EATON

April 2008

Enclosed Control Product Guide
Contents

Cutler-Hammer® Enclosed Control Products

Lighting Contactors

MVX9000 Microdrives

April 2008

Dimensions, Weights and Ratings

Dimensions, weights and ratings given in this product guide **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.

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Technical and Descriptive Publications

This product guide 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 Cutler-Hammer Products Distributor, call **1-800-525-2000** or visit our Web site at **www.eaton.com**.

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Introduction

1

Contents

Cutler-Hammer® Enclosed Control Products

1

Welcome

Welcome to the latest edition of the *Enclosed Control Product Guide* from Eaton's electrical business. In this updated edition, you will find complete details on our extensive line of Cutler-Hammer® 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 Cutler-Hammer®, MGE Office Protection Systems, Powerware®, Holec®, and MEM®. Eaton provides PowerChain Management® 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.

Technical Reference

Enclosure Types

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

Type 1

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

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

Provide 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

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

Provide 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.

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

Type 7 & 9 Bolted

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 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

Type 12 — (Conforms to IP62) — for Indoor Use

Provide 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.

Many Cutler-Hammer Type 12 enclosures are suitable for use in Class II, Division 2, Group G and Class III, Divisions 1 and 2 locations as defined in the National Electrical Code.

Type 12 — 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 which cannot be manipulated with other types of tools.

Enclosure Ratings

Table 1-1. IEC IP Index of Protection Ratings

1st Number	Description	2nd 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.

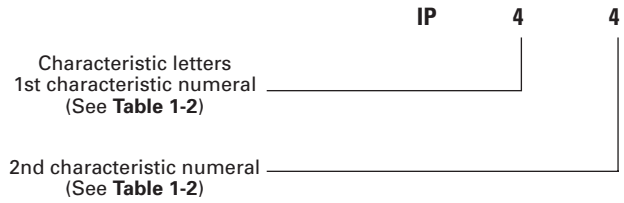
Table 1-2 is a comparison of the NEMA/UL/IEC enclosure specifications to be used as an approximate reference only. **Do not use the table to convert from IEC to NEMA designations**.

Table 1-2. NEMA/UL/IEC Enclosure Type Cross-Reference — Approximate

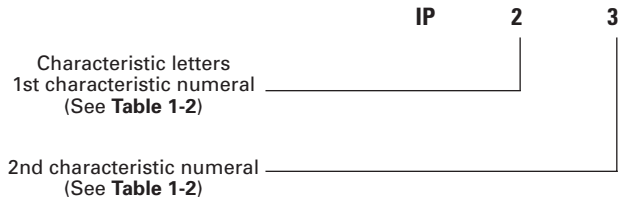
NEMA Enclosure Rating	IP10	IP20	IP21	IP22	IP23	IP30	IP31	IP32	IP33	IP40	IP41	IP42	IP43	IP50	IP51	IP52	IP53	IP54	IP55	IP56	IP60	IP61	IP62	IP63	IP64	IP65	IP66	IP67	IP68
1	X	X	X	X	X																								
2	X	X	X	X	X																								
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
3R	X	X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

Note: IEC 529 does not specify equivalents to NEMA Enclosure Types 7, 8, 9 or 10.

Table 1-3. 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

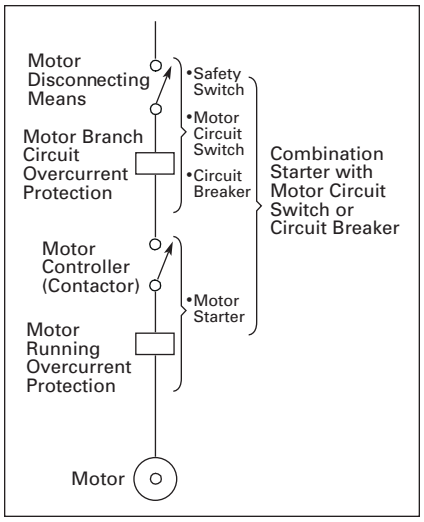


Figure 1-1. Typical Motor Circuit

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 driving parts of single machine or motors all in 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 — protect 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 which 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.

Power Supplies

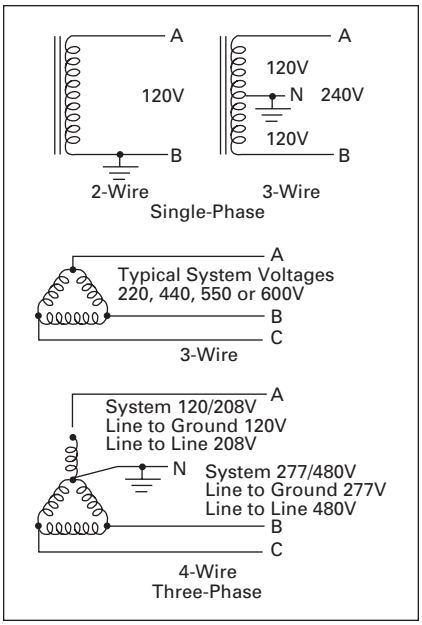


Figure 1-2. Single- and Three-Phase Power Supply

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 hertz — 50 and 25 hertz used in some specific areas — AC distribution at use location single- or three-phase — limited areas have two-phase — **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 —** 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.

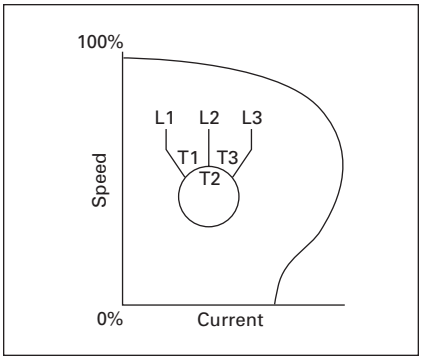


Figure 1-3. Squirrel Cage Speed

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.

Two- and Three-Wire Control

Two-Wire Control

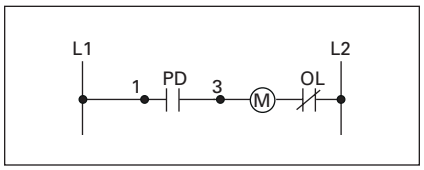


Figure 1-4. Two-Wire Wiring

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

Three-Wire Control

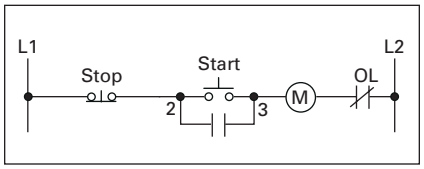


Figure 1-5. Three-Wire Wiring

Three-wire control is a control function which utilizes 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.

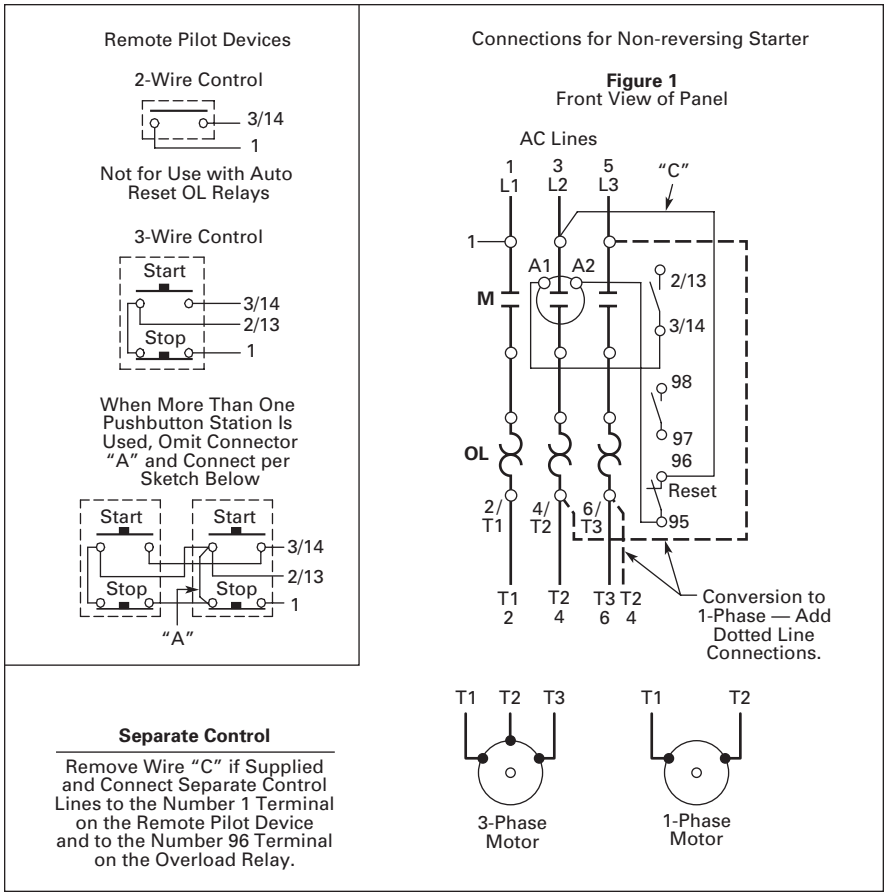


Figure 1-6. Typical Line Diagram

NEMA Contactors & Starters

Contents

NEMA IT. Control

Product Description

Eaton's Cutler-Hammer® Intelligent Technologies (***IT.***) Electro-Mechanical line of Contactors and Starters is the result of a substantial engineering, manufacturing and marketing effort involving extensive customer input, combined with new advances in solid-state technology. ***IT.*** Electro-Mechanical products have greatly increased functionality, significantly reduced size and utilize the benefits of 24V DC control. The exclusive Pulse Width Modulation (PWM) control and digital microprocessor generate a minimized DC value which reduces energy to the contact block and provides the most compact system available.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved

Catalog Number Selection

Table 3-1. NEMA Intelligent Technologies (*IT.*) Line Enclosed Control Catalog Numbering System

E C T 2 2 1 1 A A B - A _

Design
T = ***IT.*** — NEMA

Class		Table
01 =	Non-reversing Contactor — 3-Pole	**3-6**
02 =	Reversing Contactor — 3-Pole	**3-7**
05 =	Non-combination Non-reversing Starter	**3-8**
06 =	Non-combination Reversing Starter	**3-9**
16 =	Combination Non-reversing Starter — Fusible Disconnect	**3-10**
	Combination Non-reversing Starter — Non-fusible Disconnect	**3-11**
17 =	Combination Reversing Starter — Fusible Disconnect	**3-12**
	Combination Reversing Starter — Non-fusible Disconnect	**3-13**
22 =	Combination Non-reversing Starter — Circuit Breaker	**3-14**
23 =	Combination Reversing Starter — Circuit Breaker	**3-15**

NEMA Size

A = Size 00	**3** = Size 3
0 = Size 0	**4** = Size 4
1 = Size 1	**5** = Size 5
2 = Size 2	

Enclosure Type
1 = Type 1 — General Purpose
2 = Type 3R — Rainproof
3 = Type 4 — Painted Steel
4 = Type 4X — Watertight
8 = Type 12 — Dust-Tight
9 = Type 4X — 316-Grade Stainless Steel

Motor Voltage/Power Supply ①

B = 230V	**E** = 200V
C = 460V	**Q** = 24V DC ②
D = 575V	**L** = 380V/50 Hz

Cover Control — Starters
Type 1 Non-comb., **Table 3-3**
All Others, **Table 3-4**
E22 Style Comb., **Table 3-6**

Contactors
3 = 3 Poles

Solid-State ③ Overload Range

Disconnect Fuse Clip

A = None	**G** = 100A/600V
B = 30A/250V	**H** = 200A/250V
C = 30A/600V	**J** = 200A/600V
D = 60A/250V	**K** = 400A/250V
E = 60A/600V	**L** = 400A/600V
F = 100A/250V	

HMCP/E or Breaker Ratings

A = None	**W** = 70A
B = 3A	**G** = 100A/RC3
C = 7A	**X** = 100A/TC3
D = 15A	**H** = 150A
E = 30A	**J** = 250A
F = 50A	**K** = 400A

Modification Codes
See **Page 16-40**

① If CPT is selected, Power Supply to be 120V AC – 24V DC.
② Power supply omitted.
③ See **Table 3-2**, Solid-State Overload Range Codes.

Table 3-2. *IT.* Solid-State Overload Range Codes

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—

FLA Range	Size						
	00	0	1	2	3	4	5
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Cover Control

Non-combination Starters

Control Power Transformer (CPT) may be required.

Combination Starters

- Cover control for Combination Starters uses 10250T style devices as standard.
- E22 style cover control options are available (**Table 3-5**).
- 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, **Page 16-40**.

Type 1 Cover Control

Table 3-3. Type 1 Non-combination Cover Control

Description	Factory Installed Flange Control ①	Field Installation Kits
	Position 9 Code	Catalog Number
Non-reversing		
No Cover Mounted Pilot Devices	**A**	**C400GK0**
START/STOP 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 2 Red Pilot Lights	**C**	**C400GR14** ②
UP/STOP/DOWN Pushbuttons	**E**	**C400GR2**
with 2 Red Pilot Lights	**F**	**C400GR24** ②
Two Red Pilot Lights	**P**	**C400GK44** ②
One Green Pilot Light	**Q**	**C400GK41** ②

① For more available factory installed flange control, see **Table 3-4**.

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

10250T Selector Switch

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

Description	Factory Installed Flange Control	Field Installation Kits
	Position 9 Code	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** ④
Green OFF	**Q**	**C400T10** ④
Red RUN/Green OFF Pilot Lights	**R**	**C400T11** ④
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 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**	**C400T15**
with 2 Red Pilot Lights	**J**	**—**
with 2 Red/1 Green Pilot Lights	**K**	**—**
Two Red Pilot Lights	**P**	⑤
One Green Pilot Light	**Q**	**C400T10** ④
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**	**—**

③ For Type 1 Non-combination field installation kits, see **Table 3-3**.

④ 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**	277V 60 Hz	**H**	480V 60 Hz	**C**
208V 60 Hz	**E**	380V 50 Hz	**L**	600V 60 Hz	**D**
240V 60 Hz	**B**				

⑤ Order Quantity (2) of **C400T10**.

E22 Selector Switch

Table 3-5. Type 1, 3R, 4X and 12 E22 Style Combination Starter Cover Control

Description	Factory Installed ① Position 9 Cover Control Code	Field Installation Kits Combination Only Catalog Number
Non-reversing		
No Cover Mounted Pilot Devices	**A**	—
START/STOP Pushbuttons (PB)	**B**	**CE400T01**
START/STOP PB & Red RUN Light	**C**	**CE400T02** ②
START/STOP PB, Red RUN, & Green STOPPED Light	**D**	**CE400T03** ②
HAND/OFF/AUTO Selector Switch (SS)	**H**	**CE400T04**
H-O-A SS & Red RUN Light	**J**	**CE400T05** ②
H-O-A SS, Red RUN, & Green STOPPED Light	**K**	**CE400T06** ②
Red RUN Pilot Light	**P**	**CE400T10** ②
Green Off Pilot Light	**Q**	**CE400T11** ②
Red RUN/Green OFF Pilot Light	**R**	**CE400T12** ②
ON/OFF Selector Switch (SS)	**S**	**CE400T07**
ON/OFF SS, Red RUN Light	**T**	**CE400T08** ②
ON/OFF SS, Red RUN, & Green STOPPED Light	**U**	**CE400T09** ②
Reversing		
No Cover Mounted Pilot Devices	**A**	—
FWD/REV/STOP Pushbuttons (PB)	**B**	**CE400T50**
FWD/REV/STOP PB + Red FWD & REV Lights	**C**	**CE400T51** ②
FWD/REV/STOP PB, Red FWD/REV, & Green STOPPED	**D**	**CE400T52** ②
FOR/OFF/REV Selector Switch (SS)	**H**	**CE400T53**
FOR/OFF/REV SS + Red FWD & REV Lights	**J**	**CE400T54** ②
FOR/OFF/REV SS, Red FWD/REV, & Green STOPPED	**K**	**CE400T55** ②
OPEN/OFF/CLOSE Selector Switch (SS)	**V**	**CE400T56**
OPEN/OFF/CLOSE SS + Red FWD & REV Lights	**W**	**CE400T57** ②
OPEN/OFF/CLOSE SS, Red FWD/REV, & Green STOPPED	**X**	**CE400T58** ②

① To include any of the above cover controls, place the control code character in position 9 of your Catalog Number and add Mod Code **C29**.
Example: ECT1604E**D**B-_**C29**.
Full voltage non-reversing fusible starter with START/STOP pushbutton with red RUN and green OFF pilot lights.

