G08	2050A12G08
200/208	60	2050A14G09	2050A12G09
220/240	60	2050A14G10	2050A12G10
277/303	60	2050A14G12	2050A12G12
380/415	50	2050A14G14	2050A12G14
440/480	60	2050A14G15	2050A12G15
440/480	50	2050A14G16	2050A12G16
550/600	60	2050A14G17	2050A12G17
550/600	50	2050A14G18	2050A12G18
380/415	60	2050A14G19	2050A12G19
120/240	60	2050A14G20	2050A12G20
24 DC	—	2050A14G21	2050A12G21
48 DC	—	2050A14G22	2050A12G22
125 DC	—	2050A14G25	2050A12G25
250 DC	—	2050A14G27	2050A12G27

Sizes 7 and 8

Line Voltage	Required	Size 7, 8 Style Number
125 Vdc	2	438C805G04
230 Vdc	2	438C805G02
250 Vdc	2	438C805G03
110/120 Vac ^{①②}	2	438C805G12
220/240 Vac ^{②③}	2	438C805G11
380 Vac ^{②④}	2	438C805G15
440/480 Vac ^{②④}	2	438C805G10
550/575 Vac ^{②④}	2	438C805G13

Size 9

Line Voltage	Size 9 Style Number
110 Vdc	5264C34G01 ^⑤

Notes

- ① Rectifier 125V 2018A40G01 (1 required).
- ② These coils require an external rectifier. If the rectifier needs replacement, order by the appropriate style number.
- ③ Rectifier 250V 2018A40G02 (1 required).
- ④ Rectifier 600V 2018A40G03 (1 required).
- ⑤ Contains coil and resistor.

XTLine

XTCERENC_



Replacement Coil—Frame C

Voltage	Coil Suffix	Catalog Number
110/50 120/60	A	XTCERENCOILCA
110–130 Vdc	AD	XTCERENCOILCAD
220/50 240/60	B	XTCERENCOILCB
200–240 Vdc	BD	XTCERENCOILCBD
415/50 480/60	C	XTCERENCOILCC
550/50 600/60	D	XTCERENCOILCD
208/60	E	XTCERENCOILCE
230/50	F	XTCERENCOILCF
190/50 220/60	G	XTCERENCOILCG
240/50 277/60	H	XTCERENCOILCH
380/50 440/60	L	XTCERENCOILCL
400/50	N	XTCERENCOILCN
380/60	P	XTCERENCOILCP
12/50 12/60	R	XTCERENCOILCR
12–14 Vdc	RD	XTCERENCOILCRD
24/50 24/60	T	XTCERENCOILCT
24–27 Vdc	TD	XTCERENCOILCTD
42/50 48/60	W	XTCERENCOILCW
48–60 Vdc	WD	XTCERENCOILCWD
48/50	Y	XTCERENCOILCY

Replacement Coil—Frame D

Voltage	Coil Suffix	Catalog Number
110/50 120/60	A	XTCERENCOILDA
110–130 Vdc	AD	XTCERENCOILDAD
220/50 240/60	B	XTCERENCOILDB
200–240 Vdc	BD	XTCERENCOILDBD
415/50 480/60	C	XTCERENCOILDC
550/50 600/60	D	XTCERENCOILDD
208/60	E	XTCERENCOILDE
230/50	F	XTCERENCOILDF
190/50 220/60	G	XTCERENCOILDG
240/50 277/60	H	XTCERENCOILDH
380/50 440/60	L	XTCERENCOILDL
400/50	N	XTCERENCOILDN
380/60	P	XTCERENCOILD P
12/50 12/60	R	XTCERENCOILDR
12–14 Vdc	RD	XTCERENCOILDRD
24/50 24/60	T	XTCERENCOILD T
24–27 Vdc	TD	XTCERENCOILD TD
42/50 48/60	W	XTCERENCOILD W
48–60 Vdc	WD	XTCERENCOILD WD
48/50	Y	XTCERENCOILD Y

Replacement Coil—Frame F ①

Voltage	Coil Suffix	Catalog Number
110/50 120/60	A	XTCERENCOILFA
110–130 Vdc	AD	XTCERENCOILFAD
220/50 240/60	B	XTCERENCOILFB
200–240 Vdc	BD	XTCERENCOILFBD
415/50 480/60	C	XTCERENCOILFC
550/50 600/60	D	XTCERENCOILFD
208/60	E	XTCERENCOILFE
230/50	F	XTCERENCOILFF
190/50 220/60	G	XTCERENCOILFG
240/50 277/60	H	XTCERENCOILFH
380/50 440/60	L	XTCERENCOILFL
400/50	N	XTCERENCOILFN
380/60	P	XTCERENCOILFP
12/50 12/60	R	XTCERENCOILFR
24/50 24/60	T	XTCERENCOILFT
24–27 Vdc	TD	XTCERENCOILFTD
42/50 48/60	W	XTCERENCOILFW
48–60 Vdc	WD	XTCERENCOILFWD
48/50	Y	XTCERENCOILFY

Replacement Coil—Frame G ②

Voltage	Coil Suffix	Catalog Number
100–120V 50/60	A	XTCERENCOILGA
110–130 Vdc	AD	XTCERENCOILGAD
190–240V 50/60	B	XTCERENCOILGB
200–240 Vdc	BD	XTCERENCOILGBD
480–500V 50/60	C	XTCERENCOILGC
380–440V 50/60	L	XTCERENCOILGL
4/50 24/60	T	XTCERENCOILGT
24–27 Vdc	TD	XTCERENCOILGTD
42–48V 50/60	W	XTCERENCOILGW
48–60 Vdc	WD	XTCERENCOILGWD

Notes

- ① Frame F replacement coils can only be used with contactors having the following date codes: DC coils, 2706 or later; AC coils, 4706 or later.
- ② Frame G replacement coils can only be used with contactors having date codes of 2706 or later.

Replacement Coil—Frame L ①

Voltage	Coil Suffix	Catalog Number
110–250 Vac/Vdc	A	XTCERENCOILLA
250–500V 40–60	C	XTCERENCOILLC
24–48 Vdc	TD	XTCERENCOILLTD
48–110 Vac/Vdc	Y	XTCERENCOILLY

Replacement Coil—Frame L, S-Series

Voltage	Coil Suffix	Catalog Number
110–120V 50/60 Hz	A	XTCSRENCOILLA
220–240V 50/60 Hz	B	XTCSRENCOILLB

Replacement Coil—Frame M ①

Voltage	Coil Suffix	Catalog Number
110–250 Vac/Vdc	A	XTCERENCOILMA
250–500V 40–60	C	XTCERENCOILMC
24–48 Vdc	TD	XTCERENCOILMTD
48–110 Vac/Vdc	Y	XTCERENCOILMY

Replacement Coil—Frame M, S-Series

Voltage	Coil Suffix	Catalog Number
110–120V 50/60 Hz	A	XTCSRENCOILMA
220–240V 50/60 Hz	B	XTCSRENCOILMB

Replacement Coil—Frame N ①

Voltage	Coil Suffix	Catalog Number
110–250 Vac/Vdc	A	XTCERENCOILNA
250–500V 40–60	C	XTCERENCOILNC
48–110 Vac/Vdc	Y	XTCERENCOILNY

Replacement Contact Kit

For Use with...	Catalog Number
XTCE040D–XTCE065D	XTCERENCONTACTD
XTCE185L–XTCE250L	XTCERENCONTACTL
XTCE300M–XTCE570M	XTCERENCONTACTM
XTCE085F–XTCE095F	XTCERENCONTACTF
XTCE115G–XTCE150G	XTCERENCONTACTG

Replacement Vacuum Tube Assembly

For Use with...	Catalog Number
XTCE580N	XTCERENVACT580
XTCE650N	XTCERENVACT650
XTCE750N	XTCERENVACT750
XTCE820N	XTCERENVACT820

Replacement Arc Chamber

For Use with...	Catalog Number
XTCE185L	XTCERENARC185
XTCE225L	XTCERENARC225
XTCE250L	XTCERENARC250
XTCE300M	XTCERENARC300
XTCE400M	XTCERENARC400
XTCE500M–XTCE570M	XTCERENARC500

Note

① Electronic modules including coils.

C30CN Lighting Contactors

Magnet Coils for the Base Contactor

Magnetic Coils



Magnetic Coils

Coil Voltage	Catalog Number
115–120V 60 Hz/110V 50 Hz	9-3242-1
230–240V 60 Hz/220V 50 Hz	9-3242-2
460–480V 60 Hz/440V 50 Hz	9-3242-3
575–600V 60 Hz/550V 50 Hz	9-3242-4
200–208V 60 Hz	9-3242-5
265–277V 60 Hz/240V 50 Hz	9-3242-6
24V 60 Hz/20V 50 Hz	9-3242-7
28V 60 Hz/24V 50 Hz	9-3242-8
347V 60 Hz	9-3242-9

CN35 Lighting Contactors

Renewal Parts for CN35 Lighting Contactors

Description	10A	20A, 30A	60A	100A	200A	300A
	Series C1 Part No.	Series C1 Part No.	Series B1 Part No.	Part No.	Part No.	Series B1 Part No.
Contact Kits						
Two-pole	①	①	6-65-7	6-43-5	6-44	6-45
Three-pole	①	①	6-65-8	6-43-6	6-44-2	6-45-2
Four-pole	①	①	6-65-15	—	—	—
Five-pole	①	①	6-65-16	—	—	—
Magnet Coils						
	Coil Suffix					
120V 60 Hz or 110V 50 Hz	A	9-2875-1	9-2876-1	9-2703-1	9-2756-1	9-1891-1
240V 60 Hz or 220V 50 Hz	B	9-2875-2	9-2876-2	9-2703-2	9-2756-2	9-1891-2
480V 60 Hz or 440V 50 Hz	C	9-2875-3	9-2876-3	9-2703-3	9-2756-3	9-1891-3
600V 60 Hz or 550V 50 Hz	D	9-2875-4	9-2876-4	9-2703-4	9-2756-4	9-1891-4
208V 60 Hz	E	9-2875-5	9-2876-5	9-2703-9	9-2756-5	9-1891-13
277V 60 Hz	H	9-2875-12	9-2876-12	9-2703-7	9-2756-9	9-1891-26
208/240V 60Hz	J	9-2875-37	9-2876-37	—	—	—
240V 50Hz	K	9-2875-11	9-2876-11	9-2703-14	9-2756-13	9-1891-20
380–415V 50 Hz	L	9-2875-6	9-2876-6	9-2703-8	—	—
380V 50 Hz	L	—	—	—	9-2756-12	9-1891-14
415V 50 Hz	M	—	—	—	9-2756-8	9-1891-21
550V 50 Hz	N	—	—	—	9-2756-14	9-1891-8
24V 60 Hz–24V 50 Hz	T	9-2875-36	9-2876-36	—	—	—
24V 60 Hz	T	—	—	9-2703-6	9-2756-6	9-1891-15
24V 50 Hz	U	9-2875-36	9-2876-13	9-2703-12	9-2756-11	9-1891-16
32V 50 Hz	V	9-2875-16	9-2876-16	9-2703-10	9-2756-10	—
48V 60 Hz	W	9-2875-8	9-2876-8	9-2703-11	9-2756-15	—
48V 50 Hz	Y	9-2875-9	9-2876-9	9-2703-13	9-2756-7	9-1891-18

Note

① Replace with complete contactor.

A202 Lighting Contactors

AC Coil Renewal Parts for A202—Magnetically Latched

Voltage	Hz	Two-, Three- and Four-Pole	Five-Pole	Voltage	Hz	Two- and Three-Pole	Four- and Five-Pole	Voltage	Hz	Two- and Three-Pole	Four- and Five-Pole
		Part Number	Part Number			Part Number	Part Number			Part Number	Part Number
30 Ampere				60 Ampere				100 and 200 Ampere			
110/120	50/60	7874A93G01	7874A89G01	110/120	50/60	7874A93G01	7874A87G01	110/120	50/60	7874A85G01	7874A83G01
208/240		7874A93G02	7874A89G02	208/240		7874A93G02	7874A87G02	208/240		7874A85G02	7874A83G02
277		7874A93G03	7874A89G03	277		7874A93G03	7874A87G03	277		7874A85G03	7874A83G03
440/480		7874A93G04	7874A89G04	440/480		7874A93G04	7874A87G04	440/480		7874A85G04	7874A83G04
575		7874A93G05	7874A89G05	575		7874A93G05	7874A87G05	550/575		7874A85G05	7874A83G05

Terminals (Line and Load)

Two-Pole Part Number	Three-Pole Part Number	Four-Pole Part Number	Five-Pole Part Number
30 Ampere			
N/A	N/A	N/A	N/A
60 Ampere			
179C755G17	179C755G16	179C755G17	179C755G16
—	—	①	179C755G17 ②
100 Ampere			
179C755G19	179C755G18	179C755G19	179C755G18
—	—	①	179C755G19 ②
200 Ampere Model K Electrically Held			
179C755G28	179C755G27	179C755G28	179C755G27
—	—	①	179C755G28 ②
200 Ampere Model J Magnetically Latched			
179C755G31	179C755G30	179C755G31	179C755G30
—	—	①	179C755G31 ②

Other Accessories

Description	Size	Part Number
Control module (rectifier)	30–200A	3915B98G01

Arc boxes, upper base assemblies and cross bars are equivalent to the A201 series. Consult Eaton.

Contact kits are equivalent to the A201 Model J series, with the exception of the magnetically latched 200A unit. It uses catalog number 672B788G07 for the three-pole device. For other poles, consult Eaton.

Notes

- ① Order quantity of two for four-pole design.
- ② Group members for the five-pole terminal represent the combination of the two- and three-pole number.

Replacement Coils

Vacuum Contactor—Replacement Coils

Description	Suffix	Part Number
Size 4		
110/120 Vac, 50/60 Hz	J	9085A57G01
220/240 Vac, 50/60 Hz	K	9085A57G02
380/415 Vac, 50/60 Hz	H	1D89221G07
440/480 Vac, 50/60 Hz	U	9085A57G03
Size 5		
110/120 Vac, 50/60 Hz	J	7874A09G01 ^①
220/240 Vac, 50/60 Hz	K	7874A09G04 ^②
380/415 Vac, 50/60 Hz	H	7874A09G10
440/480 Vac, 50/60 Hz	U	7874A09G05
Size 6		
110/120 Vac, 50/60 Hz	J	7874A24G01 ^①
220/240 Vac, 50/60 Hz	K	7874A24G02 ^②
380/415 Vac, 50/60 Hz	H	7874A24G07
440/480 Vac, 50/60 Hz	U	7874A24G03

Notes

- ① 125 Vdc can be directly applied to the Size 5 and 6 coil rated for 120V/60 Hz AC (cannot be applied to Size 4).
- ② 250 Vdc can be directly applied to the Size 5 and 6 coil rated for 240V/60 Hz AC (cannot be applied to Size 4).

Technical Data and Specifications

NEMA Freedom Combination Starter



IEC Contactors and Starter



Lighting Contactor



S801+ and S811+ Combination Soft Starters



Control Power Transformer Kit



17.1	General Standards and Ratings	
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	Short-Circuit Testing	V10-T17-2
17.2	NEMA Contactors and Starters	
	Freedom Line	V10-T17-3
17.3	IEC Contactors and Starters	
	XT Line	V10-T17-11
17.4	Solid State Overload Relay	
	C440/XTOE	V10-T17-36
17.5	Lighting Contactors	
	C30CN Lighting Contactors	V10-T17-39
	A202 Lighting Contactors	V10-T17-39
17.6	Reduced Voltage Starters	
	S611 Solid-State Soft Starters	V10-T17-40
	S801+/S811+ Solid-State Soft Starters	V10-T17-52
17.7	NEMA Vacuum Break Contactors and Starters	
	Specifications	V10-T17-73
17.8	Control Power Transformer Selection	
	Control Power Transformer Selection Procedure	V10-T17-75
	Selection Example	V10-T17-75
17.9	Ampere Ratings of AC Motors	
	Ampere Ratings of AC Motors	V10-T17-77
17.10	Product Codes	
	Product Codes	V10-T17-78

Standards and Certifications



UL File Numbers

The enclosed control products from Eaton's electrical sector are covered by three UL file numbers. Where UL or UL 508 is listed under the Standards and Certifications headers in this catalog or labeled on the products, the following UL file numbers apply. For example: ECN0521AAA is covered by UL file number E19224, while ECS92S1EAF is covered by UL file number E175513.

- E19224—Non-Combination Motor Controllers
- E176513—Combination Motor Controllers
- E195239—Power Conversion Equipment



ABS Type Approval

The Eaton enclosed control products have been tested and approved for American Bureau of Shipping standards. Both a Product Quality Assurance and Design Assessment approvals must be met in order to comply to ABS Type Approval. The following are Eaton's ABS file numbers for products:

- QA-1597-X—Product Quality Assurance
- 63-HS385744-PDA—Design Assessment



cUL Label

The Eaton enclosed control products have been tested and approved for Canadian UL where cUL is listed in this catalog under the Standards and Certifications headers or labeled on the products. The cUL label also indicates that the appropriate **CSA Standard** has been investigated. The following numbers demonstrate cUL approval:

- E19224—Non-Combination Motor Controllers
- E176513—Combination Motor Controllers
- E195239—Power Conversion Equipment



CE Label

Where the CE label is applied or certification is mentioned, Eaton has undergone the proper testing to meet or exceed CE requirements. As CE is a self-administered certification, no CE file number is available. However, several products have undergone KEMA KEUR testing, a third party CE-certification testing agency. KEMA reference numbers are available upon request.

Other standards and certifications may apply as noted in product literature. For additional reference information, refer to the Consulting Application Guide or your local Eaton distributor.

Component Standards and Certifications

The standards and certifications described in this catalog are for enclosed control products from Eaton's electrical sector. Testing has been done on the complete enclosed assembly in order to achieve these certifications. For additional information on the standards and certifications for the components used in Eaton's enclosed control, please refer to the Eaton Control Products Catalog.

Short-Circuit Testing

Interrupting ratings—

All Eaton enclosed control products have been designed and tested for short-circuit interrupting capabilities.

Interrupting Ratings

- **Fusible**—Sizes 1–5 suitable for use on a circuit capable of delivering not more than 100,000 rms symmetrical amperes. 600V maximum where a Class R fuse clip kit is properly installed and Class R fuses are used. If Class R fuses are not used, the switch should not be installed on circuits capable of delivering more than 10,000 rms symmetrical amperes. Size 6 is limited to 18,000 and Size 7 is limited to 30,000 rms symmetrical amperes
- **Circuit breaker HMCPE**—Sizes 1–3 controllers are suitable for use on circuits capable of delivering not more than 100,000 rms symmetrical amperes at 480V maximum; for 600V applications not more than 25,000 rms symmetrical amperes
- **HVAC panel and ECP irrigation pump panel**—suitable for use on circuits capable of delivering not more than 10,000 rms symmetrical amperes at 600V maximum

Freedom Line

Furnish as indicated Eaton Class ECN combination starters manufactured by Eaton’s electrical sector or approved equal. All starters

shall be UL listed and conform to the latest standards and the National Electric Code.

Non-Reversing

Description	Catalog Number
Disconnect switch	ECN16
Disconnect switch with control power transformer	ECN18
Circuit breaker (HMCPE/HMCP)	ECN22
Circuit breaker with control power transformer	ECN24

Reversing

Description	Catalog Number
Disconnect switch	ECN17
Circuit breaker (HMCPE/HMCP)	ECN23

General

- All motor starters shall be NEMA Sizes 0–9. Each starter shall have one NO auxiliary contact, or as scheduled
- Overload relays shall be ambient compensated bimetallic type with interchangeable heaters, calibrated for 1.0 and 1.15 service factor motors. Electrically isolated NO and NC contacts shall be provided on the relay. Visual trip indication shall be standard. A test trip feature shall be provided for ease of troubleshooting and shall be conveniently operable without removing components or the motor starter
- Control circuit transformers, where specified, shall be encapsulated. Primary and secondary fusing shall be provided. Unless otherwise specified, the secondary shall be 120 Vac. 50 VA is minimum
- Pilot devices, where specified, shall be oiltight and mounted in the flange. Pilot lights shall be transformer type for longer lamp life. Pilot device legend plates shall be engraved aluminum

- Solid-state overloads (SSOL), when specified, shall be heaterless and be capable of selecting Class 10, 20 or 30 protection with manual or automatic reset options. Full-load current settings shall be dial-adjustable

Enclosure

- Enclosures shall be Type 1, 3R, 4, 4X, 7/9 or 12, as scheduled
- The operating mechanism shall be mounted on the flange and shall have positive, non-teasing ON/OFF action. The handle shall be color-coded: red for ON and black for OFF
- The operating handle shall have a means to lock the handle in the OFF position with a minimum of three standard padlocks having 1/4 in diameter shackles
- The enclosure sub-panel shall be easily removed without disturbing the operating mechanism on Sizes 0–3
- Enclosures shall have means for locking the cover

Short-Circuit Protective Device

Disconnect Switch

- Where specified, a disconnect switch with double break, rotary blades and quick make/quick break action shall be provided
- A line shield with test probe holes for inspection shall be provided. The shield shall be removable
- The switch shall have readily visible blades in the open (OFF) position
- The fusible disconnect switch (through 100A) shall have built-in fuse pullers to make it easier to remove fuses

Circuit Breaker

- Where specified, an adjustable instantaneous trip, magnetic only circuit breaker shall be provided
- A manual push-to-trip button shall be provided to exercise the trip unit

Short-Circuit Rating

- Fusible disconnect switches shall be UL listed for 100,000 amperes available when Class R fuses are used
- Combination starters with adjustable instantaneous trip, magnetic only circuit breakers shall be UL listed for 100,000 amperes available through 480 Vac
- Note specific short-circuit ratings for the ECP irrigation pump panel and the HVAC panel on **Page V10-T17-2**

17.2

Technical Data and Specifications

NEMA Contactors and Starters

Technical Data

All data is based on a standard contactor with no auxiliary devices and a 120 Vac or 24 Vdc magnet

coil. Coil data has a $\pm 5\%$ range depending on the application, therefore specific data may vary.

Coil Data Notes

- P.U.** Pickup time is the average time taken from closing of the coil circuit to main contact touch
- D.O.** Dropout time is the average time taken from opening of the coil circuit to main contact separation
- Cold** Coil data with a cold coil
- Hot** Coil data with a hot coil

Specifications—Sizes 00–3

Description	Contactor Catalog Number/Size				
	CN15A NEMA Size 00	CN15B NEMA Size 0	CN15D NEMA Size 1	CN15G NEMA Size 2	CN15K NEMA Size 3
Configuration					
Number of poles	2, 3, 4	2, 3	2, 3, 4, 5	2, 3, 4, 5	2, 3
Auxiliary contacts, standard	Fourth pole NO (1)	Side NO (1)	Side NO (1)	Side NO (1)	Side NO (1)
Add-on auxiliary contacts	Top (4) or side (4)	Top (4) or side (3)	Top (4) or side (3)	Top (4) or side (3)	Left side (4) or right side (3)
Frame size	45 mm	45 mm	65 mm	65 mm	90 mm
Maximum voltage rating	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Continuous ampere ratings (I)	9A	18A	27A	45A	90A
Maximum Horsepower (hp)					
Single-phase					
115V	1/3	1	2	3	7-1/2
230V	1	2	3	7-1/2	15
Three-phase					
200V	1-1/2	3	7-1/2	10	25
230V	1-1/2	3	7-1/2	15	30
460V	2	5	10	25	50
575V	2	5	10	25	50
AC Magnet Coil Data					
Pickup volts—cold	74%	74%	74%	74%	72%
Pickup volts—hot	78%	78%	78%	78%	76%
Pickup voltamperes	80	100	230	230	390
Pickup watts	49	65	95	95	112
Sealed voltamperes	7.5	10	28	28	49.8
Sealed watts	2.4	3.1	7.8	7.8	13
Dropout volts—cold	45%	45%	49%	49%	50%
Dropout volts—hot	46%	46%	50%	50%	52%
Maximum operation rate—ops/hour	12,000	12,000	12,000	12,000	7,200
Pickup time (ms)	12	12	20	20	14
Dropout time (ms)	12	12	14	14	11
Coil operating range % of rated voltage	-15% to +10%	-15% to +10%	-15% to +10%	-15% to +10%	-15% to +10%
DC magnet coil data	For DC magnet coils (and coil data), see Accessories, Tab14 .				
Operating temperature	-20° to 65°C	-20° to 65°C	-20° to 65°C	-20° to 65°C	-20° to 65°C
Maximum operating altitude (ft)	6000	6000	6000	6000	6000
Mechanical life	20,000,000	20,000,000	10,000,000	10,000,000	6,000,000

Specifications—Sizes 00–3, continued

Description	Contactor Catalog Number/Size				
	CN15A NEMA Size 00	CN15B NEMA Size 0	CN15D NEMA Size 1	CN15G NEMA Size 2	CN15K NEMA Size 3
Electrical Life (480V/60 Hz)					
AC-3	4,000,000	3,000,000	5,000,000	3,500,000	1,700,000
AC-4	90,000	85,000	200,000	62,000	80,000
Wire Range					
Power terminals	12–16 stranded, 12–14 solid Cu	8–16 stranded, 10–14 solid Cu	8–14 stranded or solid Cu	2–14 (upper) and/or 6–14 (lower) stranded or solid Cu	1/0–14 Cu
Control terminals	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu
Power terminal torque line and load—lb-in	7	15	20	40 (14–8 AWG) 45 (6–4 AWG) 50 (3 AWG)	35 (14–10 AWG) 40 (8 AWG) 45 (6–4 AWG) 50 (3–1/0 AWG)
Auxiliary contact rating	A600, P300	A600, P300	A600, P300	A600, P300	A600, P300

Specifications—Sizes 4–8

Description	Contactor Catalog Number/Size				
	CN15N NEMA Size 4	CN15S NEMA Size 5	CN15T NEMA Size 6	CN15U NEMA Size 7	CN15V NEMA Size 8
Configuration					
Number of poles	2, 3	2, 3	3	3	3
Auxiliary contacts, standard	Side NO (1)	Side NO (1)	Top left 2NO/2NC (1)	Top left 2NO/2NC (1)	Side 2NO/NC (1)
Add-on auxiliary contacts	Left side (3) or right side (4)	Left side (3) or right side (4)	Top right 2NO/2NC (1)	Top right 2NO/2NC (1)	NO/NC (2)
Frame size	180 mm	180 mm	280 mm	280 mm	334 mm
Maximum voltage rating	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Continuous ampere ratings (I)	135A	270A	540A	810A	1215A
Maximum Horsepower (hp)					
Single-phase					
115V	—	—	—	—	—
230V	—	—	—	—	—
Three-phase					
200V	40	75	150	200	400
230V	50	100	200	300	450
460V	100	200	400	600	900
575V	100	200	400	600	900
AC Magnet Coil Data					
Pickup volts—cold	72.5%	75%	75%	75%	75%
Pickup volts—hot	76%	77%	75%	75%	75%
Pickup voltamperes	1158	1158	1600	1600	2450
Pickup watts	240	240	1345	1345	2060
Sealed voltamperes	100	100	25	25	75
Sealed watts	27.2	27.2	22	22	60

Specifications—Sizes 4–8, continued

Description	Contactor Catalog Number/Size				
	CN15N NEMA Size 4	CN15S NEMA Size 5	CN15T NEMA Size 6	CN15U NEMA Size 7	CN15V NEMA Size 8
AC Magnet Coil Data, continued					
Dropout volts—cold	54%	63%	①	①	①
Dropout volts—hot	56%	64%	①	①	①
Maximum operation rate—ops/hour	2,400	2,400	N/A	N/A	N/A
Pickup time (ms)	28	25	105	105	70
Dropout time (ms)	14	13	200	200	50
Coil operating range % of rated voltage	–15% to +10%	–15% to +10%	–15% to +10%	–15% to +10%	–15% to +10%
DC magnet coil data	For DC magnet coils (and coil data), see Accessories, Tab 15				
Operating temperature	–20° to 65°C	–20° to 65°C	–20° to 65°C	–20° to 65°C	–20° to 65°C
Maximum operating altitude (ft)	6,000	6,000	6,000	6,000	6,000
Mechanical life	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Electrical Life (480V/60 Hz)					
AC-3	800,000	500,000	590,000	450,000	420,000
AC-4	70,000	34,000	7,400	5,000	4,200
Wire Range					
Power terminals	Open—3/0–8 Cu, Enclosed— 250 kcmil–6 Cu/Al	750 kcmil—2 or (2) 250 kcmil–3/0 Cu/Al	(2) 750 kcmil–3/0 Cu/Al	(3) 750 kcmil–3/0 Cu/Al	(4) 750 kcmil–1/0 Cu/Al
Control terminals	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu	12–16 stranded, 12–14 solid Cu
Power terminal torque line and load—lb-in	200	550	550	550	500
Auxiliary contact rating	A600, P300	A600, P300	A600, P300	A600, P300	A600, P300

Note

① 20–30% of rated coil voltage.

Electrical Life—AC-3 and AC-4 Utilization Categories

Life Load Curves

Eaton’s Freedom Series NEMA contactors have been designed and manufactured for superior life performance in any worldwide application. All testing has been based on requirements as found in NEMA and UL standards and conducted by Eaton. Actual application life may vary depending on environmental conditions and application duty cycle.

Utilization Categories

AC-1—Non-inductive or slightly inductive loads, such as resistance furnaces and heating.

AC-2—Starting of slip-ring motors.

AC-3—Squirrel cage motors; starting, switching off motors during running.