② Suffix for lights (required for field installed kits only) in the table below:

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

Features

- Full Voltage
- 3-Phase Electromechanical

Type 1 IT. NEMA Contactor

Product Selection

Table 3-6. Class ECT01 — Non-reversing Contactor — 3-Pole

NEMA Size	Motor Voltage	Max. hp	Coil ① Voltage	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Contactor (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	24V DC	**ECT01A1QAA**	**ECT01A2QAA**	**ECT01A4QAA**	**ECT01A8QAA**	**N111BSAX3N**
	200/208	1-1/2		**ECT01A1EAA**	**ECT01A2EAA**	**ECT01A4EAA**	**ECT01A8EAA**	
	230/240	1-1/2		**ECT01A1BAA**	**ECT01A2BAA**	**ECT01A4BAA**	**ECT01A8BAA**	
	460/480	2		**ECT01A1CAA**	**ECT01A2CAA**	**ECT01A4CAA**	**ECT01A8CAA**	
	575/600	2		**ECT01A1DAA**	**ECT01A2DAA**	**ECT01A4DAA**	**ECT01A8DAA**	
	380/50 Hz	1-1/2		**ECT01A1LAA**	**ECT01A2LAA**	**ECT01A4LAA**	**ECT01A8LAA**	
0	—	—	24V DC	**ECT0101QAA**	**ECT0102QAA**	**ECT0104QAA**	**ECT0108QAA**	**N111BS0X3N**
	200/208	3		**ECT0101EAA**	**ECT0102EAA**	**ECT0104EAA**	**ECT0108EAA**	
	230/240	3		**ECT0101BAA**	**ECT0102BAA**	**ECT0104BAA**	**ECT0108BAA**	
	460/480	5		**ECT0101CAA**	**ECT0102CAA**	**ECT0104CAA**	**ECT0108CAA**	
	575/600	5		**ECT0101DAA**	**ECT0102DAA**	**ECT0104DAA**	**ECT0108DAA**	
	380/50 Hz	5		**ECT0101LAA**	**ECT0102LAA**	**ECT0104LAA**	**ECT0108LAA**	
1	—	—	24V DC	**ECT0111QAA**	**ECT0112QAA**	**ECT0114QAA**	**ECT0118QAA**	**N111CS1X3N**
	200/208	7-1/2		**ECT0111EAA**	**ECT0112EAA**	**ECT0114EAA**	**ECT0118EAA**	
	230/240	7-1/2		**ECT0111BAA**	**ECT0112BAA**	**ECT0114BAA**	**ECT0118BAA**	
	460/480	10		**ECT0111CAA**	**ECT0112CAA**	**ECT0114CAA**	**ECT0118CAA**	
	575/600	10		**ECT0111DAA**	**ECT0112DAA**	**ECT0114DAA**	**ECT0118DAA**	
	380/50 Hz	10		**ECT0111LAA**	**ECT0112LAA**	**ECT0114LAA**	**ECT0118LAA**	
2	—	—	24V DC	**ECT0121QAA**	**ECT0122QAA**	**ECT0124QAA**	**ECT0128QAA**	**N111DS2X3N**
	200/208	10		**ECT0121EAA**	**ECT0122EAA**	**ECT0124EAA**	**ECT0128EAA**	
	230/240	15		**ECT0121BAA**	**ECT0122BAA**	**ECT0124BAA**	**ECT0128BAA**	
	460/480	25		**ECT0121CAA**	**ECT0122CAA**	**ECT0124CAA**	**ECT0128CAA**	
	575/600	25		**ECT0121DAA**	**ECT0122DAA**	**ECT0124DAA**	**ECT0128DAA**	
	380/50 Hz	25		**ECT0121LAA**	**ECT0122LAA**	**ECT0124LAA**	**ECT0128LAA**	
3	—	—	24V DC	**ECT0131QAA**	**ECT0132QAA**	**ECT0134QAA**	**ECT0138QAA**	**N111ES3X3N**
	200/208	25		**ECT0131EAA**	**ECT0132EAA**	**ECT0134EAA**	**ECT0138EAA**	
	230/240	30		**ECT0131BAA**	**ECT0132BAA**	**ECT0134BAA**	**ECT0138BAA**	
	460/480	50		**ECT0131CAA**	**ECT0132CAA**	**ECT0134CAA**	**ECT0138CAA**	
	575/600	50		**ECT0131DAA**	**ECT0132DAA**	**ECT0134DAA**	**ECT0138DAA**	
	380/50 Hz	50		**ECT0131LAA**	**ECT0132LAA**	**ECT0134LAA**	**ECT0138LAA**	
4	—	—	24V DC	**ECT0141QAA**	**ECT0142QAA**	**ECT0144QAA**	**ECT0148QAA**	**N111ES4X3N**
	200/208	40		**ECT0141EAA**	**ECT0142EAA**	**ECT0144EAA**	**ECT0148EAA**	
	230/240	50		**ECT0141BAA**	**ECT0142BAA**	**ECT0144BAA**	**ECT0148BAA**	
	460/480	100		**ECT0141CAA**	**ECT0142CAA**	**ECT0144CAA**	**ECT0148CAA**	
	575/600	100		**ECT0141DAA**	**ECT0142DAA**	**ECT0144DAA**	**ECT0148DAA**	
	380/50 Hz	75		**ECT0141LAA**	**ECT0142LAA**	**ECT0144LAA**	**ECT0148LAA**	
5	—	—	24V DC	**ECT0151QAA**	**ECT0152QAA**	**ECT0154QAA**	**ECT0158QAA**	**N111FS5X3N**
	200/208	75		**ECT0151EAA**	**ECT0152EAA**	**ECT0154EAA**	**ECT0158EAA**	
	230/240	100		**ECT0151BAA**	**ECT0152BAA**	**ECT0154BAA**	**ECT0158BAA**	
	460/480	200		**ECT0151CAA**	**ECT0152CAA**	**ECT0154CAA**	**ECT0158CAA**	
	575/600	200		**ECT0151DAA**	**ECT0152DAA**	**ECT0154DAA**	**ECT0158DAA**	
	380/50 Hz	150		**ECT0151LAA**	**ECT0152LAA**	**ECT0154LAA**	**ECT0158LAA**	

① All ***IT.*** Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT01A**4**QAA. 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 14**.

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Table 3-7. Class ECT02 — Reversing Contactor — 3-Pole

NEMA Size	Motor Voltage	Max. hp	Coil ① Voltage	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Contactor (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	24V DC	**ECT02A1QAA**	**ECT02A2QAA**	**ECT02A4QAA**	**ECT02A8QAA**	**N511BSAX3N**
	200/208	1-1/2		**ECT02A1EAA**	**ECT02A2EAA**	**ECT02A4EAA**	**ECT02A8EAA**	
	230/240	1-1/2		**ECT02A1BAA**	**ECT02A2BAA**	**ECT02A4BAA**	**ECT02A8BAA**	
	460/480	2		**ECT02A1CAA**	**ECT02A2CAA**	**ECT02A4CAA**	**ECT02A8CAA**	
	575/600	2		**ECT02A1DAA**	**ECT02A2DAA**	**ECT02A4DAA**	**ECT02A8DAA**	
	380/50 Hz	1-1/2		**ECT02A1LAA**	**ECT02A2LAA**	**ECT02A4LAA**	**ECT02A8LAA**	
0	—	—	24V DC	**ECT0201QAA**	**ECT0202QAA**	**ECT0204QAA**	**ECT0208QAA**	**N511BS0X3N**
	200/208	3		**ECT0201EAA**	**ECT0202EAA**	**ECT0204EAA**	**ECT0208EAA**	
	230/240	3		**ECT0201BAA**	**ECT0202BAA**	**ECT0204BAA**	**ECT0208BAA**	
	460/480	5		**ECT0201CAA**	**ECT0202CAA**	**ECT0204CAA**	**ECT0208CAA**	
	575/600	5		**ECT0201DAA**	**ECT0202DAA**	**ECT0204DAA**	**ECT0208DAA**	
	380/50 Hz	5		**ECT0201LAA**	**ECT0202LAA**	**ECT0204LAA**	**ECT0208LAA**	
1	—	—	24V DC	**ECT0211QAA**	**ECT0212QAA**	**ECT0214QAA**	**ECT0218QAA**	**N511CS1X3N**
	200/208	7-1/2		**ECT0211EAA**	**ECT0212EAA**	**ECT0214EAA**	**ECT0218EAA**	
	230/240	7-1/2		**ECT0211BAA**	**ECT0212BAA**	**ECT0214BAA**	**ECT0218BAA**	
	460/480	10		**ECT0211CAA**	**ECT0212CAA**	**ECT0214CAA**	**ECT0218CAA**	
	575/600	10		**ECT0211DAA**	**ECT0212DAA**	**ECT0214DAA**	**ECT0218DAA**	
	380/50 Hz	10		**ECT0211LAA**	**ECT0212LAA**	**ECT0214LAA**	**ECT0218LAA**	
2	—	—	24V DC	**ECT0221QAA**	**ECT0222QAA**	**ECT0224QAA**	**ECT0228QAA**	**N511DS2X3N**
	200/208	10		**ECT0221EAA**	**ECT0222EAA**	**ECT0224EAA**	**ECT0228EAA**	
	230/240	15		**ECT0221BAA**	**ECT0222BAA**	**ECT0224BAA**	**ECT0228BAA**	
	460/480	25		**ECT0221CAA**	**ECT0222CAA**	**ECT0224CAA**	**ECT0228CAA**	
	575/600	25		**ECT0221DAA**	**ECT0222DAA**	**ECT0224DAA**	**ECT0228DAA**	
	380/50 Hz	25		**ECT0221LAA**	**ECT0222LAA**	**ECT0224LAA**	**ECT0228LAA**	
3	—	—	24V DC	**ECT0231QAA**	**ECT0232QAA**	**ECT0234QAA**	**ECT0238QAA**	**N511ES3X3N**
	200/208	25		**ECT0231EAA**	**ECT0232EAA**	**ECT0234EAA**	**ECT0238EAA**	
	230/240	30		**ECT0231BAA**	**ECT0232BAA**	**ECT0234BAA**	**ECT0238BAA**	
	460/480	50		**ECT0231CAA**	**ECT0232CAA**	**ECT0234CAA**	**ECT0238CAA**	
	575/600	50		**ECT0231DAA**	**ECT0232DAA**	**ECT0234DAA**	**ECT0238DAA**	
	380/50 Hz	50		**ECT0231LAA**	**ECT0232LAA**	**ECT0234LAA**	**ECT0238LAA**	
4	—	—	24V DC	**ECT0241QAA**	**ECT0242QAA**	**ECT0244QAA**	**ECT0248QAA**	**N511ES4X3N**
	200/208	40		**ECT0241EAA**	**ECT0242EAA**	**ECT0244EAA**	**ECT0248EAA**	
	230/240	50		**ECT0241BAA**	**ECT0242BAA**	**ECT0244BAA**	**ECT0248BAA**	
	460/480	100		**ECT0241CAA**	**ECT0242CAA**	**ECT0244CAA**	**ECT0248CAA**	
	575/600	100		**ECT0241DAA**	**ECT0242DAA**	**ECT0244DAA**	**ECT0248DAA**	
	380/50 Hz	75		**ECT0241LAA**	**ECT0242LAA**	**ECT0244LAA**	**ECT0248LAA**	
5	—	—	24V DC	**ECT0251QAA**	**ECT0252QAA**	**ECT0254QAA**	**ECT0258QAA**	**N511FS5X3N**
	200/208	75		**ECT0251EAA**	**ECT0252EAA**	**ECT0254EAA**	**ECT0258EAA**	
	230/240	100		**ECT0251BAA**	**ECT0252BAA**	**ECT0254BAA**	**ECT0258BAA**	
	460/480	200		**ECT0251CAA**	**ECT0252CAA**	**ECT0254CAA**	**ECT0258CAA**	
	575/600	200		**ECT0251DAA**	**ECT0252DAA**	**ECT0254DAA**	**ECT0258DAA**	
	380/50 Hz	150		**ECT0251LAA**	**ECT0252LAA**	**ECT0254LAA**	**ECT0258LAA**	

① All ***IT.*** Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT02A**4**QAA. 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 14**.

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Features

- Full Voltage
- 3-Phase Electromechanical
- Solid-State Overload Relay

Type 12 Non-combination IT. Starter

Product Selection

Table 3-8. Class ECT05 — Non-combination Non-reversing Starter

NEMA Size	Motor Voltage	Max. hp	Coil ① Voltage	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
00	—	—	24V DC	ECT05A1QAA-_	ECT05A2QAA-_	ECT05A4QAA-_	ECT05A8QAA-_	N101BSA_3A
	200/208	1-1/2		ECT05A1EAA-_	ECT05A2EAA-_	ECT05A4EAA-_	ECT05A8EAA-_	
	230/240	1-1/2		ECT05A1BAA-_	ECT05A2BAA-_	ECT05A4BAA-_	ECT05A8BAA-_	
	460/480	2		ECT05A1CAA-_	ECT05A2CAA-_	ECT05A4CAA-_	ECT05A8CAA-_	
	575/600	2		ECT05A1DAA-_	ECT05A2DAA-_	ECT05A4DAA-_	ECT05A8DAA-_	
	380/50 Hz	1-1/2		ECT05A1LAA-_	ECT05A2LAA-_	ECT05A4LAA-_	ECT05A8LAA-_	
0	—	—	24V DC	ECT0501QAA-_	ECT0502QAA-_	ECT0504QAA-_	ECT0508QAA-_	N101BS0_3A
	200/208	3		ECT0501EAA-_	ECT0502EAA-_	ECT0504EAA-_	ECT0508EAA-_	
	230/240	3		ECT0501BAA-_	ECT0502BAA-_	ECT0504BAA-_	ECT0508BAA-_	
	460/480	5		ECT0501CAA-_	ECT0502CAA-_	ECT0504CAA-_	ECT0508CAA-_	
	575/600	5		ECT0501DAA-_	ECT0502DAA-_	ECT0504DAA-_	ECT0508DAA-_	
	380/50 Hz	5		ECT0501LAA-_	ECT0502LAA-_	ECT0504LAA-_	ECT0508LAA-_	
1	—	—	24V DC	ECT0511QAA-_	ECT0512QAA-_	ECT0514QAA-_	ECT0518QAA-_	N101CS1_3A
	200/208	7-1/2		ECT0511EAA-_	ECT0512EAA-_	ECT0514EAA-_	ECT0518EAA-_	
	230/240	7-1/2		ECT0511BAA-_	ECT0512BAA-_	ECT0514BAA-_	ECT0518BAA-_	
	460/480	10		ECT0511CAA-_	ECT0512CAA-_	ECT0514CAA-_	ECT0518CAA-_	
	575/600	10		ECT0511DAA-_	ECT0512DAA-_	ECT0514DAA-_	ECT0518DAA-_	
	380/50 Hz	10		ECT0511LAA-_	ECT0512LAA-_	ECT0514LAA-_	ECT0518LAA-_	
2	—	—	24V DC	ECT0521QAA-K	ECT0522QAA-K	ECT0524QAA-K	ECT0528QAA-K	N101DS2_3A
	200/208	10		ECT0521EAA-K	ECT0522EAA-K	ECT0524EAA-K	ECT0528EAA-K	
	230/240	15		ECT0521BAA-K	ECT0522BAA-K	ECT0524BAA-K	ECT0528BAA-K	
	460/480	25		ECT0521CAA-K	ECT0522CAA-K	ECT0524CAA-K	ECT0528CAA-K	
	575/600	25		ECT0521DAA-K	ECT0522DAA-K	ECT0524DAA-K	ECT0528DAA-K	
	380/50 Hz	25		ECT0521LAA-K	ECT0522LAA-K	ECT0524LAA-K	ECT0528LAA-K	
3	—	—	24V DC	ECT0531QAA-M	ECT0532QAA-M	ECT0534QAA-M	ECT0538QAA-M	N101ES3_3A
	200/208	25		ECT0531EAA-M	ECT0532EAA-M	ECT0534EAA-M	ECT0538EAA-M	
	230/240	30		ECT0531BAA-M	ECT0532BAA-M	ECT0534BAA-M	ECT0538BAA-M	
	460/480	50		ECT0531CAA-M	ECT0532CAA-M	ECT0534CAA-M	ECT0538CAA-M	
	575/600	50		ECT0531DAA-M	ECT0532DAA-M	ECT0534DAA-M	ECT0538DAA-M	
	380/50 Hz	50		ECT0531LAA-M	ECT0532LAA-M	ECT0534LAA-M	ECT0538LAA-M	
4	—	—	24V DC	ECT0541QAA-P	ECT0542QAA-P	ECT0544QAA-P	ECT0548QAA-P	N101ES4_3A
	200/208	40		ECT0541EAA-P	ECT0542EAA-P	ECT0544EAA-P	ECT0548EAA-P	
	230/240	50		ECT0541BAA-P	ECT0542BAA-P	ECT0544BAA-P	ECT0548BAA-P	
	460/480	100		ECT0541CAA-P	ECT0542CAA-P	ECT0544CAA-P	ECT0548CAA-P	
	575/600	100		ECT0541DAA-P	ECT0542DAA-P	ECT0544DAA-P	ECT0548DAA-P	
	380/50 Hz	75		ECT0541LAA-P	ECT0542LAA-P	ECT0544LAA-P	ECT0548LAA-P	
5	—	—	24V DC	ECT0551QAA-S	ECT0552QAA-S	ECT0554QAA-S	ECT0558QAA-S	N101FS5_3A
	200/208	75		ECT0551EAA-S	ECT0552EAA-S	ECT0554EAA-S	ECT0558EAA-S	
	230/240	100		ECT0551BAA-S	ECT0552BAA-S	ECT0554BAA-S	ECT0558BAA-S	
	460/480	200		ECT0551CAA-S	ECT0552CAA-S	ECT0554CAA-S	ECT0558CAA-S	
	575/600	200		ECT0551DAA-S	ECT0552DAA-S	ECT0554DAA-S	ECT0558DAA-S	
	380/50 Hz	150		ECT0551LAA-S	ECT0552LAA-S	ECT0554LAA-S	ECT0558LAA-S	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT05A**4**QAA. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from **Table 3-2** on **Page 3-2.**