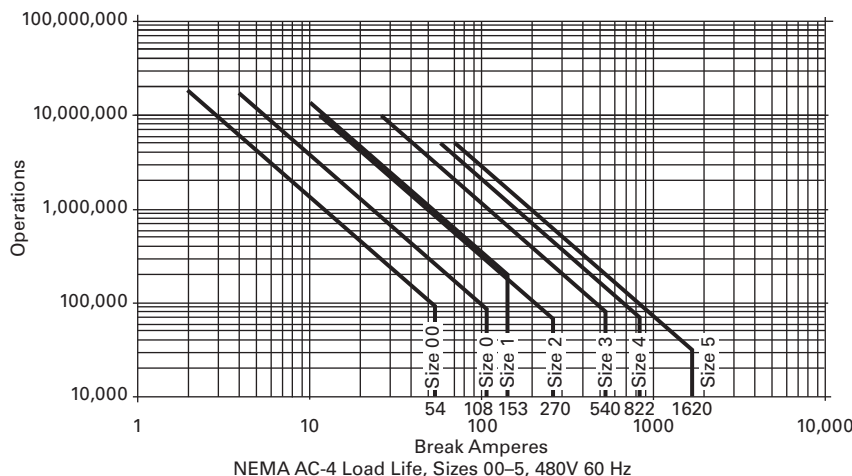
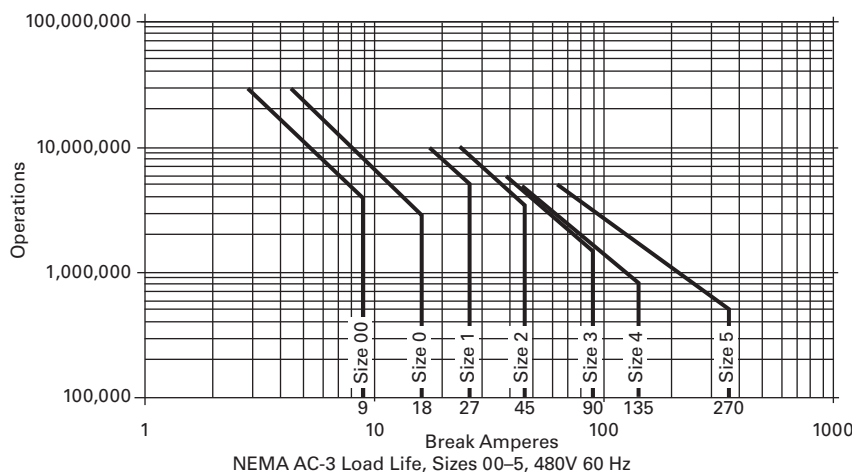
AC-4—Squirrel cage motors; starting, plugging, inching or jogging.

Note: AC-3 tests are conducted at rated device currents and AC-4 tests are conducted at six times rated device currents. All tests have been run at 460V, 60 Hz.

Contactor Choice

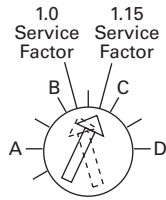
- Decide what utilization category your application is and choose the appropriate curve
- Locate the intersection of the life-load curve of the appropriate contactor with the applications operational current (I_o), as found on the horizontal axis
- Read the estimated contact life along the vertical axis in number of operational cycles

AC-3 and AC-4 Utilization Categories



C306 Overload Relay Setting

FLA Dial Adjustment



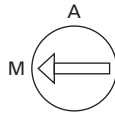
Example of 12.0 FLA Setting for Heater Pack Number H2011B Showing Position for 1.0 or 1.15 Service Factor Motors

For motors having a 1.15 service factor, rotate the FLA adjustment dial to correspond to the motor's FLA rating.

Estimate the dial position when the motor FLA falls between two letter values as shown in the example.

For motors having a 1.0 service factor, rotate the FLA dial one-half position counterclockwise (CCW).

Manual/Automatic Reset



Example of Setting for Manual Reset

The overload relay is factory set at M for manual reset operation. For automatic reset operation, turn the reset adjustment dial to the A position as shown in the illustration.

Automatic reset is not intended for two-wire control devices.

Test for Trip Indication

To test overload relay for trip indication when in manual reset, pull out the blue reset button. An orange flag will appear indicating that the device has tripped. Push reset button in to reset.

Warning—To provide continued protection against fire or shock hazard, the complete overload relay must be replaced if burnout of the heater element occurs.

Heater Pack Selection

"Overload relays are provided to protect motors, motor control apparatus and motor-branch circuit conductors against excessive heating due to motor overloads and failure to start. This definition does not include: 1) motor circuits over 600V, 2) short-circuits, 3) ground faults and 4) fire pump control." (NEC Art. 430-31)

Time Current Characteristics

The time-current characteristics of an overload relay is an expression of performance that defines its operating time at various multiples of its current setting. Tests are run at Underwriters Laboratories (UL) in accordance with NEMA Standards and the NEC. UL requires:

- When tested at 100 percent of its current rating, the overload relay shall trip ultimately
- When tested at 200 percent of its current rating, the overload relay shall trip in not more than 8 minutes

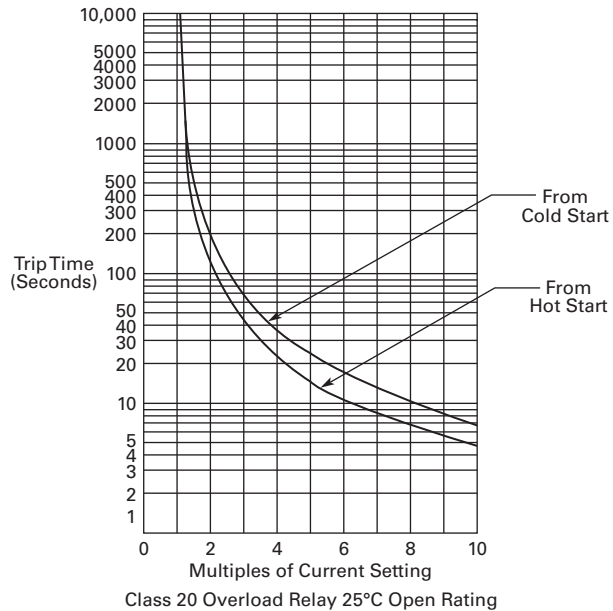
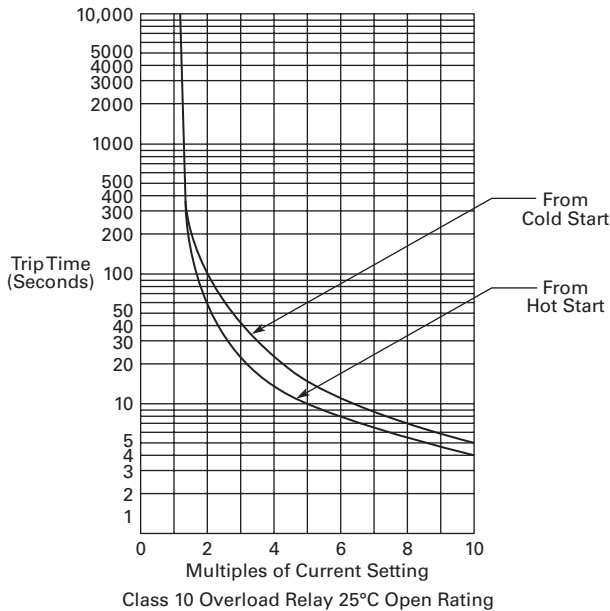
- When tested at 600 percent of the current rating, the overload relay shall trip in not more than 10 or 20 seconds, depending on the Class of the relay

"Current rating" is defined as the minimum current at which the relay will trip. Per NEC, an overload must ultimately trip at 125% of FLA current (heater) setting for a 1.15 service factor motor and 115% FLA for a 1.0 service factor motor.

"Current setting" is defined as the FLA (Full Load Amperes) of the motor and thus the overload heater pack setting.

Example: 600% of current rating is defined as 750% (600 x 1.25) of FLA current (heater) setting for a 1.15 service factor motor. A 10A heater setting must trip in 20 seconds or less at 75A motor current for a Class 20 relay.

Class 10 and Class 20 Trip Curves



Relays

Wire (75°C) Sizes—AWG or kcmil—NEMA Sizes 00–2—Open

NEMA Size	Cu Only
Power Terminals—Line	
00	12–16 stranded, 12–14 solid
0	8–16 stranded, 10–14 solid
1	8–14 stranded or solid
2	3–14 (upper) and/or 6–14 (lower) stranded or solid ①

Power Terminals—Load—Cu Only (Stranded or Solid)

Terminal	Wire Size	Catalog Number
32A	14–6 AWG	C306DN3B
75A	14–2 AWG	C306GN3B

Control Terminals—Cu Only

12–16 AWG stranded, 12–14 AWG solid

Wire (75°C) Sizes—AWG or kcmil—NEMA Sizes 3–8—Open

NEMA Size	Wire Size
Power Terminals—Line and Load	
3	1/0–14 Cu/Al
4	Open—3/0–8 Cu
	Enclosed—250 kcmil—6 Cu/Al
5	750 kcmil—2 or (2) 250 kcmil—3/0 Cu/Al
6–7	(2) 750 kcmil—3/0 Cu/Al
8	(2) 750 kcmil—1/0 Cu/Al

Control Terminals—Cu Only

12–16 AWG stranded, 12–14 AWG solid

Overload Relay UL/CSA Contact Ratings Control Circuit ②

AC Volts	120V	240V	480V	600V
NC Contact B600				
Make and break amps	30	15	7.5	6
Break amps	3	1.5	0.75	0.6
Continuous amps	5	5	5	5
NO Contact C600				
Make and break amps	15	7.5	3.375	3
Break amps	1.5	0.75	0.375	0.3
Continuous amps	2.5	2.5	2.5	2.5

Notes

- ① Two compartment box lug.
- ② DC ratings cover Freedom Series coils only.
- ③ Maximum horsepower where operation is interrupted more than 5 times per minute or more than 10 times in a 10 minute period. NEMA standard ICS 2-1993 table 2-4-3.

Power Terminal Torque Line and Load Terminals

Terminal	Torque in lb-in	Catalog Number	
32A	20	C306DT3B	
75A	35 (14–10 AWG)	C306GT3B	
	40 (8 AWG)		
	45 (6–4 AWG)		
	50 (3–2 AWG)		
105A	120 (3/16)	C306KN3 (Socket head screw)	
	200 (1/4)		
	250 (5/16)		
144A	120 (3/16)	C306NN3 (Socket head screw)	
	200 (1/4)		
	250 (5/16)		
	35 (14–10 AWG)		C306NN3 (Slotted head screw)
	40 (8 AWG)		
45 (6–4 AWG)			
	50 (3–1/0 AWG)		

Plugging and Jogging Service Horsepower Ratings ③

NEMA Size	200V	230V	460V	575V
00	—	1/2	1/2	1/2
0	1-1/2	1-1/2	2	2
1	3	3	5	5
2	7-1/2	10	15	15
3	15	20	30	30
4	25	30	60	60
5	60	75	150	150
6	125	150	300	300

17.2

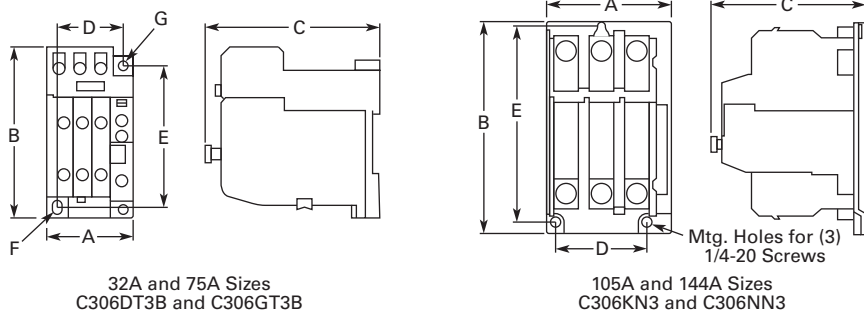
Technical Data and Specifications

NEMA Contactors and Starters

Dimensions and Weights

Approximate Dimensions in Inches (mm)

C306 Standalone Overload Relays



Ampere Size	Wide A	High B	Deep C	Mounting D	E	F (Slot)	G (Hole)	Ship. Wt. Lbs (kg)
32A	1.77 (45.0)	4.13 (104.9)	3.69 (93.7)	1.36 (34.5)	3.74 (95.0)	0.18 x 0.30 (4.6 x 7.6)	0.18 (4.6) dia.	0.8 (0.4)
75A	2.54 (64.5)	4.69 (119.1)	3.74 (95.0)	2.00 (50.8)	3.45 (87.6)	0.22 x 0.26 (5.6 x 6.6)	0.21 (5.3) dia.	1.4 (0.6)
105 and 144A	4.00 (101.6)	7.17 (182.1)	4.91 (124.7)	3.00 (76.2)	6.62 (168.1)	—	—	4.0 (1.8)

XTLine

Furnish as indicated Eaton Class ECX combination starters manufactured by Eaton’s electrical sector or approved equal. All starters

shall be UL listed and conform to the latest IEC Standards and the National Electric Code.

Non-Reversing

Description	Catalog Number
Disconnect switch	ECX19
Circuit breaker (HMCP)	ECX25

Reversing

Description	Catalog Number
Disconnect switch	ECX20
Circuit breaker (HMCP)	ECX26

General

- All motor starters shall be IEC Sizes A–N (60 hp at 460V). Each starter shall have one NO auxiliary contact, or as scheduled
- Overload relays shall be ambient compensated bimetallic type with interchangeable heaters, calibrated for 1.0 and 1.15 service factor motors. Electrically isolated NO and NC contacts shall be provided on the relay. Visual trip indication shall be standard. A test trip feature shall be provided for ease of troubleshooting and shall be conveniently operable without removing components or the motor starter. Overload relays may also be solid-state
- Control circuit transformers, where specified, shall be encapsulated. Primary and secondary fusing shall be provided. Unless otherwise specified, the secondary shall be 120 Vac. 50 VA is minimum

- Pilot devices, where specified, shall be oiltight and mounted in the flange. Pilot lights shall be transformer type for longer lamp life. Pilot device legend plates shall be engraved aluminum

Enclosure

- Enclosures shall be Type 1, 3R, 4, 4X, 7/9 or 12, as scheduled
- The operating mechanism shall be mounted on the flange and shall have positive, non-teasing ON/OFF action. The handle shall be color-coded: red for ON and black for OFF
- The operating handle shall have a means to lock the handle in the OFF position with a minimum of three standard padlocks having 1/4 in diameter shackles
- The enclosure sub-panel shall be easily removed without disturbing the operating mechanism
- Enclosures shall have means for locking the cover

Short-Circuit Protective Device

Disconnect Switch

- Where specified, a disconnect switch with double break, rotary blades and quick make/quick break action shall be provided
- A line shield with test probe holes for inspection shall be provided. The shield shall be removable
- The switch shall have readily visible blades in the open (OFF) position
- The fusible disconnect switch (through 100A) shall have built-in fuse pullers to make it easier to remove fuses

Circuit Breaker

- Where specified, an adjustable instantaneous trip, magnetic only circuit breaker shall be provided
- A manual push-to-trip button shall be provided to exercise the trip unit

Short-Circuit Rating

- Fusible disconnect switches shall be UL listed for 100,000 amperes available when Class R fuses are used
- Combination starters with adjustable instantaneous trip, magnetic only circuit breakers shall be UL listed for 100,000 amperes available through 480 Vac

Technical Data**Instructional Leaflets****Instructional Leaflets**

Publication Number	Description
Pub51210	7–15A, B Frame XTCE, XTCEC and XTCECF Contactors and Accessories (inside of packaging)
Pub51211	18–32A, C Frame XTCE and XTCEC Contactors and Accessories (inside of packaging)
Pub51221	XTOB, D Frame Overload Relays (inside of packaging)
Pub51222	XTOB, B–C Frame Overload Relays (inside of packaging)
Pub51237	7–12A, B Frame XTCE Contactors and Auxiliary Contacts
Pub51232	18–32A, C Frame XTCE Contactors and Auxiliary Contacts
Pub51216	40–65A, D Frame XTCE Contactors and Auxiliary Contacts
Pub51203	185–500A, L–M Frame XTCE Contactors and Auxiliary Contacts
Pub51215	S-Series 185–500A, L–M Frame XTCE Contactors and Auxiliary Contacts
Pub51204	580–1000A, N Frame XTCE Contactors and Auxiliary Contacts
Pub51209	1400–2000A, P–R Frame XTCE Contactors and Auxiliary Contacts
Pub51213	7–150A, B–G Frame XTAE non-reversing and XTAR Reversing Starters
Pub51217	XTCEXFA and XTCEXSA Front and Side-mount Auxiliary Contacts from 40–150A, D–G Frame XTCE Contactors
Pub51212	XTCEXML Mechanical Interlock for 7–150A, B–G Frame XTCE Contactors
Pub51214	XTCEXRL Reversing Link Kits for 18–32A, C Frame XTCE Contactors
Pub51218	XTCEXTL Lug Kits for 500–820A, M–N Frame XTCE Contactors
Pub51219	XTCEXRLB and XTCEXSDLB Reversing and Star-Delta (Wye-Delta) Link Kits for 7–12A, B Frame XTCE Contactors
Pub51205	Accessories for 185–500A, L–M Frame XTCE Contactors
Pub51207	Replacement DC Coils
Pub51213	Renewal Parts—Coils for 18–32A, C Frame XTCE Contactors
Pub51186	Renewal Parts—Coils for 40–65A, D Frame XTCE Contactors

Coil Data

Frame B–D

Coil Data—Frame B–D

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
Voltage Tolerance										
Pickup (x U _c)										
AC operated	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1
DC operated	0.8–1.1 ^①	0.8–1.1 ^①	0.8–1.1 ^①	0.8–1.1 ^①	0.7–1.2 ^②	0.7–1.2 ^②	0.7–1.2 ^②	0.7–1.2 ^②	0.7–1.2 ^②	0.7–1.2 ^②
Dropout (x U _c)										
AC operated	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6	0.3–0.6
DC operated	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6
Power Consumption of the Coil at Cold State and 1.0 x U_c										
AC operated										
Single-voltage coil 50 Hz										
Pickup VA	24	24	24	24	52	52	52	149	149	149
Pickup W	19	19	19	19	40	40	40	80	80	80
Sealing VA	3.4	3.4	3.4	3.4	7.1	7.1	7.1	16	16	16
Sealing W	1.2	1.2	1.2	1.2	2.1	2.1	2.1	4.3	4.3	4.3
Single-voltage coil 60 Hz										
Pickup VA	30	30	30	30	67	67	67	178	178	178
Pickup W	23	23	23	23	50	50	50	117	117	117
Sealing VA	4.4	4.4	4.4	4.4	8.7	8.7	8.7	19	19	19
Sealing W	1.4	1.4	1.4	1.4	2.6	2.6	2.6	5.3	5.3	5.3
50/60 Hz										
Pickup VA	27	27	27	27	62	62	62	168	168	168
	25	25	25	25	58	58	58	154	154	154
Pickup W	22	22	22	22	48	48	48	120	120	120
	21	21	21	21	43	43	43	43	43	43
Sealing VA	4.2	4.2	4.2	4.2	9.1	9.1	9.1	22	22	22
	3.3	3.3	3.3	3.3	6.5	6.5	6.5	14	14	14
Sealing W	1.4	1.4	1.4	1.4	2.5	2.5	2.5	5.3	5.3	5.3
	1.2	1.2	1.2	1.2	2	2	2	4.3	4.3	4.3
DC operated										
Pickup W	3	3	4.5	4.5	12 at 24V	12 at 24V	12 at 24V	24 at 24V	24 at 24V	24 at 24V
Sealing W	3	3	4.5	4.5	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V
Duty factor (%DF)	100	100	100	100	100	100	100	100	100	100
Switching Time at 100% U_c (Approximate Values)										
Main contact										
AC operated										
Closing delay (ms)	<21	<21	<21	<21	<22	<22	<22	<18	<18	<18
Opening delay (ms)	<18	<18	<18	<18	<14	<14	<14	<13	<13	<13
DC operated										
Closing delay (ms)	<31	<31	<31	<31	<47	<47	<47	<54	<54	<54
Opening delay (ms)	<12	<12	<12	<12	<30	<30	<30	<24	<24	<24
Arcing time (ms)	10	10	10	10	10	10	10	10	10	10
Electromagnetic Compatibility (EMC)										
Emitted interference	To EN-60947-1									
Noise immunity	To EN-60947-1									

Notes

- ① 0.7–1.3 without additional auxiliary contact modules and ambient temperature +40°C (104°F).
- ② Coil suffix TD: U_{min} 24 Vdc/U_{max} 27 Vdc.
 Coil suffix WD: U_{min} 48 Vdc/U_{max} 60 Vdc.
 Coil suffix AD: U_{min} 110 Vdc/U_{max} 130 Vdc.
 Coil suffix BD: U_{min} 200 Vdc/U_{max} 240 Vdc.
 Example:
 U_c = 0.7 x U_{min}—1.2 x U_{max}
 U_c = 0.7 x 24V—1.2 x 27 Vdc

Frame F–G**Coil Data—Frame F–G**

	XTCE80F	XTCE95F	XTCE115G	XTCE150G
Voltage Tolerance				
Pickup (x U _c)				
AC operated	0.8–1.1	0.8–1.1	0.8–1.1	0.8–1.1
DC operated	0.7–1.2 ①	0.7–1.2 ①	0.7–1.2 ①	0.7–1.2 ①
Dropout (x U _c)				
AC operated	0.3–0.6	0.3–0.6	0.25–0.6	0.25–0.6
DC operated	0.15–0.6	0.15–0.6	0.15–0.6	0.15–0.6
Power Consumption of the Coil at Cold State and 1.0 x U_c				
AC operated				
Single-voltage coil 50 Hz				
Pickup VA	310	310	180	180
Pickup W	165	165	130	130
Sealing VA	26	26	3.1	3.1
Sealing W	5.8	5.8	2.1	2.1
Single-voltage coil 60 Hz				
Pickup VA	345	345	170	170
Pickup W	190	190	130	130
Sealing VA	30	30	3.1	3.1
Sealing W	7.1	7.1	2.1	2.1
50/60 Hz				
Pickup VA	372	328	170	170
Pickup W	190	190	130	130
Sealing VA	37.1	22.6	3.1	3.1
Sealing W	7.5	6.1	2.1	2.1
DC operated				
Pickup W	90 at 24V	90 at 24V	149 at 24V	149 at 24V
Sealing W	1.3 at 24V	1.3 at 24V	2.1 at 24V	2.1 at 24V
Duty factor (%DF)	100	100	100	100
Switching Time at 100% U_c (Approximate Values)				
Main contact				
AC operated				
Closing delay (ms)	<20	<20	<33	<33
Opening delay (ms)	<14	<14	<41	<41
DC operated				
Closing delay (ms)	<45	<45	<35	<35
Opening delay (ms)	<34	<34	<30	<30
Arcing time (ms)	15	15	15	15
Permissible residual current with actuation of A1–A2 by the electronics (with 0 signal) (mA)	≤1	≤1	≤1	≤1
Electromagnetic Compatibility (EMC)				
Emitted interference	To EN60947-1			
Noise immunity	To EN60947-1			

Note

① At 24V: 0.7–1.3 without additional auxiliary contact modules and ambient temperature +40°C (104°F).

Frame L–R
Coil Data—Frame L–R

Description	XTCE185L	XTCE225L, XTCE250L	XTCE300M, XTCE400M	XTCE500M
Voltage Tolerance				
Pickup ($\times U_c$)				
XTCE185L–XTCEC20R	$0.7 \times U_{cmin} - 1.15 \times U_{cmax}$			
XTCS185L–XTCS500M	$0.85 \times U_{cmin} - 1.1 \times U_{cmax}$			
Dropout ($\times U_c$)				
XTCE185L–XTCEC20R	$0.2 \times U_{cmin} - 0.6 \times U_{cmax}$			
XTCS185L–XTCS500M	$0.2 \times U_{cmin} - 0.4 \times U_{cmax}$			
Power Consumption of the Coil at Cold State and $1.0 \times U_c$				
XTCE185L–XTCEC20R				
Pickup VA	250 ①	250 ①	450 ①	450 ①
Pickup W	200	200	350	350
Sealing VA	4.3	4.3	4.3	4.3
Sealing W	3.3	3.3	3.3	3.3
XTCS185L–XTCS500M				
Pickup VA	360	360	715	715
Pickup W	325	325	645	645
Sealing VA	4.3	4.3	4.3	4.3
Sealing W	3.3	3.3	3.3	3.3
Duty Factor (%DF)	100	100	100	100
Switching Time at 100% Main Contact U_c (Approximate Values)				
XTCE185L–XTCEC20R				
Closing delay (ms)				
Opening delay (ms)	<100	<100	<80	<80
XTCS185L–XTCS500M				
Closing delay (ms)	<50	<50	<50	<50
Opening delay (ms)	<40	<40	<40	<40
Reaction in Threshold and Sealing State Transition Range (XTCE185L–XTCEC20R)				
Voltage interruptions				
$(0 - 0.2 \times U_{cmin}) \leq 10$ ms	Time is bridged successfully			
$(0 - 0.2 \times U_{cmin}) > 10$ ms	Dropout of the contactor			
Voltage dips				
$(0.2 - 0.6 \times U_{cmin}) \leq 12$ ms	Time is bridged successfully			
$(0.2 - 0.6 \times U_{cmin}) > 12$ ms	Dropout of the contactor			
$(0.6 - 0.7 \times U_{cmin})$	Contactor remains switched on			
Excess voltage				
$(1.15 - 1.3 \times U_{cmax})$	Contactor remains switched on			
$(> 1.3 \times U_{cmax}) \leq 3$ s	Contactor remains switched on			
$(> 1.3 \times U_{cmax}) > 3$ s	Dropout of the contactor			
Pickup phase				
$(0 - 0.7 \times U_{cmin})$	Contactor does not switch on			
$(0.7 \times U_{cmin} - 1.15 \times U_{cmax})$	Contactor switches on with certainty			
$(> 1.15 \times U_{cmax})$	Contactor switches on with certainty			
Permissible contact resistance (of the external command device with actuation of A11), ohms	≤ 500	≤ 500	≤ 500	≤ 500
Permissible residual current (with actuation of A11 by the electronics with 0 signal)	≤ 1	≤ 1	≤ 1	≤ 1
SPS signal level (A3–A4) to IEC/EN 61131-2 (Type 2)				
High	15V	15V	15V	15V
Low	5V	5V	5V	5V
Electromagnetic compatibility (EMC)	This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.			

Note

 ① Control transformer with $U_k \leq 6\%$.

Coil Data—Frame L-R, continued

Description	XTCE580N	XTCE750N, XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
Voltage Tolerance					
Pickup ($x U_c$)					
XTCE185L–XTCEC20R	$0.7 \times U_{cmin}$ — $1.15 \times U_{cmax}$				
XTCS185L–XTCS500M	$0.85 \times U_{cmin}$ — $1.1 \times U_{cmax}$				
Dropout ($x U_c$)					
XTCE185L–XTCEC20R	$0.2 \times U_{cmin}$ — $0.6 \times U_{cmax}$				
XTCS185L–XTCS500M	$0.2 \times U_{cmin}$ — $0.4 \times U_{cmax}$				
Power Consumption of the Coil at Cold State and $1.0 \times U_c$					
XTCE185L–XTCEC20R					
Pickup VA	800 ^①	800 ^①	800 ^①	800 ^①	1600 ^①
Pickup W	700	700	700	700	1400
Sealing VA	7.5	7.5	7.5	7.5	7.5
Sealing W	6.5	6.5	6.5	6.5	6.5
XTCS185L–XTCS500M					
Pickup VA	—	—	—	—	—
Pickup W	—	—	—	—	—
Sealing VA	—	—	—	—	—
Sealing W	—	—	—	—	—
Duty Factor (%DF)	100	100	100	100	100
Switching Time at 100% Main Contact U_c (Approximate Values)					
XTCE185L–XTCEC20R					
Closing delay (ms)	<70	<70	<70	<70	<70
Opening delay (ms)	<70	<70	<70	<70	<70
XTCS185L–XTCS500M					
Closing delay (ms)	—	—	—	—	—
Opening delay (ms)	—	—	—	—	—
Reaction in Threshold and Sealing State Transition Range (XTCE185L–XTCEC20R)					
Voltage interruptions					
($0-0.2 \times U_{cmin}$) ≤ 10 ms	Time is bridged successfully				
($0-0.2 \times U_{cmin}$) > 10 ms	Dropout of the contactor				
Voltage dips					
($0.2-0.6 \times U_{cmin}$) ≤ 12 ms	Time is bridged successfully				
($0.6-0.7 \times U_{cmin}$)	Dropout of the contactor				
($0.6-0.7 \times U_{cmin}$)	Contactors remains switched on				
Excess voltage					
($1.15-1.3 \times U_{cmax}$)	Contactors remains switched on				
($>1.3 \times U_{cmax}$) ≤ 3 s	Contactors remains switched on				
($>1.3 \times U_{cmax}$) > 3 s	Dropout of the contactor				
Pickup phase					
($0-0.7 \times U_{cmin}$)	Contactors does not switch on				
($0.7 \times U_{cmin}$ — $1.15 \times U_{cmax}$)	Contactors switches on with certainty				
($>1.15 \times U_{cmax}$)	Contactors switches on with certainty				
Permissible contact resistance (of the external command device with actuation of A11), ohms	≤ 500	≤ 500	≤ 500	≤ 500	≤ 500
Permissible residual current (with actuation of A11 by the electronics with 0 signal)	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
SPS signal level (A3–A4) to IEC/EN 61131-2 (Type 2)					
High	15V	15V	15V	15V	15V
Low	5V	5V	5V	5V	5V
Electromagnetic compatibility (EMC)	This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.				

Note

^① Control transformer with $U_k \leq 7\%$.

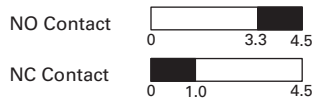
Contactors Contact Travel Diagrams

The diagrams indicate the closing and travel of the contacts of the contactors and auxiliary contacts at no-load. Tolerances are not taken into consideration.

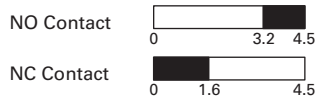
Contactors Contact Travel Diagrams

Frame B

XTCE 7-15A, XTCE--AC



XTCEXSAC11

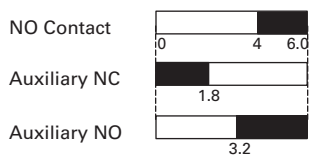


XTCEXF...LC_

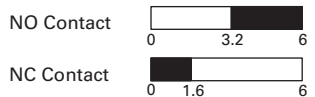


Frame C

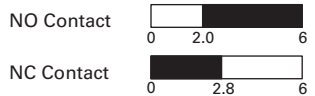
XTCE 15-32A



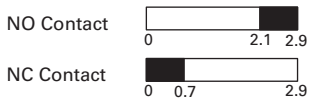
XTCEXSAC11, XTCEXF...C-



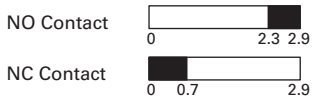
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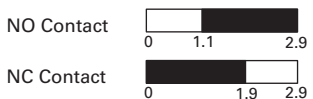
XTCE 7-9A-DC



XTCEXSAC11



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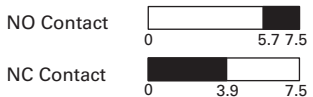


Frame D

XTCE 40-65A



XTCEXF...G_



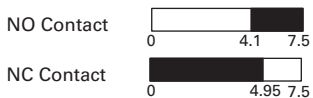
XTCEXF...LG_



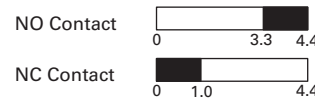
XTCEXS...N_



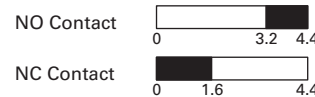
XTCEXSBLN11



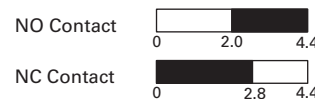
XTCE 12-15A, XTCE--DC



XTCEXSAC11

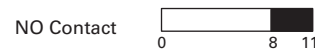


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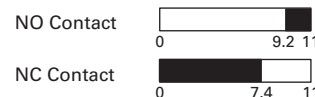


Frame F and G

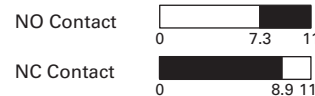
XTCE 80-150A



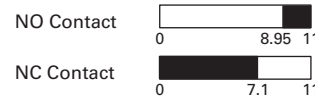
XTCEXF...G-



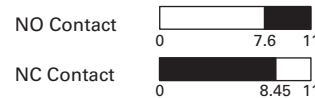
XTCEXF...LG_



XTCEXS...N_



XTCEXSBLN11



Auxiliary Contacts

Auxiliary Contacts Technical Data and Specifications

Description	XTCE007B_ XTCE032C	XTCEXFAC_ XTCEXFATC_	XTCEXFCC_ XTCEXSCC_	XTCEXFAG_	XTCEXSBLN_ XTCEXSBN_ XTCEXSBN_ XTCEXSCN_ XTCEXSCNC_
Interlocked opposing contacts with an auxiliary contact module (to IEC 60947-5-1 Annex L)	—	Yes	Yes	Yes	Yes
Break contact (not late-break contact) suitable as a mirror contact (to IEC/EN 60947-4-1 Annex F)	XTCE007B_ XTCE032C	XTCE007B_ XTCE032C	XTCE007B_ XTCE032C	XTCE040D_ XTCE065D_	XTCE040D_ XTCE065D_ XTCE185L_ XTCEC10N_
Rated impulse withstand voltage, (U _{imp}) Vac	6000	6000	6000	6000	6000
Overtoltage category/pollution degree	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage, (U _i) Vac	690	690	690	690	690
Rated operational voltage, (U _e) Vac	500	500	500	500	500
Safe isolation to VDE 0106 Part 101 and Part 101(A) in Vac					
Between coil and auxiliary contacts	400	400	400	440	440
Between the auxiliary contacts	400	400	400	440	440
Rated operational current, I _e					
AC-15					
230V	6A	6A	6A	6A	6A
380/415V	4A	3A	4A	4A	4A
500V	1.5A	—	1.5A	1.5A	1.5A
DC-3 L/R ≤5 ms ^①					
24V	10A	10A	10A	10A	10A
60V	6A	6A	6A	6A	6A
110V	3A	3A	3A	3A	3A
220V	1A	1A	1A	1A	1A
Conventional thermal current, I _{th}	16A	16A	16A ^②	10A	10A
Control circuit reliability (at U _e = 24 Vdc, U _{min} = 17 V, I _{min} = 5.4 mA)	<10 ⁻⁸ , < one failure at 100 million operations				
Component lifespan, operations x 10 ⁶ at U _e = 230V, AC-15, 3A	1.3	1.3	1.3	1.3	1.3
Short-circuit rating without welding ^③					
Maximum fuse, gG/gL	10A	10A	10A	16A	16A

Notes

- ① Making and breaking conditions to DC-13, time L/R contact as stated.
 ② Conventional thermal current (I_{th}) of XTCEXSCC_ is 10A.
 ③ See fuses overlay for time/current characteristic (on request).

Parallel Link Technical Data and Specifications

Description	XTCEXPLKB	XTECXPLKC	XTCEXPLKD	XTCEXPLKG	XTCEXPLK185
Terminal capacity					
Solid (mm ²)	1–16	16	16	—	—
Flexible with ferrule (mm ²)	1 x (0.5–25) 2 x (0.5–16)	1 x (16–35)	1 x (16–120)	—	—
Stranded (mm ²)	1 x (0.5–25) 2 x (0.5–16)	1 x (16–50)	1 x (16–120)	1 x (35–300) 2 x (35–120)	—
Flat conductor— number of segments x width x thickness (mm)	6 x 9 x 0.8	—	—	2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)
Tightening torque (Nm)	4	4	14	—	—
Tools					
Pozidriv screwdriver	Size 2	Size 2	—	—	—
Hexagon socket head spanner—SW (mm)	—	—	5	6	—
Conventional thermal current					
Three-pole (I _{th}) A	60	100	180	400	—
Four-pole (I _{th}) A	60	—	—	—	—

Cable Terminal Block, Flat Cable Terminal Technical Data and Specifications

Description	XTCEXTLA225	XTCEXTLA400	XTCEXPLK185	XTCEXTFB650	XTCEXTFB820
Terminal capacity					
Stranded (mm ²)	1 x (16–185) 2 x (16–150)	1 x (120–300) 2 x (70–240)	—	—	—
Stranded (AWG)	1 x (6–350 kcmil) 2 x (6–300 kcmil)	1 x (1/0–600 kcmil) 2 x (1/0–500 kcmil)	—	—	—
Flat conductor— number of segments x width x thickness (mm)	1 x (3 x 9 x 0.8) 2 x (10 x 16 x 0.8)	1 x (10 x 16 x 0.8) 2 x (20 x 24 x 0.5) 2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (10 x 40 x 1) 2 x (20 x 40 x 0.5)

AC Ratings—AC-1 Operation

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Conventional free air thermal current, three-pole, 50–60 Hz							
Open							
at 40°C (I_{th})	22A	22A	22A	22A	40A	45A	45A
at 50°C (I_{th})	21A	21A	21A	21A	38A	43A	43A
at 55°C (I_{th})	21A	21A	21A	21A	37A	42A	42A
at 60°C (I_{th})	20A	20A	20A	20A	35A	40A	40A
Enclosed	18A	18A	18A	18A	32A	36A	36A
Conventional free air thermal current, single-pole (I_{th})							
Open	50A	50A	50A	50A	88A	100A	100A
Enclosed	45A	45A	45A	45A	80A	90A	90A

AC Ratings—AC-3 Operation

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operational current, 50/60 Hz ^① (I_g) in amperes							
220/230V	7	9	12	15.5	18	25	32
240V	7	9	12	15.5	18	25	32
380/400V	7	9	12	15.5	18	25	32
415V	7	9	12	15.5	18	25	32
440V	7	9	12	15.5	18	25	32
500V	5	7	10	12.5	18	25	32
660/690V	4	5	7	9	12	15	18
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	2.2	2.5	3.5	4	5	7.5	10
240V	2.2	3	4	4.6	5.5	8.5	11
380/400V	3	4	5.5	7.5	7.5	11	15
415V	4	5.5	7	8	10	14.5	19
440V	4.5	5.5	7.5	8.4	10.5	15.5	20
500V	3.5	4.5	7	7.5	12	17.5	23
660/690V	3.5	4.5	6.5	7	11	14	17
1000V	—	—	—	—	—	—	—

Note

^① At maximum permissible ambient temperature.

AC Ratings—AC-4 Operation

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operational current, 50/60 Hz ^① (I ₀) in amperes							
220/230V	5	6	7	7	10	13	15
240V	5	6	7	7	10	13	15
380/400V	5	6	7	7	10	13	15
415V	5	6	7	7	10	13	15
440V	5	6	7	7	10	13	15
500V	4.5	5	6	6	1	13	1
660/690V	4	4.5	5	5	8	10	12
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	1	1.5	2	2	2.5	3.5	4
240V	1.5	1.6	2.2	2.2	3	4	4.5
380/400V	2.2	2.5	3	3	4.5	6	7
415V	2.3	2.8	3.4	3.4	5	6.5	7.5
440V	2.4	3	3.6	3.6	5.5	7	8
500V	2.5	2.8	3.5	3.5	6	8	9
660/690V	2.9	3.6	4.4	4.4	6.5	8.5	10
1000V	—	—	—	—	—	—	—

Note

^① Example—

The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of $18/6 \times 10A = 30A$. Using an XTCE032C (32A AC-3) contactor is recommended.

AC Ratings—AC-6A Operation

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Transformer loads	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific

Calculation is $I_g \text{ AC-3} = X / 6 * I_g \text{ transformer}$ where X is the inrush current of the transformer and $I_g \text{ transformer}$ is the nominal current. ①

AC Ratings—AC-6B Operation

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Capacitor loads							
Individual compensation rated operational current I_g of three-phase capacitors in amperes							
Up to 525V	See Volume 5—Motor Control and Protection, CA08100006E, Tab 27 for capacitor ratings						
690V	See Volume 5—Motor Control and Protection, CA08100006E, Tab 27 for capacitor ratings						
Maximum inrush current peak (x I_g)	30	30	30	30	30	30	30
Component lifesaving (operations)	—	—	—	—	—	—	—
Maximum operating frequency (ops/hr)	—	—	—	—	—	—	—

AC Ratings—AC-1 Operation

Description	XTCE040D	XTCE050D	XTCE065D	XTCE072D	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE170G
Conventional free air thermal current, three-pole, 50–60 Hz									
Open									
at 40°C (I_{th})	60A	80A	98A	98A	110A	130A	160A	190A	275A ②
at 50°C (I_{th})	57A	71A	88A	88A	98A	125A	142A	180A	200A
at 55°C (I_{th})	55A	68A	83A	83A	94A	115A	135A	170A	190A
at 60°C (I_{th})	50A	65A	80A	80A	90A	110A	130A	160A	185A
Enclosed	45A	58A	72A	72A	80A	100A	115A	144A	166A
Conventional free air thermal current, single-pole (I_{th})									
Open	125A	162A	200A	200A	225A	275A	325A	400A	460A
Enclosed	112A	145A	180A	180A	200A	250A	285A	360A	415A

Notes

- ① Example—
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of $18/6 \times 10A = 30A$. Using an XTCE032C (32A AC-3) contactor is recommended.
- ② For 225–275A, use 2X 70 mm² wire.
- ③ At maximum permissible ambient temperature.

AC Ratings—AC-3 Operation

Description	XTCE040D	XTCE050D	XTCE065D	XTCE072D	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE170G
Rated operational current, 50/60 Hz ^① (I _g) in amperes									
220/230V	40	50	65	72	80	95	115	150	170
240V	40	50	65	72	80	95	115	150	170
380/400V	40	50	65	7	80	95	115	150	170
415V	40	50	65	72	80	95	115	150	170
440V	40	50	65	72	80	95	115	15	170
500V	40	50	65	72	80	95	115	150	170
660/690	25	32	37	37	65	80	93	100	150
1000V	—	—	—	—	—	—	—	—	—
Rated power (P) in kilowatts									
220/230V	12.5	15.5	20	22	25	30	37	48	52
240V	13.5	17	22	35	27.5	34	40	52	57
380/400V	18.5	22	30	37	37	45	55	75	90
415V	24	30	39	41	43	57	70	91	100
440V	25	32	41	44	51	60	75	95	105
500V	28	36	47	45	58	70	85	110	120
660/690V	23	30	35	35	63	75	90	96	140
1000V	—	—	—	—	—	—	—	—	—

AC Ratings—AC-4 Operation

Description	XTCE040D	XTCE050D	XTCE065D	XTCE072D	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE170G
Rated operational current, 50/60 Hz ^① (I _g) in amperes									
220/230V	18	21	25	25	40	50	55	65	65
240V	18	21	25	25	40	50	55	65	65
380/400V	18	21	25	25	40	50	55	65	65
415V	18	21	25	25	40	50	55	65	65
440V	18	21	25	25	40	50	55	65	65
500V	18	21	25	25	40	50	55	65	65
660/690V	14	17	20	20	40	50	45	50	50
1000V	—	—	—	—	—	—	—	—	—
Rated power (P) in kilowatts									
220/230V	5	6	7	7	12	16	17	20	20
240V	5.5	6.5	7.5	7.5	13	17	19	22	22
380/400V	9	10	12	12	20	26	28	33	33
415V	9.5	11	13	13	24	30	33	39	39
440V	10	12	14	14	25	32	35	41	41
500V	11	13	16	16	29	36	40	47	47
660/690V	12	14	17	17	26	35	43	48	48
1000V	—	—	—	—	—	—	—	—	—

Note

^① At maximum permissible ambient temperature.

AC Ratings—AC6-A Operation

Description	XTCE040D	XTCE050D	XTCE065D	XTCE072D	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE170G
Transformer loads	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific

Calculation is $I_g AC-3 = X / 6 * I_g$ transformer where X is the inrush current of the transformer and I_g transformer is the nominal current. ^①

AC Ratings—AC6-B Operation

Description	XTCE040D	XTCE050D	XTCE065D	XTCE072D	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE170G
Capacitor loads									
Individual compensation rated operational current I_g of three-phase capacitors in amperes									
Up to 525V									
690V									
Maximum inrush current peak (x I_g)	30	30	30	30	30	30	30	30	30
Component lifesaving (operations)	—	—	—	—	—	—	—	—	—
Maximum operating frequency (ops/hr)	—	—	—	—	—	—	—	—	—

See **Volume 5—Motor Control and Protection**, CA08100006E, Tab 27 for capacitor ratings

AC Ratings—AC-1 Operation

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE570M	XTCE580N
Conventional free air thermal current, three-pole, 50–60 Hz								
at 40°C (I_{th})	337	386	429	490	612	857	857	980
at 50°C (I_{th})	301	345	383	438	548	767	767	876
at 55°C (I_{th})	287	329	366	418	522	731	731	836
at 60°C (I_{th})	275	315	350	400	500	700	700	800
Conventional free air thermal current, single-pole (I_{th})	685	785	875	1000	1250	1750	1750	2000

Note

^① Example—The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of $18/6 \times 10A = 30A$. Using an XTCE032C (32A AC-3) contactor is recommended.

AC Ratings—AC-3 Operation

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE570M	XTCE580N
Rated operational current, 50/60 Hz ^① (I _g) in amperes								
220/230V	185	225	250	300	400	500	580	580
240V	185	225	250	300	400	500	580	580
380/400V	185	225	250	300	400	500	580	580
415V	185	225	250	300	400	500	580	580
440V	185	225	250	300	400	500	580	580
500V	185	225	250	300	400	500	580	580
660/690V	185	225	250	300	400	500	580	580
1000V	76	76	76	95	95	95	95	435
Rated power (P) in kilowatts								
220/230V	55	70	75	90	125	155	185	185
240V	62	75	85	100	132	170	200	200
380/400V	90	110	132	160	200	250	315	315
415V	110	132	148	180	240	300	348	348
440V	115	142	157	190	255	345	370	370
500V	132	160	180	21	290	360	420	420
660/690V	175	215	240	286	344	344	344	560
1000V	108	108	108	132	132	132	132	600

AC Ratings—AC-4 Operation

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE570M	XTCE580N
Rated operational current, 50/60 Hz ^① (I _g) in amperes								
220/230V	136	164	200	240	296	360	360	456
240V	136	164	200	240	296	360	360	456
380/400V	136	164	200	240	296	360	360	456
415V	136	164	200	240	296	360	360	456
440V	136	164	200	240	296	360	360	456
500V	136	164	200	240	296	360	360	456
660/690V	136	164	200	240	296	360	360	456
1000V	76	76	76	95	95	95	95	348
Rated power (P) in kilowatts								
220/230V	41	51	62	75	92	112	112	143
240V	45	54	68	82	101	122	122	156
380/400V	75	90	110	132	160	200	200	250
415V	80	96	117	142	176	216	216	274
440V	85	102	125	151	186	229	229	290
500V	96	116	143	172	214	260	260	330
660/690V	127	155	189	229	283	344	344	440
1000V	108	108	108	132	132	132	132	509

Note

^① At maximum permissible ambient temperature.

AC Ratings—AC-6A Operation

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE570M	XTCE580N
Transformer loads	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific

Calculation is $I_g \text{ AC-3} = X / 6 * I_g$ transformer where X is the inrush current of the transformer and I_g transformer is the nominal current. ^①

AC Ratings—AC-6B Operation

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE570M	XTCE580N
Capacitor loads								
Individual compensation rated operational current I_g of three-phase capacitors in amperes								
Up to 525V	220	220	220	307	307	307	307	463
690V	133	133	133	177	177	177	177	265
Maximum inrush current peak (x I_g)	30	30	30	30	30	30	30	30
Component lifesaving (operations)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Maximum operating frequency (ops/hr)	200	200	200	200	200	200	200	200

AC Ratings—AC-1 Operation

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC16R	XTCEC20R
Conventional free air thermal current, three-pole, 50–60 Hz							
at 40°C (I_{th})	1041	1102	1225	1225	1714 ^②	2200	2450 ^②
at 50°C (I_{th})	931	986	1095	1095	1533 ^②	1970	2190 ^②
at 55°C (I_{th})	888	940	1044	1044	1462 ^②	1800	2089 ^②
at 60°C (I_{th})	850	900	1000	1000	1400 ^②	1800	2000 ^②
Conventional free air thermal current, single-pole (I_{th})	2125	2250	2500	2500	3500	4500	5000

Notes

- ① Example—The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of $18/6 \times 10A = 30A$. Using an XTCE032C (32A AC-3) contactor is recommended.
- ② Up to 690V.

AC Ratings—AC-3 Operation

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC16R	XTCEC20R
Rated operational current, 50/60 Hz ^① (I _g) in amperes							
220/230V	650	750	820	1000	—	1600	—
240V	650	750	820	1000	—	1600	—
380/400V	650	750	820	1000	—	1600	—
415V	650	750	820	1000	—	1600	—
440V	650	750	820	1000	—	1600	—
500V	650	750	820	1000	—	1600	—
660/690V	650	750	820	1000	—	1600	—
1000V	435	580	580	700	—	—	—
Rated power (P) in kilowatts							
220/230V	205	240	260	315	—	500	—
240V	225	260	285	340	—	550	—
380/400V	355	400	450	560	—	900	—
415V	390	455	500	610	—	930	—
440V	420	480	525	650	—	1000	—
500V	470	550	600	730	—	1180	—
660/690V	630	720	750	1000	—	1600	—
1000V	600	800	800	1000	—	—	—

AC Ratings—AC-4 Operation

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC16R	XTCEC20R
Rated operational current, 50/60 Hz ^① (I _g) in amperes							
220/230V	512	576	656	800	—	1280	—
240V	512	576	656	800	—	1280	—
380/400V	512	576	656	800	—	1280	—
415V	512	576	656	800	—	1280	—
440V	512	576	656	800	—	1280	—
500V	512	576	656	800	—	1280	—
660/690V	512	576	656	800	—	1280	—
1000V	348	464	464	700	—	—	—
Rated power (P) in kilowatts							
220/230V	161	181	209	260	—	30	—
240V	176	200	228	280	—	450	—
380/400V	280	315	355	450	—	750	—
415V	307	346	394	490	—	770	—
440V	32	367	41	520	—	830	—
500V	370	417	474	590	—	940	—
660/690V	494	556	633	780	—	1300	—
1000V	509	678	678	1000	—	—	—

Note

^① At maximum permissible ambient temperature.

AC Ratings—AC-6A Operation

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC16R	XTCEC20R
Transformer loads	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific	Values are application specific
Calculation is $I_g \text{ AC-3} = X / 6 * I_g$ transformer where X is the inrush current of the transformer and I_g transformer is the nominal current. ^①							

AC Ratings—AC-6B Operation

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC16R	XTCEC20R
Capacitor loads							
Individual compensation rated operational current I_g of three-phase capacitors in amperes							
Up to 525V	463	463	463	463	—	—	—
690V	265	265	265	265	—	—	—
Maximum inrush current peak (x I_g)	30	30	30	30	—	—	—
Component lifesaving (operations)	100,000	100,000	100,000	100,000	—	—	—
Maximum operating frequency (ops/hr)	200	200	200	200	—	—	—

AC Ratings—Four-Pole—AC-1 Operation

Description	XTCF020B	XTCF032C	XTCF045C	XTCF063D	XTCF080D	XTCF125G	XTCF160G	XTCF200G
Conventional free air thermal current, three-pole, 50-60 Hz								
Open (amps)								
at 40°C (I_{th})	22	32	45	3	80	125	160	200
at 50°C (I_{th})	21	30	41	60	76	116	15	188
at 60°C (I_{th})	20	28	39	54	69	108	138	172
Enclosed (amps)	18	27	36	50	64	100	128	160
Conventional free air thermal current, single-pole								
Open (amps)	60	84	117	162	207	325	415	516
Enclosed (amps)	54	76	105	146	186	292	373	464

AC Ratings—Four-Pole—AC-3 Operation

Description	XTCF020B	XTCF032C	XTCF045C	XTCF063D	XTCF080D	XTCF125G	XTCF160G	XTCF200G
Rated operational current, 50/60 Hz (I_g) in amperes								
220/230V	12	18	25	40	50	80	95	115
240V	12	18	25	40	50	80	95	115
380/400V	12	18	25	40	50	80	95	115
415V	12	18	25	40	50	80	95	115
440V	12	18	25	40	50	80	95	115
500V	10	18	25	40	50	80	95	115
660/690V	7	12	15	25	32	65	80	93
Rated power, (P) in kilowatts								
220/230V	3.5	5	7.5	2.5	15.5	25	30	37
240V	4	5.5	8.5	13.5	17	27.5	33	40
380/400V	5.5	7.5	11	18.5	22	37	45	55
415V	7	10	14.5	24	30	48	57	70
440V	7.5	10.5	15.5	25	32	51	60	75
500V	47	12	17.5	28	36	58	70	85
660/690V	6.5	11	14	23	30	63	75	90

Note

^① Example—The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of $18/6 \times 10A = 30A$. Using an XTCE032C (32A AC-3) contactor is recommended.

DC Ratings—DC-1

Description Rated Operation Current {1}(I _e) in Amperes										
	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
60V	20	20	20	20	35	40	40	50	60	72
110V	20	20	20	20	35	40	40	50	50	72
220V	15	15	15	15	3	4	40	45	45	65
440V	1	1.3	1.3	1.3	2.9	2.9	2.9	2.9	2.9	2.9

	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
60V	110	110	160	160	300	300	300	400	400	400
110V	110	110	160	160	300	300	300	400	400	400
220V	70	70	90	90	300	300	300	400	400	400
440V	4.5	4.5	4.5	4.5	11	11	11	11	11	11

	XTCE580N	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R	XTCEC16R
60V	—	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—	—

DC Ratings—DC-3

Description Rated Operation Current {1}(I _e) in Amperes										
	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
60V	20	20	20	20	35	35	40	50	60	72
110V	20	20	20	20	35	35	40	50	50	72
220V	1.5	1.5	1.5	1.5	10	10	25	25	25	35
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6	0.6	0.6	0.6

	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
60V	110	110	160	160	300	300	300	400	400	400
110V	110	110	160	160	300	300	300	400	400	400
220V	35	35	40	40	300	300	300	400	400	400
440V	1	1	1	1	—	—	—	—	—	—

	XTCE580N	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R	XTCEC16R
60V	—	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—	—

DC Ratings—DC-5

Description
Rated Operation
Current {1} (I_e) in
Amperes

	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
60V	20	20	20	20	35	35	40	50	60	72
110V	20	20	20	20	35	35	40	50	50	72
220V	1.5	1.5	1.5	1.5	10	10	25	25	25	35
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6	0.6	0.6	0.6

	XTCE080F	XTCE095F	XTCE115G	XTCE150G	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
60V	110	110	160	160	300	300	300	400	400	400
110V	110	110	160	160	300	300	300	400	400	400
220V	35	35	40	40	300	300	300	400	400	400
440V	1	1	1	1	—	—	—	—	—	—

	XTCE580N	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

DC Ratings—Four-Pole—DC-1 Operation

Description
Rated Operation
Current {1} (I_e) in
Amperes

	XTCF020B	XTCF032C	XTCF045C	XTCF063D	XTCF080D	XTCF125G	XTCF160G	XTCF200G
60V	22	32	45	63	80	125	160	200
110V	22	32	45	6	80	125	160	200
220V	6	32	45	63	80	125	160	200
440V	1.3	3	3	5	5	100	125	150

DC Ratings—Four-Pole—DC-3 Operation

Description
Rated Operation
Current {1} (I_e) in
Amperes

	XTCF020B	XTCF032C	XTCF045C	XTCF063D	XTCF080D	XTCF125G	XTCF160G	XTCF200G
60V	20	32	45	63	80	125	160	200
110V	20	32	45	63	80	125	160	200
220V	1.5	32	45	63	80	125	160	200
440V	0.2	6	6	8	8	75	95	115

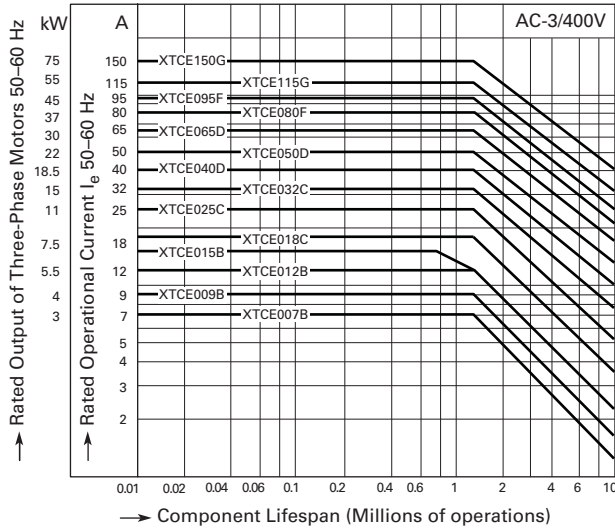
DC Ratings—Four-Pole—DC-5 Operation

Description
Rated Operation
Current {1} (I_e) in
Amperes

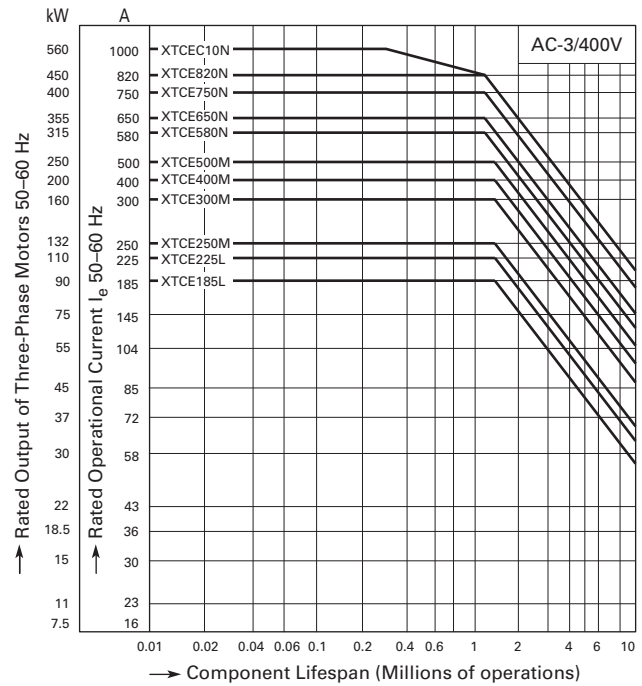
	XTCF020B	XTCF032C	XTCF045C	XTCF063D	XTCF080D	XTCF125G	XTCF160G	XTCF200G
60V	20	32	45	63	80	125	160	200
110V	20	25	32	508	80	125	160	200
220V	1.5	15	22	38	70	100	125	150
440V	0.2	4	4	8	8	60	75	90