Table 3-9. Class ECT06 — Non-combination Reversing Starter

NEMA Size	Motor Voltage	Max. hp	Coil ① Voltage	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
00	—	—	24V DC	ECT06A1QAA-_	ECT06A2QAA-_	ECT06A4QAA-_	ECT06A8QAA-_	N501BSA_3A
	200/208	1-1/2		ECT06A1EAA-_	ECT06A2EAA-_	ECT06A4EAA-_	ECT06A8EAA-_	
	230/240	1-1/2		ECT06A1BAA-_	ECT06A2BAA-_	ECT06A4BAA-_	ECT06A8BAA-_	
	460/480	2		ECT06A1CAA-_	ECT06A2CAA-_	ECT06A4CAA-_	ECT06A8CAA-_	
	575/600	2		ECT06A1DAA-_	ECT06A2DAA-_	ECT06A4DAA-_	ECT06A8DAA-_	
	380/50 Hz	1-1/2		ECT06A1LAA-_	ECT06A2LAA-_	ECT06A4LAA-_	ECT06A8LAA-_	
0	—	—	24V DC	ECT0601QAA-_	ECT0602QAA-_	ECT0604QAA-_	ECT0608QAA-_	N501BS0_3A
	200/208	3		ECT0601EAA-_	ECT0602EAA-_	ECT0604EAA-_	ECT0608EAA-_	
	230/240	3		ECT0601BAA-_	ECT0602BAA-_	ECT0604BAA-_	ECT0608BAA-_	
	460/480	5		ECT0601CAA-_	ECT0602CAA-_	ECT0604CAA-_	ECT0608CAA-_	
	575/600	5		ECT0601DAA-_	ECT0602DAA-_	ECT0604DAA-_	ECT0608DAA-_	
	380/50 Hz	5		ECT0601LAA-_	ECT0602LAA-_	ECT0604LAA-_	ECT0608LAA-_	
1	—	—	24V DC	ECT0611QAA-_	ECT0612QAA-_	ECT0614QAA-_	ECT0618QAA-_	N501CS1_3A
	200/208	7-1/2		ECT0611EAA-_	ECT0612EAA-_	ECT0614EAA-_	ECT0618EAA-_	
	230/240	7-1/2		ECT0611BAA-_	ECT0612BAA-_	ECT0614BAA-_	ECT0618BAA-_	
	460/480	10		ECT0611CAA-_	ECT0612CAA-_	ECT0614CAA-_	ECT0618CAA-_	
	575/600	10		ECT0611DAA-_	ECT0612DAA-_	ECT0614DAA-_	ECT0618DAA-_	
	380/50 Hz	10		ECT0611LAA-_	ECT0612LAA-_	ECT0614LAA-_	ECT0618LAA-_	
2	—	—	24V DC	ECT0621QAA-K	ECT0622QAA-K	ECT0624QAA-K	ECT0628QAA-K	N501DS2_3A
	200/208	10		ECT0621EAA-K	ECT0622EAA-K	ECT0624EAA-K	ECT0628EAA-K	
	230/240	15		ECT0621BAA-K	ECT0622BAA-K	ECT0624BAA-K	ECT0628BAA-K	
	460/480	25		ECT0621CAA-K	ECT0622CAA-K	ECT0624CAA-K	ECT0628CAA-K	
	575/600	25		ECT0621DAA-K	ECT0622DAA-K	ECT0624DAA-K	ECT0628DAA-K	
	380/50 Hz	25		ECT0621LAA-K	ECT0622LAA-K	ECT0624LAA-K	ECT0628LAA-K	
3	—	—	24V DC	ECT0631QAA-M	ECT0632QAA-M	ECT0634QAA-M	ECT0638QAA-M	N501ES3_3A
	200/208	25		ECT0631EAA-M	ECT0632EAA-M	ECT0634EAA-M	ECT0638EAA-M	
	230/240	30		ECT0631BAA-M	ECT0632BAA-M	ECT0634BAA-M	ECT0638BAA-M	
	460/480	50		ECT0631CAA-M	ECT0632CAA-M	ECT0634CAA-M	ECT0638CAA-M	
	575/600	50		ECT0631DAA-M	ECT0632DAA-M	ECT0634DAA-M	ECT0638DAA-M	
	380/50 Hz	50		ECT0631LAA-M	ECT0632LAA-M	ECT0634LAA-M	ECT0638LAA-M	
4	—	—	24V DC	ECT0641QAA-P	ECT0642QAA-P	ECT0644QAA-P	ECT0648QAA-P	N501ES4_3A
	200/208	40		ECT0641EAA-P	ECT0642EAA-P	ECT0644EAA-P	ECT0648EAA-P	
	230/240	50		ECT0641BAA-P	ECT0642BAA-P	ECT0644BAA-P	ECT0648BAA-P	
	460/480	100		ECT0641CAA-P	ECT0642CAA-P	ECT0644CAA-P	ECT0648CAA-P	
	575/600	100		ECT0641DAA-P	ECT0642DAA-P	ECT0644DAA-P	ECT0648DAA-P	
	380/50 Hz	75		ECT0641LAA-P	ECT0642LAA-P	ECT0644LAA-P	ECT0648LAA-P	
5	—	—	24V DC	ECT0651QAA-S	ECT0652QAA-S	ECT0654QAA-S	ECT0658QAA-S	N501FS5_3A
	200/208	75		ECT0651EAA-S	ECT0652EAA-S	ECT0654EAA-S	ECT0658EAA-S	
	230/240	100		ECT0651BAA-S	ECT0652BAA-S	ECT0654BAA-S	ECT0658BAA-S	
	460/480	200		ECT0651CAA-S	ECT0652CAA-S	ECT0654CAA-S	ECT0658CAA-S	
	575/600	200		ECT0651DAA-S	ECT0652DAA-S	ECT0654DAA-S	ECT0658DAA-S	
	380/50 Hz	150		ECT0651LAA-S	ECT0652LAA-S	ECT0654LAA-S	ECT0658LAA-S	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT06A**4**QAA. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	A	A	A	—	—	—	—
.59 – 1.9	B	B	B	—	—	—	—
1.4 – 4.4	C	C	C	—	—	—	—
2.8 – 9.0	D	D	D	—	—	—	—
5.0 – 16	—	—	F	—	—	—	—
6.3 – 20	—	G	—	—	—	—	—
8.4 – 27	—	—	H	—	—	—	—
10 – 32	—	J	—	—	—	—	—
14 – 45	—	—	—	K	—	—	—
16 – 50	—	—	L	—	—	—	—
28 – 90	—	—	—	—	M	—	—
31 – 100	—	—	—	N	—	—	—
42 – 135	—	—	—	—	—	P	—
63 – 200	—	—	—	—	—	R	—
84 – 270	—	—	—	—	—	—	S
131 – 420	—	—	—	—	—	—	T

Features

- Full Voltage
- 3-Phase Electromechanical
- Solid-State Overload Relay

Product Selection

Table 3-10. Class ECT16 — Combination Non-reversing Starter — Fusible Disconnect

Motor Voltage	Max. hp	Coil ① Voltage	Disconnect	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
NEMA Size 0								
—	—	24V DC	30A	ECT1601QAB-_	ECT1602QAB-_	ECT1604QAB-_	ECT1608QAB-_	N101BS0_3A
—	—			ECT1601QAC-_	ECT1602QAC-_	ECT1604QAC-_	ECT1608QAC-_	
200/208	3			ECT1601EAB-_	ECT1602EAB-_	ECT1604EAB-_	ECT1608EAB-_	
230/240	3			ECT1601BAB-_	ECT1602BAB-_	ECT1604BAB-_	ECT1608BAB-_	
460/480	5			ECT1601CAC-_	ECT1602CAC-_	ECT1604CAC-_	ECT1608CAC-_	
575/600	5			ECT1601DAC-_	ECT1602DAC-_	ECT1604DAC-_	ECT1608DAC-_	
380/50 Hz	5			ECT1601LAC-_	ECT1602LAC-_	ECT1604LAC-_	ECT1608LAC-_	
NEMA Size 1								
—	—	24V DC	30A	ECT1611QAB-_	ECT1612QAB-_	ECT1614QAB-_	ECT1618QAB-_	N101CS1_3A
—	—			ECT1611QAC-_	ECT1612QAC-_	ECT1614QAC-_	ECT1618QAC-_	
200/208	7-1/2			ECT1611EAB-_	ECT1612EAB-_	ECT1614EAB-_	ECT1618EAB-_	
230/240	7-1/2			ECT1611BAB-_	ECT1612BAB-_	ECT1614BAB-_	ECT1618BAB-_	
460/480	10			ECT1611CAC-_	ECT1612CAC-_	ECT1614CAC-_	ECT1618CAC-_	
575/600	10			ECT1611DAC-_	ECT1612DAC-_	ECT1614DAC-_	ECT1618DAC-_	
380/50 Hz	10			ECT1611LAC-_	ECT1612LAC-_	ECT1614LAC-_	ECT1618LAC-_	
NEMA Size 2								
—	—	24V DC	60A	ECT1621QAD-K	ECT1622QAD-K	ECT1624QAD-K	ECT1628QAD-K	N101DS2_3A
—	—			ECT1621QAE-K	ECT1622QAE-K	ECT1624QAE-K	ECT1628QAE-K	
200/208	10			ECT1621EAD-K	ECT1622EAD-K	ECT1624EAD-K	ECT1628EAD-K	
230/240	15			ECT1621BAD-K	ECT1622BAD-K	ECT1624BAD-K	ECT1628BAD-K	
460/480	25			ECT1621CAE-K	ECT1622CAE-K	ECT1624CAE-K	ECT1628CAE-K	
575/600	25			ECT1621DAE-K	ECT1622DAE-K	ECT1624DAE-K	ECT1628DAE-K	
380/50 Hz	25			ECT1621LAE-K	ECT1622LAE-K	ECT1624LAE-K	ECT1628LAE-K	
NEMA Size 3								
—	—	24V DC	100A	ECT1631QAF-M	ECT1632QAF-M	ECT1634QAF-M	ECT1638QAF-M	N101ES3_3A
—	—			ECT1631QAG-M	ECT1632QAG-M	ECT1634QAG-M	ECT1638QAG-M	
200/208	25			ECT1631EAF-M	ECT1632EAF-M	ECT1634EAF-M	ECT1638EAF-M	
230/240	30			ECT1631BAF-M	ECT1632BAF-M	ECT1634BAF-M	ECT1638BAF-M	
460/480	50			ECT1631CAG-M	ECT1632CAG-M	ECT1634CAG-M	ECT1638CAG-M	
575/600	50			ECT1631DAG-M	ECT1632DAG-M	ECT1634DAG-M	ECT1638DAG-M	
380/50 Hz	50			ECT1631LAG-M	ECT1632LAG-M	ECT1634LAG-M	ECT1638LAG-M	
NEMA Size 4								
—	—	24V DC	200A	ECT1641QAH-P	ECT1642QAH-P	ECT1644QAH-P	ECT1648QAH-P	N101ES4_3A
—	—			ECT1641QAJ-P	ECT1642QAJ-P	ECT1644QAJ-P	ECT1648QAJ-P	
200/208	40			ECT1641EAH-P	ECT1642EAH-P	ECT1644EAH-P	ECT1648EAH-P	
230/240	50			ECT1641BAH-P	ECT1642BAH-P	ECT1644BAH-P	ECT1648BAH-P	
460/480	100			ECT1641CAJ-P	ECT1642CAJ-P	ECT1644CAJ-P	ECT1648CAJ-P	
575/600	100			ECT1641DAJ-P	ECT1642DAJ-P	ECT1644DAJ-P	ECT1648DAJ-P	
380/50 Hz	75			ECT1641LAJ-P	ECT1642LAJ-P	ECT1644LAJ-P	ECT1648LAJ-P	
NEMA Size 5								
—	—	24V DC	400A	ECT1651QAK-S	ECT1652QAK-S	ECT1654QAK-S	ECT1658QAK-S	N101FS5_3A
—	—			ECT1651QAL-S	ECT1652QAL-S	ECT1654QAL-S	ECT1658QAL-S	
200/208	75			ECT1651EAK-S	ECT1652EAK-S	ECT1654EAK-S	ECT1658EAK-S	
230/240	100			ECT1651BAK-S	ECT1652BAK-S	ECT1654BAK-S	ECT1658BAK-S	
460/480	200			ECT1651CAL-S	ECT1652CAL-S	ECT1654CAL-S	ECT1658CAL-S	
575/600	200			ECT1651DAL-S	ECT1652DAL-S	ECT1654DAL-S	ECT1658DAL-S	
380/50 Hz	150			ECT1651LAL-S	ECT1652LAL-S	ECT1654LAL-S	ECT1658LAL-S	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT160**4**QAB. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from **Table 3-2** on **Page 3-2.**

Table 3-11. Class ECT16 — Combination Non-reversing Starter — Non-fusible Disconnect

Motor Voltage	Max. hp	Coil ① Voltage	Disconnect	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
NEMA Size 0								
—	—	24V DC	30A	ECT1601QAA-_	ECT1602QAA-_	ECT1604QAA-_	ECT1608QAA-_	N101BS0_3A
200/208	3			ECT1601EAA-_	ECT1602EAA-_	ECT1604EAA-_	ECT1608EAA-_	
230/240	3			ECT1601BAA-_	ECT1602BAA-_	ECT1604BAA-_	ECT1608BAA-_	
460/480	5			ECT1601CAA-_	ECT1602CAA-_	ECT1604CAA-_	ECT1608CAA-_	
575/600	5			ECT1601DAA-_	ECT1602DAA-_	ECT1604DAA-_	ECT1608DAA-_	
380/50 Hz	5			ECT1601LAA-_	ECT1602LAA-_	ECT1604LAA-_	ECT1608LAA-_	
NEMA Size 1								
—	—	24V DC	30A	ECT1611QAA-_	ECT1612QAA-_	ECT1614QAA-_	ECT1618QAA-_	N101CS1_3A
200/208	7-1/2			ECT1611EAA-_	ECT1612EAA-_	ECT1614EAA-_	ECT1618EAA-_	
230/240	7-1/2			ECT1611BAA-_	ECT1612BAA-_	ECT1614BAA-_	ECT1618BAA-_	
460/480	10			ECT1611CAA-_	ECT1612CAA-_	ECT1614CAA-_	ECT1618CAA-_	
575/600	10			ECT1611DAA-_	ECT1612DAA-_	ECT1614DAA-_	ECT1618DAA-_	
380/50 Hz	10			ECT1611LAA-_	ECT1612LAA-_	ECT1614LAA-_	ECT1618LAA-_	
NEMA Size 2								
—	—	24V DC	60A	ECT1621QAA-K	ECT1622QAA-K	ECT1624QAA-K	ECT1628QAA-K	N101DS2_3A
200/208	10			ECT1621EAA-K	ECT1622EAA-K	ECT1624EAA-K	ECT1628EAA-K	
230/240	15			ECT1621BAA-K	ECT1622BAA-K	ECT1624BAA-K	ECT1628BAA-K	
460/480	25			ECT1621CAA-K	ECT1622CAA-K	ECT1624CAA-K	ECT1628CAA-K	
575/600	25			ECT1621DAA-K	ECT1622DAA-K	ECT1624DAA-K	ECT1628DAA-K	
380/50 Hz	25			ECT1621LAA-K	ECT1622LAA-K	ECT1624LAA-K	ECT1628LAA-K	
NEMA Size 3								
—	—	24V DC	100A	ECT1631QAA-M	ECT1632QAA-M	ECT1634QAA-M	ECT1638QAA-M	N101ES3_3A
200/208	25			ECT1631EAA-M	ECT1632EAA-M	ECT1634EAA-M	ECT1638EAA-M	
230/240	30			ECT1631BAA-M	ECT1632BAA-M	ECT1634BAA-M	ECT1638BAA-M	
460/480	50			ECT1631CAA-M	ECT1632CAA-M	ECT1634CAA-M	ECT1638CAA-M	
575/600	50			ECT1631DAA-M	ECT1632DAA-M	ECT1634DAA-M	ECT1638DAA-M	
380/50 Hz	50			ECT1631LAA-M	ECT1632LAA-M	ECT1634LAA-M	ECT1638LAA-M	
NEMA Size 4								
—	—	24V DC	200A	ECT1641QAA-P	ECT1642QAA-P	ECT1644QAA-P	ECT1648QAA-P	N101ES4_3A
200/208	40			ECT1641EAA-P	ECT1642EAA-P	ECT1644EAA-P	ECT1648EAA-P	
230/240	50			ECT1641BAA-P	ECT1642BAA-P	ECT1644BAA-P	ECT1648BAA-P	
460/480	100			ECT1641CAA-P	ECT1642CAA-P	ECT1644CAA-P	ECT1648CAA-P	
575/600	100			ECT1641DAA-P	ECT1642DAA-P	ECT1644DAA-P	ECT1648DAA-P	
380/50 Hz	75			ECT1641LAA-P	ECT1642LAA-P	ECT1644LAA-P	ECT1648LAA-P	
NEMA Size 5								
—	—	24V DC	400A	ECT1651QAA-S	ECT1652QAA-S	ECT1654QAA-S	ECT1658QAA-S	N101FS5_3A
200/208	75			ECT1651EAA-S	ECT1652EAA-S	ECT1654EAA-S	ECT1658EAA-S	
230/240	100			ECT1651BAA-S	ECT1652BAA-S	ECT1654BAA-S	ECT1658BAA-S	
460/480	200			ECT1651CAA-S	ECT1652CAA-S	ECT1654CAA-S	ECT1658CAA-S	
575/600	200			ECT1651DAA-S	ECT1652DAA-S	ECT1654DAA-S	ECT1658DAA-S	
380/50 Hz	150			ECT1651LAA-S	ECT1652LAA-S	ECT1654LAA-S	ECT1658LAA-S	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT160**4**QAA. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Table 3-12. Class ECT17 — Combination Reversing Starter — Fusible Disconnect