Life Curves

Normal Switching Duty

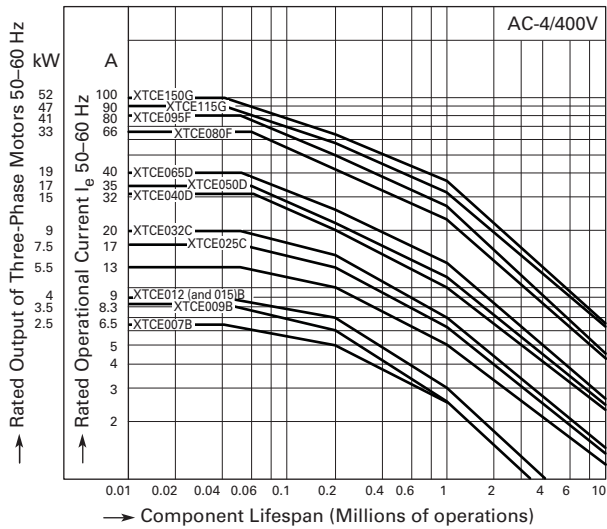


XTCE007B–XTCE150G

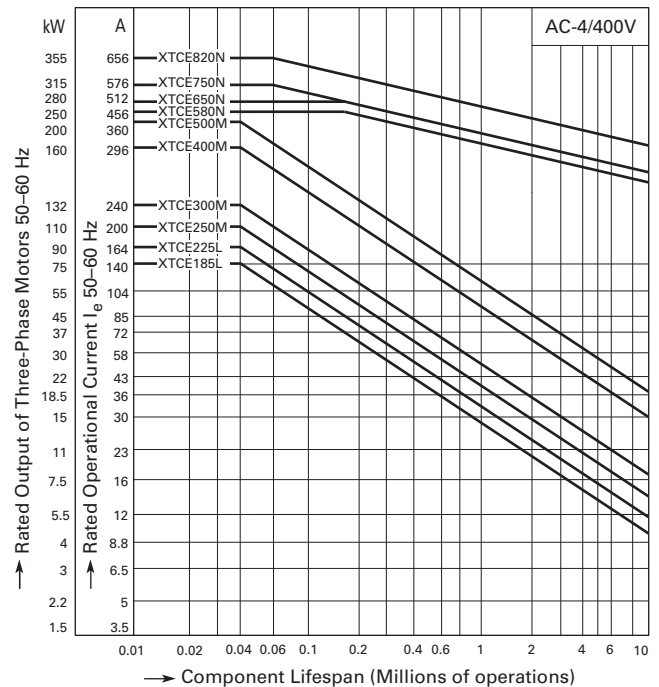


XTCE185L–XTCE10N

Extreme Switching Duty

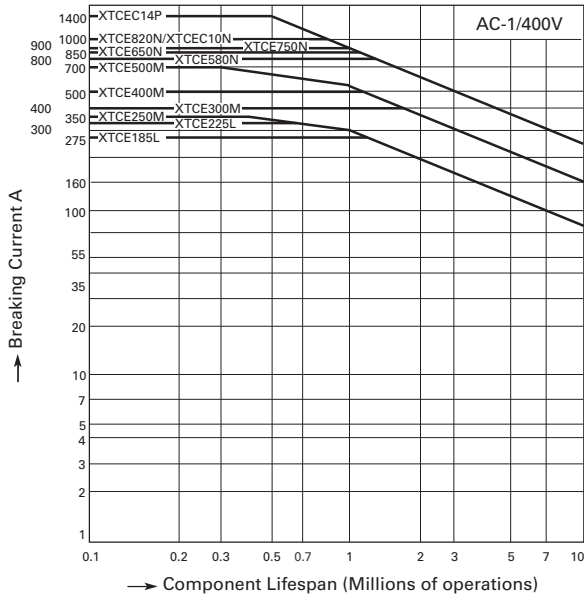


XTCE007B–XTCE150G

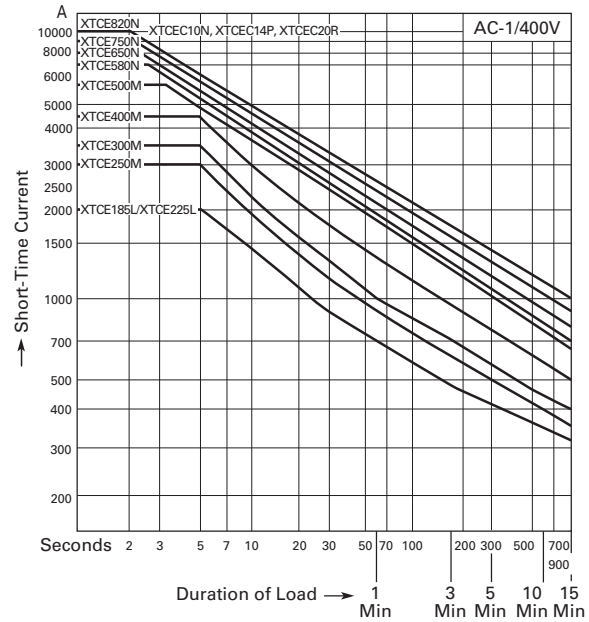


XTCE185L–XTCE820N

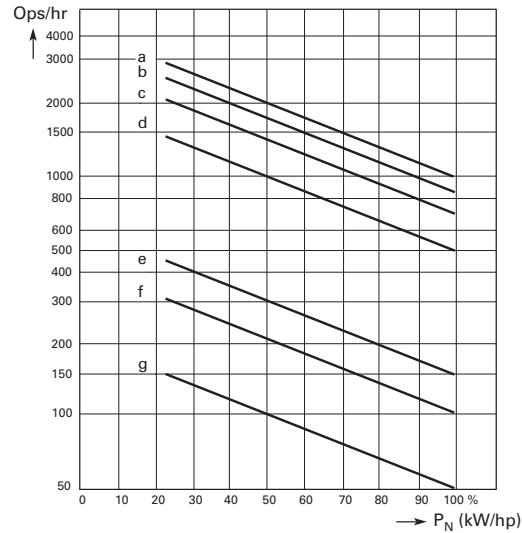
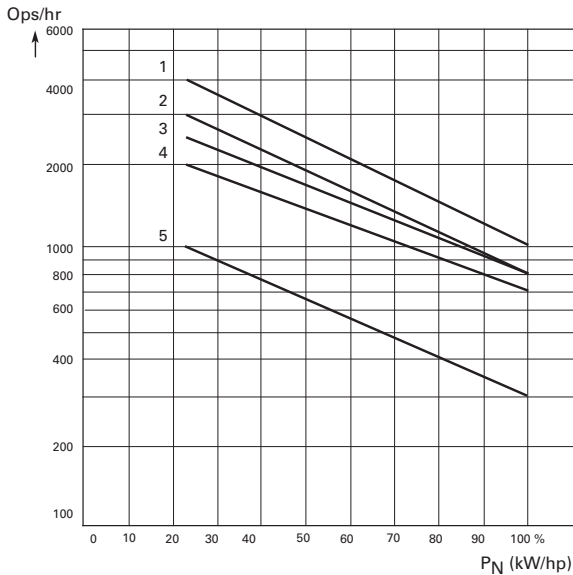
Switching Duty for Non-Motor Loads, Three-Pole, Four-Pole—XTCE185L—XTCEC14P



Short-Time Loading, Three-Pole—XTCE185L—XTCEC20R



Maximum Operating Frequency—Related to Rating and Utilization Category (400V)



Utilization Category ①

Type	Characteristic Curve Above		
	AC-1	AC-3	AC-2 AC-4
XTCE007B—XTCE015B	3	1	5
XTCE018C—XTCE032C	3	2	5
XTCE040D—XTCE065D	3	2	5
XTCE080F—XTCE150G	3	4	5

7–150 hp

Utilization Category ①

Type	Characteristic Curve Above			Type	Characteristic Curve Above		
	AC-1	AC-3	AC-4		AC-1	AC-3	AC-4
XTCE185L	2	1	6	XTCE500M	3	2	7
XTCE225L	2	1	6	XTCE580N	3	4	5
XTCE250L	2	1	6	XTCE650N	3	4	5
XTCE300M	3	2	7	XTCE750N	3	4	5
XTCE400M	3	2	7	XTCE820N	3	4	5

185–820 hp

Note

① P_N = maximum motor rating (kW/hp) of the relevant contactor.
ops/hr = maximum number of operations per hour.

Overload Relays
XTOB Overload Relay—Technical Data and Specifications

Description	XTOB...BC1, XTOB...CC1	XTOB...DC1	XTOB...GC1, XTOB...GC1S	XTOB...LC1
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA			
Climate proofing	Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature ^①	–25° to 55°C (–13° to 131°F)	–25° to 55°C (–13° to 131°F)	–25° to 55°C (–13° to 131°F)	–25° to 50°C (–13° to 122°F)
Temperature compensation	Continuous	Continuous	Continuous	Continuous
Mechanical shock resistance (IEC/EN 60068-2-27) half-sinusoidal shock 10 ms	10g	10g	10g	10g
Degree of protection	IP20	IP20	IP20	P00
Protection against direct contact when actuated from front (IEC 536)	Finger- and back of hand-proof	Finger- and back of hand-proof	Finger- and back of hand-proof	With terminal cover XTOBXTS...L
Insulation voltage (U _i) Vac	690	690	690	1000
Overvoltage category/pollution degree	III/3	III/3	III/3	III/3
Impulse withstand voltage (U _{imp}) Vac	6000	6000	6000	8000
Operational voltage (U _o) Vac	690	690	690	1000
Safe isolation to VDE 0106 Part 101 and Part 101/A1 Between auxiliary contacts and main contacts (Vac)	440	440	440	440
Between main contacts (Vac)	440	440	440	440
Overload release setting range	0.1–32A	6–75A	25–150A	50–250A
Short-circuit protection maximum fuse	②	②	②	②
Temperature compensation residual error >40°C	<0.25	<0.25	<0.25	<0.25
Current heat loss (three conductors) Lower value of setting range, W	2.5	3	16	16
Upper value of setting range	6	7.5	28	28
Terminal capacity				
Solid, mm ²	2 x (1–6)	2 x (1–16)	2 x (4–16)	—
Flexible with ferrule, mm ²	2 x (1–4) 2 x (1–6) ^③	1 x 25 2 x (1–10) ^④	1 x (4–70) 2 x (4–50)	—
Flexible with cable lug, mm ²	—	—	—	95
Stranded with cable lug, mm ²	—	—	—	120
Solid or stranded, AWG	14–8	14–2	2/0	250 kcmil
Flat conductor— number of segments x width x thickness (mm ²)	—	—	—	6 x 16 x 18
Bus bar—width (mm)	—	—	—	20 x 3
Terminal screw	M4	M6	M10	M8 x 25
Tightening torque				
Nm	1.8	3.5	10	24
Lb-in	16	31	88.5	221.3
Tools				
Pozidriv screwdriver	Size 2	Size 2	—	—
Standard screwdriver	1 x 6	1 x 6	—	—
Hexagon socket head spanner (SW)	—	—	5 mm	13 mm

Notes

① Ambient temperature operating range to IEC/EN 60947, PTB: –5° to 50°C.

② Consult factory.

③ 6 mm² flexible with ferrules to DIN 46228.

④ Main contact terminal capacity, solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section.

XTOB Overload Relay—Technical Data and Specifications, continued

Description	XTOB...BC1, XTOB...CC1	XTOB...DC1	XTOB...GC1, XTOB...GC1S	XTOB...LC1
Auxiliary and Control Circuit Connections				
Impulse withstand voltage (U_{imp}) Vac	6000	6000	6000	6000
Overtoltage category/pollution degree	III/3	III/3	III/3	III/3
Terminal capacity				
Solid, mm ²	2 x (0.75–4)	2 x (0.75–4)	2 x (0.75–4)	2 x (0.75–4)
Flexible with ferrule, mm ²	2 x (0.75–2.5)	2 x (0.75–2.5)	2 x (0.75–2.5)	2 x (0.75–2.5)
Solid or stranded (AWG)	2 x (18–12)	2 x (18–12)	2 x (18–12)	2 x (18–12)
Terminal screw	M3.5	M3.5	M3.5	M3.5
Tightening torque				
Nm	0.8–1.2	0.8–1.2	0.8–1.2	0.8–1.2
Lb-in	7–10.6	7–10.6	7–10.6	7–10.6
Tools				
Pozidriv screwdriver	Size 2	Size 2	Size 2	Size 2
Standard screwdriver	1 x 6	1 x 6	1 x 6	1 x 6
Rated insulated voltage (U_i) Vac	500	500	500	500
Rated operational voltage	500	500	500	500
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 between auxiliary contacts	240	240	240	240
Conventional thermal current, I_{th}	6	6	6	—
Rated operational current—AC-15				
Make contact				
120V	1.5	1.5	1.5	1.5
240V	1.5	1.5	1.5	1.5
415V	0.5	0.5	0.5	0.5
500V	0.5	0.5	0.5	0.5
Break contact				
120V	1.5	1.5	1.5	1.5
240V	1.5	1.5	1.5	1.5
415V	0.9	0.9	0.9	0.9
500V	0.8	0.8	0.8	0.8
Rated operational current—DC-13 L/R ≤15 ms ^①				
24V	0.9	0.9	0.9	0.9
60V	0.75	0.75	0.75	0.75
110V	0.4	0.4	0.4	0.4
220V	0.2	0.2	0.2	0.2
Short-circuit rating without welding				
Maximum fuse, A gG/gL	6	6	6	6

Note

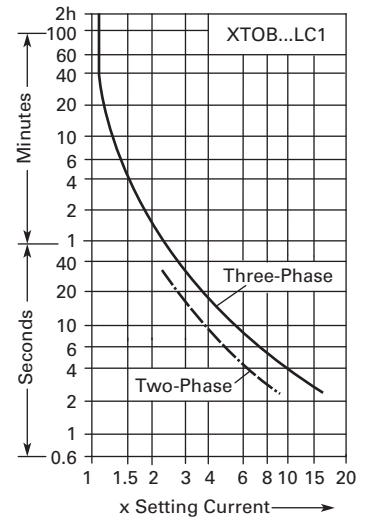
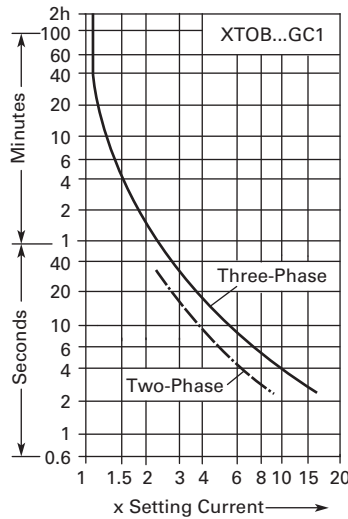
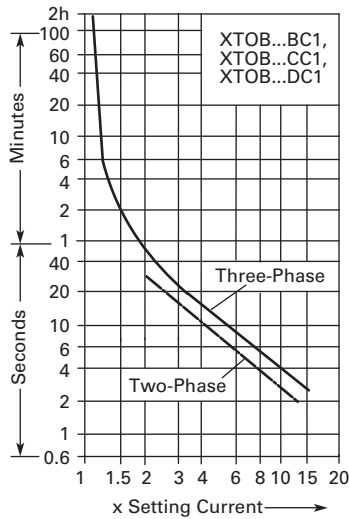
^① Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

Tripping Characteristics

These tripping characteristics are the mean values of the spread at 20°C ambient temperature in a cold state.

Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approximately 25% of the read off value. Specific characteristics for each individual setting range can be found in MN03402001E.

Tripping Characteristics



Instructional Leaflets

Instructional Leaflets

Publication Number	Description
Pub51221	XTOD, D Frame Overload Relays (inside of packaging)
Pub51222	XTOD, B-C Frame Overload Relays (inside of packaging)

C440/XTOE**Electronic Overload Relays up to 1500A**

Description	Specification		
	45 mm	55 mm	110 mm
Electrical Ratings	Range	Range	Range
Operating voltage (three-phase) and frequency	690 Vac (60/50 Hz)	690 Vac (60/50 Hz)	690 Vac (60/50 Hz)
FLA Range			
	0.33–1.65A 1–5A 4–20A 9–45A	20–100A	28–140A (NEMA) 35–175A (IEC)
Use with Contactors			
XTIEC frames	B, C, D	F, G	G, H
Freedom NEMA sizes	00, 0, 1, 2	3	4
Trip Class			
	10A, 10, 20, 30 Selectable	10A, 10, 20, 30 Selectable	10A, 10, 20, 30 Selectable
Motor Protection			
Thermal overload setting	1.05 x FLA: does not trip 1.15 x FLA: overload trip	1.05 x FLA: does not trip 1.15 x FLA: overload trip	1.05 x FLA: does not trip 1.15 x FLA: overload trip
Feature	Range	Range	Range
Phase loss	Fixed threshold 50%	Fixed threshold 50%	Fixed threshold 50%
Phase unbalance (selectable: enable/disable)	Fixed threshold 50%	Fixed threshold 50%	Fixed threshold 50%
Ground fault (selectable: enable/disable)	50% of FLA dial setting >150% = 2 sec >250% = 1 sec	50% of FLA dial setting >150% = 2 sec >250% = 1 sec	50% of FLA dial setting >150% = 2 sec >250% = 1 sec
Reset	Manual/automatic	Manual/automatic	Manual/automatic
Indicators			
Trip status	Orange flag	Orange flag	Orange flag
Mode LED	One flash: Overload operating properly Two flashes: Current is above FLA dial setting—pending trip	One flash: Overload operating properly Two flashes: Current is above FLA dial setting—pending trip	One flash: Overload operating properly Two flashes: Current is above FLA dial setting—pending trip
Options			
Remote reset	Yes	Yes	Yes
Reset bar	Yes	Yes	Yes
Communication expansion module	Yes	Yes	Yes
Communication adapter	Yes	Yes	Yes
Capacity			
Load terminals			
Terminal capacity	12–10 AWG (4–6 mm ²) 8–6 AWG (6–16 mm ²)	6–1 AWG (16–50 mm ²)	8–4/0 AWG (10–95 mm ²)
Tightening torque	20–25 lb-in (2.3–2.8 Nm) 25–30 lb-in (2.8–3.4 Nm)	25–30 lb-in (2.8–3.4 Nm)	124 lb-in (14 Nm)
Input, auxiliary contact and remote reset terminals			
Terminal capacity	2 x (18–12) AWG	2 x (18–12) AWG	2 x (18–12) AWG
Tightening torque	7–11 lb-in (0.8–1.2 Nm)	7–11 lb-in (0.8–1.2 Nm)	7–11 lb-in (0.8–1.2 Nm)
Voltages			
Insulation voltage U _i (three-phase)	690 Vac	690 Vac	690 Vac
Insulation voltage U _i (control)	500 Vac	500 Vac	500 Vac
Rated impulse withstand voltage	6000 Vac	6000 Vac	6000 Vac
Overvoltage category/pollution degree	III/3	III/3	III/3

Electronic Overload Relays up to 1500A, continued

Description	Specification		
	45 mm	55 mm	110 mm
Auxiliary and Control Circuit Ratings			
Conventional thermal continuous current	5A	5A	5A
Rated operational current—IEC AC-15			
Make contact (1800 VA)			
120V	15A	15A	15A
240V	15A	15A	15A
415V	0.5A	0.5A	0.5A
500V	0.5A	0.5A	0.5A
Break contact (180 VA)			
120V	1.5A	1.5A	1.5A
240V	1.5A	1.5A	1.5A
415V	0.9A	0.9A	0.9A
500V	0.8A	0.8A	0.8A
IEC DC-13 (L/R F 15 ms1)			
0–250V	1.0A	1.0A	1.0A
Rated operational current—UL B600			
Make contact (3600 VA)			
120V	30A	30A	30A
240V	15A	15A	15A
480V	7.5A	7.5A	7.5A
600V	6A	6A	6A
Break contact (360 VA)			
120V	3A	3A	3A
240V	1.5A	1.5A	1.5A
480V	0.75A	0.75A	0.75A
600V	0.6A	0.6A	0.6A
R300—Vdc ratings (28 VA)			
0–120V	0.22A	0.22A	0.22A
250V	0.11A	0.11A	0.11A
Short-Circuit Rating without Welding			
Maximum fuse	6A gG/gL	6A gG/gL	6A gG/gL
Environmental Ratings			
Ambient temperature (operating)	–13° to 149°F (–25° to 65°C)	–13° to 149°F (–25° to 65°C)	–13° to 149°F (–25° to 65°C)
Ambient temperature (storage)	–40° to 185°F (–40° to 85°C)	–40° to 185°F (–40° to 85°C)	–40° to 185°F (–40° to 85°C)
Operating humidity UL 991 (H3)	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing
Altitude (no derating) NEMA ICS1	2000m	2000m	2000m
Shock (IEC 600068-2-27)	15g any direction	15g any direction	15g any direction
Vibration (IEC 60068-2-6)	3g any direction	3g any direction	3g any direction
Pollution degree per IEC 60947-4-1	3 for product (2 for pcb)	3 for product (2 for pcb)	3 for product (2 for pcb)
Ingress protection	IP20	IP20	IP20
Protection against direct contact when actuated from front (IEC 536)	Finger- and back-of-hand proof	Finger- and back-of-hand proof	Finger- and back-of-hand proof
Mounting position	Any	Any	Any
Climatic proofing	Damp heat, constant to IEC 60068-2-30	Damp heat, constant to IEC 60068-2-30	Damp heat, constant to IEC 60068-2-30

Electronic Overload Relays up to 1500A, continued

Description	Specification		
	45 mm	55 mm	110 mm
Electrical/EMC			
Radiated emissions IEC 60947-4-1-Table 15 EN 55011 (CISPR 11) Group 1, Class A, ISM	30 mHz to 1000 mHz	30 mHz to 1000 mHz	30 mHz to 1000 mHz
Conducted emissions IEC 60947-4-1-Table 14 EN 55011 (CISPR 11) Group 1; Class ISM	0.15 mHz to 30 mHz	0.15 mHz to 30 mHz	0.15 mHz to 30 mHz
ESD immunity IEC 60947-4-1 (Table 13)	±8 kV air, ±6 kV contact	±8 kV air, ±6 kV contact	±8 kV air, ±6 kV contact
Radiated immunity IEC 60947-4-1 IEC 61000-4-3	10 V/m 80 mHz–1000 mHz 3 V/m from 1.4 to 2.7 GHz 80% amplitude modulated 1 kHz sine wave	10 V/m 80 mHz–1000 mHz 3 V/m from 1.4 to 2.7 GHz 80% amplitude modulated 1 kHz sine wave	10 V/m 80 mHz–1000 mHz 3 V/m from 1.4 to 2.7 GHz 80% amplitude modulated 1 kHz sine wave
Conducted immunity IEC 60947-4-1, IEC 61000-4-6	140 dub (10V rms) 150 kHz–100 mHz	140 dub (10V rms) 150 kHz–100 mHz	140 dub (10V rms) 150 kHz–100 mHz
Fast transient immunity IEC 60947-4-1 (Table 13) IEC 61000-4-4	±4 kV using direct method with accessory installed in expansion bay ±2 kV using direct method	±4 kV using direct method with accessory installed in expansion bay ±2 kV using direct method	±4 kV using direct method with accessory installed in expansion bay ±2 kV using direct method
Surge immunity IEC 60947-4-1 (Table 13) IEC 61000-4-5 a Class 4	Three-phase power inputs: ±4 kV line-to-line (DM) ±4 kV line-to-ground (CM) With accessory installed in expansion bay: ±2 kV line-to-line (DM) →1.2/50 us; 2 kV line-to-earth, 1 kV line-to-line ±4 kV line-to-ground (CM)	Three-phase power inputs: ±4 kV line-to-line (DM) ±4 kV line-to-ground (CM) With accessory installed in expansion bay: ±2 kV line-to-line (DM) →1.2/50 us; 2 kV line-to-earth, 1 kV line-to-line ±4 kV line-to-ground (CM)	Three-phase power inputs: ±4 kV line-to-line (DM) ±4 kV line-to-ground (CM) With accessory installed in expansion bay: ±2 kV line-to-line (DM) →1.2/50 us; 2 kV line-to-earth, 1 kV line-to-line ±4 kV line-to-ground (CM)
Power freq. magnetic field immunity IEC 60947-4-1, IEC 61000-4-8	30 A/m, 50 Hz	30 A/m, 50 Hz	30 A/m, 50 Hz
Electromagnetic field IEC 60947-4-1 Table 13, IEC 61000-4-3	10 V/m	10 V/m	10 V/m
Distortion IEEE 519	5% THD max., 5th harmonic 3% max.	5% THD max., 5th harmonic 3% max.	5% THD max., 5th harmonic 3% max.
Electrostatic discharge (ESD) IEC 61000-4-2, EN 61131-2	4 kV contact 8 kV air discharge	4 kV contact 8 kV air discharge	4 kV contact 8 kV air discharge
Electrical fast transient (EFT) IEC 61000-4-4, EN 61131-2	±2 kV using direct method	±2 kV using direct method	±2 kV using direct method
Surge immunity IEC 61000-4-5, EN 61131-2	±2 kV line-to-ground (CM)	±2 kV line-to-ground (CM)	±2 kV line-to-ground (CM)

C30CN Lighting Contactors

Main Power Poles

Maximum AC Voltage and Amp Ratings

Load Type	Amps Continuous	Poles	
		Single-Phase	Three-Phase
Ballast	30	347 Vac	600 Vac
General use	30	600 Vac	600 Vac
Tungsten	20	277 Vac	480 Vac
AC resistive	30	600 Vac	600 Vac

Maximum Horsepower Rating

Normal Starting Duty

Volts	Horsepower
Single-Pole, Single-Phase	
110–120V	1
220–240V	2
Three-Pole, Three-Phase	
200–208V	3
220–240V	5
440–480V	10
550–600V	15

Control Circuit Characteristics

Coil

Description	VA
Inrush	248 VA
Sealed	28 VA

Control Module

Input Voltage	Steady State Current at Rated Voltage (mA)	Maximum VA
12–24 Vdc	42	2
24 Vac	80	5
115–120 Vac	83	12
200–277 Vac	91	30

Other Control Module Characteristics

Description	Specification
Minimum pulse duration (three-wire control module)	250 ms
Maximum allowable leakage current	1.8 mA
EMI	35 V/m
Surge transient peak	6 kV
Frequency range	40–70 Hz

Note

① 8 AWG stranded only.

Auxiliary Contacts Rating

A600, 24 Vdc, 24 VA

Ambient Temperature

–13° to 104°F (–25° to 40°C)

Mounting Position

Vertical three-point mounting only.

Wire Size

Wire Specifications

Component	Number of Cables	Wire Range (Solid or Stranded)	Wire Temperature
Power poles	1	14–8 AWG	75°C Cu
	2	14–8 AWG ①	75°C Cu
Coil	1 or 2	18–14 AWG	60°/75°C Cu
Control module	1	22–12 AWG	60°/75°C Cu
Auxiliary contacts	1 or 2	22–12 AWG	60°/75°C Cu

A202 Lighting Contactors

- Terminals
 - All except 30A devices: Cu/Al
 - 30A devices: Cu only
- Ballast load: 600 AC, breaking all lines
- Tungsten lamp loads, maximum volts
 - Line-to-line: 480 Vac
 - Line-to-neutral: 277 Vac

S611 Solid-State Soft Starters**Technical Data and Specifications****Soft Starters—S611**

Description		S611 Soft Starter (Partial Catalog Number)			
		S611A052	S611A065	S611A072	S611B099
Max. current capacity	A	52	65	77	99
FLA range	A	26–52	32.5–65	38.5–77	48–99
Dimensions					
Width	inch (mm)	11.58 (294)	11.58 (294)	11.58 (294)	11.58 (294)
Height	inch (mm)	19.45 (494)	19.45 (494)	19.45 (494)	19.45 (494)
Depth	inch (mm)	7.46 (189)	7.46 (189)	7.46 (189)	7.46 (189)
Weight	lb (kg)	24 (11)	24 (11)	24 (11)	24 (11)
General Information					
Bypass mechanical lifespan		10M	10M	10M	10M
Insulating voltage	V	660	660	660	660
Ramp time range	Seconds	0.5–180	0.5–180	0.5–180	0.5–180
Vibration resistance—non-operating	g	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units
Vibration resistance—operating	g	1	1	1	1
Shock resistance	g	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units
Electrical Information					
Operating voltage	V	130–600	130–600	130–600	130–600
Operating frequency	Hertz	47–63	47–63	47–63	47–63
Overload setting (frame)	% FLA	50–100	50–100	50–100	50–100
Trip class		5, 10, 20, 30	5, 10, 20, 30	5, 10, 20, 30	5, 10, 20, 30
Cabling Capacity (IEC 947)					
Number of conductors		1	1	1	1
Wire sizes	AWG	14–2/0	14–2/0	14–2/0	14–2/0
Type of connectors		Lug	Lug	Lug	Lug
Control Wiring					
Wire sizes	AWG	22–12	22–12	22–12	22–12
Number of conductors		2 (or one 12–14 AWG)	2 (or one 12–14 AWG)	2 (or one 12–14 AWG)	2 (or one 12–14 AWG)
Torque requirements	lb-in	3.5	3.5	3.5	3.5
Maximum size	AWG	12	12	12	12
Control Power Requirements					
Voltage range (120V ±10%)	V	108–132	108–132	108–132	108–132
Steady state current	A	0.375	0.375	0.375	0.375
Inrush current	A	0.5	0.5	0.5	0.5
Ripple	%	1	1	1	1
Relays (1) Class A and C					
Voltage AC—maximum	V	120	120	120	120
Voltage DC—maximum	V	24	24	24	24
Amps—maximum	A	3	3	3	3
Environment					
Temperature—operating	°C	–20° to 50°C	–20° to 50°C	–20° to 50°C	–20° to 50°C
Temperature—storage	°C	–40° to 85°C	–40° to 85°C	–40° to 85°C	–40° to 85°C
Altitude	Meters	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m
Humidity	%	<95% non-condensing	<95% non-condensing	<95% non-condensing	<95% non-condensing
Operating position		Vertical, line side up	Vertical, line side up	Vertical, line side up	Vertical, line side up
Pollution degree IEC947-1		3	3	3	3
Impulse withstand voltage IEC947-4-1	V	6000	6000	6000	6000

Soft Starters—S611, continued

Description		S611 Soft Starter (Partial Catalog Number)			
		S611B125	S611C156	S611C180	S611D242
Max. current capacity	A	125	156	180	242
FLA range	A	62.5–125	78–156	90–180	120–242
Dimensions					
Width	inch (mm)	11.58 (294)	11.58 (294)	11.58 (294)	11.58 (294)
Height	inch (mm)	19.45 (494)	20.83 (529)	20.83 (529)	20.83 (529)
Depth	inch (mm)	7.46 (189)	8.37 (213)	8.37 (213)	8.37 (213)
Weight	lb (kg)	24 (11)	33 (15)	33 (15)	38 (17)
General Information					
Bypass mechanical lifespan		10M	10M	10M	10M
Insulating voltage	V	660	660	660	660
Ramp time range	Seconds	0.5–180	0.5–180	0.5–180	0.5–180
Vibration resistance—non-operating	g	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units
Vibration resistance—operating	g	1	1	1	1
Shock resistance	g	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units
Electrical Information					
Operating voltage	V	130–600	130–600	130–600	130–600
Operating frequency	Hertz	47–63	47–63	47–63	47–63
Overload setting (frame)	% FLA	50–100	50–100	50–100	50–100
Trip class		5, 10, 20, 30	5, 10, 20, 30	5, 10, 20, 30	5, 10, 20, 30
Cabing Capacity (IEC 947)					
Number of conductors		1	1	1	1
Wire sizes	AWG	2–600 kcmil	2–600 kcmil	2–600 kcmil	2–600 kcmil
Type of connectors		Lug	Lug	Lug	Lug
Control Wiring					
Wire sizes	AWG	22–12	22–12	22–12	22–12
Number of conductors		2 (or one 12–14 AWG)	2 (or one 12–14 AWG)	2 (or one 12–14 AWG)	2 (or one 12–14 AWG)
Torque requirements	lb-in	3.5	3.5	3.5	3.5
Maximum size	AWG	12	12	12	12
Control Power Requirements					
Voltage range (120V ±10%)	V	108–132	108–132	108–132	108–132
Steady state current	A	0.375	0.375	0.375	0.375
Inrush current	A	0.5	0.5	0.5	0.5
Ripple	%	1	1	1	1
Relays (1) Class A and C					
Voltage AC—maximum	V	120	120	120	120
Voltage DC—maximum	V	24	24	24	24
Amps—maximum	A	3	3	3	3
Environment					
Temperature—operating	°C	–20° to 50°C	–20° to 50°C	–20° to 50°C	–20° to 50°C
Temperature—storage	°C	–40° to 85°C	–40° to 85°C	–40° to 85°C	–40° to 85°C
Altitude	Meters	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m
Humidity	%	<95% non-condensing	<95% non-condensing	<95% non-condensing	<95% non-condensing
Operating position		Vertical, line side up	Vertical, line side up	Vertical, line side up	Vertical, line side up
Pollution degree IEC947-1		3	3	3	3
Impulse withstand voltage IEC947-4-1	V	6000	6000	6000	6000

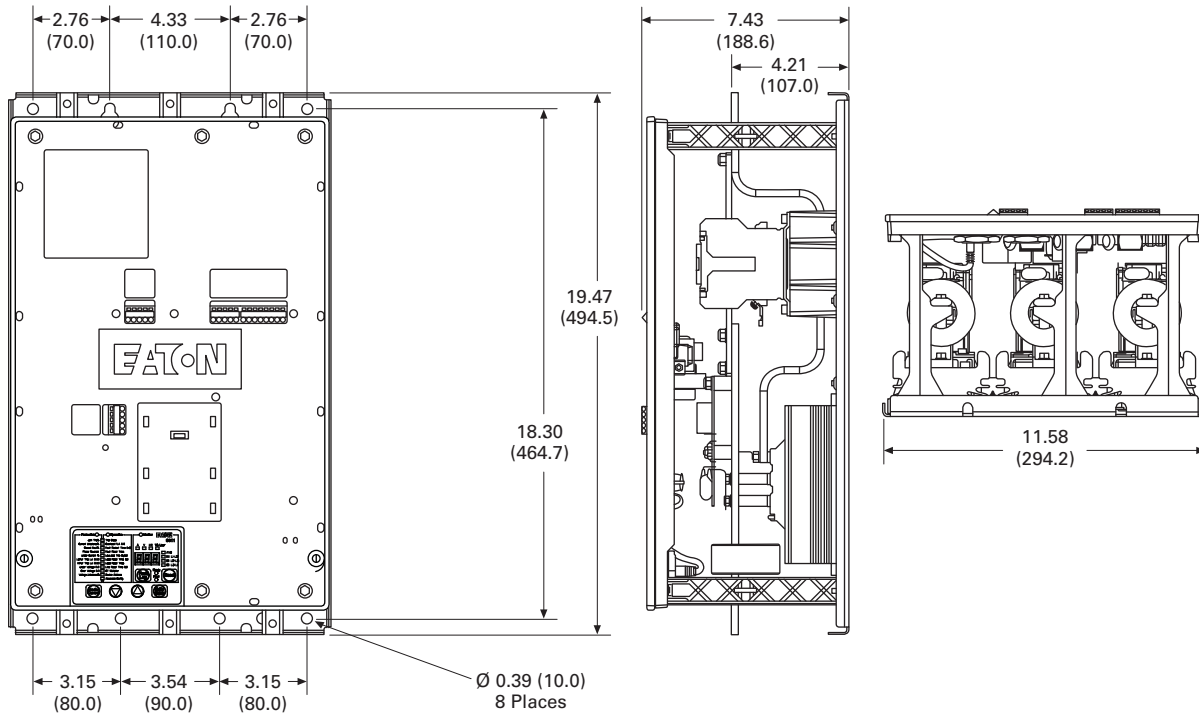
Soft Starters—S611, continued

Description		S611 Soft Starter (Partial Catalog Number)		
		S611E302	S611E361	S611F414
Max. current capacity	A	302	361	414
FLA range	A	151–302	180.5–361	207–414
Dimensions				
Width	inch (mm)	17.56 (446)	17.56 (446)	17.56 (446)
Height	inch (mm)	31.15 (791)	31.15 (791)	31.15 (791)
Depth	inch (mm)	9.54 (242)	9.54 (242)	9.54 (242)
Weight	lb (kg)	86 (39)	86 (39)	102 (46)
General Information				
Bypass mechanical lifespan		10M	10M	10M
Insulating voltage	V	660	660	660
Ramp time range	Seconds	0.5–180	0.5–180	0.5–180
Vibration resistance—non-operating	g	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units	3g up to 242A units, 2g on 302A to 414A units
Vibration resistance—operating	g	1	1	1
Shock resistance	g	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units	15g up to 242A units, 5g on 302A to 414A units
Electrical Information				
Operating voltage	V	130–600	130–600	130–600
Operating frequency	Hertz	47–63	47–63	47–63
Overload setting (frame)	% FLA	50–100	50–100	50–100
Trip class		5, 10, 20, 30	5, 10, 20, 30	5, 10, 20, 30
Cabling Capacity (IEC 947)				
Number of conductors		2	2	2
Wire sizes	AWG	2–600 kcmil	2–600 kcmil	2–600 kcmil
Type of connectors		Lug	Lug	Lug
Control Wiring				
Wire sizes	AWG	22–12	22–12	22–12
Number of conductors		2 (or one 12–14 AWG)	2 (or one 12–14 AWG)	2 (or one 12–14 AWG)
Torque requirements	lb-in	3.5	3.5	3.5
Maximum size	AWG	12	12	12
Control Power Requirements				
Voltage range (120V ±10%)	V	108–132	108–132	108–132
Steady state current	A	0.75	0.75	0.75
Inrush current	A	1	1	1
Ripple	%	1	1	1
Relays (1) Class A and C				
Voltage AC—maximum	V	120	120	120
Voltage DC—maximum	V	24	24	24
Amps—maximum	A	3	3	3
Environment				
Temperature—operating	°C	–20° to 50°C	–20° to 50°C	–20° to 50°C
Temperature—storage	°C	–40° to 85°C	–40° to 85°C	–40° to 85°C
Altitude	Meters	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m	<2000m, derate 0.5% per 100m >2000m
Humidity	%	<95% non-condensing	<95% non-condensing	<95% non-condensing
Operating position		Vertical, line side up	Vertical, line side up	Vertical, line side up
Pollution degree IEC947-1		3	3	3
Impulse withstand voltage IEC947-4-1	V	6000	6000	6000

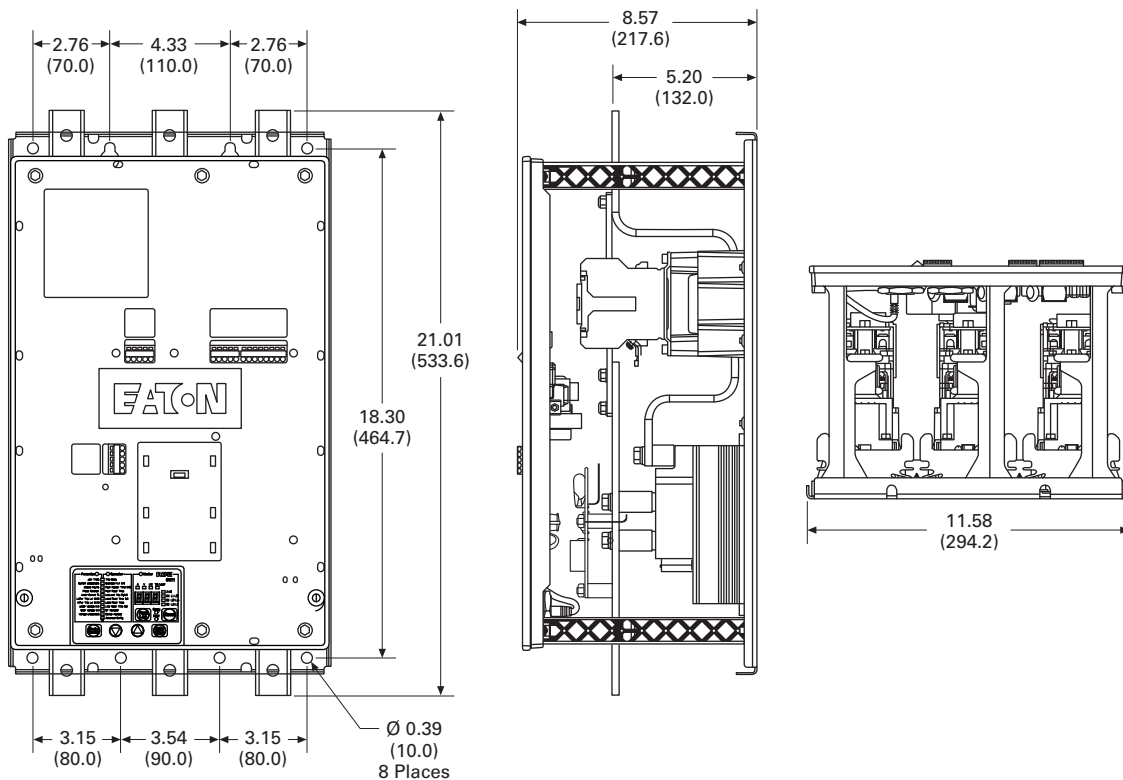
Dimensions

Approximate Dimensions in inches (mm)

A and B Frame



C and D Frame



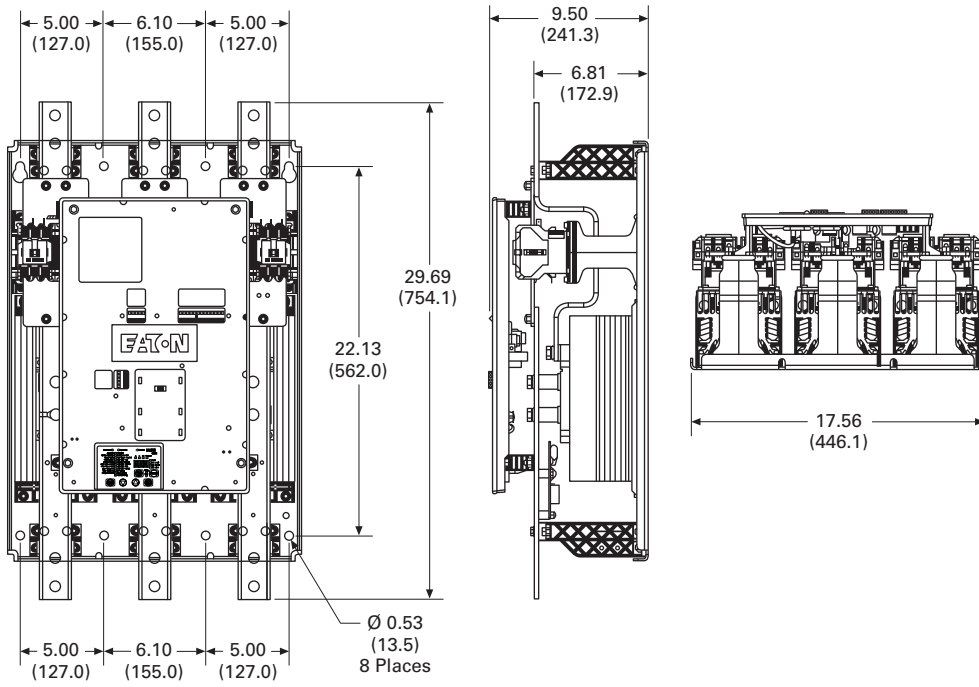
17.6

Technical Data and Specifications

Reduced Voltage Starters

Approximate Dimensions in inches (mm)

E and F Frame



Operation

Starting and Stopping Modes

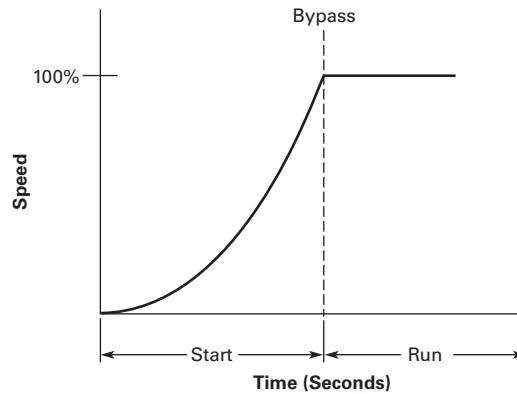
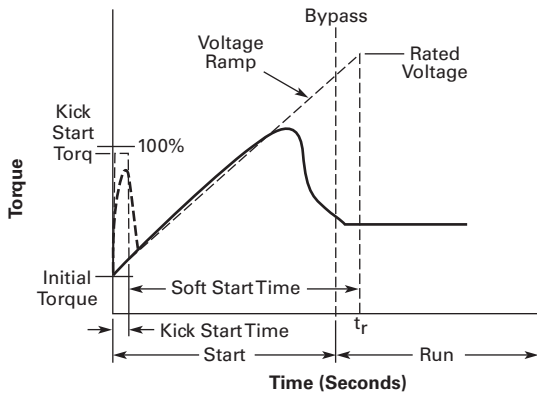
The S611 has a variety of starting and stopping methods to provide superior performance in the most demanding applications. The motor can be started in either Voltage Ramp Start or Current Limit Start mode. Kick Start and Soft Stop are available within both starting modes.

Voltage Ramp Start

Provides a voltage ramp to the motor resulting in a constant torque increase. The most commonly used form of soft start, this start mode allows you to set the initial torque value and the duration of the ramp to full voltage conditions. Bypass contactors close after ramp time.

- Adjustable initial torque 0–85% of locked rotor torque
- Adjustable ramp time 0.5–180 seconds (can be extended with factory modification)

Starting Characteristics—Ramp Start



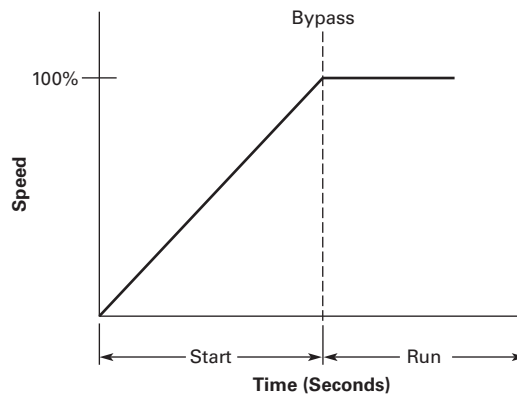
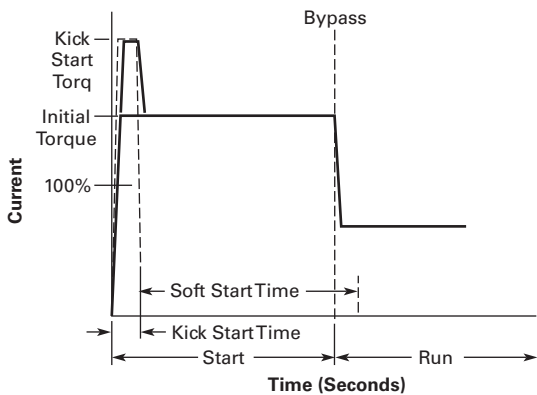
Current Limit Start

Limits the maximum current available to the motor during the start phase. This mode of soft starting is used when it becomes necessary to limit the maximum starting current due to long start times or to protect the motor. This start

mode allows you to set the maximum starting current as a percentage of locked rotor current and the duration of the current limit. Bypass contactors close after current limit time.

- Maximum current of 0–85% locked rotor current
- Adjustable ramp time 0.5–180 seconds (can be extended with factory modification)

Starting Characteristics—Current Limit Start



17.6 Technical Data and Specifications

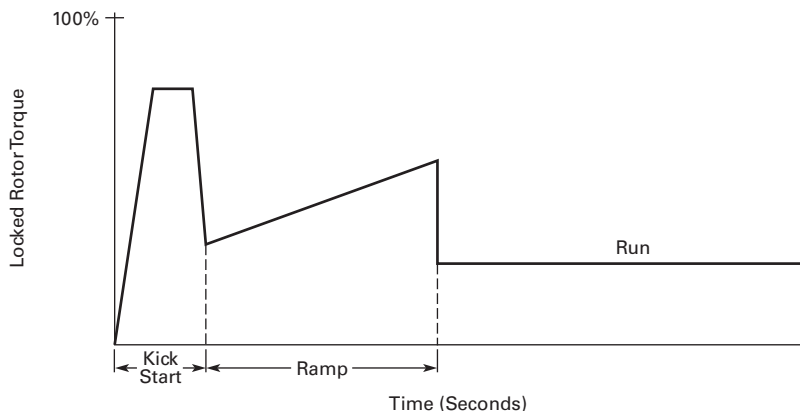
Reduced Voltage Starters

Kick Start

Selectable feature in both Voltage Ramp Start and Current Limit Start modes. Provides a current and torque “kick” for 0 to 2.0 seconds. This provides greater initial current to develop additional torque to breakaway a high friction load.

- 0–85% of locked rotor torque
- 0–2.0 seconds duration

Starting Characteristics—Kick Start

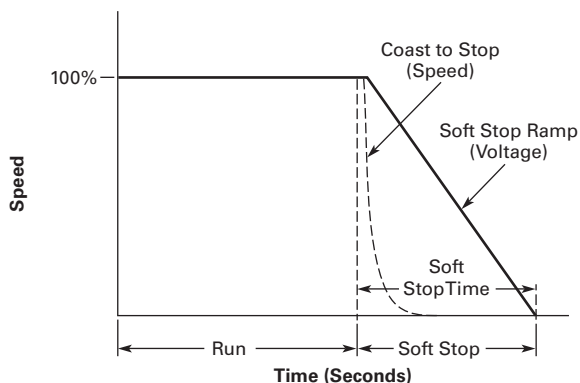


Soft Stop

Allows for a controlled stopping of a load. Used when a stop-time that is greater than the coast-to-stop time is desired. Often used with high friction loads where a sudden stop may cause system or load damage.

- Stop time = 0–60 seconds

Starting Characteristics—Soft Stop



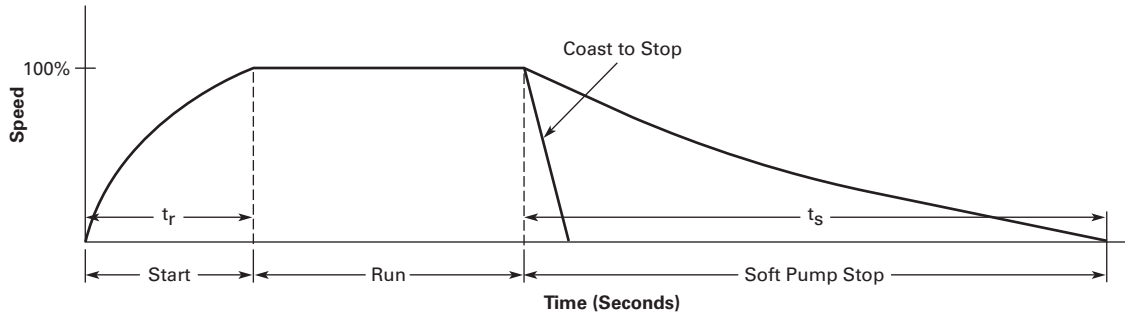
Pump Control Option

This option is intended to reduce the potential for water hammer in a centrifugal pump system by using a starting and stopping algorithm developed for pump control. Upon a start command, the speed of the motor is

increased, under the control of the S611 soft starter microprocessor, to achieve a gentle start. After the speed has reached its nominal value, the bypass contactors close and the pump operates as with any other starter.

Upon a stop command, the bypass contactors are opened and the motor speed is decreased in a tapered manner, to gradually slow the flow until the motor is brought to a stop.

Pump Control Option



Edge and Level Sensing Control

Edge or Level Sensing is selected with the Start Control parameter in the Advanced Configuration Menu. Factory default is Level Sensing.

Edge Sensing

Edge sensing requires 120 Vac power be momentarily applied to the Start terminal (with the Permissive terminal 120 Vac) to initiate a start under all conditions. After a stop or fault occurs, the 120 Vac must be reapplied to the start terminal before another start can occur. This control configuration should be used when restarting of the motor after a fault or stop must be supervised manually or as a part of a control scheme. The cycling of 120 Vac power to the Permissive terminal before starting is required regardless of the position of the auto reset parameter.

Level Sensing

Level sensing will enable a motor to restart after a fault is cleared without cycling 120V AC to the Permissive terminal as long as:

- Permissive terminal is supplied with 120 Vac
- The auto reset parameter is set to enabled
- All faults have cleared or have been reset

This control configuration should be used where it is desirable to restart a motor after a fault without additional manual or automatic control. An example of this condition would be on a remote pumping station where it is desirable to automatically restart a pump after a power outage without operator intervention.

Note: If the auto reset feature is used, CAUTION must be exercised to assure that any restart occurs in a safe manner.

17.6 Technical Data and Specifications

Reduced Voltage Starters

Features and Benefits

- The User Interface Module (UI) provides an intuitive, easy-to-use human interface with powerful configuration capabilities to maximize system performance
- Door or device mounted UI enables users to safely configure, commission, monitor and troubleshoot the system at the electrical panel without opening the enclosure door, eliminating the possibility of an arc flash incident
- System operating parameters can be monitored enterprise-wide through a communications network. Increase uptime by providing data for process management and preventive diagnostics
- Run bypass mode greatly reduces internal heating created by the greater power dissipation in the SCRs. Bypass contactors directly connect the motor to the line and improves system efficiency by reducing internal power losses
- Internal solid-state overload protection provides accurate current measurement and trip settings. Sophisticated algorithms solve a series of differential equations that model true motor heating and cooling, resulting in superior motor overload protection while minimizing nuisance trips. Advanced selectable protective features safeguard the motor and system against a variety of system faults
- Internal run bypass contactors and overload protection eliminate the need for additional devices, reducing enclosure sizes minimizing installation and wiring time and reducing overall assembly size and cost
- Wide range of overload FLA settings (50–100% of rated frame current) and a selectable trip class (5–30) offers users the flexibility to fine tune the starter to match specific application requirements
- Variable ramp times and torque control settings provide unlimited starting configurations, allowing for maximum application flexibility
- Kick-start feature enables soft starting of high friction loads
- Soft stop control for applications where an abrupt stop of the load is not acceptable
- Pump control option with sophisticated pump algorithms on both starting and stopping that minimize the pressure surges that cause water hammer. The pump control option will maximize the life of the pump and piping systems while minimizing the downtime caused by system failure
- Six SCRs control all three motor phases, providing smooth acceleration and deceleration performance
- Soft acceleration and deceleration reduces wear on belts, gears, chains, clutches, shafts and bearings
- Reduce the peak inrush current's stress on the power system
- Minimize peak starting torque to diminish mechanical system wear and damage
- 120 Vac control voltage enhances ease of connections
- The S611 lends itself to serviceability. The PCBs and contactors can be replaced in the field

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Protective Features

All protective features can be configured, enabled or disabled with the UI or through the communications network.

Motor Overload

The S611 includes electronic overload protection as standard. The overload meets applicable requirements for a motor overload protective device. The overload protects the motor from over heat conditions with the use of sophisticated algorithms that model true motor heating, resulting in superior motor protection and fewer nuisance trips.

The S611 calculates a thermal memory value. A 100% value represents the maximum safe temperature of the motor. When the thermal memory value reaches 100%, an overload trip will occur removing power to the motor.

Upon trip, the S611 stores the calculated motor heating value and will not allow a motor re-start until the motor has cooled. This feature ensures the motor will not be damaged by repeated overload trip, reset and re-start cycles.

The thermal memory value can be monitored through the UI or the communications network. The thermal memory value can be of great use in determining an impending overload trip condition. Alarms can be implemented in the process monitoring system warning of an impending trip before a trip occurs halting the process. Costly system downtime can be avoided.

The trip current is adjusted to match the specific application requirements by entering the motor nameplate full load current rating and trip class. The FLA adjustment includes a 2 to 1 adjustment range. The overload trip class is adjustable from class 5 through class 30. The overload is ambient temperature compensated - meaning its trip characteristics will not vary with changes in ambient temperature. The overload protection can be enabled, disabled, or disabled on start.

Short Circuit

The use of a short circuit protective device in coordination with the S611 is required in branch motor circuits by most electrical codes. Short circuit coordination ratings with both fuses and Eaton molded case circuit breakers are available providing customers with design flexibility. The S611 has short circuit coordination ratings as an open component, an enclosed starter, and in a motor control center. The short circuit ratings can go up to 100KA.

Jam

Excessive current and torque up to locked rotor levels can occur in a jam condition. The condition can result in stress and damage to the motor, load, mechanical system, and the electrical distribution system. Jam protection prevents the stress and damage from a jam during normal run. After the motor is started, a current greater than 300% FLA setting will cause the starter to trip on a jam fault.

Stall

Excessive current and torque up to locked rotor levels can occur in a stall condition. The condition can lead to an overload trip and result in stress and damage to the motor, load, mechanical system, and the electrical distribution system. Stall protection prevents stress and damage to a motor that has not come up to speed, or stalled after the soft start time. The S611 will trip to protect the system in the event that the motor did not get to the rated speed in the defined soft start period. A current greater than 200% FLA at the end of the soft start period will cause the starter to trip on a stall fault.

Pole Over Temperature

High ambient temperatures, extended ramp times and high duty cycle conditions may cause the S611 power pole conductors to reach a temperature that exceeds their thermal rating. The S611 is equipped with sensors that monitor the temperature of the power poles. Over temperature protection occurs if the device's thermal capacity is exceeded. The soft starter will trip in over temperature conditions, preventing device failure.

The device pole temperature value can be monitored through the UI or the communications network. This feature can be of use in determining an impending over temperature trip condition. Alarms can be implemented in the process monitoring system warning of an impending trip before a trip occurs, halting the process. Costly system shutdown can be avoided.

Phase Loss

Loss of a phase can cause a significant increase in the current drawn in the remaining two phases. Phase loss can lead to motor damage before an eventual overload trip occurs. Phase loss is typically an indication of a failure in the electrical distribution system. The S611 will detect a phase loss and trip if any phase current drops below a preset value. The phase loss trip level is adjustable from 0% to 100% of the average of the other two phase levels with an adjustable trip delay of 0.1 to 60 seconds.

Phase Imbalance

Phase current or voltage imbalance can cause a significant increase in the current drawn in the remaining two phases. Phase imbalance can lead to motor damage before an eventual overload trip. Phase imbalance is typically an indication of a failure in the electrical distribution system or the motor. The S611 will detect both current and voltage phase imbalances and trip if any phase becomes imbalanced as compared to the average of the other two phases.

The phase current imbalance trip level is adjustable from 0% to 100% of the average of the current in the other two phases with an adjustable trip delay of 0.1 to 60 seconds.

The phase voltage imbalance trip level is adjustable from 0% to 100% of the average of the voltage in the other two phases with an adjustable trip delay of 0.1 to 60 seconds.

Reset Mode

The S611 can be set up for automatic or manual reset on trip. The manual reset mode requires the operator to physically press the RESET button located on the soft starter. The overload can be manually reset through the UI or through the communications network.