Motor Voltage	Max. hp	Coil ① Voltage	Disconnect	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
NEMA Size 0								
—	—	24V DC	30A	**ECT1701QAB-_**	**ECT1702QAB-_**	**ECT1704QAB-_**	**ECT1708QAB-_**	**N501BS0_3A**
—	—			**ECT1701QAC-_**	**ECT1702QAC-_**	**ECT1704QAC-_**	**ECT1708QAC-_**	
200/208	3			**ECT1701EAB-_**	**ECT1702EAB-_**	**ECT1704EAB-_**	**ECT1708EAB-_**	
230/240	3			**ECT1701BAB-_**	**ECT1702BAB-_**	**ECT1704BAB-_**	**ECT1708BAB-_**	
460/480	5			**ECT1701CAC-_**	**ECT1702CAC-_**	**ECT1704CAC-_**	**ECT1708CAC-_**	
575/600	5			**ECT1701DAC-_**	**ECT1702DAC-_**	**ECT1704DAC-_**	**ECT1708DAC-_**	
380/50 Hz	5			**ECT1701LAC-_**	**ECT1702LAC-_**	**ECT1704LAC-_**	**ECT1708LAC-_**	
NEMA Size 1								
—	—	24V DC	30A	**ECT1711QAB-_**	**ECT1712QAB-_**	**ECT1714QAB-_**	**ECT1718QAB-_**	**N501CS1_3A**
—	—			**ECT1711QAC-_**	**ECT1712QAC-_**	**ECT1714QAC-_**	**ECT1718QAC-_**	
200/208	7-1/2			**ECT1711EAB-_**	**ECT1712EAB-_**	**ECT1714EAB-_**	**ECT1718EAB-_**	
230/240	7-1/2			**ECT1711BAB-_**	**ECT1712BAB-_**	**ECT1714BAB-_**	**ECT1718BAB-_**	
460/480	10			**ECT1711CAC-_**	**ECT1712CAC-_**	**ECT1714CAC-_**	**ECT1718CAC-_**	
575/600	10			**ECT1711DAC-_**	**ECT1712DAC-_**	**ECT1714DAC-_**	**ECT1718DAC-_**	
380/50 Hz	10			**ECT1711LAC-_**	**ECT1712LAC-_**	**ECT1714LAC-_**	**ECT1718LAC-_**	
NEMA Size 2								
—	—	24V DC	60A	**ECT1721QAD-K**	**ECT1722QAD-K**	**ECT1724QAD-K**	**ECT1728QAD-K**	**N501DS2_3A**
—	—			**ECT1721QAE-K**	**ECT1722QAE-K**	**ECT1724QAE-K**	**ECT1728QAE-K**	
200/208	10			**ECT1721EAD-K**	**ECT1722EAD-K**	**ECT1724EAD-K**	**ECT1728EAD-K**	
230/240	15			**ECT1721BAD-K**	**ECT1722BAD-K**	**ECT1724BAD-K**	**ECT1728BAD-K**	
460/480	25			**ECT1721CAE-K**	**ECT1722CAE-K**	**ECT1724CAE-K**	**ECT1728CAE-K**	
575/600	25			**ECT1721DAE-K**	**ECT1722DAE-K**	**ECT1724DAE-K**	**ECT1728DAE-K**	
380/50 Hz	25			**ECT1721LAE-K**	**ECT1722LAEK**	**ECT1724LAE-K**	**ECT1728LAE-K**	
NEMA Size 3								
—	—	24V DC	100A	**ECT1731QAF-M**	**ECT1732QAF-M**	**ECT1734QAF-M**	**ECT1738QAF-M**	**N501ES3_3A**
—	—			**ECT1731QAG-M**	**ECT1732QAG-M**	**ECT1734QAG-M**	**ECT1738QAG-M**	
200/208	25			**ECT1731EAF-M**	**ECT1732EAF-M**	**ECT1734EAF-M**	**ECT1738EAF-M**	
230/240	30			**ECT1731BAF-M**	**ECT1732BAF-M**	**ECT1734BAF-M**	**ECT1738BAF-M**	
460/480	50			**ECT1731CAG-M**	**ECT1732CAG-M**	**ECT1734CAG-M**	**ECT1738CAG-M**	
575/600	50			**ECT1731DAG-M**	**ECT1732DAG-M**	**ECT1734DAG-M**	**ECT1738DAG-M**	
380/50 Hz	50			**ECT1731LAG-M**	**ECT1732LAG-M**	**ECT1734LAG-M**	**ECT1738LAG-M**	
NEMA Size 4								
—	—	24V DC	200A	**ECT1741QAH-P**	**ECT1742QAH-P**	**ECT1744QAH-P**	**ECT1748QAH-P**	**N501ES4_3A**
—	—			**ECT1741QAJ-P**	**ECT1742QAJ-P**	**ECT1744QAJ-P**	**ECT1748QAJ-P**	
200/208	40			**ECT1741EAH-P**	**ECT1742EAH-P**	**ECT1744EAH-P**	**ECT1748EAH-P**	
230/240	50			**ECT1741BAH-P**	**ECT1742BAH-P**	**ECT1744BAH-P**	**ECT1748BAH-P**	
460/480	100			**ECT1741CAJ-P**	**ECT1742CAJ-P**	**ECT1744CAJ-P**	**ECT1748CAJ-P**	
575/600	100			**ECT1741DAJ-P**	**ECT1742DAJ-P**	**ECT1744DAJ-P**	**ECT1748DAJ-P**	
380/50 Hz	75			**ECT1741LAJ-P**	**ECT1742LAJ-P**	**ECT1744LAJ-P**	**ECT1748LAJ-P**	
NEMA Size 5								
—	—	24V DC	400A	**ECT1751QAK-S**	**ECT1752QAK-S**	**ECT1754QAK-S**	**ECT1758QAK-S**	**N501FS5_3A**
—	—			**ECT1751QAL-S**	**ECT1752QAL-S**	**ECT1754QAL-S**	**ECT1758QAL-S**	
200/208	75			**ECT1751EAK-S**	**ECT1752EAK-S**	**ECT1754EAK-S**	**ECT1758EAK-S**	
230/240	100			**ECT1751BAK-S**	**ECT1752BAK-S**	**ECT1754BAK-S**	**ECT1758BAK-S**	
460/480	200			**ECT1751CAL-S**	**ECT1752CAL-S**	**ECT1754CAL-S**	**ECT1758CAL-S**	
575/600	200			**ECT1751DAL-S**	**ECT1752DAL-S**	**ECT1754DAL-S**	**ECT1758DAL-S**	
380/50 Hz	150			**ECT1751LAL-S**	**ECT1752LAL-S**	**ECT1754LAL-S**	**ECT1758LAL-S**	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT170**4**QAB. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from **Table 3-2** on **Page 3-2**.

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Table 3-13. Class ECT17 — Combination Reversing Starter — Non-fusible Disconnect

Motor Voltage	Max. hp	Coil ① Voltage	Disconnect	3-Pole Type 1	3-Pole Type 3R	3-Pole Type 4X ②	3-Pole Type 12	3-Pole Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
NEMA Size 0								
—	—	24V DC	30A	ECT1701QAA-_	ECT1702QAA-_	ECT1704QAA-_	ECT1708QAA-_	N501BS0_3A
200/208	3			ECT1701EAA-_	ECT1702EAA-_	ECT1704EAA-_	ECT1708EAA-_	
230/240	3			ECT1701BAA-_	ECT1702BAA-_	ECT1704BAA-_	ECT1708BAA-_	
460/480	5			ECT1701CAA-_	ECT1702CAA-_	ECT1704CAA-_	ECT1708CAA-_	
575/600	5			ECT1701DAA-_	ECT1702DAA-_	ECT1704DAA-_	ECT1708DAA-_	
380/50 Hz	5			ECT1701LAA-_	ECT1702LAA-_	ECT1704LAA-_	ECT1708LAA-_	
NEMA Size 1								
—	—	24V DC	30A	ECT1711QAA-_	ECT1712QAA-_	ECT1714QAA-_	ECT1718QAA-_	N501CS1_3A
200/208	7-1/2			ECT1711EAA-_	ECT1712EAA-_	ECT1714EAA-_	ECT1718EAA-_	
230/240	7-1/2			ECT1711BAA-_	ECT1712BAA-_	ECT1714BAA-_	ECT1718BAA-_	
460/480	10			ECT1711CAA-_	ECT1712CAA-_	ECT1714CAA-_	ECT1718CAA-_	
575/600	10			ECT1711DAA-_	ECT1712DAA-_	ECT1714DAA-_	ECT1718DAA-_	
380/50 Hz	10			ECT1711LAA-_	ECT1712LAA-_	ECT1714LAA-_	ECT1718LAA-_	
NEMA Size 2								
—	—	24V DC	60A	ECT1721QAA-K	ECT1722QAA-K	ECT1724QAA-K	ECT1728QAA-K	N501DS2_3A
200/208	10			ECT1721EAA-K	ECT1722EAA-K	ECT1724EAA-K	ECT1728EAA-K	
230/240	15			ECT1721BAA-K	ECT1722BAA-K	ECT1724BAA-K	ECT1728BAA-K	
460/480	25			ECT1721CAA-K	ECT1722CAA-K	ECT1724CAA-K	ECT1728CAA-K	
575/600	25			ECT1721DAA-K	ECT1722DAA-K	ECT1724DAA-K	ECT1728DAA-K	
380/50 Hz	25			ECT1721LAA-K	ECT1722LAA-K	ECT1724LAA-K	ECT1728LAA-K	
NEMA Size 3								
—	—	24V DC	100A	ECT1731QAA-M	ECT1732QAA-M	ECT1734QAA-M	ECT1738QAA-M	N501ES3_3A
200/208	25			ECT1731EAA-M	ECT1732EAA-M	ECT1734EAA-M	ECT1738EAA-M	
230/240	30			ECT1731BAA-M	ECT1732BAA-M	ECT1734BAA-M	ECT1738BAA-M	
460/480	50			ECT1731CAA-M	ECT1732CAA-M	ECT1734CAA-M	ECT1738CAA-M	
575/600	50			ECT1731DAA-M	ECT1732DAA-M	ECT1734DAA-M	ECT1738DAA-M	
380/50 Hz	50			ECT1731LAA-M	ECT1732LAA-M	ECT1734LAA-M	ECT1738LAA-M	
NEMA Size 4								
—	—	24V DC	200A	ECT1741QAA-P	ECT1742QAA-P	ECT1744QAA-P	ECT1748QAA-P	N501ES4_3A
200/208	40			ECT1741EAA-P	ECT1742EAA-P	ECT1744EAA-P	ECT1748EAA-P	
230/240	50			ECT1741BAA-P	ECT1742BAA-P	ECT1744BAA-P	ECT1748BAA-P	
460/480	100			ECT1741CAA-P	ECT1742CAA-P	ECT1744CAA-P	ECT1748CAA-P	
575/600	100			ECT1741DAA-P	ECT1742DAA-P	ECT1744DAA-P	ECT1748DAA-P	
380/50 Hz	75			ECT1741LAA-P	ECT1742LAA-P	ECT1744LAA-P	ECT1748LAA-P	
NEMA Size 5								
—	—	24V DC	400A	ECT1751QAA-S	ECT1752QAA-S	ECT1754QAA-S	ECT1758QAA-S	N501FS5_3A
200/208	75			ECT1751EAA-S	ECT1752EAA-S	ECT1754EAA-S	ECT1758EAA-S	
230/240	100			ECT1751BAA-S	ECT1752BAA-S	ECT1754BAA-S	ECT1758BAA-S	
460/480	200			ECT1751CAA-S	ECT1752CAA-S	ECT1754CAA-S	ECT1758CAA-S	
575/600	200			ECT1751DAA-S	ECT1752DAA-S	ECT1754DAA-S	ECT1758DAA-S	
380/50 Hz	150			ECT1751LAA-S	ECT1752LAA-S	ECT1754LAA-S	ECT1758LAA-S	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT170**4**QAA. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Features

- Full Voltage
- 3-Phase Electromechanical
- Solid-State Overload Relay
- Integrated Cover Control (Type 1/12)

Type 12 Combination IT. Starter with HMCPE

Product Selection

Table 3-14. Class ECT22 — Combination Non-reversing Starter — Circuit Breaker

Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 1 General Purpose Catalog Number ③	3-Pole Type 3R Rainproof Catalog Number ③	3-Pole Type 4X ② Watertight Catalog Number ③	3-Pole Type 12 Dust-Tight Catalog Number ③	3-Pole Component Starter (Open) Catalog Number ③
NEMA Size 0								
200	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2201EAC-_** **ECT2201EAD-_**	**ECT2202EAC-_** **ECT2202EAD-_**	**ECT2204EAC-_** **ECT2204EAD-_**	**ECT2208EAC-_** **ECT2208EAD-_**	**N101BS0_3A**
230	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2201BAC-_** **ECT2201BAD-_**	**ECT2202BAC-_** **ECT2202BAD-_**	**ECT2204BAC-_** **ECT2204BAD-_**	**ECT2208BAC-_** **ECT2208BAD-_**	**N101BS0_3A**
460	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2201CAB-_** **ECT2201CAC-_** **ECT2201CAD-_**	**ECT2202CAB-_** **ECT2202CAC-_** **ECT2202CAD-_**	**ECT2204CAB-_** **ECT2204CAC-_** **ECT2204CAD-_**	**ECT2208CAB-_** **ECT2208CAC-_** **ECT2208CAD-_**	**N101BS0_3A**
575	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2201DAB-_** **ECT2201DAC-_** **ECT2201DAD-_**	**ECT2202DAB-_** **ECT2202DAC-_** **ECT2202DAD-_**	**ECT2204DAB-_** **ECT2204DAC-_** **ECT2204DAD-_**	**ECT2208DAB-_** **ECT2208DAC-_** **ECT2208DAD-_**	**N101BS0_3A**
NEMA Size 1								
200	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2211EAC-_** **ECT2211EAD-_** **ECT2211EAE-_** **ECT2211EAF-_**	**ECT2212EAC-_** **ECT2212EAD-_** **ECT2212EAE-_** **ECT2212EAF-_**	**ECT2214EAC-_** **ECT2214EAD-_** **ECT2214EAE-_** **ECT2214EAF-_**	**ECT2218EAC-_** **ECT2218EAD-_** **ECT2218EAE-_** **ECT2218EAF-_**	**N101CS1_3A**
230	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2211BAC-_** **ECT2211BAD-_** **ECT2211BAE-_** **ECT2211BAF-_**	**ECT2212BAC-_** **ECT2212BAD-_** **ECT2212BAE-_** **ECT2212BAF-_**	**ECT2214BAC-_** **ECT2214BAD-_** **ECT2214BAE-_** **ECT2214BAF-_**	**ECT2218BAC-_** **ECT2218BAD-_** **ECT2218BAE-_** **ECT2218BAF-_**	**N101CS1_3A**
460	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2211CAB-_** **ECT2211CAC-_** **ECT2211CAD-_** **ECT2211CAE-_**	**ECT2212CAB-_** **ECT2212CAC-_** **ECT2212CAD-_** **ECT2212CAE-_**	**ECT2214CAB-_** **ECT2214CAC-_** **ECT2214CAD-_** **ECT2214CAE-_**	**ECT2218CAB-_** **ECT2218CAC-_** **ECT2218CAD-_** **ECT2218CAE-_**	**N101CS1_3A**
575	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2211DAB-_** **ECT2211DAC-_** **ECT2211DAD-_** **ECT2211DAE-_**	**ECT2212DAB-_** **ECT2212DAC-_** **ECT2212DAD-_** **ECT2212DAE-_**	**ECT2214DAB-_** **ECT2214DAC-_** **ECT2214DAD-_** **ECT2214DAE-_**	**ECT2218DAB-_** **ECT2218DAC-_** **ECT2218DAD-_** **ECT2218DAE-_**	**N101CS1_3A**

① All ***IT.*** Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Ω** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT220**4**QAB. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

3

Tables 3-14 Class ECT22 — Combination Non-reversing Starter — Circuit Breaker (Continued)

Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 1 General Purpose Catalog Number ③	3-Pole Type 3R Rainproof Catalog Number ③	3-Pole Type 4X ② Watertight Catalog Number ③	3-Pole Type 12 Dust-Tight Catalog Number ③	3-Pole Component Starter (Open) Catalog Number ③
NEMA Size 2								
200	10	24V DC	HMCPE 50A	**ECT2221EAF-K**	**ECT2222EAF-K**	**ECT2224EAF-K**	**ECT2228EAF-K**	**N101DS2_3A**
230	10 15	24V DC	HMCPE 50A HMCPE 70A	**ECT2221BAF-K** **ECT2221BAW-K**	**ECT2222BAF-K** **ECT2222BAW-K**	**ECT2224BAF-K** **ECT2224BAW-K**	**ECT2228BAF-K** **ECT2228BAW-K**	**N101DS2_3A**
460	25	24V DC	HMCPE 50A	**ECT2221CAF-K**	**ECT2222CAF-K**	**ECT2224CAF-K**	**ECT2228CAF-K**	**N101DS2_3A**
575	15 25	24V DC	HMCPE 30A HMCPE 50A	**ECT2221DAE-K** **ECT2221DAF-K**	**ECT2222DAE-K** **ECT2222DAF-K**	**ECT2224DAE-K** **ECT2224DAF-K**	**ECT2228DAE-K** **ECT2228DAF-K**	**N101DS2_3A**
NEMA Size 3								
200	20 25	24V DC	HMCPE 100A HMCPE 100A	**ECT2231EAG-M** **ECT2231EAX-M**	**ECT2232EAG-M** **ECT2232EAX-M**	**ECT2234EAG-M** **ECT2234EAX-M**	**ECT2238EAG-M** **ECT2238EAX-M**	**N101ES3_3A**
230	25 30	24V DC	HMCPE 100A HMCPE 100A	**ECT2231BAG-M** **ECT2231BAX-M**	**ECT2232BAG-M** **ECT2232BAX-M**	**ECT2234BAG-M** **ECT2234BAX-M**	**ECT2238BAG-M** **ECT2238BAX-M**	**N101ES3_3A**
460	50	24V DC	HMCPE 100A	**ECT2231CAG-M**	**ECT2232CAG-M**	**ECT2234CAG-M**	**ECT2238CAG-M**	**N101ES3_3A**
575	30 50	24V DC	HMCPE 50A HMCPE 100A	**ECT2231DAF-M** **ECT2231DAG-M**	**ECT2232DAF-M** **ECT2232DAG-M**	**ECT2234DAF-M** **ECT2234DAG-M**	**ECT2238DAF-M** **ECT2238DAG-M**	**N101ES3_3A**
NEMA Size 4								
200	40	24V DC	HMCP 150A	**ECT2241EAH-P**	**ECT2242EAH-P**	**ECT2244EAH-P**	**ECT2248EAH-P**	**N101ES4_3A**
230	50	24V DC	HMCP 150A	**ECT2241BAH-P**	**ECT2242BAH-P**	**ECT2244BAH-P**	**ECT2248BAH-P**	**N101ES4_3A**
460	100	24V DC	HMCP 150A	**ECT2241CAH-P**	**ECT2242CAH-P**	**ECT2244CAH-P**	**ECT2248CAH-P**	**N101ES4_3A**
575	100	24V DC	HMCP 150A	**ECT2241DAH-P**	**ECT2242DAH-P**	**ECT2244DAH-P**	**ECT2248DAH-P**	**N101ES4_3A**
NEMA Size 5								
200	50 75	24V DC	HMCP 250A HMCP 400A	**ECT2251EAJ-S** **ECT2251EAK-S**	**ECT2252EAJ-S** **ECT2252EAK-S**	**ECT2254EAJ-S** **ECT2254EAK-S**	**ECT2258EAJ-S** **ECT2258EAK-S**	**N101FS5_3A**
230	60 100	24V DC	HMCP 250A HMCP 400A	**ECT2251BAJ-S** **ECT2251BAK-S**	**ECT2252BAJ-S** **ECT2252BAK-S**	**ECT2254BAJ-S** **ECT2254BAK-S**	**ECT2258BAJ-S** **ECT2258BAK-S**	**N101FS5_3A**
460	125 200	24V DC	HMCP 250A HMCP 400A	**ECT2251CAJ-S** **ECT2251CAK-S**	**ECT2252CAJ-S** **ECT2252CAK-S**	**ECT2254CAJ-S** **ECT2254CAK-S**	**ECT2258CAJ-S** **ECT2258CAK-S**	**N101FS5_3A**
575	150 200	24V DC	HMCP 250A HMCP 400A	**ECT2251DAJ-S** **ECT2251DAK-S**	**ECT2252DAJ-S** **ECT2252DAK-S**	**ECT2254DAJ-S** **ECT2254DAK-S**	**ECT2258DAJ-S** **ECT2258DAK-S**	**N101FS5_3A**

① All ***IT.*** Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT222**4**QAB. 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 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Table 3-15. Class ECT23 — Combination Reversing Starter — Circuit Breaker

Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 1 General Purpose Catalog Number ③	3-Pole Type 3R Rainproof Catalog Number ③	3-Pole Type 4X ② Watertight Catalog Number ③	3-Pole Type 12 Dust-Tight Catalog Number ③	3-Pole Component Starter (Open) Catalog Number ③
NEMA Size 0								
200	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2301EAC-_** **ECT2301EAD-_**	**ECT2302EAC-_** **ECT2302EAD-_**	**ECT2304EAC-_** **ECT2304EAD-_**	**ECT2308EAC-_** **ECT2308EAD-_**	**N501BS0_3A**
230	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2301BAC-_** **ECT2301BAD-_**	**ECT2302BAC-_** **ECT2302BAD-_**	**ECT2304BAC-_** **ECT2304BAD-_**	**ECT2308BAC-_** **ECT2308BAD-_**	**N501BS0_3A**
460	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2301CAB-_** **ECT2301CAC-_** **ECT2301CAD-_**	**ECT2302CAB-_** **ECT2302CAC-_** **ECT2302CAD-_**	**ECT2304CAB-_** **ECT2304CAC-_** **ECT2304CAD-_**	**ECT2308CAB-_** **ECT2308CAC-_** **ECT2308CAD-_**	**N501BS0_3A**
575	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2301DAB-_** **ECT2301DAC-_** **ECT2301DAD-_**	**ECT2302DAB-_** **ECT2302DAC-_** **ECT2302DAD-_**	**ECT2304DAB-_** **ECT2304DAC-_** **ECT2304DAD-_**	**ECT2308DAB-_** **ECT2308DAC-_** **ECT2308DAD-_**	**N501BS0_3A**
NEMA Size 1								
200	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2311EAC-_** **ECT2311EAD-_** **ECT2311EAE-_** **ECT2311EAF-_**	**ECT2312EAC-_** **ECT2312EAD-_** **ECT2312EAE-_** **ECT2312EAF-_**	**ECT2314EAC-_** **ECT2314EAD-_** **ECT2314EAE-_** **ECT2314EAF-_**	**ECT2318EAC-_** **ECT2318EAD-_** **ECT2318EAE-_** **ECT2318EAF-_**	**N501CS1_3A**
230	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2311BAC-_** **ECT2311BAD-_** **ECT2311BAE-_** **ECT2311BAF-_**	**ECT2312BAC-_** **ECT2312BAD-_** **ECT2312BAE-_** **ECT2312BAF-_**	**ECT2314BAC-_** **ECT2314BAD-_** **ECT2314BAE-_** **ECT2314BAF-_**	**ECT2318BAC-_** **ECT2318BAD-_** **ECT2318BAE-_** **ECT2318BAF-_**	**N501CS1_3A**
460	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2311CAB-_** **ECT2311CAC-_** **ECT2311CAD-_** **ECT2311CAE-_**	**ECT2312CAB-_** **ECT2312CAC-_** **ECT2312CAD-_** **ECT2312CAE-_**	**ECT2314CAB-_** **ECT2314CAC-_** **ECT2314CAD-_** **ECT2314CAE-_**	**ECT2318CAB-_** **ECT2318CAC-_** **ECT2318CAD-_** **ECT2318CAE-_**	**N501CS1_3A**
575	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2311DAB-_** **ECT2311DAC-_** **ECT2311DAD-_** **ECT2311DAE-_**	**ECT2312DAB-_** **ECT2312DAC-_** **ECT2312DAD-_** **ECT2312DAE-_**	**ECT2314DAB-_** **ECT2314DAC-_** **ECT2314DAD-_** **ECT2314DAE-_**	**ECT2318DAB-_** **ECT2318DAC-_** **ECT2318DAD-_** **ECT2318DAE-_**	**N501CS1_3A**
NEMA Size 2								
200	10	24V DC	HMCPE 50A	**ECT2321EAF-K**	**ECT2322EAF-K**	**ECT2324EAF-K**	**ECT2328EAF-K**	**N501DS2_3A**
230	10 15	24V DC	HMCPE 50A HMCPE 70A	**ECT2321BAF-K** **ECT2321BAW-K**	**ECT2322BAF-K** **ECT2322BAW-K**	**ECT2324BAF-K** **ECT2324BAW-K**	**ECT2328BAF-K** **ECT2328BAW-K**	**N501DS2_3A**
460	25	24V DC	HMCPE 50A	**ECT2321CAF-K**	**ECT2322CAF-K**	**ECT2324CAF-K**	**ECT2328CAF-K**	**N501DS2_3A**
575	15 25	24V DC	HMCPE 30A HMCPE 50A	**ECT2321DAE-K** **ECT2321DAF-K**	**ECT2322DAE-K** **ECT2322DAF-K**	**ECT2324DAE-K** **ECT2324DAF-K**	**ECT2328DAE-K** **ECT2328DAF-K**	**N501DS2_3A**

① All ***IT.*** Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT2304EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Cover Control ..... **Page 3-3**
Wiring Diagrams ..... **Page 3-17**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-2**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-2**

Table 3-15 Class ECT23 — Combination Reversing Starter — Circuit Breaker (Continued)

Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 1 General Purpose Catalog Number ③	3-Pole Type 3R Rainproof Catalog Number ③	3-Pole Type 4X ② Watertight Catalog Number ③	3-Pole Type 12 Dust-Tight Catalog Number ③	3-Pole Component Starter (Open) Catalog Number ③
NEMA Size 3								
200	20 25	24V DC	HMCPE 100A HMCPE 100A	**ECT2331EAG-M** **ECT2331EAX-M**	**ECT2332EAG-M** **ECT2332EAX-M**	**ECT2334EAG-M** **ECT2334EAX-M**	**ECT2338EAG-M** **ECT2338EAX-M**	**N501ES3_3A**
230	25 30	24V DC	HMCPE 100A HMCPE 100A	**ECT2331BAG-M** **ECT2331BAX-M**	**ECT2332BAG-M** **ECT2332BAX-M**	**ECT2334BAG-M** **ECT2334BAX-M**	**ECT2338BAG-M** **ECT2338BAX-M**	**N501ES3_3A**
460	50	24V DC	HMCPE 100A	**ECT2331CAG-M**	**ECT2332CAG-M**	**ECT2334CAG-M**	**ECT2338CAG-M**	**N501ES3_3A**
575	30 50	24V DC	HMCPE 50A HMCPE 100A	**ECT2331DAF-M** **ECT2331DAG-M**	**ECT2332DAF-M** **ECT2332DAG-M**	**ECT2334DAF-M** **ECT2334DAG-M**	**ECT2338DAF-M** **ECT2338DAG-M**	**N501ES3_3A**
NEMA Size 4								
200	40	24V DC	HMCP 150A	**ECT2341EAH-P**	**ECT2342EAH-P**	**ECT2344EAH-P**	**ECT2348EAH-P**	**N501ES4_3A**
230	50	24V DC	HMCP 150A	**ECT2341BAH-P**	**ECT2342BAH-P**	**ECT2344BAH-P**	**ECT2348BAH-P**	**N501ES4_3A**
460	100	24V DC	HMCP 150A	**ECT2341CAH-P**	**ECT2342CAH-P**	**ECT2344CAH-P**	**ECT2348CAH-P**	**N501ES4_3A**
575	100	24V DC	HMCP 150A	**ECT2341DAH-P**	**ECT2342DAH-P**	**ECT2344DAH-P**	**ECT2348DAH-P**	**N501ES4_3A**
NEMA Size 5								
200	50 75	24V DC	HMCP 250A HMCP 400A	**ECT2351EAJ-S** **ECT2351EAK-S**	**ECT2352EAJ-S** **ECT2352EAK-S**	**ECT2354EAJ-S** **ECT2354EAK-S**	**ECT2358EAJ-S** **ECT2358EAK-S**	**N501FS5_3A**
230	60 100	24V DC	HMCP 250A HMCP 400A	**ECT2351BAJ-S** **ECT2351BAK-S**	**ECT2352BAJ-S** **ECT2352BAK-S**	**ECT2354BAJ-S** **ECT2354BAK-S**	**ECT2358BAJ-S** **ECT2358BAK-S**	**N501FS5_3A**
460	125 200	24V DC	HMCP 250A HMCP 400A	**ECT2351CAJ-S** **ECT2351CAK-S**	**ECT2352CAJ-S** **ECT2352CAK-S**	**ECT2354CAJ-S** **ECT2354CAK-S**	**ECT2358CAJ-S** **ECT2358CAK-S**	**N501FS5_3A**
575	150 200	24V DC	HMCP 250A HMCP 400A	**ECT2351DAJ-S** **ECT2351DAK-S**	**ECT2352DAJ-S** **ECT2352DAK-S**	**ECT2354DAJ-S** **ECT2354DAK-S**	**ECT2358DAJ-S** **ECT2358DAK-S**	**N501FS5_3A**

① All ***IT.*** Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECT230**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

3

Wiring Diagrams

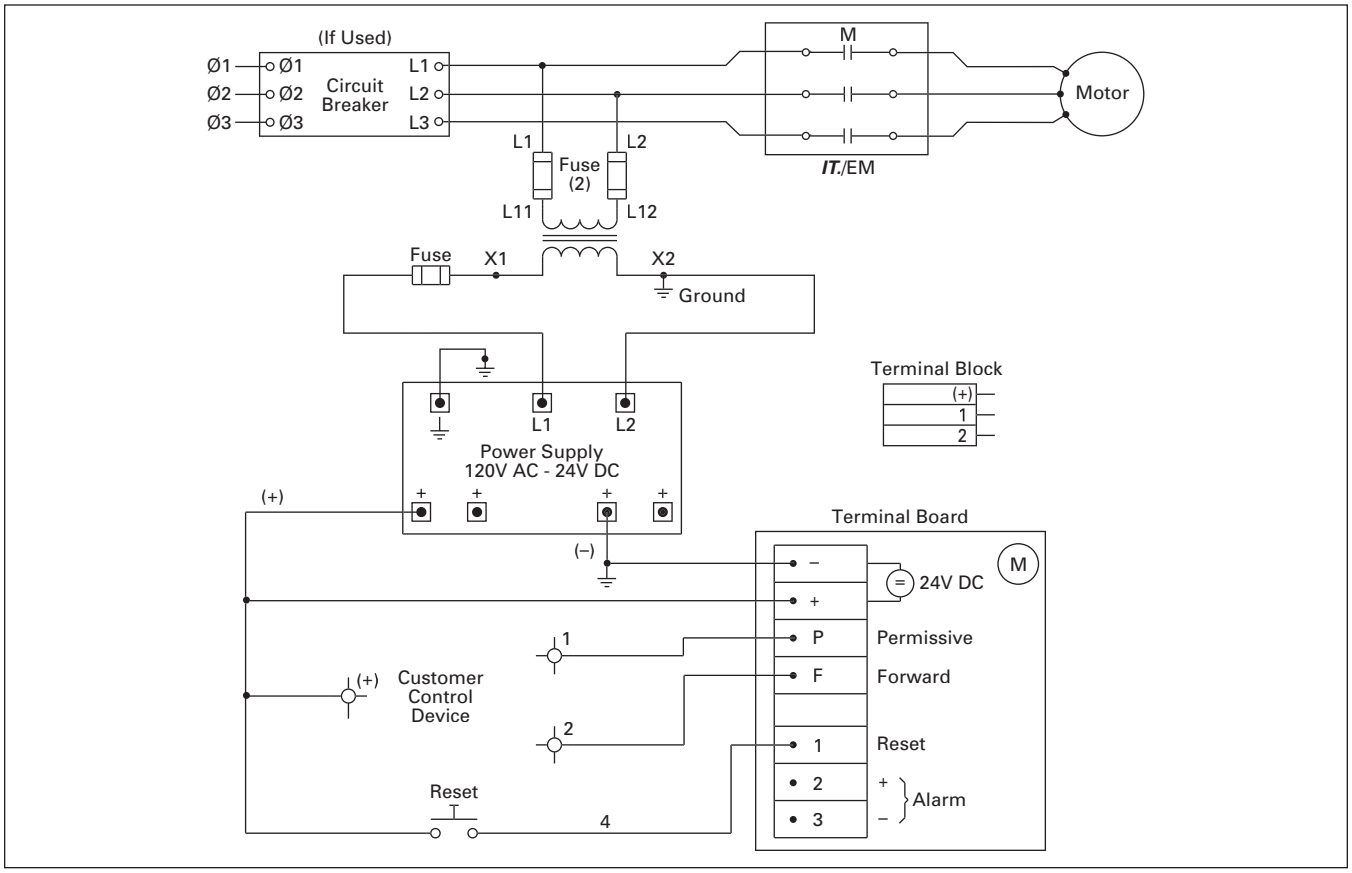


Figure 3-1. *IT.* Combination Starter with CPT and Power Supply

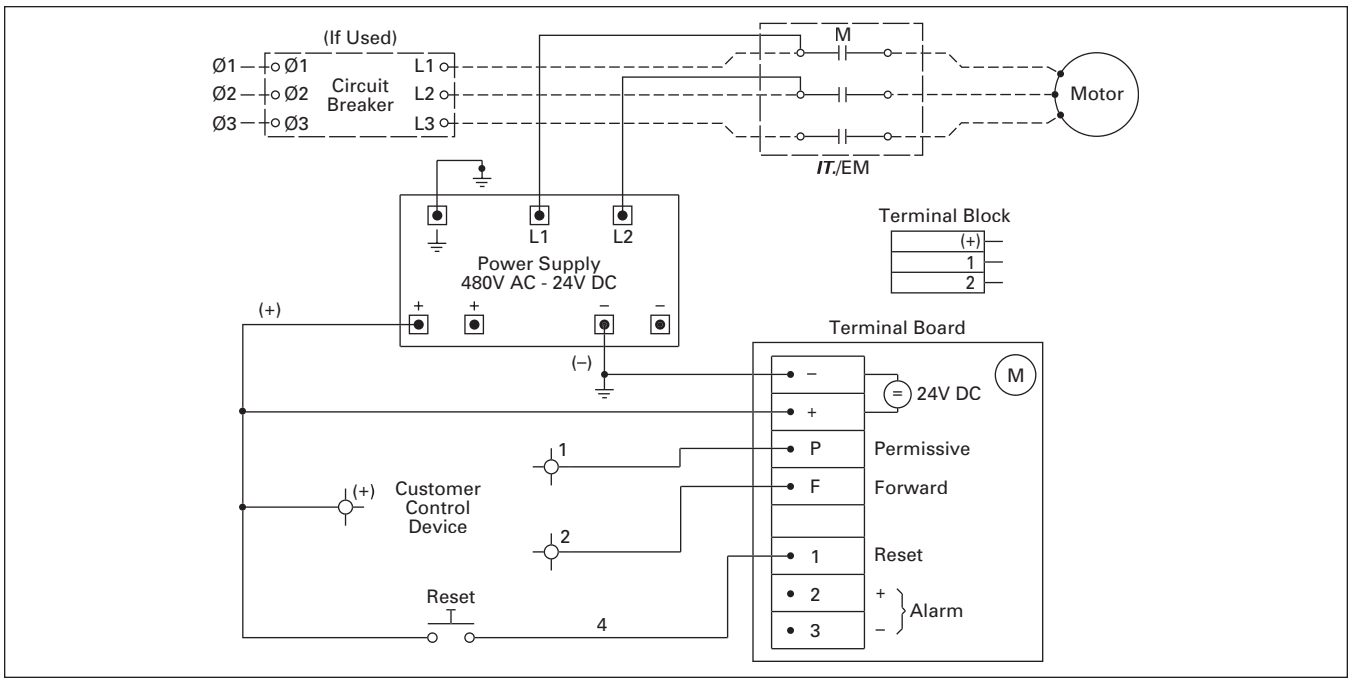


Figure 3-2. *IT.* Combination Starter with Power Supply

Catalog Number ECN2208AAC

Product Description

Eaton's Cutler-Hammer® "Freedom Series" Starters and Contactors feature a compact, space-saving design, high strength, impact and temperature resistant insulating materials.

Features

- Adjustable Bimetallic Ambient Compensated Overload Relays with interchangeable heater packs — available in three basic sizes, covering applications up to 900 hp — reducing the number of different contactor/overload relay combinations that have to be stocked.
- Fixed heater overloads optional.
- Electronic/Solid-State Overload optional.
- A full line of snap-on accessories — top and side mounted auxiliary contacts, solid-state and pneumatic timers, etc.
- 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.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved

Certified Type 2 Coordination

Eaton's Cutler-Hammer Freedom Series IEC starters and NEMA starters are UL Certified to achieve IEC 947 Type 2 coordination against 100,000A 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 Cutler-Hammer 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.

3

Catalog Number Selection

Table 3-16. NEMA Freedom Line Enclosed Control Catalog Numbering System

E C N 2 2 2 1 A A F - ____

Design

N = Freedom NEMA
2 = A200

Modification Codes

See **Page 16-40**

Class		Table
01 =	Non-reversing Contactor — 3-Pole	**3-22**
	Non-reversing Contactor — 2-Pole	**3-23**
	Non-reversing Contactor — 4-Pole	**3-24**
	Non-reversing Contactor — 5-Pole	**3-25**
02 =	Reversing Contactor — 3-Pole	**3-26**
05 =	Non-combination Non-reversing Starter	**3-27**
06 =	Non-combination Reversing Starter	**3-28**
07 =	Non-combination Non-reversing Starter with CPT	**3-29**
08 =	Non-combination Single-Phase Non-reversing Starter	**3-30**
16 =	Combination Non-reversing Starter — Fusible Disconnect	**3-31, 3-42**
	Combination Non-reversing Starter — Non-fusible Disconnect	**3-32**
	Special Enclosure Combination Non-reversing Starter — Fusible/Non-fusible Disconnect	**3-33**
17 =	Combination Reversing Starter — Fusible Disconnect	**3-34**
	Combination Reversing Starter — Non-fusible Disconnect	**3-35**
18 =	Combination Reversing Starter — Fusible Disconnect with CPT	**3-36, 3-43**
	Combination Reversing Starter — Non-fusible Disconnect with CPT	**3-37**
22 =	Combination Non-reversing Starter — Circuit Breaker	**3-38,**
	Special Enclosure Combination Non-reversing Starter — Circuit Breaker	**3-39**
23 =	Combination Reversing Starter — Circuit Breaker	**3-40**
24 =	Combination Non-reversing Starter — Circuit Breaker with CPT	**3-41, 3-43**

Cover Control

Type 1 Non-comb., **Table 3-19**
All Others, **Table 3-20**
E22 Style Comb., **Table 3-22**

Contactors

3 = 3 Poles

Coil Voltage and/or Control Transformers

See **Tables 3-17** and **3-18**

Disconnect Fuse Clip Ratings

A = None	**G** = 100A/600V R	**N** = 600A/600V R
B = 30A/250V R	**H** = 200A/250V R	**P** = 800A/600V L
C = 30A/600V R	**J** = 200A/600V R	**Q** = 1200A/600V L
D = 60A/250V R	**K** = 400A/250V R	**R** = 1600A/600V L
E = 60A/600V R	**L** = 400A/600V R	**S** = 2000A/600V L
F = 100A/250V R	**M** = 600A/250V R	**T** = by Description

HMCP/E or Breaker Ratings

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

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	

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 (Nonmetallic)
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

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

Table 3-17. 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**	12V DC	**X**	104 – 120/60
E	208/60	**Q**	24V DC	**Y**	48/50
G	550/50	**R**	48V DC	**Z**	By Description
H	277/60	**S**	125V DC		
J	208 – 240/60	**T**	24/60		

② When control power transformer modification codes (**C1** – **C11**) are used or when starter class includes CPT (i.e. ECN07, 18) see **Table 3-18** for system voltage code.

Table 3-18. 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	

Cover Control

Non-combination Starters

Control Power Transformer (CPT) may be required.

Combination Starters

- Cover control for Combination Starters uses 10250T style devices as standard.
- E22 style cover control options are available (**Table 3-21**).
- 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, **Page 16-40**.

Type 1 Cover Control

Table 3-19. Type 1 Non-combination Cover Control

Description	Factory Installed Flange Control ①	Field Installation Kits
	Position 9 Code	Catalog Number
Non-reversing		
No Cover Mounted Pilot Devices	A	C400GK0
START/STOP 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 2 Red Pilot Lights	C	C400GR14 ②
UP/STOP/DOWN Pushbuttons	E	C400GR2
with 2 Red Pilot Lights	F	C400GR24 ②
Two Red Pilot Lights	P	C400GK44 ②
One Green Pilot Light	Q	C400GK41 ②

① For more available factory installed flange control, see **Table 3-20**.

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

10250T Selector Switch

Table 3-20. Type 1 Combination and All Type 3R, 4X and 12 Cover Control ③

Description	Factory Installed Flange Control	Field Installation Kits
	Position 9 Code	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 ④
Green OFF	Q	C400T10 ④
Red RUN/Green OFF Pilot Lights	R	C400T11 ④
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 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	C400T15
with 2 Red Pilot Lights	J	—
with 2 Red/1 Green Pilot Lights	K	—
Two Red Pilot Lights	P	⑤
One Green Pilot Light	Q	C400T10 ④
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	—

③ For Type 1 Non-combination field installation kits, see **Table 3-19**.

④ 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	277V 60 Hz	H	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D
240V 60 Hz	B				

⑤ Order Quantity (2) of **C400T10**.

E22 Selector Switch

Table 3-21. Type 1, 3R, 4X and 12 E22 Style Combination Starter Cover Control

Description	Factory Installed ① Position 9 Cover Control Code	Field Installation Kits Combination Only Catalog Number
Non-reversing		
No Cover Mounted Pilot Devices	**A**	—
START/STOP Pushbuttons (PB)	**B**	**CE400T01**
START/STOP PB & Red RUN Light	**C**	**CE400T02** ②
START/STOP PB, Red RUN, & Green STOPPED Light	**D**	**CE400T03** ②
HAND/OFF/AUTO Selector Switch (SS)	**H**	**CE400T04**
H-O-A SS & Red RUN Light	**J**	**CE400T05** ②
H-O-A SS, Red RUN, & Green STOPPED Light	**K**	**CE400T06** ②
Red RUN Pilot Light	**P**	**CE400T10** ②
Green Off Pilot Light	**Q**	**CE400T11** ②
Red RUN/Green OFF Pilot Light	**R**	**CE400T12** ②
ON/OFF Selector Switch (SS)	**S**	**CE400T07**
ON/OFF SS, Red RUN Light	**T**	**CE400T08** ②
ON/OFF SS, Red RUN, & Green STOPPED Light	**U**	**CE400T09** ②
Reversing		
No Cover Mounted Pilot Devices	**A**	—
FWD/REV/STOP Pushbuttons (PB)	**B**	**CE400T50**
FWD/REV/STOP PB + Red FWD & REV Lights	**C**	**CE400T51** ②
FWD/REV/STOP PB, Red FWD/REV, & Green STOPPED	**D**	**CE400T52** ②
FOR/OFF/REV Selector Switch (SS)	**H**	**CE400T53**
FOR/OFF/REV SS + Red FWD & REV Lights	**J**	**CE400T54** ②
FOR/OFF/REV SS, Red FWD/REV, & Green STOPPED	**K**	**CE400T55** ②
OPEN/OFF/CLOSE Selector Switch (SS)	**V**	**CE400T56**
OPEN/OFF/CLOSE SS + Red FWD & REV Lights	**W**	**CE400T57** ②
OPEN/OFF/CLOSE SS, Red FWD/REV, & Green STOPPED	**X**	**CE400T58** ②

① To include any of the above cover controls, place the control code character in position 9 of your Catalog Number and add Mod Code **C29**.
Example: ECN16A4A**D**A-**C29**.
Full voltage non-reversing fusible starter with START/STOP pushbutton with red RUN and green OFF pilot lights.

② Suffix for lights (required for field installed kits only) in the table below:

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

Features

- 1-Phase or 3-Phase Magnetic
- 2-, 3-, 4- or 5-Pole Non-reversing or 3-Pole Reversing
- 600V Maximum

Product Selection

Table 3-22. Class ECN01 — Non-reversing Contactor — 3-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating ①	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ③	Type 12 Dust-Tight Industrial	Component Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	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
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 ②	ECN0178A3A	CN15UN3A
		230	300	240	ECN0171B3A	ECN0172B3A	ECN0173B3A ②	ECN0178B3A	CN15UN3B
		460	600	480	ECN0171C3A	ECN0172C3A	ECN0173C3A ②	ECN0178C3A	CN15UN3C
		575	600	600	ECN0171D3A	ECN0172D3A	ECN0173D3A ②	ECN0178D3A	CN15UN3D
8	1215	—	—	120	ECN0181A3A	ECN0182A3A	ECN0183A3A ②	ECN0188A3A	CN15VN3A
		230	450	240	ECN0181B3A	ECN0182B3A	ECN0183B3A ②	ECN0188B3A	CN15VN3B
		460	900	480	ECN0181C3A	ECN0182C3A	ECN0183C3A ②	ECN0188C3A	CN15VN3C
		575	900	600	ECN0181D3A	ECN0182D3A	ECN0183D3A ②	ECN0188D3A	CN15VN3D
9	2250	—	—	120	ECN0191A3A	ECN0192A3A	ECN0193A3A ②	ECN0198A3A	CN15WN3A
		230	800	240	ECN0191B3A	ECN0192B3A	ECN0193B3A ②	ECN0198B3A	CN15WN3B
		460	1600	480	ECN0191C3A	ECN0192C3A	ECN0193C3A ②	ECN0198C3A	CN15WN3C
		575	1600	600	ECN0191D3A	ECN0192D3A	ECN0193D3A ②	ECN0198D3A	CN15WN3D

① Maximum horsepower rating of contactors 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

② Type 4 (Painted steel) Sizes 7 – 9.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Note: NEMA Sizes 00, 0 and 1 of 3-Pole/3-Phase Non-reversing Contactors are available with auxiliary contact omitted. Add Modification Code **A44**. Example: ECN0101A3A-**A44**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-23. Class ECN01 — Non-reversing Contactor — 2-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ② Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial	Component Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	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**
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** ①	**ECN0178A2A**	**CN15UN2A**
		—	—	208	**ECN0171E2A**	**ECN0172E2A**	**ECN0173E2A** ①	**ECN0178E2A**	**CN15UN2E**
		—	—	240	**ECN0171B2A**	**ECN0172B2A**	**ECN0173B2A** ①	**ECN0178B2A**	**CN15UN2B**
		—	—	480	**ECN0171C2A**	**ECN0172C2A**	**ECN0173C2A** ①	**ECN0178C2A**	**CN15UN2C**
		—	—	600	**ECN0171D2A**	**ECN0172D2A**	**ECN0173D2A** ①	**ECN0178D2A**	**CN15UN2D**
8	1215	—	—	120	**ECN0181A2A**	**ECN0182A2A**	**ECN0183A2A** ①	**ECN0188A2A**	**CN15VN2A**
		—	—	208	**ECN0181E2A**	**ECN0182E2A**	**ECN0183E2A** ①	**ECN0188E2A**	**CN15VN2E**
		—	—	240	**ECN0181B2A**	**ECN0182B2A**	**ECN0183B2A** ①	**ECN0188B2A**	**CN15VN2B**
		—	—	480	**ECN0181C2A**	**ECN0182C2A**	**ECN0183C2A** ①	**ECN0188C2A**	**CN15VN2C**
		—	—	600	**ECN0181D2A**	**ECN0182D2A**	**ECN0183D2A** ①	**ECN0188D2A**	**CN15VN2D**
9	2250	—	—	120	**ECN0181A2A**	**ECN0192A2A**	**ECN0193A2A** ①	**ECN0198A2A**	**CN15WN2A**
		—	—	208	**ECN0181E2A**	**ECN0192E2A**	**ECN0193E2A** ①	**ECN0198E2A**	**CN15WN2E**
		—	—	240	**ECN0191B2A**	**ECN0192B2A**	**ECN0193B2A** ①	**ECN0198B2A**	**CN15WN2B**
		—	—	480	**ECN0191C2A**	**ECN0192C2A**	**ECN0193C2A** ①	**ECN0198C2A**	**CN15WN2C**
		—	—	600	**ECN0191D2A**	**ECN0192D2A**	**ECN0193D2A** ①	**ECN0198D2A**	**CN15WN2D**

① Type 4 (Painted steel) Sizes 7 – 9.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Note: NEMA Sizes 00, 0 and 1 of 2-Pole/2-Phase Non-reversing Contactors are available with auxiliary contact omitted. Add Modification Code **A44**. Example: ECN0101A2A-**A44**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-24. Class ECN01 — Non-reversing Contactor — 4-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ① Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial	Component 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 1 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**

① The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Table 3-25. Class ECN01 — Non-reversing Contactor — 5-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ① Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial	Component Contactor (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	9	—	—	120	**ECN01A1A5A**	(Select Contactor from Size 1 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 1 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**

① The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-26. Class ECN02 — Reversing Contactor — 3-Pole