The automatic reset mode allows the soft starter to be automatically reset as soon as the trip condition is no longer present. With the automatic reset mode, after the fault is no longer present, the motor will be restarted as soon as a valid start signal is present.

Phase Reversal

The S611 can determine if the proper line phase sequence is present by default. The device will trip if the line phase sequence is something other than A-B-C. The S611 can be configured to operate under reversed phase conditions (A-C-B).

Shorted SCR Detection

The S611 monitors the operation of the power poles and will trip under a shorted SCR condition.

Open SCR Detection

The S611 monitors the operation of the power poles and will trip under an open SCR condition.

Low Current

Low current conditions can be a result of a loss of load or a failure in the mechanical system. The S611 has low current protection that will trip if the average RMS current falls below a preset value. The low current protection can be programmed as a percent of motor FLA from 0% to 100%.

Low Voltage

Low voltage conditions can result from disturbances in the electrical power distribution system. Low voltage conditions can cause a malfunction and damage to electrical equipment. The S611 has low voltage protection that will trip if the average RMS voltage falls below a preset value. The low voltage protection can be programmed as a percent of nominal voltage from 1% to 99% with a trip delay of 0.1 to 60 seconds.

High Voltage

High voltage conditions can result from disturbances in the electrical power distribution system. High voltage conditions can cause malfunctions or failures of electrical equipment. The S611 has high voltage protection that will trip if the average RMS voltage is greater than a preset value. The high voltage protection can be programmed as a percent of nominal voltage from 101% to 120% with a trip delay of 0.1 to 60 seconds.

Monitoring Capabilities

The S611 has an impressive array of system monitoring capabilities that allow users to access real time process and diagnostic data. This data can be viewed at the device with the UI or through a communications network. Data over a communications network can provide valuable insight into the condition of the equipment and processes. Maintenance and production personnel can

monitor critical operational and maintenance data from a central control station that can be located far away from the production facility. Process data can be monitored to determine system anomalies that may indicate a need for preventive maintenance or an Impeding failure.

Adjustments made through the communications network can reduce costs by minimizing

the time traveling to the location where the motor controls are located. When faults do occur, real time fault data can assist maintenance in troubleshooting and planning repair resources. Remote reset signals can be given to tripped devices without the need for manual intervention by maintenance personnel.

Average Line Current

Provides the average of the three phase RMS line currents in amps, accurate to within 2%. Current data can be used to indicate a need for maintenance. Increased currents in a fixed load application can indicate a reduction in system efficiencies and performance, signifying system maintenance is due.

Average Pole Current

Provides the average of the three phase RMS pole currents in amps, accurate to within 2%. The pole current is the current through the soft starter. The line and pole current will be identical in in-line applications, and will differ in inside-the-delta applications.

Average Line Current as a % FLA

Provides the average RMS line current as a percentage of the S611 FLA setting.

Three-Phase Line Currents

Provides three RMS phase line currents in amps, accurate to within 2%. Imbalances or changes in the relative phase current to one another can indicate anomalies in the motor or electrical distribution system.

Three-Phase Pole Currents

Provides three RMS phase pole currents in amps, accurate to within 2%. The pole current is the current through the soft starter. The line and pole current will be identical in in-line applications.

Three-Phase Line Voltages

Provides the individual RMS three phase line voltages. Imbalances or changes in the relative phase voltage to one another can indicate anomalies in the motor or electrical distribution system. Voltage can be used to monitor electrical distribution system performance. Warnings, alarms and system actions to low or high voltage conditions can be implemented.

Percent Thermal Memory

Provides the real time calculated thermal memory value. The S611 calculates thermal memory value. A 100% value represents the maximum safe temperature of the motor. When the thermal memory value reaches 100%, an overload trip will occur, removing power to the motor.

The thermal memory value can be of great use in determining an impending overload trip Condition. Alarms can be implemented in the process monitoring system warning of an Impending trip before a trip occurs, halting the process. Costly system downtime can be avoided.

Pole Temperature

Increases in pole temperature are caused by increases in ambient temperature, start/stop times and start duty cycles. Changes in pole temperatures represent a change in system operating conditions. Identifying unexpected operating conditions or changes can prompt maintenance and aid in process evaluation activities.

Power Monitoring

S611 can monitor power and it can be displayed on the UI.

Start Count

Number of starts are stored in the device and can be displayed using field bus.

Diagnostics

Fault Queue

Current fault and a fault queue containing the last nine system faults can be read through the UI or communications network. Fault identification can minimize troubleshooting time and cost and prevent arc flash incidents. The fault queue can be remotely accessed through a communications network to assist in planning maintenance resources. 30 different faults can be identified by the S611.

Control Status

The S611 provides data that represents system conditions that can be read through the UI or the communications network. This data identifies the status of the system and the control commands the system is requesting of the S611. This can be used for advanced Troubleshooting and system integration activities.

Field Serviceability

In the case of maintenance, the S611 provides easy access and replacement of key components including control board and internal bypass contactors—significantly increasing its service life. If a component ever needs to be replaced, this straightforward operation can be completed by an end-user without the need to call in an outside service technician or engineer. These components are stocked and available for order and quick fulfillment—ensuring your operation continues with minimal downtime.

Standards and Certifications

- IEC 60947-4-2
- UL listed
- CSA certified (3211 06)



Instructional Leaflets

- Instruction Manual: MN03902011E
- Quick Start Guide: MN03901003E

S801+/S811+ Solid-State Soft Starters

Furnish as indicated Eaton Class ECS combination starters manufactured by Eaton's electrical sector or approved equal. All starters shall be UL listed and conform to the latest IEC and NEMA Standards and the National Electric Code.

S801+ Soft Starter

Description	Catalog Number
Non-combination	ECS90
Disconnect switch	ECS91
Circuit breaker	ECS92

S811+ Soft Starter

Description	Catalog Number
Non-combination	ECS93
Disconnect switch	ECS94
Circuit breaker	ECS95

General

- All motor starters shall be fully rated SCR devices up to 1000 amperes, with an adjustable ramp time up to 360 seconds as either current limit or torque, an initial torque kick start adjustable from 0–85% and soft stop adjustable up to 60 seconds
- Overload relays shall be solid-state and provide motor protection accuracy to 2%. Phase loss and phase unbalance protection shall be included as standard. The overload relay shall be heaterless and capable of selecting Class 10, 20 or 30 protection. Full-load current settings shall be set with dial settings or control interface module
- 24 Vdc power supplies are supplied as standard and are available with primary ratings from 480–120 Vac and have ratings available from 10–160 watts. Power supplies are equipped with a built-in short-circuit protection
- Control circuit transformers, where specified, shall be encapsulated. Primary and secondary fusing shall be provided. Unless otherwise specified, the secondary shall be 120 Vac. 100 VA is minimum
- Pilot devices, where specified, shall be oiltight and mounted in the flange. Pilot lights shall be transformer type for longer lamp life. Pilot device legend plates shall be engraved aluminum
- Running bypass contactor shall be supplied integral to the soft starter and capable of handling full load amperage
- Option available for full-voltage emergency bypass contactor
- S801+/S811+ shall have built-in communication port to enable control network connectivity
- S811+ shall have a removable digital interface module allowing access to monitor and adjust all parameters. DIM shall be an LCD display
- S801+ shall have a removable control interface module allowing adjustments to Class, FLA, ramp time, stop time, initial torque and protective features

Enclosure

- Enclosures shall be Type 1, 3R, 4, 4X, 7/9 or 12, as scheduled
- The operating mechanism shall be mounted on the flange and shall have positive, non-teasing ON/OFF action. The handle shall be color-coded: red for ON and black for OFF
- The operating handle shall have a means to lock the handle in the OFF position with a minimum of three standard padlocks having 1/4 in diameter shackles
- The enclosure sub-panel shall be easily removed without disturbing the operating mechanism
- Enclosures shall have means for locking the cover

Short-Circuit Protective Device**Disconnect Switch**

- Where specified, a disconnect switch with double break, rotary blades and quick make/quick break action shall be provided
- A line shield with test probe holes for inspection shall be provided. The shield shall be removable

- The switch shall have readily visible blades in the open (OFF) position
- The fusible disconnect switch (through 100A) shall have built-in fuse pullers to make it easier to remove fuses

Circuit Breaker

- Where specified, an adjustable instantaneous trip, magnetic only circuit breaker shall be provided
- A manual push-to-trip button shall be provided to exercise the trip unit

Short-Circuit Rating

- Fusible disconnect switches shall be UL listed for 100,000 amperes available when Class R fuses are used
- Combination starters with adjustable instantaneous trip, magnetic only circuit breakers shall be UL listed for 100,000 amperes available through 480 Vac

Technical Data and Specifications

Soft Starters—S801+

Description	S801+N37N3S	S801+N66N3S	S801+R10N3S	S801+R13N3S
Max. current capacity	37	66	105	135
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage Ui	660V	660V	660V	660V
Ramp time range	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)				
Number of conductors	1	1	1	1
Wire sizes	14–2	14–2	14–4/0	14–4/0
Type of connectors	Box lug	Box lug	Box lug	Box lug
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.0	1.0
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Soft Starters—S801+, continued

Description	S801+T18N3S	S801+T24N3S	S801+T30N3S	S801+U36N3S ①②
Max. current capacity	180	240	304	360
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage U_i	660V	660V	660V	660V
Ramp time range	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)				
Number of conductors	1 or 2	1 or 2	1 or 2	1 or 2
Wire sizes	4 AWG to 500 kcmil	4 AWG to 500 kcmil	4 AWG to 500 kcmil	4 AWG to 500 kcmil
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.0	1.0
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Notes

① 801+U50N3S unit does not have IEC certification.

② UL recognized component.

Soft Starters—S801+, continued

Description	S801+U42N3S	S801+U50N3S ①	S801+V36N3S	S801+V42N3S
Max. current capacity	420	500	360	420
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage U _i	660V	660V	660V	660V
Ramp time range	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)				
Number of conductors	1 or 2	1 or 2	2, 4 or 6	2, 4 or 6
Wire sizes	4 AWG to 500 kcmil	4 AWG to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.4	1.4
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Note

① 801+U50N3S unit does not have IEC certification.

Soft Starters—S801+, continued

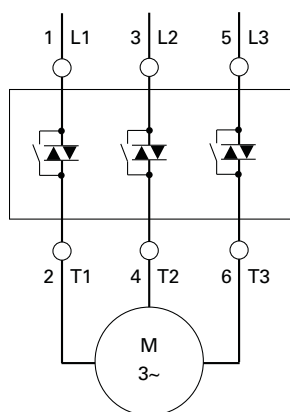
Description	S801+V50N3S	S801+V65N3S	S801+V72N3S	S801+V85N3S	S801+V10N3S ^①
Max. current capacity	500	650	720	850	1000
Dimensions					
Width in inches (mm)	11.03 (280.2)	11.03 (280.2)	11.03 (280.2)	11.03 (280.2)	11.03 (280.2)
Height in inches (mm)	16.57 (420.8)	16.57 (420.8)	16.57 (420.8)	16.57 (420.8)	16.57 (420.8)
Depth in inches (mm)	7.23 (183.7)	7.23 (183.7)	7.23 (183.7)	7.23 (183.7)	7.23 (183.7)
Weight in lbs (kg)	103 (46.8) with lugs 91 (41.4) without lugs	103 (46.8) with lugs 91 (41.4) without lugs	103 (46.8) with lugs 91 (41.4) without lugs	103 (46.8) with lugs 91 (41.4) without lugs	103 (46.8) with lugs 91 (41.4) without lugs
General Information					
Bypass mechanical lifespan	10M	10M	10M	10M	10M
Insulating voltage U _i	660V	660V	660V	660V	660V
Ramp time range	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds	0.5–180 seconds
Resistance to vibration	3g	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g	15g
Electrical Information					
Operating voltage	200–600V	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)					
Number of conductors	2, 4 or 6	2, 4 or 6	2, 4 or 6	2, 4 or 6	2, 4 or 6
Wire sizes	2/0 to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)					
Wire sizes in AWG	22–14	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31	3.31
Control Power Requirements					
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.4	1.4	1.4	1.4	1.4
Inrush current amps	10	10	10	10	10
Ripple	1%	1%	1%	1%	1%
Relays (1) Class A and C					
Voltage AC—maximum	240	240	240	240	240
Voltage DC—maximum	120	120	120	120	120
Amps—maximum	3	3	3	3	3
Environment					
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V	6000V

Note

① UL recognized component.

Wiring Diagrams

Line Connected Soft Starter



Dimensions

Approximate Dimensions in Inches (mm)

Soft Starters—S801+

Catalog Number	W	H	D	Weight in Lbs (kg)
S801+N37N3S	2.66 (67.6)	7.37 (187.2)	6.45 (163.9)	5.8 (2.6)
S801+N66N3S	2.66 (67.6)	7.37 (187.2)	6.45 (163.9)	5.8 (2.6)
S801+R10N3S	4.38 (111.3)	7.92 (201.1)	6.64 (168.6)	10.5 (4.8)
S801+R13N3S	4.38 (111.3)	7.92 (201.1)	6.64 (168.6)	10.5 (4.8)
S801+T18N3S	7.65 (194.4)	12.71 (322.9)	6.47 (164.4)	48 (21.8) with lugs 41 (18.6) without lugs
S801+T24N3S	7.65 (194.4)	12.71 (322.9)	6.47 (164.4)	48 (21.8) with lugs 41 (18.6) without lugs
S801+T30N3S	7.65 (194.4)	12.71 (322.9)	6.47 (164.4)	48 (21.8) with lugs 41 (18.6) without lugs
S801+U36N3S	7.73 (196.3)	12.72 (323.1)	7.16 (181.8)	48 (21.8) with lugs 41 (18.6) without lugs
S801+U42N3S	7.73 (196.3)	12.72 (323.1)	7.16 (181.8)	48 (21.8) with lugs 41 (18.6) without lugs
S801+U50N3S	7.73 (196.3)	12.72 (323.1)	7.16 (181.8)	48 (21.8) with lugs 41 (18.6) without lugs
S801+V36N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S801+V42N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S801+V50N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S801+V65N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S801+V72N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S801+V85N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S801+V10N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs

17.6

Technical Data and Specifications

Reduced Voltage Starters

Operation

Overload Functionality

Overtemperature

Protects the device from overheating. Starter will shut down at 100°C.

Stall

Selectable protective feature, unit trips to protect system in event motor can not get to rated speed in the defined ramp period.

Jam

Selectable protective feature, unit trips to prevent damage to motor during normal run.

Phase Loss

Selectable protective feature, trips under voltage loss condition to any phase.

Phase Reversal

Selectable protective feature, trips when phase rotation is something other than A-B-C.

Kick Start

Selectable feature that provides a current "kick" of up to 550% of full load current for 0 to 2.0 seconds. This provides the additional torque required at startup to break free a motor.

Ramp Start

Provides a constant increase in torque to the motor.

Current Limit Start

Limits the maximum current available to the motor during the startup phase.

Soft Stop

Allows for a controlled stopping of a frictional load.

Shorted SCR Detection

Monitors for shorted SCR in the power poles.

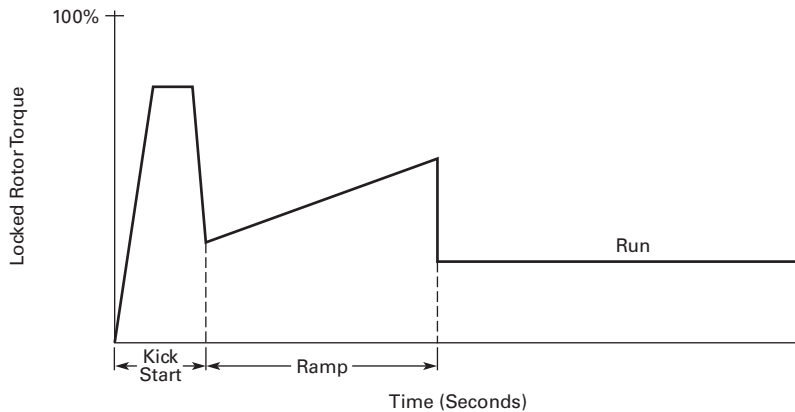
Starting Characteristics

Kick Start

Provides an initial boost of current to the motor to help overcome motor inertia and begin motor rotation.

- 0–85% of locked rotor torque
- 0–2.0 seconds duration

Starting Characteristics—Kick Start

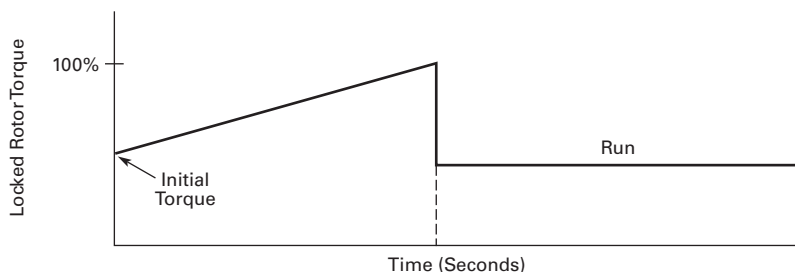


Ramp Start

The most commonly used form of soft start. This allows you to set the initial torque value (of the ramp) and then raises it to full voltage conditions.

- Adjustable initial torque = 0–85% of locked rotor torque
- Adjustable ramp time = 0.5–180 seconds

Starting Characteristics—Ramp Start

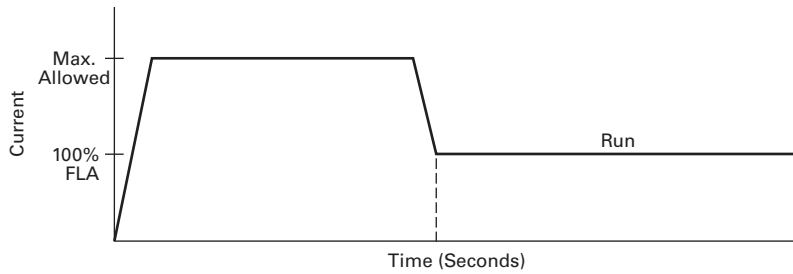


Current Limit

This mode of soft starting is used when it becomes necessary to limit the maximum starting current due to long start times or to protect the motor.

- Maximum current of 0–85% locked rotor current
- Adjustable ramp time = 0.5–180 seconds

Starting Characteristics—Current Limit

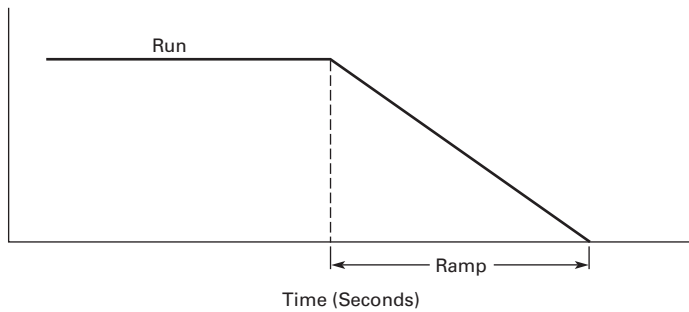


Soft Stop

Used when an extended coast-to-rest period is desired. Often used with high friction loads where a sudden stop may cause system or product damage.

- Stop time = 0–60 seconds

Starting Characteristics—Soft Stop



Technical Data and Specifications

Soft Starters—S811+

Description	S811+N37_	S811+N66_	S811+R10+	S811+R13_
Max. current capacity	37	66	105	135
FLA range	11–37	20–66	32–105	42–135
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage Ui	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)				
Number of conductors	1	1	1	1
Wire sizes	14–2	14–2	14–4/0	14–4/0
Type of connectors	Box lug	Box lug	Box lug	Box lug
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.0	1.0
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Soft Starters—S811+, continued

Description	S811+T18_	S811+T24_	S811+T30_	S811+U36_
Max. current capacity	180	240	304	360
FLA range	56–180	75–240	95–304	112–360
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage U_i	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)				
Number of conductors	1 or 2	1 or 2	1 or 2	1 or 2
Wire sizes	4 AWG to 500 kcmil	4 AWG to 500 kcmil	4 AWG to 500 kcmil	4 AWG to 500 kcmil
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.0	1.0
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Soft Starters—S811+, continued

Description	S811+U42_	S811+U50_ ①	S811+V36_	S811+V42_
Max. current capacity	420	500	360	420
FLA range	131–420	156–500	112–360	131–420
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage U _i	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)				
Number of conductors	1 or 2	1 or 2	2, 4 or 6	2, 4 or 6
Wire sizes	4 AWG to 500 kcmil	4 AWG to 500 kcmil	4 AWG to 500 kcmil	4 AWG to 500 kcmil
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.4	1.4
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Note

① S811+U50_ unit does not have IEC certification.

Soft Starters—S811+, continued

Description	S811+V50_	S811+V65_	S811+V72_	S811+V85_	S811+V10_ ①
Max. current capacity	500	650	720	850	1000
FLA range	156–500	203–650	225–720	265–580	320–1000
General Information					
Bypass mechanical lifespan	10M	10M	10M	10M	10M
Insulating voltage U _i	660V	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)	0.5–180 seconds (0.5–360 seconds S811+ Premium)
Resistance to vibration	3g	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g	15g
Electrical Information					
Operating voltage	200–600V	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30	5, 10, 20 and 30
Cabling Capacity (IEC 947)					
Number of conductors	2, 4 or 6	2, 4 or 6	2, 4 or 6	2, 4 or 6	2, 4 or 6
Wire sizes	2/0 to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil	2/0 to 500 kcmil
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)					
Wire sizes in AWG	22–14	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)	2 (or one AWG 12)
Torque requirements in lb-in	3.5	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31	3.31
Control Power Requirements					
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.4	1.4	1.4	1.4	1.4
Inrush current amps	10	10	10	10	10
Ripple	1%	1%	1%	1%	1%
Relays (1) Class A and C					
Voltage AC—maximum	240	240	240	240	240
Voltage DC—maximum	120	120	120	120	120
Amps—maximum	3	3	3	3	3
Environment					
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m	<2000m—consult factory for operation >2000m
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V	6000V

Note

① UR recognized product.

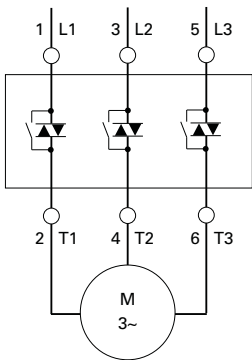
17.6

Technical Data and Specifications

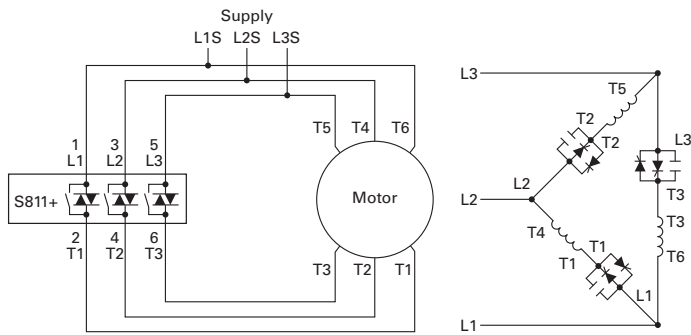
Reduced Voltage Starters

Wiring Diagrams

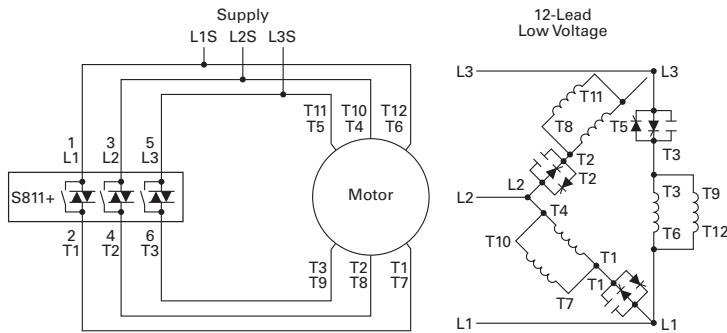
Line Connected Soft Starter



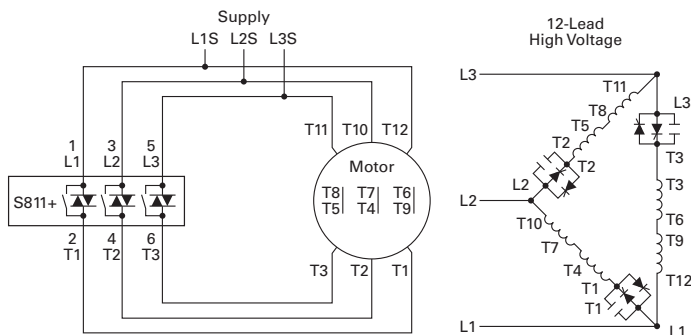
Inside-the-Delta Connected Soft Starter for a 6-Lead Motor



Inside-the-Delta Connected Soft Starter for a 12-Lead Low Voltage Motor



Inside-the-Delta Connected Soft Starter for a 12-Lead High Voltage Motor



Dimensions

Approximate Dimensions in Inches (mm)

Soft Starters—S811+

Catalog Number	W	H	D	Weight in Lbs (kg)
S811+N37N3S	2.66 (67.6)	7.37 (187.2)	6.45 (163.9)	5.8 (2.6)
S811+N66N3S	2.66 (67.6)	7.37 (187.2)	6.45 (163.9)	5.8 (2.6)
S811+R10N3S	4.38 (111.3)	7.92 (201.1)	6.64 (168.6)	10.5 (4.8)
S811+R13N3S	4.38 (111.3)	7.92 (201.1)	6.64 (168.6)	10.5 (4.8)
S811+T18N3S	7.65 (194.4)	12.71 (322.9)	6.47 (164.4)	48 (21.8) with lugs 41 (18.6) without lugs
S811+T24N3S	7.65 (194.4)	12.71 (322.9)	6.47 (164.4)	48 (21.8) with lugs 41 (18.6) without lugs
S811+T30N3S	7.65 (194.4)	12.71 (322.9)	6.47 (164.4)	48 (21.8) with lugs 41 (18.6) without lugs
S811+U36N3S	7.73 (196.3)	12.72 (323.1)	7.16 (181.8)	48 (21.8) with lugs 41 (18.6) without lugs
S811+U42N3S	7.73 (196.3)	12.72 (323.1)	7.16 (181.8)	48 (21.8) with lugs 41 (18.6) without lugs
S811+U50N3S	7.73 (196.3)	12.72 (323.1)	7.16 (181.8)	48 (21.8) with lugs 41 (18.6) without lugs
S811+V36N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S811+V42N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S811+V50N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S811+V65N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S811+V72N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S811+V85N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs
S811+V10N3S	11.05 (280.6)	16.57 (420.8)	7.39 (187.8)	103 (46.8) with lugs 91 (41.4) without lugs

17.6 Technical Data and Specifications

Reduced Voltage Starters

Communications

The S811+ has native Modbus RTU communication capabilities. The S811+ may be connected to a variety of networks, including DeviceNet™, Modbus TCP, EtherNet/IP and PROFIBUS.

The S811+ communication parameters can be configured with the DIM or through the Fieldbus using CH Studio Component Manager. Advanced communication configuration settings provide the system integrator with powerful tools to facilitate system optimization

Communications Reference

Description	Part Number
Modbus TCP Communication Adapter with 120 Vac I/O	C441U
Modbus TCP Communication Adapter with 24 Vdc I/O	C441V
EtherNet/IP Communication Adapter with 120 Vac I/O	C441U
EtherNet/IP Communication Adapter with 24 Vdc I/O	C441V
85–264 Vac input, 24 Vdc output	PSG240E
360–575 Vac input, 24 Vdc output	PSG240F

Operation

Starting and Stopping Modes

The S811+ has a variety of starting and stopping methods to provide superior performance in the most demanding applications. The motor can be started in either voltage ramp start or current limit start mode. Kick start and soft stop are available within both starting modes. The user has the option to configure two independent start ramp profiles to accommodate variations in starting requirements.

Voltage Ramp Start

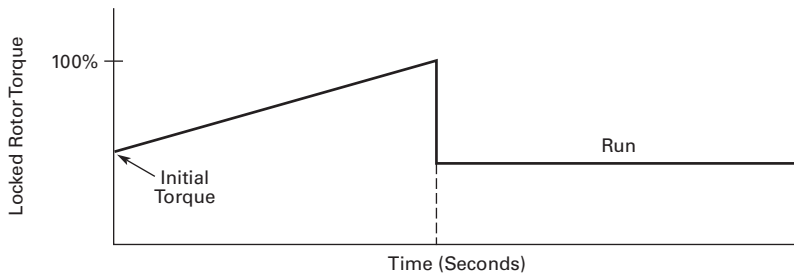
Provides a voltage ramp to the motor resulting in a constant torque increase. The most commonly used form of soft start, this start mode allows

you to set the initial torque value and the duration of the ramp to full voltage conditions. Bypass contactors close after ramp time.

- Adjustable initial torque 0–85% of locked rotor torque
- Adjustable ramp time 0.5–180 seconds (0.5–360 seconds with the S811+ Premium)

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Starting Characteristics—Ramp Start



Current Limit Start

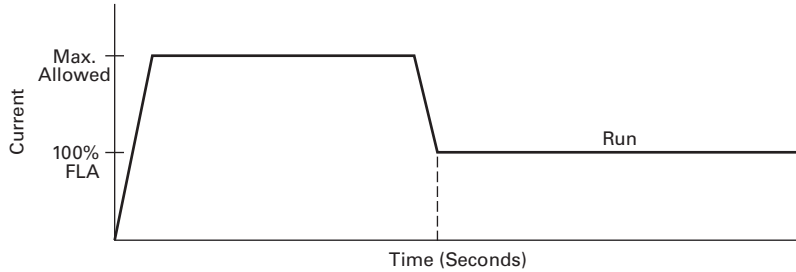
Limits the maximum current available to the motor during the start phase. This mode of soft starting is used when it becomes necessary to limit

the maximum starting current due to long start times or to protect the motor. This start mode allows you to set the maximum starting current as a

percentage of locked rotor current and the duration of the current limit. Bypass contactors close after current limit time.

- Maximum current of 0–85% locked rotor current
- Adjustable ramp time 0.5–180 seconds (0.5–360 seconds with the S811+ Premium)

Starting Characteristics—Current Limit Start



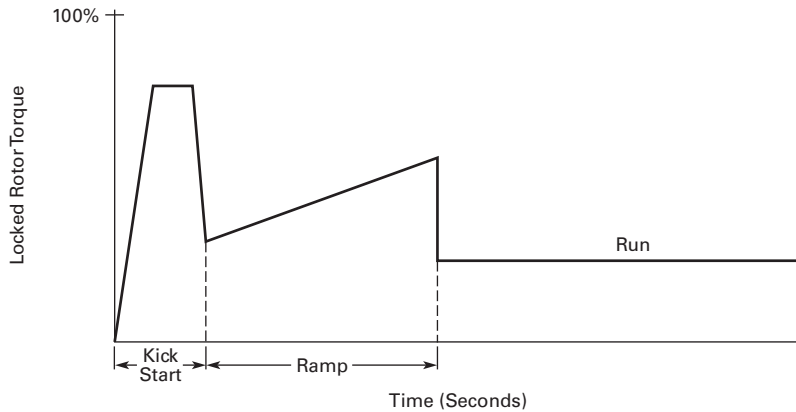
Kick Start

Selectable feature in both voltage ramp start and current limit start modes. Provides a current and torque “kick” for 0 to 2.0 seconds.

This provides greater initial current to develop additional torque to breakaway a high friction load.

- 0–85% of locked rotor torque
- 0–2.0 seconds duration

Starting Characteristics—Kick Start



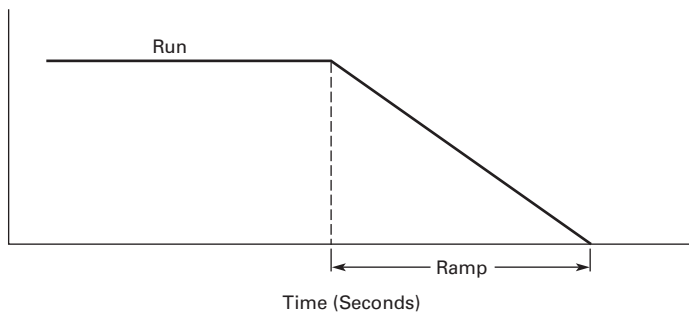
Soft Stop

Allows for a controlled stopping of a load. Used when a stop-time that is greater than the coast-to-stop

time is desired. Often used with high friction loads where a sudden stop may cause system or load damage.

- Stop time = 0–60 seconds

Starting Characteristics—Soft Stop



Edge and Level Sensing Control**Edge Sensing**

Edge sensing requires +24 Vdc power be momentarily applied to Control Terminal Block Pin 1 (with Terminal P at +24 Vdc) to initiate a start under all conditions. After a stop or fault occurs, the +24 Vdc must be removed, then reapplied to Terminal Pin 1 before another start can occur. This control configuration should be used when restarting of the motor after a fault or stop must be supervised manually or as a part of a control scheme. The cycling of +24 Vdc power to Terminal 1 Pin before starting is required regardless of the position of the auto reset switch on the DIM.

Level Sensing

Level sensing will enable a motor to restart after a fault is cleared without cycling +24 Vdc power to Terminal Pin 1 as long as:

- Terminal Pin P is supplied with +24 Vdc (to start from Control Terminal Block, Terminal Pin 3 must also be enabled)
- The auto reset switch on the DIM is set to enabled
- All faults have been reset

This control configuration should be used where it is desirable to restart a motor after a fault without additional manual or automatic control. An example of this condition would be on a remote pumping station where it is desirable to automatically restart a pump after a power outage without operator intervention.

Note: If the auto reset feature is used, CAUTION must be exercised to ensure that any restart occurs in a safe manner.

Features and Benefits

- Communication capabilities with various protocols
- The Digital Interface Module (DIM) provides an intuitive, easy-to-use human interface with powerful configuration capabilities to maximize system performance
- Door or device mounted DIM enables users to safely configure, commission, monitor and troubleshoot the system at the electrical panel without opening the enclosure door, eliminating the possibility of an arc flash incident
- System operating parameters can be monitored enterprise-wide through a communications network. Increase uptime by providing data for process management and preventive diagnostics
- Run internal bypass mode greatly reduces internal heating created by the greater power dissipation in the SCRs. Bypass contactor directly connects the motor to the line and improves system efficiency by reducing internal power losses
- Internal solid-state overload protection provides accurate current measurement and trip settings. Sophisticated algorithms solve a series of differential equations that model true motor heating and cooling, resulting in superior motor overload protection while minimizing nuisance trips. Advanced selectable protective features safeguard the motor and system against a variety of system faults
- Internal run bypass contactors and overload protection eliminate the need for additional devices, reducing enclosure sizes, minimizing installation and wiring time, and reducing overall assembly size and cost
- Wide range of overload FLA settings (31–100% of rated current) and a selectable trip class (5–30) offers users the flexibility to fine tune the starter to match specific application requirements
- Variable ramp times and torque control settings provide unlimited starting configurations, allowing for maximum application flexibility
- Kick-start feature enables soft starting of high friction loads
- Soft stop control for applications where an abrupt stop of the load is not acceptable
- The S811+ Premium with sophisticated pump control algorithms on both starting and stopping that minimize the pressure surges that cause water hammer. The pump control feature will maximize the life of the pump and piping systems while minimizing the downtime caused by system failure
- Six SCRs control all three motor phases, providing smooth acceleration and deceleration performance
- Soft acceleration and deceleration reduces wear on belts, gears, chains, clutches, shafts and bearings
- Reduce the peak inrush current's stress on the power system
- Manage peak starting torque to diminish mechanical system wear and damage
- 24 Vdc control voltage enhances personnel and equipment safety
- Removable, lockable control terminal block reduces maintenance costs. Also provides the opportunity for OEMs to reduce assembly and test costs by utilizing pre-assembled wire harnesses

Second Start Ramp Profile Capability

A second start ramp profile may be configured for the soft starter. This profile is independent of the primary profile and retains all the parameter options such as start time and initial torques. With a signal at a terminal programmed for this feature, the second profile may be selected by a pushbutton station or a network.

Alarm-No-Trip Functionality

Some applications require the ability to effectively disable most protections with the intent of enabling the RVSS unit to control a motor under the most severe operating conditions characterized by current or voltage imbalances, high or low value deviations, or other fault conditions. This function causes the S811+ to ignore most fault trip conditions and continue operation of the application.

Digital Interface Module (DIM) Cloning

For OEMs or other users that desire to load identical parameter settings into multiple RVSS units, the DIM may be used to extract and duplicate parameter settings from one RVSS and loaded into other units, saving time, effort, and reducing chances for errors while programming.

Motor Wiring Configuration User Selectable Inline or Inside-the-Delta

Mains Motor Wiring Configuration is accomplished by simply selecting the required configuration from a menu. This feature allows adaptability from one configuration to another without any additional programming operations and reduces inventory levels by not having to stock both configurations.

Modbus Native Communications Protocol

Modbus RTU communications is now standard on all S811+ units. This allows users to quickly configure the unit for network communications using a common protocol. Adapters are available for users who prefer to use EtherNet/IP or Modbus TCP protocols.

Programmable Control Terminal Block Functionality

Four programmable terminals on the S811+ enable the user to expand functionality with options such as a second start ramp profile, externally triggered trip or warning functions, analog inputs, and others, in addition to the normal start, stop, reset, and so on, functions.

Protective Features

All protective features can be configured, enabled or disabled with the DIM or through the communications network.

Motor Overload

The S811+ includes electronic overload protection as standard. The overload meets applicable requirements for a motor overload protective device. The overload protects the motor from over heat conditions with the use of sophisticated algorithms that model true motor heating, resulting in superior motor protection and fewer nuisance trips.

The S811+ calculates a thermal memory value based on the heat energy introduced into the motor during the start process. A 100% value represents the maximum safe internal temperature of the motor.

When the thermal memory value reaches 100%, an overload trip will occur removing power to the motor. Upon trip, the S811+ stores the calculated motor heating value and will not allow a motor re-start until the motor has a thermal memory value of less than 100%. This feature ensures the motor will not be damaged by repeated overload trip, reset and re-start cycles.

The thermal memory value can be monitored through the DIM or the communications network. The thermal memory value can be of great use in determining an impending overload trip condition. Alarms can be implemented in the process monitoring system warning of an impending trip before a trip occurs halting the process. Costly system downtime can be avoided.

The trip current is adjusted to match the specific application requirements by entering the motor nameplate full load current rating and trip class. The FLA parameter is adjustable from 32% to 100% of the unit's rated current. The overload trip class is adjustable from class 5 through class 30. The overload is ambient temperature compensated—meaning its trip characteristics will not vary with changes in ambient temperature. The overload protection can be enabled, disabled, or disabled on start.

Short Circuit

The use of a short-circuit protective device in coordination with the S811+ is required in branch motor circuits by most electrical codes. Short-circuit coordination ratings with both fuses and Eaton molded case circuit breakers are available providing customers with design flexibility. The S811+ has short-circuit coordination ratings as an open component, an enclosed starter, and in a motor control center.

External E-Stop

Emergency Stop functionality may be triggered from an external source. Removal of the 24 Vdc signal from a terminal configured for E-Stop will initiate an E-Stop action. The External E-Stop option is useful in applications where it is desirable to accomplish a motor shutdown in the event that an external condition(s) exist that will damage system components and/or product flows or operations.

External Trip

External Trip functionality may be triggered from an external source. Removal of the 24 Vdc signal from a terminal configured for External Trip will initiate an External Trip action. The External Trip option is useful in applications where it is desirable to accomplish a motor stop in the event that an external condition(s) exist that will damage system components and/or product flows or operations.

Fault Warning Functionality

Selected protection parameters may be assigned to provide a Fault Warning instead of a Fault Trip with user adjustable set points. When a Fault Warning condition is detected, the fault condition is reported via the DIM, network connection, or an auxiliary relay configured for this function. The soft starter remains in operation. At such time the fault condition no longer exists, the Fault Warning message will be extinguished.

External Warning

The S811+ will accept a Warning signal from an external source or device. In a fashion similar to the Fault Warning, the fault condition is reported via the DIM, network connection, or an auxiliary relay configured for this function. The soft starter remains in operation. At such time the fault condition no longer exists, the Fault Warning message will be extinguished.

Custom Fault/Warning Auxiliary Relays

Up to three fault and/or warning codes may be selected to operate an auxiliary relay configured to operate when any of these codes are detected. This option enables the user to provide external warnings or fault indications to increase monitoring effectiveness and to provide additional system control.

Motor Power

Motor Power can be not only be monitored, but trip levels can be adjusted to provide indications of system malfunctions or operating discrepancies. Both High and Low Power thresholds can be set to provide Fault Warning or Fault Trip functions. Additionally, fault delays times may be set to up to 60 seconds.

Analog Input

An input control terminal may be configured to accept a 0–20 mA DC signal with range scaling. This feature enables the S811+ to respond to an external device that may be monitoring a critical component or process and provides Fault Trip or Fault Warning capability to protect operating systems and processes.

Start Delay

Three start delay timers are available to enhance motor protection or to provide simple logic functions to coordinate motor control with other devices in the system. The timers will allow delays from 24 Vdc power up, receipt of a valid START command, or a delay in switch from one start ramp profile to another.

Jam

Excessive current and torque up to locked rotor levels can occur in a jam condition. The condition can result in stress and damage to the motor, load, mechanical system, and the electrical distribution system. Jam protection prevents the stress and damage from a jam during normal run. After the motor is in bypass, a current greater than 300% FLA setting will cause the starter to trip on a jam fault.

Stall

Excessive current and torque up to locked rotor levels can occur in a stall condition. The condition can lead to an overload trip and result in stress and damage to the motor, load, mechanical system, and the electrical distribution system. Stall protection prevents stress and damage to a motor that has not come up to speed during the soft start time. The S811+ will trip to protect the system in the event that the motor did not get to the rated speed in the defined soft start period. A current greater than 200% FLA at the end of the soft start period will cause the starter to trip on a stall fault.

Pole Over Temperature

High ambient temperatures, extended ramp times and high duty cycle conditions may cause the S811+ power pole conductors to reach a temperature that exceeds their thermal rating. The S811+ is equipped with sensors that monitor the temperature of the power poles. Over temperature protection occurs if the power pole's thermal capacity is exceeded. The soft starter will trip in over temperature conditions, preventing device failure.

Each power pole temperature value can be monitored through the DIM or the communications network. This feature can be of use in determining an impending over temperature trip condition.

When using a communications network, alarms can be implemented in the process monitoring system warning of an impending trip before the trip occurs, halting the process.

Phase Loss

Loss of a phase can cause a significant increase in the current drawn in the remaining two phases. Phase loss can lead to motor damage before an eventual overload trip occurs. Phase loss is typically an indication of a failure in the electrical distribution system. The S811+ will detect a phase loss and trip if any phase current drops below a preset value. The phase loss trip level is adjustable from 0% to 100% of the average of the other two phase levels with an adjustable trip delay of 0.1 to 60 seconds.

Phase Imbalance

Phase current or voltage imbalance can cause a significant increase in the current drawn in the remaining two phases. Phase imbalance can lead to motor damage before an eventual overload trip. Phase imbalance is typically an indication of a failure in the electrical distribution system or the motor. The S811+ will detect both current and voltage phase imbalances and trip if any phase becomes imbalanced as compared to the average of the other two phases.

The phase current imbalance trip level is adjustable from 0% to 100% of the average of the current in the other two phases with an adjustable trip delay of 0.1 to 60 seconds.

The phase voltage imbalance trip level is adjustable from 0% to 100% of the average of the voltage in the other two phases with an adjustable trip delay of 0.1 to 60 seconds.

Reset Mode

The S811+ can be set up for automatic or manual reset on trip. The manual reset mode requires the operator to physically press the RESET button located on the soft starter. The trip can be manually reset through the DIM or through the communications network. The trip can also be electrically reset by energizing a 24 Vdc input on the control terminal block.

The automatic reset mode allows the soft starter to be automatically reset as soon as the trip condition is no longer present. With the automatic reset mode, after the fault is no longer present, the motor will be restarted as soon as a valid start signal is present.

Phase Reversal

The S811+ can determine if the proper line phase sequence is present by default. The device will trip if the line phase sequence is something other than A-B-C. The S811+ can be configured to operate under reversed phase conditions (A-C-B).

Shorted SCR Detection

The S811+ monitors the operation of the power poles and will trip under a shorted SCR condition.

Open SCR Detection

The S811+ monitors the operation of the power poles and will trip under an open SCR condition.

Low Current

Low current conditions can be a result of a loss of load or a failure in the mechanical system. The S811+ has low current protection that will trip if the average rms current falls below a preset value. The low current protection can be programmed as a percent of motor FLA from 0% to 100%.

Low Voltage

Low voltage conditions can result from disturbances in the electrical power distribution system. Low voltage conditions can cause a malfunction and damage to electrical equipment. The S811+ has low voltage protection that will trip if the average rms voltage falls below a preset value. The low voltage protection can be programmed as a percent of nominal voltage from 1% to 99% with a trip delay of 0.1 to 60 seconds to accommodate short temporary voltage drops during the start process.

High Voltage

High voltage conditions can result from disturbances in the electrical power distribution system. High voltage conditions can cause malfunctions or failures of electrical equipment. The S811+ has high voltage protection that will trip if the average rms voltage is greater than a preset value. The high voltage protection can be programmed as a percent of nominal voltage from 101% to 120% with a trip delay of 0.1 to 60 seconds.

Monitoring Capabilities

The S811+ has an impressive array of system monitoring capabilities that allows users to access real time process and diagnostic data. This data can be viewed at the device with the DIM or through a communications network. Data over a communications network can provide valuable insight into the condition of the equipment and processes. Maintenance and production personnel can monitor critical operational and maintenance data from a central control station that can be located far away from the production facility. Process data can be monitored to determine system anomalies that may indicate a need for preventive maintenance or an impending failure. Adjustments made through the communications network can reduce costs by minimizing the time traveling to the location where the motor controls are located. When faults do occur, real time fault data can assist maintenance in trouble-shooting and planning repair resources. Remote reset signals can be given to tripped devices without the need for manual intervention by maintenance personnel.

Average Line Current

Provides the average of the three-phase rms line currents in amps, accurate to within 2%. Current data can be used to indicate a need for maintenance. Increased currents in a fixed load application can indicate a reduction in system efficiencies and performance, signifying system maintenance is due.

Average Pole Current

Provides the average of the three-phase rms pole currents in amps, accurate to within 2%. The pole current is the current through the soft starter. The line and pole current will be identical in inline applications, and will differ in inside-the-delta applications.

Average Line Current as a % FLA

Provides the average rms line current as a percentage of the S811+ FLA setting.

Three-Phase Line Currents

Provides three rms phase line currents in amps, accurate to within 2%. Imbalances or changes in the relative phase current to one another can indicate anomalies in the motor or electrical distribution system.

Three-Phase Pole Currents

Provides three rms phase pole currents in amps, accurate to within 2%. The pole current is the current through the soft starter. The line and pole current will be identical in in-line applications, and will differ in inside-the-delta applications.

Three-Phase Line Voltages

Provides the individual rms three-phase line voltages. Imbalances or changes in the relative phase voltage to one another can indicate anomalies in the motor or electrical distribution system. Voltage can be used to monitor electrical distribution system performance. Warnings, alarms and system actions to low or high voltage conditions can be implemented.

Percent Thermal Memory

Provides the real time calculated thermal memory value. The S811+ calculates thermal memory value. A 100% value represents the maximum safe internal temperature of the motor. When the thermal memory value reaches 100%, an overload trip will occur, removing power to the motor.

The thermal memory value can be of great use in determining an impending overload trip condition. When using a communications network, alarms can be implemented in the process monitoring system warning of an impending trip before the trip occurs, halting the process. Costly system downtime can be avoided.

DC Control Voltage

Monitors level of the 24 Vdc control voltage. Fluctuations in control voltage can cause component malfunction and failure. System control voltage data can be used to implement warnings, alarms and system actions to low or high voltage conditions.

Pole Temperature

Increases in power pole temperature are caused by increases in ambient temperature, start/stop times and start duty cycles. Changes in pole temperatures represent a change in system operating conditions. Identifying unexpected operating conditions or changes can prompt maintenance and aid in process evaluation activities.

PCB Device Temperature

An increase in printed circuit board (PCB) device temperature is a strong indication of an increase in ambient temperature. High ambient temperature operation can be identified with the device temperature data. Device temperature increases can be due to undersized enclosures, failure of cooling fans or blocked venting. High operating temperatures will reduce the life of all electrical equipment in the enclosure.

Start Count

Start count data can be used to monitor system output, schedule preventative maintenance, identify system anomalies and identify changes in system operation.

Average Line Power

Provides the average of the three-phase line power in kilowatts, accurate to 5%. Power data may be used to monitor power transmitted to the load. Increased power demand may indicate degraded system components or connections. Additionally, such data is useful in determine power utilization in branch circuits consisting of multiple loads.

Power Factor

Provides the three-phase power factor value, accurate to 5%. The power factor of the circuit may be used to identify circuit conditions that may need to be corrected due to low power factor indications. Low circuit power factor can indicate improper or degraded components.

Specifications

Description	NEMA		Special Purpose				
	Size 4 V201K4_	Size 5 V201K5_	Size 6 V201K6_	160A V201KR_	320A V201KT_	540A V201KV_	610A V201KZ_
Poles	3	3	3	3	3	3	3
Maximum voltage rating	600V	600V	600V	1500V	1500V	1500V	1500V
Ampere rating	135A	270A	540A	160A	320A	540A	610A
Frequency, Hz	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Maximum closing current	1600A	3000A	6000A	1600A	3000A	6000A	6000A
Maximum interrupting current	1600A	3000A	6000A	1600A	3000A	6000A	6000A
Short time current							
1 second	2400A rms	4500A rms	9000A rms	2400A rms	4500A rms	9000A rms	9000A rms
2 seconds	1600A rms	3000A rms	6000A rms	1600A rms	3000A rms	6000A rms	6000A rms
Dielectric strength	2200 Vac	5375 Vac	5375 Vac	2200 Vac	5375 Vac	5375 Vac	5375 Vac
Maximum allowable interrupting	1200/hr.	—	—	1200/hr.	—	—	—
Impulse voltage (1 x 40 ms)	15 kV	15 kV	15 kV	15 kV	15 kV	15 kV	15 kV
Maximum motor horsepower at							
200V	40 hp	75 hp	150 hp	50 hp	100 hp	150 hp	200 hp
230V	50 hp	100 hp	200 hp	60 hp	125 hp	200 hp	200 hp
380V	75 hp	150 hp	300 hp	100 hp	200 hp	300 hp	300 hp
460V	100 hp	200 hp	400 hp	125 hp	250 hp	400 hp	450 hp
575V	100 hp	200 hp	400 hp	150 hp	300 hp	400 hp	500 hp
800V	—	—	—	200 hp	400 hp	—	800 hp
1000V	—	—	—	250 hp	—	—	1000 hp
1500V	—	—	—	400 hp	800 hp	1300 hp	1600 hp
Three-phase capacitive switching (kVAR)							
230V	40 kVAR	80 kVAR	160 kVAR	50 kVAR	80 kVAR	160 kVAR	176 kVAR
460V	80 kVAR	160 kVAR	320 kVAR	100 kVAR	160 kVAR	320 kVAR	356 kVAR
600V	100 kVAR	200 kVAR	400 kVAR	125 kVAR	200 kVAR	400 kVAR	400 kVAR
1500V	—	—	—	205 kVAR	500 kVAR	—	1000 kVAR
Transformer switching (kVA) [Ⓢ]							
Single-phase, two-pole							
120V	6.8 kVA	14 kVA	27 kVA	8 kVA	14 kVA	27 kVA	27 kVA
240V	14 kVA	27 kVA	54 kVA	16 kVA	27 kVA	54 kVA	54 kVA
480V	27 kVA	54 kVA	108 kVA	32 kVA	54 kVA	108 kVA	108 kVA
600V	34 kVA	68 kVA	135 kVA	40 kVA	68 kVA	135 kVA	135 kVA
Three-phase, three-pole							
240V	23 kVA	47 kVA	94 kVA	27 kVA	47 kVA	94 kVA	94 kVA
480V	47 kVA	94 kVA	188 kVA	55 kVA	94 kVA	188 kVA	188 kVA
600V	59 kVA	117 kVA	234 kVA	70 kVA	117 kVA	234 kVA	234 kVA

Note

[Ⓢ] For transformers having inrush currents of not more than 20 times the rated full load current.

Electrical Characteristics—Apply to Both NEMA and Special Purpose Types

Description	Size 4 (160A)	Size 5 (320A)	Size 6 (540A and 610A)
DC coil data—burden (AC supply rectified)			
Open VA	300 VA	500 VA	1450 VA
Closed VA	30 VA	25 VA	32 VA
Closed watts	6W	20W	30W
Pickup volts	70% of rated coil volts		
Dropout volts	50% of rated coil volts		
Pickup time in Hz	1.5–2 Hz		
Dropout time in Hz	6–6.15 Hz		
Max. voltage rating	600V	600V	600V
Max. closing current	1600A	3000A	6000A
Max. interrupting current	1600A	3000A	6000A
Short time current			
1 second	2400A rms	4500A rms	9000A rms
2 seconds	1600A rms	3000A rms	6000A rms

Electrical Characteristics Coil Data (AC Supply Rectified)

Burden	Size 4 (160A)	Size 5 (320A)	Size 6 (540A and 610A)
Inrush VA	300	600	1700
Sealed VA	30	20	28
Sealed watts	6	20	28
Pickup volts	70% of rated coil volts		
Dropout volts	50% of rated coil volts		
Pickup time in Hz	1.5–2	1.5–2	1.5–2
Dropout time in Hz	6–7.5	6–6.15	6–6.15

Control Power Transformer Selection Procedure

The following steps will assure that the secondary voltage delivered by your transformer will be either 85%, 90% or 95% of the nameplate secondary voltage under maximum inrush conditions, at rated input voltage. A typical selection example based on these steps follows.

Step 1

Calculate the total SEALED (steady state) VA load of your control circuit. This is done by adding the continuous VA requirements of the maximum number of components that will be energized at any given time, including non-inductive as well as inductive components. For Sealed VA data see **Page V10-T17-76.**

Step 2

Calculate the PEAK INRUSH VA of your control circuit. First, analyze the sequence of operation of all components. Then add together the inrush VA ratings of the components that will be energized simultaneously. Next, determine the peak—or maximum simultaneous—inrush VA load that the transformer will “see.” The VA requirements for indicating lights, timers and other non-inductive components which do not have an inrush VA also should be included since they will present a load to the transformer at the time of maximum inrush.

Step 3

Calculate the TRANSFORMER SELECTION INRUSH VA. Use the following formula:

$$\text{Selection Inrush} = \sqrt{(\text{VA Sealed})^2 + (\text{VA Inrush})^2}$$

Note: Transformer selection inrush VA also can be determined by adding the inrush VA and sealed VA arithmetically, but this usually results in an oversized transformer.

Step 4

Determine the correct transformer NAMEPLATE VA RATING. Refer to the Inrush/Regulation Data table: If the line supply to the transformer is fairly stable (does not vary more than 5%), use the 90% secondary voltage column—the 90% column is most commonly used. If the line supply voltage varies up to 10%, use the 95% voltage regulation column. To determine the correct VA transformer rating, go down the column until you arrive at the inrush VA rating closest to, but not less than, the Transformer Selection Inrush VA calculated in Step 3. The left hand column of the table will give the corresponding transformer NAMEPLATE VA RATING.

Inrush/Regulation Data

Transformer VA Rating 55° C	Inrush VA—40% Power Factor		
	At 95% Secondary Voltage	At 90% Secondary Voltage	At 85% Secondary Voltage
60	137	185	227
95	242	329	409
105	294	407	512
180	592	842	1071
225	929	1312	1663
275	1271	1801	2288
320	1581	2224	2816
380	2124	3048	3895
550	3196	4604	5896
850	5500	7914	10,141
1100	8382	12,067	15,477
1500	11,100	16,066	21,032
2000	21,820	24,356	41,100
3000	29,123	32,770	59,997
5000	74,595	111,000	145,000
7500	104,000	162,000	219,000
10,000	111,000	166,000	237,000

Note: When evaluating supply-line stability, remember that supply-line voltage drop frequently is associated with motor-starting inrush current. When motors and motor controls are connected to a common

feeder, the controls will experience a momentary voltage dip when the motor starts. This reduces the control transformer voltage supplied to the motor starting contactor and may cause the contactor to chatter or drop out.

Selection Example

Steps 1 and 2

By following Steps 1 and 2 described in column one at left, analysis of the control

circuits shows the following sealed VA and inrush VA data:

Example Data

Qty.	Description	Sealed VA	Inrush VA
3	Three-pole Size 1 contactors	60	309
2	Three-pole Size 3 contactors	99	780
4	Relays	88	620
2	Electronic timers	36	36
4	Indicating lights	28	28
Totals		311	1773

Step 3

Following Step 3 in column two at left, the Transformer Selection Inrush VA is calculated at 1773 VA.

Transformer Selection VA

$$\begin{aligned}
 &= \sqrt{(\text{VA Sealed})^2 + (\text{VA Inrush})^2} \\
 &= \sqrt{(311)^2 + (1773)^2} \\
 &= \sqrt{3,240,250} \\
 &= 1800
 \end{aligned}$$

Steps 4 and 5

Following Steps 3 and 4 at left, the Inrush/Regulation Data Chart is then consulted to find the correction nameplate VA size of the transformer. Under the 90% Secondary Voltage column, we find that a 320 VA transformer will deliver 2224 VA, amply covering circuit demands of 1800 Inrush VA. Checking this selection against the requirements of 311 VA sealed, we confirm that a 320 VA transformer will be sufficient.

Component VA Table

	Inrush VAR	Watts	VA	Sealed VAR	Watts	VA
Relays						
Type AA (single- and two-pole)	18	8.5	20	8	6.6	11
Type D15	64	49	80	7.1	2.4	7.5
Type M (two- to 12-pole)	122	95	155	20	9	22
Type M latch coil	36.5	18.5	41	13	11	17
Type MRD	—	168	—	—	13.2	13.2
Type MRD latch coil ^①	—	21.6	—	—	21.6	—
Type R	—	6	6	—	6	6
Type RM						
Set	—	—	—	—	3.5	3.5
Release	—	—	—	—	3.1	3.1
Type TF	3	3	4	3	3	4
Type TH	4	4	5	4	4	5
Timers						
Type D80	60	67	90	18	6	19
Type D80 with inst. contacts	89	95	130	20	7	21
Freedom Series Starters and Contactors						
IEC						
Frames A–C	64	49	80	7.1	2.4	7.5
Frames D–F	78	65	100	9.2	3.1	10
Frames G–K	210	95	230	27	7.8	28
Frames L–N	374	112	390	48	13	49.8
Frames P–S	1132	216	1040	96	17	116
Frames T–U	—	798	950	—	10	11
Frame V	—	1345	1600	—	22	25
Frames W–X	—	—	1000	—	—	23
Frame Z	—	—	2400	—	—	70
NEMA						
Size 00	64	49	80	7.1	2.4	7.5
Size 0	78	65	100	9.2	3.1	10
Sizes 1–2	210	95	230	27	7.8	28
Size 3	374	112	390	48	13	49.8
Sizes 4–5	1132	240	1158	96	27.2	100
Sizes 6–7	868	1345	1600	11	22	25
Size 8	—	2060	2450	—	60	75

Note

① Intermittent duty coil.

Ampere ratings of motors vary somewhat, depending upon the type of motor. The values given below are for drip-proof, Class B insulated (T Frame) where available, 1.15 service factor, NEMA Design B motors. These values represent an average

full load motor current that was calculated from the motor performance data published by several motor manufacturers. In the case of high torque squirrel cage motors, the ampere ratings will be at least 10% greater than the values given below.

Caution—These average ratings could be high or low for a specific motor and therefore heater coil selection on this basis always involves risk. For fully

reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.

Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor

hp ①	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ②	460V	575V	2200V
1/4	1800	1.09	0.95	0.55	0.48	0.38	—
	1200	1.61	1.40	0.81	0.70	0.56	—
	900	1.84	1.60	0.93	0.80	0.64	—
1/3	1800	1.37	1.19	0.69	0.60	0.48	—
	1200	1.83	1.59	0.92	0.80	0.64	—
	900	2.07	1.80	1.04	0.90	0.72	—
1/2	1800	1.98	1.72	0.99	0.86	0.69	—
	1200	2.47	2.15	1.24	1.08	0.86	—
	900	2.74	2.38	1.38	1.19	0.95	—
3/4	1800	2.83	2.46	1.42	1.23	0.98	—
	1200	3.36	2.92	1.69	1.46	1.17	—
	900	3.75	3.26	1.88	1.63	1.30	—
1	3600	3.22	2.80	1.70	1.40	1.12	—
	1800	4.09	3.56	2.06	1.78	1.42	—
	1200	4.32	3.76	2.28	1.88	1.50	—
1-1/2	3600	4.95	4.30	2.60	2.15	1.72	—
	1800	5.01	4.36	2.64	2.18	1.74	—
	1200	5.59	4.86	2.94	2.43	1.94	—
2	3600	6.07	5.28	3.20	2.64	2.11	—
	1800	6.44	5.60	3.39	2.80	2.24	—
	1200	6.44	5.60	3.39	2.80	2.24	—
2	3600	6.44	5.60	3.39	2.80	2.24	—
	1800	7.36	6.40	3.87	3.20	2.56	—
	1200	7.87	6.84	4.14	3.42	2.74	—
3	3600	9.09	7.90	4.77	3.95	3.16	—
	1800	9.59	8.34	5.02	4.17	3.34	—
	1200	10.8	9.40	5.70	4.70	3.76	—
5	3600	11.7	10.2	6.20	5.12	4.10	—
	1800	13.1	11.4	6.90	5.70	4.55	—
	1200	15.5	13.5	8.20	6.76	5.41	—
5	3600	16.6	14.4	8.74	7.21	5.78	—
	1800	18.2	15.8	9.59	7.91	6.32	—
	1200	18.3	15.9	9.60	7.92	6.33	—
7-1/2	3600	22.4	19.5	11.8	9.79	7.81	—
	1800	24.7	21.5	13.0	10.7	8.55	—
	1200	25.1	21.8	13.2	10.9	8.70	—
10	3600	26.5	23.0	13.9	11.5	9.19	—
	1800	29.2	25.4	15.4	12.7	10.1	—
	1200	30.8	26.8	16.3	13.4	10.7	—
15	3600	32.2	28.0	16.9	14.0	11.2	—
	1800	35.1	30.5	18.5	15.2	12.2	—
	1200	41.9	36.4	22.0	18.2	14.5	—
20	3600	45.1	39.2	23.7	19.6	15.7	—
	1800	47.6	41.4	25.0	20.7	16.5	—
	1200	51.2	44.5	26.9	22.2	17.8	—
20	3600	58.0	50.4	30.5	25.2	20.1	—
	1800	58.9	51.2	31.0	25.6	20.5	—
	1200	60.7	52.8	31.9	26.4	21.1	—
20	3600	63.1	54.9	33.2	27.4	21.9	—

hp ①	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ②	460V	575V	2200V
25	3600	69.9	60.8	36.8	30.4	24.3	—
	1800	74.5	64.8	39.2	32.4	25.9	—
	1200	75.4	65.6	39.6	32.8	26.2	—
30	3600	84.8	73.7	44.4	36.8	29.4	—
	1800	86.9	75.6	45.7	37.8	30.2	—
	1200	90.6	78.8	47.6	39.4	31.5	—
40	3600	94.1	81.8	49.5	40.9	32.7	—
	1800	111	96.4	58.2	48.2	38.5	—
	1200	116	101	61.0	50.4	40.3	—
50	3600	117	102	61.2	50.6	40.4	—
	1800	121	105	63.2	52.2	41.7	—
	3600	138	120	72.9	60.1	48.2	—
60	1800	143	124	75.2	62.2	49.7	—
	1200	145	126	76.2	63.0	50.4	—
	900	150	130	78.5	65.0	52.0	—
75	3600	164	143	86.8	71.7	57.3	—
	1800	171	140	90.0	74.5	59.4	—
	1200	173	150	91.0	75.0	60.0	—
100	3600	177	154	93.1	77.0	61.5	—
	1800	206	179	108	89.6	71.7	—
	1200	210	183	111	91.6	73.2	—
125	3600	212	184	112	92.0	73.5	—
	1800	222	193	117	96.5	77.5	—
	3600	—	231	140	115	92.2	—
150	1800	—	236	144	118	94.8	23.6
	1200	—	239	145	120	95.6	24.2
	900	—	252	153	126	101	24.8
200	3600	—	292	176	146	116	—
	1800	—	293	177	147	117	29.2
	1200	—	298	180	149	119	29.9
250	3600	—	305	186	153	122	30.9
	1800	—	343	208	171	137	—
	1200	—	348	210	174	139	34.8
300	3600	—	350	210	174	139	35.5
	1800	—	365	211	183	146	37.0
	1200	—	452	257	226	181	—
400	1800	—	458	265	229	184	46.7
	1200	—	460	266	230	184	47.0
	900	—	482	279	241	193	49.4
500	3600	—	559	338	279	223	—
	1800	—	568	343	284	227	57.5
	1200	—	573	345	287	229	58.5
500	3600	—	600	347	300	240	60.5
	1800	—	678	392	339	271	69.0
	1200	—	684	395	342	274	70.0
500	3600	—	896	518	448	358	91.8
	1800	—	1110	642	555	444	116

Notes

- ① To convert horsepower to kW, multiply horsepower by 0.7457.
- ② 380V 50 Hz.

17.10 Technical Data and Specifications

Product Codes

Product Codes—By Description

Description	Code
Accessories, Fuse Clips and Cover Control	AF40
C361 Flange Mounted Switch	AN20
C371 Circuit Breaker Operator	AN50
Combination Enclosed Starters, Specials	AM60
Combination Full Voltage NEMA Freedom Starter	AE61
Combination Full Voltage Type 4X and 7/9 NEMA Starter	AE65
Combination Full Voltage Vacuum Starter	AE64
Combination NEMA HVAC	EH61
Combination Reduced Voltage IT Soft Starters	NS22
Duplex Pump Panels, Freedom	AJ65
Ghisalba Coils and Feeder Groups	HD70A1
Lighting, Electrically Held Enclosed A202 Contactor	AB76
Lighting, Electrically Held Enclosed CN35 Contactor	AB66
Lighting, Magnetically Latched Enclosed A202 Contactor	AB72
Lighting, Mechanically Held Enclosed A202 Contactor	AB67
Lighting, Mechanically Held Enclosed C30 Contactor	AB79
Manual Starters Type B100	2916
Manual Starters Type MS	2915
Multispeed Combination, NEMA Freedom	AI65

Description	Code
Multispeed, NEMA Freedom	AI61
Multispeed, Vacuum	AI64
Non-Combination Enclosed Starters, Specials	AM50
Non-Combination Full Voltage NEMA Freedom Contactor	AB61
Non-Combination Full Voltage NEMA Freedom Starter	AA61
Non-Combination Full Voltage Type 4X Starter	AA65
Non-Combination Full Voltage Type 7/9 Explosion Proof Starter	AA66
Non-Combination Full Voltage Type 7/9 NEMA Starter	AE66
Non-Combination Full Voltage Vacuum Contactor	AB64
Non-Combination Full Voltage Vacuum Starter	AA64
Non-Combination Reduced Voltage IT Soft Starter	NS12
Oil Pump Panel, NEMA Freedom	AJ71
Pump Panel, NEMA Freedom	AJ61
Pump Panel, Vacuum	AJ64
Reduced Voltage IEC Starter	AG62
Reduced Voltage NEMA Starter	AG61
Reduced Voltage Vacuum Starter	AG64
Reduced Voltage, IT	AG68
Renewal Parts for Enclosed Control, C361, C371, C400	HD70H4

Product Codes—By Code

Code	Description
2915	Manual Starters Type MS
2916	Manual Starters Type B100
AA61	Non-Combination Full Voltage NEMA Freedom Starter
AA64	Non-Combination Full Voltage Vacuum Starter
AA65	Non-Combination Full Voltage Type 4X Starter
AA66	Non-Combination Full Voltage Type 7/9 Explosion Proof Starter
AB61	Non-Combination Full Voltage NEMA Freedom Contactor
AB64	Non-Combination Full Voltage Vacuum Contactor
AB66	Lighting, Electrically Held Enclosed CN35 Contactor
AB67	Lighting, Mechanically Held Enclosed A202 Contactor
AB72	Lighting, Magnetically Latched Enclosed A202 Contactor
AB76	Lighting, Electrically Held Enclosed A202 Contactor
AB79	Lighting, Mechanically Held Enclosed C30 Contactor
AE61	Combination Full Voltage NEMA Freedom Starter
AE64	Combination Full Voltage Vacuum Starter
AE65	Combination Full Voltage Type 4X and 7/9 NEMA Starter
AE66	Non-Combination Full Voltage Type 7/9 NEMA Starter
AF40	Accessories, Fuse Clips and Cover Control
AG61	Reduced Voltage NEMA Starter

Code	Description
AG62	Reduced Voltage IEC Starter
AG64	Reduced Voltage Vacuum Starter
AG68	Reduced Voltage, IT
AI61	Multispeed, NEMA Freedom
AI64	Multispeed, Vacuum
AI65	Multispeed Combination, NEMA Freedom
AJ61	Pump Panel, NEMA Freedom
AJ64	Pump Panel, Vacuum
AJ65	Duplex Pump Panels, Freedom
AJ71	Oil Pump Panel, NEMA Freedom
AM50	Non-Combination Enclosed Starters, Specials
AM60	Combination Enclosed Starters, Specials
AN20	C361 Flange Mounted Switch
AN50	C371 Circuit Breaker Operator
EH61	Combination NEMA HVAC
HD70A1	Ghisalba Coils and Feeder Groups
HD70H4	Renewal Parts for Enclosed Control, C361, C371, C400
NS12	Non-Combination Reduced Voltage IT Soft Starter
NS22	Combination Reduced Voltage IT Soft Starters

Eaton Terms & Conditions



Terms & Conditions



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Selling Policy (Supersedes Selling Policy 25-000, dated November 1, 2008)

Terms and Conditions of Sale

The Terms and Conditions of Sale set forth herein, and any supplements which may be attached hereto, constitute the full and final expression of the contract for the sale of products or services (hereinafter referred to as Product(s) or Services by Eaton Corporation (hereinafter referred to as Seller) to the Buyer, and supersedes all prior quotations, purchase orders, correspondence or communications whether written or oral between the Seller and the Buyer. Notwithstanding any contrary language in the Buyer's purchase order, correspondence or other form of acknowledgment, Buyer shall be bound by these Terms and Conditions of Sale when it sends a purchase order or otherwise indicates acceptance of this contract, or when it accepts delivery from Seller of the Products or Services.

THE CONTRACT FOR SALE OF THE PRODUCTS OR SERVICES IS EXPRESSLY LIMITED TO THE TERMS AND CONDITIONS OF SALE STATED HEREIN. ANY ADDITIONAL OR DIFFERENT TERMS PROPOSED BY BUYER ARE REJECTED UNLESS EXPRESSLY AGREED TO IN WRITING BY SELLER. No contract shall exist except as herein provided.

Complete Agreement

No amendment or modification hereto nor any statement, representation or warranty not contained herein shall be binding on the Seller unless made in writing by an authorized representative of the Seller. Prior dealings, usage of the trade or a course of performance shall not be relevant to determine the meaning of this contract even though the accepting or acquiescing party had knowledge of the nature of the performance and opportunity for objection.

Quotations

Written quotations are valid for 30 days from its date unless otherwise stated in the quotation or terminated sooner by notice.

Verbal quotations, unless accepted, expire the same day they are made.

A complete signed order must be received by Seller within 20 calendar days of notification of award, otherwise the price and shipment will be subject to re-negotiation.

Termination and Cancellation

Products

Any order may be terminated by the Buyer only by written notice and upon payment of reasonable termination charges, including all progress billings and all incurred direct manufacturing costs.

Services

Any order may be terminated by the Buyer only by written notice and upon payment of reasonable termination charges including all costs plus profit.

Seller shall have the right to cancel any order at any time by written notice if Buyer breaches any of the terms hereof, becomes the subject of any proceeding under state or federal law for the relief of debtors, or otherwise becomes insolvent or bankrupt, generally does not pay its debts as they become due or makes an assignment for the benefit of creditors.

Appendix 1—General Terms and Conditions of Sale

Effective Date: November 1, 2017

Prices

All prices are subject to change without notice. In the event of a price change, the effective date of the change will be the date of the new price or discount sheet, letter or telegram. All quotations made or orders accepted after the effective date will be on the new basis. For existing orders, the price of the unshipped portion of an order will be the price in effect at time of shipment.

Price Policy—Products and Services

When prices are quoted as firm for quoted shipment, they are firm provided the following conditions are met:

1. The order is released with complete engineering details.
2. Shipment of Products are made, and Services purchased are provided within the quoted lead time.
3. When drawings for approval are required for any Products, the drawings applicable to those Products must be returned within 30* calendar days from the date of the original mailing of the drawings by Seller. The return drawings must be released for manufacture and shipment and must be marked "APPROVED" or "APPROVED AS NOTED." Drawing re-submittals which are required for any other reason than to correct Seller errors will not extend the 30-day period.

* 60 days for orders through contractors to allow time for their review and approval before and after transmitting them to their customers.

If the Buyer initiates or in any way causes delays in shipment, provision of Services or return of approval drawings beyond the periods stated above, the price of the Products or Services will be increased 1% per month or fraction thereof up to a maximum of 18 months from the date of the Buyer's order. For delays resulting in shipment or provision of Services beyond 18 months from the date of the Buyer's order, the price must be renegotiated.

Price Policy—BLS

Refer to Price Policy 25-050.

Minimum Billing

Orders less than \$1,000 will be assessed a shipping and handling charge of 5% of the price of the order, with a minimum charge of \$25.00 unless noted differently on Product discount sheets.

Taxes

The price does not include any taxes. Buyer shall be responsible for the payment of all taxes applicable to, or arising from the transaction, the Products, its sale, value, or use, or any Services performed in connection therewith regardless of the person or entity actually taxed.

Terms of Payment

Products

Acceptance of all orders is subject to the Buyer meeting Seller's credit requirements. Terms of payment are subject to change for failure to meet such requirements. Seller reserves the right at any time to demand full or partial payment before proceeding with a contract of sale as a result of changes in the financial condition of the Buyer. Terms of Payment are either Net 30 days from the date of invoice of each shipment or carry a cash discount based on Product type. Specific payment terms for Products are outlined in the applicable Product discount schedules.

Services

Terms of payment are net within 30 days from date of invoice for orders amounting to less than \$50,000.00.

Terms of payment for orders exceeding \$50,000.00 shall be made according to the following:

1. Twenty percent (20%) of order value with the purchase order payable 30 days from date of invoice.
2. Eighty percent (80%) of order value in equal monthly payments over the performance period payable 30 days from date of invoice.

Except for work performed (i) under a firm fixed price basis or (ii) pursuant to terms of a previously priced existing contract between Seller and Buyer, invoices for work performed by Seller shall have added and noted on each invoice a charge of 3% (over and above the price of the work) which is related to Seller compliance with present and proposed environmental, health, and safety regulations associated with prescribed requirements covering hazardous materials management and employee training, communications, personal protective equipment, documentation and record keeping associated therewith.

Adequate Assurances

If, in the judgment of Seller, the financial condition of the Buyer, at any time during the period of the contract, does not justify the terms of payment specified, Seller may require full or partial payment in advance.

Delayed Payment

If payments are not made in accordance with these terms, a service charge will, without prejudice to the right of Seller to immediate payment, be added in an amount equal to the lower of 1.5% per month or fraction thereof or the highest legal rate on the unpaid balance.

Freight

Freight policy will be listed on the Product discount sheets, or at option of Seller one of the following freight terms will be quoted.

F.O.B.—P/S—Frt./Ppd. and Invoiced

Products are sold F.O.B. point of shipment freight prepaid and invoiced to the Buyer.

F.O.B.—P/S—Frt./Ppd. and Allowed

Products sold are delivered F.O.B. point of shipment, freight prepaid and included in the price.

F.O.B. Destination—Frt./Ppd. and Allowed

At Buyer's option, Seller will deliver the Products F.O.B. destination freight prepaid and 2% will be added to the net price.

The term "freight prepaid" means that freight charges will be prepaid to the accessible common carrier delivery point nearest the destination for shipments within the United States and Puerto Rico unless noted differently on the Product discount sheets. For any other destination, contact Seller's representative.

Shipment and Routing

Seller shall select the point of origin of shipment, the method of transportation, the type of carrier equipment and the routing of the shipment.

If the Buyer specifies a special method of transportation, type of carrier equipment, routing, or delivery requirement, Buyer shall pay all special freight and handling charges.

When freight is included in the price, no allowance will be made in lieu of transportation if the Buyer accepts shipment at factory, warehouse, or freight station or otherwise supplies its own transportation.

Risk of Loss

Risk of loss or damage to the Products shall pass to Buyer at the F.O.B. point.

Concealed Damage

Except in the event of F.O.B. destination shipments, Seller will not participate in any settlement of claims for concealed damage.

When shipment has been made on an F.O.B. destination basis, the Buyer must unpack immediately and, if damage is discovered, must:

1. Not move the Products from the point of examination.
2. Retain shipping container and packing material.
3. Notify the carrier in writing of any apparent damage.
4. Notify Seller representative within 72 hours of delivery.
5. Send Seller a copy of the carrier's inspection report.

Witness Tests/Customer Inspection

Standard factory tests may be witnessed by the Buyer at Seller's factory for an additional charge calculated at the rate of \$2,500 per day (not to exceed eight (8) hours) per Product type. Buyer may final inspect Products at the Seller's factory for \$500 per day per Product type.

Witness tests will add one (1) week to the scheduled shipping date. Seller will notify Buyer fourteen (14) calendar days prior to scheduled witness testing or inspection. In the event Buyer is unable to attend, the Parties shall mutually agree on a rescheduled date. However, Seller reserves the right to deem the witness tests waived with the right to ship and invoice Products.

Held Orders

For any order held, delayed or rescheduled at the request of the Buyer, Seller may, at its sole option (1) require payment to be based on any reasonable basis, including but not limited to the contract price, and any additional expenses, or cost resulting from such a delay; (2) store Products at the sole cost and risk of loss of the Buyer; and/ or (3) charge to the Buyer those prices under the applicable price policy. Payment for such price, expenses and costs, in any such event, shall be due by Buyer within thirty (30) days from date of Seller's invoice. Any order so held delayed or rescheduled beyond six (6) months will be treated as a Buyer termination.

Drawing Approval

Seller will design the Products in line with, in Seller's judgment, good commercial practice. If at drawing approval Buyer makes changes outside of the design as covered in their specifications, Seller will then be paid reasonable charges and allowed a commensurate delay in shipping date based on the changes made.

Drawing Re-Submittal

When Seller agrees to do so in its quotation, Seller shall provide Buyer with the first set of factory customer approval drawing(s) at Seller's expense. The customer approval drawing(s) will be delivered at the quoted delivery date. If Buyer requests drawing changes or additions after the initial factory customer approval drawing(s) have been submitted by Seller, the Seller, at its option, may assess Buyer drawing charges. Factory customer approval drawing changes required due to misinterpretation by Seller will be at Seller's expense. Approval drawings generated by Bid Manager are excluded from this provision.

Warranty

Warranty for Products

Seller warrants that the Products manufactured by it will conform to Seller's applicable specifications and be free from failure due to defects in workmanship and material for one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

In the event any Product fails to comply with the foregoing warranty, Seller will, at its option, either (a) repair or replace the defective Product, or defective part or component thereof, F.O.B. Seller's facility freight prepaid, or (b) credit Buyer for the purchase price of the Product. All warranty claims shall be made in writing.

Seller requires all non-conforming Products be returned at Seller's expense for evaluation unless specifically stated otherwise in writing by Seller.

This warranty does not cover failure or damage due to storage, installation, operation or maintenance not in conformance with Seller's recommendations and industry standard practice or due to accident, misuse, abuse or negligence. This warranty does not cover reimbursement for labor, gaining access, removal, installation, temporary power or any other expenses, which may be incurred in connection with repair or replacement.

This warranty does not apply to equipment not manufactured by Seller. Seller limits itself to extending the same warranty it receives from the supplier.

Appendix 1—General Terms and Conditions of Sale

Effective Date: November 1, 2017

Extended Warranty for Products

If requested by the Buyer and specifically accepted in writing by Seller, the foregoing standard warranty for Products will be extended from the date of shipment for the period and price indicated below:

- 24 months—2% of Contract Price
- 30 months—3% of Contract Price
- 36 months—4% of Contract Price

Special Warranty (In and Out) for Products

If requested by the Buyer and specifically accepted in writing by Seller, Seller will, during the warranty period for Products, at an additional cost of 2% of the contract price, be responsible for the direct cost of:

1. Removing the Product from the installed location.
2. Transportation to the repair facility and return to the site.
3. Reinstallation on site.

The total liability of Seller for this Special Warranty for Products is limited to 50% of the contract price of the particular Product being repaired and excludes expenses for removing adjacent apparatus, walls, piping, structures, temporary service, etc.

Warranty for Services

Seller warrants that the Services performed by it hereunder will be performed in accordance with generally accepted professional standards.

The Services, which do not so conform, shall be corrected by Seller upon notification in writing by the Buyer within one (1) year after completion of the Services.

Unless otherwise agreed to in writing by Seller, Seller assumes no responsibility with respect to the suitability of the Buyer's, or its customer's, equipment or with respect to any latent defects in equipment not supplied by Seller. This warranty does not cover damage to Buyer's, or its customer's, equipment, components or parts resulting in whole or in part from improper maintenance or operation or from their deteriorated condition. Buyer will, at its cost, provide Seller with unobstructed access to the defective Services, as well as adequate free working space in the immediate vicinity of the defective Services and such facilities and systems, including, without limitation, docks, cranes and utility disconnects and connects, as may be necessary in order that Seller may perform its warranty obligations. The conducting of any tests shall be mutually agreed upon and Seller shall be notified of, and may be present at, all tests that may be made.

Warranty for Power Systems Studies

Seller warrants that any power systems studies performed by it will conform to generally accepted professional standards. Any portion of the study, which does not so conform, shall be corrected by Seller upon notification in writing by the Buyer within six (6) months after completion of the study. All warranty work shall be performed in a single shift straight time basis Monday through Friday. In the event that the study requires correction of warranty items on an overtime schedule, the premium portion of such overtime shall be for the Buyer's account.

Limitation on Warranties for Products, Services and Power Systems Studies

THE FOREGOING WARRANTIES ARE EXCLUSIVE EXCEPT FOR WARRANTY OF TITLE. SELLER DISCLAIMS ALL OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

CORRECTION OF NON-CONFORMITIES IN THE MANNER AND FOR THE PERIOD OF TIME PROVIDED ABOVE SHALL CONSTITUTE SELLER'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDY FOR FAILURE OF SELLER TO MEET ITS WARRANTY OBLIGATIONS, WHETHER CLAIMS OF THE BUYER ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), OR OTHERWISE.

Asbestos

Federal Law requires that building or facility owners identify the presence, location and quantity of asbestos containing material (hereinafter "ACM") at work sites. Seller is not licensed to abate ACM. Accordingly, for any contract which includes the provision of Services, prior to (i) commencement of work at any site under a specific Purchase Order, (ii) a change in the work scope of any Purchase Order, the Buyer will certify that the work area associated with the Seller's scope of work includes the handling of Class II ACM, including but not limited to generator wedges and high temperature gaskets which include asbestos materials. The Buyer shall, at its expense, conduct abatement should the removal, handling, modification or reinstallation, or some or all of them, of said Class II ACM be likely to generate airborne asbestos fibers; and should such abatement affect the cost of or time of performance of the work, then Seller shall be entitled to an equitable adjustment in the schedule, price and other pertinent affected provisions of the contract.

Compliance with Nuclear Regulation

Seller's Products are sold as commercial grade Products not intended for application in facilities or activities licensed by the United States Nuclear Regulatory Commission for atomic purposes. Further certification will be required for use of the Products in any safety-related application in any nuclear facility licensed by the U.S. Nuclear Regulatory Commission.

Returning Products

Authorization and shipping instructions for the return of any Products must be obtained from Seller before returning the Products.

When return is occasioned due to Seller error, full credit including all transportation charges will be allowed.

Product Notices

Buyer shall provide the user (including its employees) of the Products with all Seller supplied Product notices, warnings, instructions, recommendations, and similar materials.

Force Majeure

Seller shall not be liable for failure to perform or delay in performance due to fire, flood, strike or other labor difficulty, act of God, act of any governmental authority or of the Buyer, riot, embargo, fuel or energy shortage, car shortage, wrecks or delays in transportation, or due to any other cause beyond Seller's reasonable control. In the event of delay in performance due to any such cause, the date of delivery or time for completion will be extended by a period of time reasonably necessary to overcome the effect of such delay.

Liquidated Damages

Contracts which include liquidated damage clauses for failure to meet shipping or job completion promises are not acceptable or binding on Seller, unless such clauses are specifically accepted in writing by an authorized representative of the Seller at its headquarters office.

Patent Infringement

Seller will defend or, at its option, settle any suit or proceeding brought against Buyer, or Buyer's customers, to the extent it is based upon a claim that any Product or part thereof, manufactured by Seller or its subsidiaries and furnished hereunder, infringes any United States patent, other than a claim of infringement based upon use of a Product or part thereof in a process, provided Seller is notified in reasonable time and given authority, information and assistance (at Seller's expense) for the defense of same. Seller shall pay all legal and court costs and expenses and court-assessed damages awarded therein against Buyer resulting from or incident to such suit or proceeding. In addition to the foregoing, if at any time Seller determines there is a substantial question of infringement of any United States patent, and the use of such Product is or may be enjoined, Seller may, at its option and expense: either (a) procure for Buyer the right to continue using and selling the Product; (b) replace the Product with non-infringing apparatus; (c) modify the Product so it becomes non-infringing; or (d) as a last resort, remove the Product and refund the purchase price, equitably adjusted for use and obsolescence. In no case does Seller agree to pay any recovery based upon its Buyer's savings or profit through use of Seller's Products whether the use be special or ordinary. The foregoing states the entire liability of Seller for patent infringement.

The preceding paragraph does not apply to any claim of infringement based upon: (a) any modification made to a Product other than by Seller; (b) any design and/or specifications of Buyer to which a Product was manufactured; or (c) the use or combination of Product with other products where the Product does not itself infringe. As to the above-identified claim situations where the preceding paragraph does not apply, Buyer shall defend and hold Seller harmless in the same manner and to the extent as Seller's obligations described in the preceding paragraph. Buyer shall be responsible for obtaining (at Buyer's expense) all license rights required for Seller to be able to use software products in the possession of Buyer where such use is required in order to perform any Service for Buyer.

With respect to a Product or part thereof not manufactured by Seller or its subsidiaries, Seller will attempt to obtain for Buyer, from the supplier(s), the patent indemnification protection normally provided by the supplier(s) to customers.

Compliance with OSHA

Seller offers no warranty and makes no representation that its Products comply with the provisions or standards of the Occupational Safety and Health Act of 1970, or any regulation issued thereunder. In no event shall Seller be liable for any loss, damage, fines, penalty or expenses arising under said Act.

Limitation of Liability

THE REMEDIES OF THE BUYER SET FORTH IN THIS CONTRACT ARE EXCLUSIVE AND ARE ITS SOLE REMEDIES FOR ANY FAILURE OF SELLER TO COMPLY WITH ITS OBLIGATIONS HEREUNDER.

NOTWITHSTANDING ANY PROVISION IN THIS CONTRACT TO THE CONTRARY, IN NO EVENT SHALL SELLER BE LIABLE IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE FOR DAMAGE TO PROPERTY OR EQUIPMENT OTHER THAN PRODUCTS SOLD HEREUNDER, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF PRODUCTS, COST OF CAPITAL, CLAIMS OF CUSTOMERS OF THE BUYER OR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, REGARDLESS OF WHETHER SUCH POTENTIAL DAMAGES ARE FORESEEABLE OR IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

THE TOTAL CUMULATIVE LIABILITY OF SELLER ARISING FROM OR RELATED TO THIS CONTRACT WHETHER THE CLAIMS ARE BASED IN CONTRACT, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHERWISE, SHALL NOT EXCEED THE PRICE OF THE PRODUCT OR SERVICES ON WHICH SUCH LIABILITY IS BASED.

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