NEMA Size	Continuous Ampere Rating	Motor Voltage	Maximum hp Rating ①	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial	Component 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**	**CN15GN3AB**
		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**
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** ②	**ECN0268A3A**	**CN55TN3A**
		200	150	208	**ECN0261E3A**	**ECN0262E3A**	**ECN0263E3A** ②	**ECN0268E3A**	**CN55TN3E**
		230	200	240	**ECN0261B3A**	**ECN0262B3A**	**ECN0263B3A** ②	**ECN0268B3A**	**CN55TN3B**
		460	400	480	**ECN0261C3A**	**ECN0262C3A**	**ECN0263C3A** ②	**ECN0268C3A**	**CN55TN3C**
		575	400	600	**ECN0261D3A**	**ECN0262D3A**	**ECN0263D3A** ②	**ECN0268D3A**	**CN55TN3D**
7	810	—	—	120	**ECN0271A3A**	**ECN0272A3A**	**ECN0273A3A** ②	**ECN0278A3A**	**CN55UN3A**
		230	300	240	**ECN0271B3A**	**ECN0272B3A**	**ECN0273B3A** ②	**ECN0278B3A**	**CN55UN3B**
		460	600	480	**ECN0271C3A**	**ECN0272C3A**	**ECN0273C3A** ②	**ECN0278C3A**	**CN55UN3C**
		575	600	600	**ECN0271D3A**	**ECN0272D3A**	**ECN0273D3A** ②	**ECN0278D3A**	**CN55UN3D**
8	1215	—	—	120	**ECN0281A3A**	**ECN0282A3A**	**ECN0283A3A** ②	**ECN0288A3A**	**CN55VN3A**
		230	450	240	**ECN0281B3A**	**ECN0282B3A**	**ECN0283B3A** ②	**ECN0288B3A**	**CN55VN3B**
		460	900	480	**ECN0281C3A**	**ECN0282C3A**	**ECN0283C3A** ②	**ECN0288C3A**	**CN55VN3C**
		575	900	600	**ECN0281D3A**	**ECN0282D3A**	**ECN0283D3A** ②	**ECN0288D3A**	**CN55VN3D**
9	2250	—	—	120	**ECN0291A3A**	**ECN0292A3A**	**ECN0293A3A** ②	**ECN0298A3A**	**CN55WN3A**
		230	800	240	**ECN0291B3A**	**ECN0292B3A**	**ECN0293B3A** ②	**ECN0298B3A**	**CN55WN3B**
		460	1600	480	**ECN0291C3A**	**ECN0292C3A**	**ECN0293C3A** ②	**ECN0298C3A**	**CN55WN3C**
		575	1600	600	**ECN0291D3A**	**ECN0292D3A**	**ECN0293D3A** ②	**ECN0298D3A**	**CN55WN3D**

① Maximum horsepower rating of contactors 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

② Type 4 (Painted steel) Sizes 6 – 9.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Features

- 1-Phase or 3-Phase Magnetic
- 2- or 3-Pole Non-reversing or 3-Pole Reversing
- Standard Interchangeable Heater OLR
- Optional Electronic Overload
- 600V Maximum

Product Selection

Table 3-27. Class ECN05 — Non-combination Non-reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ①	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ② Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
				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	AN16BN0AC
	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	AN16DN0AB
	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	AN16GN0AB
	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	AN16KN0A
	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

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-27. Class ECN05 — Non-combination Non-reversing Starter (Continued)

NEMA Size	Motor Voltage	Maximum hp Rating ①	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (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** ②	**ECN0578AAA**	**AN16UN0AB**
	230	300	240	**ECN0571BAA**	**ECN0572BAA**	**ECN0573BAA** ②	**ECN0578BAA**	**AN16UN0BB**
	460	600	480	**ECN0571CAA**	**ECN0572CAA**	**ECN0573CAA** ②	**ECN0578CAA**	**AN16UN0CB**
	575	600	600	**ECN0571DAA**	**ECN0572DAA**	**ECN0573DAA** ②	**ECN0578DAA**	**AN16UN0DB**
8	—	—	120	**ECN0581AAA**	**ECN0582AAA**	**ECN0583AAA** ②	**ECN0588AAA**	**AN16VN0AB**
	230	450	240	**ECN0581BAA**	**ECN0582BAA**	**ECN0583BAA** ②	**ECN0588BAA**	**AN16VN0BB**
	460	900	480	**ECN0581CAA**	**ECN0582CAA**	**ECN0583CAA** ②	**ECN0588CAA**	**AN16VN0CB**
	575	900	600	**ECN0581DAA**	**ECN0582DAA**	**ECN0583DAA** ②	**ECN0588DAA**	**AN16VN0DB**
9	—	—	120	**ECN0591AAA**	**ECN0592AAA**	**ECN0593AAA** ②	**ECN0598AAA**	**AN16WN0A**
	230	800	240	**ECN0591BAA**	**ECN0592BAA**	**ECN0593BAA** ②	**ECN0598BAA**	**AN16WN0B**
	460	1600	480	**ECN0591CAA**	**ECN0592CAA**	**ECN0593CAA** ②	**ECN0598CAA**	**AN16WN0C**
	575	1600	600	**ECN0591DAA**	**ECN0592DAA**	**ECN0593DAA** ②	**ECN0598DAA**	**AN16WN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

② Type 4 (Painted steel) Sizes 7 – 9.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-28. Class ECN06 — Non-combination Reversing Starter

NEMA Size	Motor Voltage	Maximum hp Rating ①	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
				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
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 ②	ECN0668AAA	AN56TN0AB
	200	150	208	ECN0661EAA	ECN0662EAA	ECN0663EAA ②	ECN0668EAA	AN56TN0EB
	230	200	240	ECN0661BAA	ECN0662BAA	ECN0663BAA ②	ECN0668BAA	AN56TN0BB
	460	400	480	ECN0661CAA	ECN0662CAA	ECN0663CAA ②	ECN0668CAA	AN56TN0CB
	575	400	600	ECN0661DAA	ECN0662DAA	ECN0663DAA ②	ECN0668DAA	AN56TN0DB
7	—	—	120	ECN0671AAA	ECN0672AAA	ECN0673AAA ②	ECN0678AAA	AN56UN0AB
	230	300	240	ECN0671BAA	ECN0672BAA	ECN0673BAA ②	ECN0678BAA	AN56UN0BB
	460	600	480	ECN0671CAA	ECN0672CAA	ECN0673CAA ②	ECN0678CAA	AN56UN0CB
	575	600	600	ECN0671DAA	ECN0672DAA	ECN0673DAA ②	ECN0678DAA	AN56UN0DB
8	—	—	120	ECN0681AAA	ECN0682AAA	ECN0683AAA ②	ECN0688AAA	AN56VN0AB
	230	450	240	ECN0681BAA	ECN0682BAA	ECN0683BAA ②	ECN0688BAA	AN56VN0BB
	460	900	480	ECN0681CAA	ECN0682CAA	ECN0683CAA ②	ECN0688CAA	AN56VN0CB
	575	900	600	ECN0681DAA	ECN0682DAA	ECN0683DAA ②	ECN0688DAA	AN56VN0DB
9	—	—	120	ECN0691AAA	ECN0692AAA	ECN0693AAA ②	ECN0698AAA	AN56WN0A
	230	800	240	ECN0691BAA	ECN0692BAA	ECN0693BAA ②	ECN0698BAA	AN56WN0B
	460	1600	480	ECN0691CAA	ECN0692CAA	ECN0693CAA ②	ECN0698CAA	AN56WN0C
	575	1600	600	ECN0691DAA	ECN0692DAA	ECN0693DAA ②	ECN0698DAA	AN56WN0D

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

② Type 4 (Painted steel) Sizes 6 – 9.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

3

Table 3-29. Class ECN07 — Non-combination Non-reversing Starter with CPT

NEMA Size	Primary Voltage ②	Max. hp Rating ①	Secondary Voltage / Magnet Coil Voltage	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight & Dust-Tight Stainless Steel ④ Catalog Number	Type 12 Dust-Tight Industrial External Reset Catalog Number	Component Starter (Open) 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**
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** ③	**ECN0768EAA**	**AN56TN0EB**
	240	200		**ECN0761BAA**	**ECN0762BAA**	**ECN0763BAA** ③	**ECN0768BAA**	**AN56TN0BB**
	480	400		**ECN0761CAA**	**ECN0762CAA**	**ECN0763CAA** ③	**ECN0768CAA**	**AN56TN0CB**
	600	400		**ECN0761DAA**	**ECN0762DAA**	**ECN0763DAA** ③	**ECN0768DAA**	**AN56TN0DB**
7	240	300	120	**ECN0771BAA**	**ECN0772BAA**	**ECN0773BAA** ③	**ECN0778BAA**	**AN16UN0BB**
	480	600		**ECN0771CAA**	**ECN0772CAA**	**ECN0773CAA** ③	**ECN0778CAA**	**AN16UN0CB**
	600	600		**ECN0771DAA**	**ECN0772DAA**	**ECN0773DAA** ③	**ECN0778DAA**	**AN16UN0DB**
8	240	450	120	**ECN0781BAA**	**ECN0782BAA**	**ECN0783BAA** ③	**ECN0788BAA**	**AN16VN0BB**
	480	900		**ECN0781CAA**	**ECN0782CAA**	**ECN0783CAA** ③	**ECN0788CAA**	**AN16VN0CB**
	600	900		**ECN0781DAA**	**ECN0782DAA**	**ECN0783DAA** ③	**ECN0788DAA**	**AN16VN0DB**
9	240	800	120	**ECN0791BAA**	**ECN0792BAA**	**ECN0793BAA** ③	**ECN0798BAA**	**AN16WN0B**
	480	1600		**ECN0791CAA**	**ECN0792CAA**	**ECN0793CAA** ③	**ECN0798CAA**	**AN16WN0C**
	600	1600		**ECN0791DAA**	**ECN0792DAA**	**ECN0793DAA** ③	**ECN0798DAA**	**AN16WN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

② Other control power transformer primary and/or secondary voltages, see **Page 3-20**.

③ Type 4 (Painted steel) Sizes 6 – 9.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN0704EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

ECN0712CAA

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-30. Class ECN08 — Non-combination Single Phase Non-reversing Starter

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ① Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	115 230	1/3 1	120 240	**ECN08A1AAA** **ECN08A1BAA**	(Select Contactor from Size 0 Listing)			**AN16AN0AC** **AN16AN0BC**
0	115 230	1 2	120 240	**ECN0801AAA** **ECN0801BAA**	**ECN0802AAA** **ECN0802BAA**	**ECN0804AAA** **ECN0804BAA**	**ECN0808AAA** **ECN0808BAA**	**AN16BN0AC** **AN16BN0BC**
1	115 230	2 3	120 240	**ECN0811AAA** **ECN0811BAA**	**ECN0812AAA** **ECN0812BAA**	**ECN0814AAA** **ECN0814BAA**	**ECN0818AAA** **ECN0818BAA**	**AN16DN0AB** **AN16DN0BB**
1P	115 230	3 5	120 240	**ECN08C1AAA** **ECN08C1BAA**	**ECN08C2AAA** **ECN08C2BAA**	**ECN08C4AAA** **ECN08C4BAA**	**ECN08C8AAA** **ECN08C8BAA**	**AN16PN0A** **AN16PN0B**
2	115 230	3 7-1/2	120 240	**ECN0821AAA** **ECN0821BAA**	**ECN0822AAA** **ECN0822BAA**	**ECN0824AAA** **ECN0824BAA**	**ECN0828AAA** **ECN0828BAA**	**AN16GN0AB** **AN16GN0BB**
3	115 230	7-1/2 15	120 240	**ECN0831AAA** **ECN0831BAA**	**ECN0832AAA** **ECN0832BAA**	**ECN0834AAA** **ECN0834BAA**	**ECN0838AAA** **ECN0838BAA**	**AN16KN0A** **AN16KN0B**
Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.								

① The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Features

- 3-Phase Magnetic
- 3-Pole Non-reversing or Reversing
- Standard Interchangeable Heater OLR
- Optional Electronic Overload
- 600V Maximum
- 100,000 RMS Short Circuit Rating with Fuses

Product Selection

Table 3-31. Class ECN16 — Combination Non-reversing Starter — Fusible Disconnect

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ①②	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	30A	**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	30A	**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	30A	**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	60A	**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	100A	**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**
4	—	—	120	200A	**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**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.

② Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN160**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-31. Class ECN16 — Combination Non-reversing Starter — Fusible Disconnect (Continued)

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ①②	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	—	—	120	400A	**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	600A	**ECN1661AAM**	**ECN1662AAM**	**ECN1663AAM** ③	**ECN1668AAM**	**AN16TN0AB**
	200	150	208		**ECN1661EAM**	**ECN1662EAM**	**ECN1663EAM** ③	**ECN1668EAM**	**AN16TN0EB**
	230	200	240		**ECN1661BAM**	**ECN1662BAM**	**ECN1663BAM** ③	**ECN1668BAM**	**AN16TN0BB**
	460	400	480		**ECN1661CAN**	**ECN1662CAN**	**ECN1663CAN** ③	**ECN1668CAN**	**AN16TN0CB**
	575	400	600		**ECN1661DAN**	**ECN1662DAN**	**ECN1663DAN** ③	**ECN1668DAN**	**AN16TN0DB**
7	—	—	120	⑤	**ECN1671AAU**	**ECN1672AAU**	**ECN1673AAU** ③	**ECN1678AAU**	**AN16UN0AB**
	230	300	240		**ECN1671BAU**	**ECN1672BAU**	**ECN1673BAU** ③	**ECN1678BAU**	**AN16UN0BB**
	460	600	480		**ECN1671CAU**	**ECN1672CAU**	**ECN1673CAU** ③	**ECN1678CAU**	**AN16UN0CB**
	575	600	600		**ECN1671DAU**	**ECN1672DAU**	**ECN1673DAU** ③	**ECN1678DAU**	**AN16UN0DB**
8	—	—	120	⑤	**ECN1681AAU**	**ECN1682AAU**	**ECN1683AAU** ③	**ECN1688AAU**	**AN16VN0AB**
	230	450	240		**ECN1681BAU**	**ECN1682BAU**	**ECN1683BAU** ③	**ECN1688BAU**	**AN16VN0BB**
	460	900	480		**ECN1681CAU**	**ECN1682CAU**	**ECN1683CAU** ③	**ECN1688CAU**	**AN16VN0CB**
	575	900	600		**ECN1681DAU**	**ECN1682DAU**	**ECN1683DAU** ③	**ECN1688DAU**	**AN16VN0DB**
9	—	—	120	⑤	**ECN1691AAU**	**ECN1692AAU**	**ECN1693AAU** ③	**ECN1698AAU**	**AN16WN0A**
	230	800	240		**ECN1691BAU**	**ECN1692BAU**	**ECN1693BAU** ③	**ECN1698BAU**	**AN16WN0B**
	460	1000 ④	480		**ECN1691CAU**	**ECN1692CAU**	**ECN1693CAU** ③	**ECN1698CAU**	**AN16WN0C**
	575	1000	600		**ECN1691DAU**	**ECN1692DAU**	**ECN1693DAU** ③	**ECN1698DAU**	**AN16WN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.
② Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
③ Type 4 (Painted steel) Sizes 6 – 9.
④ For 1250 and 1600 hp ratings at 460V, consult Eaton.
⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN1604EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-32. Class ECN16 — Combination Non-reversing Starter — Non-fusible Disconnect ③

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Disconnect Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑦ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ① ②	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	30A	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	30A	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	30A	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	60A	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	100A	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	200A	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
5	—	—	120	400A	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	600A	ECN1661AAA	ECN1662AAA	ECN1663AAA ④	ECN1668AAA	AN16TN0AB
	200	150	208		ECN1661EAA	ECN1662EAA	ECN1663EAA ④	ECN1668EAA	AN16TN0EB
	230	200	240		ECN1661BAA	ECN1662BAA	ECN1663BAA ④	ECN1668BAA	AN16TN0BB
	460	400	480		ECN1661CAA	ECN1662CAA	ECN1663CAA ④	ECN1668CAA	AN16TN0CB
	575	400	600		ECN1661DAA	ECN1662DAA	ECN1663DAA ④	ECN1668DAA	AN16TN0DB
7	—	—	120	⑥	ECN1671AAA	ECN1672AAA	ECN1673AAA ④	ECN1678AAA	AN16UN0AB
	230	300	240		ECN1671BAA	ECN1672BAA	ECN1673BAA ④	ECN1678BAA	AN16UN0BB
	460	600	480		ECN1671CAA	ECN1672CAA	ECN1673CAA ④	ECN1678CAA	AN16UN0CB
	575	600	600		ECN1671DAA	ECN1672DAA	ECN1673DAA ④	ECN1678DAA	AN16UN0DB
8	—	—	120	⑥	ECN1681AAA	ECN1682AAA	ECN1683AAA ④	ECN1688AAA	AN16VN0AB
	230	450	240		ECN1681BAA	ECN1682BAA	ECN1683BAA ④	ECN1688BAA	AN16VN0BB
	460	900	480		ECN1681CAA	ECN1682CAA	ECN1683CAA ④	ECN1688CAA	AN16VN0CB
	575	900	600		ECN1681DAA	ECN1682DAA	ECN1683DAA ④	ECN1688DAA	AN16VN0DB
9	—	—	120	⑥	ECN1691AAA	ECN1692AAA	ECN1693AAA ④	ECN1698AAA	AN16WN0A
	230	800	240		ECN1691BAA	ECN1692BAA	ECN1693BAA ④	ECN1698BAA	AN16WN0B
	460	1000 ⑤	480		ECN1691CAA	ECN1692CAA	ECN1693CAA ④	ECN1698CAA	AN16WN0C
	575	1000	600		ECN1691DAA	ECN1692DAA	ECN1693DAA ④	ECN1698DAA	AN16WN0D

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.

② Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

③ Field installed Fuse Clips available, see **Page 16-12**.

④ Type 4 (Painted steel) Sizes 6 – 9.

⑤ For 1250 and 1600 hp ratings at 460V, consult Eaton.

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

⑦ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN1604AAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-33. 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 General Purpose	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial ②		Component Starter (Open)
					External Reset	External Reset	External Reset	Internal Reset	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Horizontal Enclosure — Fusible									
1	—	—	120	30A	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	60A	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
Oversize Enclosure — without Control Transformer — Fusible									
0	—	—	120	30A	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	30A	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	60A	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

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Fuse clips are for Class R fuses only. For H and J fuses see mods, **Page 16-42**.

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

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN160**4**EAB-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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-34. Class ECN17 — Combination Reversing Starter — Fusible Disconnect

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ①② Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	30A	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	30A	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	60A	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	100A	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	200A	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
5	—	—	120	400A	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	600A	ECN1761AAM	ECN1762AAM	ECN1763AAM ③	ECN1768AAM	AN56TN0AB
	200	150	208		ECN1761EAM	ECN1762EAM	ECN1763EAM ③	ECN1768EAM	AN56TN0EB
	230	200	240		ECN1761BAM	ECN1762BAM	ECN1763BAM ③	ECN1768BAM	AN56TN0BB
	460	400	480		ECN1761CAN	ECN1762CAN	ECN1763CAN ③	ECN1768CAN	AN56TN0CB
	575	400	600		ECN1761DAN	ECN1762DAN	ECN1763DAN ③	ECN1768DAN	AN56TN0DB
7	—	—	120	⑤	ECN1771AAU	ECN1772AAU	ECN1773AAU ③	ECN1778AAU	AN56UN0AB
	230	300	240		ECN1771BAU	ECN1772BAU	ECN1773BAU ③	ECN1778BAU	AN56UN0BB
	460	600	480		ECN1771CAU	ECN1772CAU	ECN1773CAU ③	ECN1778CAU	AN56UN0CB
	575	600	600		ECN1771DAU	ECN1772DAU	ECN1773DAU ③	ECN1778DAU	AN56UN0DB
8	—	—	120	⑤	ECN1781AAU	ECN1782AAU	ECN1783AAU ③	ECN1788AAU	AN56VN0AB
	230	450	240		ECN1781BAU	ECN1782BAU	ECN1783BAU ③	ECN1788BAU	AN56VN0BB
	460	900	480		ECN1781CAU	ECN1782CAU	ECN1783CAU ③	ECN1788CAU	AN56VN0CB
	575	900	600		ECN1781DAU	ECN1782DAU	ECN1783DAU ③	ECN1788DAU	AN56VN0DB
9	—	—	120	⑤	ECN1791AAU	ECN1792AAU	ECN1793AAU ③	ECN1798AAU	AN56WN0A
	230	800	240		ECN1791BAU	ECN1792BAU	ECN1793BAU ③	ECN1798BAU	AN56WN0B
	460	1000 ④	480		ECN1791CAU	ECN1792CAU	ECN1793CAU ③	ECN1798CAU	AN56WN0C
	575	1000	600		ECN1791DAU	ECN1792DAU	ECN1793DAU ③	ECN1798DAU	AN56WN0D

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.

② Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.

③ Type 4 (Painted steel) Sizes 6 – 9.

④ For 1250 and 1600 hp ratings at 460V, consult Eaton.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN170**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-35. Class ECN17 — Combination Reversing Starter — Non-fusible Disconnect

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Disconnect Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ①②	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30A	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	30A	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	60A	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	100A	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	200A	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
5	—	—	120	400A	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	600A	ECN1761AAA	ECN1762AAA	ECN1763AAA ③	ECN1768AAA	AN56TN0AB
	200	150	208		ECN1761EAA	ECN1762EAA	ECN1763EAA ③	ECN1768EAA	AN56TN0EB
	230	200	240		ECN1761BAA	ECN1762BAA	ECN1763BAA ③	ECN1768BAA	AN56TN0BB
	460	400	480		ECN1761CAA	ECN1762CAA	ECN1763CAA ③	ECN1768CAA	AN56TN0CB
	575	400	600		ECN1761DAA	ECN1762DAA	ECN1763DAA ③	ECN1768DAA	AN56TN0DB
7	—	—	120	⑤	ECN1771AAA	ECN1772AAA	ECN1773AAA ③	ECN1778AAA	AN56UN0AB
	230	300	240		ECN1771BAA	ECN1772BAA	ECN1773BAA ③	ECN1778BAA	AN56UN0BB
	460	600	480		ECN1771CAA	ECN1772CAA	ECN1773CAA ③	ECN1778CAA	AN56UN0CB
	575	600	600		ECN1771DAA	ECN1772DAA	ECN1773DAA ③	ECN1778DAA	AN56UN0DB
8	—	—	120	⑤	ECN1781AAA	ECN1782AAA	ECN1783AAA ③	ECN1788AAA	AN56VN0AB
	230	450	240		ECN1781BAA	ECN1782BAA	ECN1783BAA ③	ECN1788BAA	AN56VN0BB
	460	900	480		ECN1781CAA	ECN1782CAA	ECN1783CAA ③	ECN1788CAA	AN56VN0CB
	575	900	600		ECN1781DAA	ECN1782DAA	ECN1783DAA ③	ECN1788DAA	AN56VN0DB
9	—	—	120	⑤	ECN1791AAA	ECN1792AAA	ECN1793AAA ③	ECN1798AAA	AN56WN0A
	230	800	240		ECN1791BAA	ECN1792BAA	ECN1793BAA ③	ECN1798BAA	AN56WN0B
	460	1000 ④	480		ECN1791CAA	ECN1792CAA	ECN1793CAA ③	ECN1798CAA	AN56WN0C
	575	1000	600		ECN1791DAA	ECN1792DAA	ECN1793DAA ③	ECN1798DAA	AN56WN0D

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.
② Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
③ Type 4 (Painted steel) Sizes 6 – 9.
④ For 1250 and 1600 hp ratings at 460V, consult Eaton.
⑤ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN170**4**AAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-36. Class ECN18 — Combination Reversing Starter — Fusible Disconnect with CPT ⑥

NEMA Size	Primary Voltage ①	Max. hp Rating	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X Watertight & Dust-Tight Stainless Steel ⑨ Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) Catalog Number
00	208 240 480 600	1-1/2 1-1/2 2 2	120	30A ④	**ECN18A1EAB** **ECN18A1BAB** **ECN18A1CAC** **ECN18A1DAC**	**ECN18A2EAB** **ECN18A2BAB** **ECN18A2CAC** **ECN18A2DAC**	**ECN18A4EAB** **ECN18A4BAB** **ECN18A4CAC** **ECN18A4DAC**	**ECN18A8EAB** **ECN18A8BAB** **ECN18A8CAC** **ECN18A8DAC**	**AN16AN0EC** **AN16AN0BC** **AN16AN0CC** **AN16AN0DC**
0	208 240 480 600	3 3 5 5	120	30A ④	**ECN1801EAB** **ECN1801BAB** **ECN1801CAC** **ECN1801DAC**	**ECN1802EAB** **ECN1802BAB** **ECN1802CAC** **ECN1802DAC**	**ECN1804EAB** **ECN1804BAB** **ECN1804CAC** **ECN1804DAC**	**ECN1808EAB** **ECN1808BAB** **ECN1808CAC** **ECN1808DAC**	**AN16BN0EC** **AN16BN0BC** **AN16BN0CC** **AN16BN0DC**
1	208 240 480 600	7-1/2 7-1/2 10 10	120	30A ④	**ECN1811EAB** **ECN1811BAB** **ECN1811CAC** **ECN1811DAC**	**ECN1812EAB** **ECN1812BAB** **ECN1812CAC** **ECN1812DAC**	**ECN1814EAB** **ECN1814BAB** **ECN1814CAC** **ECN1814DAC**	**ECN1818EAB** **ECN1818BAB** **ECN1818CAC** **ECN1818DAC**	**AN16DN0EB** **AN16DN0BB** **AN16DN0CB** **AN16DN0DB**
2	208 240 480 600	10 15 25 25	120	60A ④	**ECN1821EAD** **ECN1821BAD** **ECN1821CAE** **ECN1821DAE**	**ECN1822EAD** **ECN1822BAD** **ECN1822CAE** **ECN1822DAE**	**ECN1824EAD** **ECN1824BAD** **ECN1824CAE** **ECN1824DAE**	**ECN1828EAD** **ECN1828BAD** **ECN1828CAE** **ECN1828DAE**	**AN16GN0EB** **AN16GN0BB** **AN16GN0CB** **AN16GN0DB**
3	208 240 480 600	25 30 50 50	120	100A	**ECN1831EAF** **ECN1831BAF** **ECN1831CAG** **ECN1831DAG**	**ECN1832EAF** **ECN1832BAF** **ECN1832CAG** **ECN1832DAG**	**ECN1834EAF** **ECN1834BAF** **ECN1834CAG** **ECN1834DAG**	**ECN1838EAF** **ECN1838BAF** **ECN1838CAG** **ECN1838DAG**	**AN16KN0E** **AN16KN0B** **AN16KN0C** **AN16KN0D**
4	208 240 480 600	40 50 100 100	120	200A	**ECN1841EAH** **ECN1841BAH** **ECN1841CAJ** **ECN1841DAJ**	**ECN1842EAH** **ECN1842BAH** **ECN1842CAJ** **ECN1842DAJ**	**ECN1844EAH** **ECN1844BAH** **ECN1844CAJ** **ECN1844DAJ**	**ECN1848EAH** **ECN1848BAH** **ECN1848CAJ** **ECN1848DAJ**	**AN16NN0E** **AN16NN0B** **AN16NN0C** **AN16NN0D**
5	208 240 480 600	75 100 200 200	120	400A	**ECN1851EAK** **ECN1851BAK** **ECN1851CAL** **ECN1851DAL**	**ECN1852EAK** **ECN1852BAK** **ECN1852CAL** **ECN1852DAL**	**ECN1854EAK** **ECN1854BAK** **ECN1854CAL** **ECN1854DAL**	**ECN1858EAK** **ECN1858BAK** **ECN1858CAL** **ECN1858DAL**	**AN16SN0EB** **AN16SN0BB** **AN16SN0CB** **AN16SN0DB**
6	208 240 480 600	150 200 400 400	120	600A	**ECN1861EAM** **ECN1861BAM** **ECN1861CAN** **ECN1861DAN**	**ECN1862EAM** **ECN1862BAM** **ECN1862CAN** **ECN1862DAN**	**ECN1863EAM** ⑤ **ECN1863BAM** ⑤ **ECN1863CAN** ⑤ **ECN1863DAN** ⑤	**ECN1868EAM** **ECN1868BAM** **ECN1868CAN** **ECN1868DAN**	**AN16TN0EB** **AN16TN0BB** **AN16TN0CB** **AN16TN0DB**
7	240 480 600	300 600 600	120	⑦	**ECN1871BAU** **ECN1871CAU** **ECN1871DAU**	**ECN1872BAU** **ECN1872CAU** **ECN1872DAU**	**ECN1873BAU** ⑤ **ECN1873CAU** ⑤ **ECN1873DAU** ⑤	**ECN1878BAU** **ECN1878CAU** **ECN1878DAU**	**AN16UN0BB** **AN16UN0CB** **AN16UN0DB**
8	240 480 600	450 900 900	120	⑦	**ECN1881BAU** **ECN1881CAU** **ECN1881DAU**	**ECN1882BAU** **ECN1882CAU** **ECN1882DAU**	**ECN1883BAU** ⑤ **ECN1883CAU** ⑤ **ECN1883DAU** ⑤	**ECN1888BAU** **ECN1888CAU** **ECN1888DAU**	**AN16VN0BB** **AN16VN0CB** **AN16VN0DB**
9	240 480 600	800 1000 ⑧ 1000	120	⑦	**ECN1891BAU** **ECN1891CAU** **ECN1891DAU**	**ECN1892BAU** **ECN1892CAU** **ECN1892DAU**	**ECN1893BAU** ⑤ **ECN1893CAU** ⑤ **ECN1893DAU** ⑤	**ECN1898BAU** **ECN1898CAU** **ECN1898DAU**	**AN16WN0B** **AN16WN0C** **AN16WN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Other control power transformer primary and/or secondary voltages, see **Page 3-20**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order mod code **R5**.
③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
④ Fuse clips are for Class R fuses. For H and J fuses see mods, **Page 16-42**.
⑤ Type 4 (Painted steel) Sizes 6 – 9.
⑥ 100,000 RMS short-circuit rating.
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 460V, consult Eaton.
⑨ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-37. Class ECN18 — Combination Reversing Starter — Non-fusible Disconnect with CPT

NEMA Size	Primary Voltage ①	Max. hp Rating	Magnet Coil Voltage	Disconnect Switch Rating	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ⑦	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	208 240 480 600	1-1/2 1-1/2 2 2	120	30A	ECN18A1EAA ECN18A1BAA ECN18A1CAA ECN18A1DAA	ECN18A2EAA ECN18A2BAA ECN18A2CAA ECN18A2DAA	ECN18A4EAA ECN18A4BAA ECN18A4CAA ECN18A4DAA	ECN18A8EAA ECN18A8BAA ECN18A8CAA ECN18A8DAA	AN16AN0EC AN16AN0BC AN16AN0CC AN16AN0DC
0	208 240 480 600	3 3 5 5	120	30A	ECN1801EAA ECN1801BAA ECN1801CAA ECN1801DAA	ECN1802EAA ECN1802BAA ECN1802CAA ECN1802DAA	ECN1804EAA ECN1804BAA ECN1804CAA ECN1804DAA	ECN1808EAA ECN1808BAA ECN1808CAA ECN1808DAA	AN16BN0EC AN16BN0BC AN16BN0CC AN16BN0DC
1	208 240 480 600	7-1/2 7-1/2 10 10	120	30A	ECN1811EAA ECN1811BAA ECN1811CAA ECN1811DAA	ECN1812EAA ECN1812BAA ECN1812CAA ECN1812DAA	ECN1814EAA ECN1814BAA ECN1814CAA ECN1814DAA	ECN1818EAA ECN1818BAA ECN1818CAA ECN1818DAA	AN16DN0EB AN16DN0BB AN16DN0CB AN16DN0DB
2	208 240 480 600	10 15 25 25	120	60A	ECN1821EAA ECN1821BAA ECN1821CAA ECN1821DAA	ECN1822EAA ECN1822BAA ECN1822CAA ECN1822DAA	ECN1824EAA ECN1824BAA ECN1824CAA ECN1824DAA	ECN1828EAA ECN1828BAA ECN1828CAA ECN1828DAA	AN16GN0EB AN16GN0BB AN16GN0CB AN16GN0DB
3	208 240 480 600	25 30 50 50	120	100A	ECN1831EAA ECN1831BAA ECN1831CAA ECN1831DAA	ECN1832EAA ECN1832BAA ECN1832CAA ECN1832DAA	ECN1834EAA ECN1834BAA ECN1834CAA ECN1834DAA	ECN1838EAA ECN1838BAA ECN1838CAA ECN1838DAA	AN16KN0E AN16KN0B AN16KN0C AN16KN0D
4	208 240 480 600	40 50 100 100	120	200A	ECN1841EAA ECN1841BAA ECN1841CAA ECN1841DAA	ECN1842EAA ECN1842BAA ECN1842CAA ECN1842DAA	ECN1844EAA ECN1844BAA ECN1844CAA ECN1844DAA	ECN1848EAA ECN1848BAA ECN1848CAA ECN1848DAA	AN16NN0E AN16NN0B AN16NN0C AN16NN0D
5	208 240 480 600	75 100 200 200	120	400A	ECN1851EAA ECN1851BAA ECN1851CAA ECN1851DAA	ECN1852EAA ECN1852BAA ECN1852CAA ECN1852DAA	ECN1854EAA ECN1854BAA ECN1854CAA ECN1854DAA	ECN1858EAA ECN1858BAA ECN1858CAA ECN1858DAA	AN16SN0EB AN16SN0BB AN16SN0CB AN16SN0DB
6	208 240 480 600	150 200 400 400	120	600A	ECN1861EAA ECN1861BAA ECN1861CAA ECN1861DAA	ECN1862EAA ECN1862BAA ECN1862CAA ECN1862DAA	ECN1863EAA ④ ECN1863BAA ④ ECN1863CAA ④ ECN1863DAA ④	ECN1868EAA ECN1868BAA ECN1868CAA ECN1868DAA	AN16TN0EB AN16TN0BB AN16TN0CB AN16TN0DB
7	240 480 600	300 600 600	120	⑤	ECN1871BAA ECN1871CAA ECN1871DAA	ECN1872BAA ECN1872CAA ECN1872DAA	ECN1873BAA ④ ECN1873CAA ④ ECN1873DAA ④	ECN1878BAA ECN1878CAA ECN1878DAA	AN16UN0BB AN16UN0CB AN16UN0DB
8	240 480 600	450 900 900	120	⑤	ECN1881BAA ECN1881CAA ECN1881DAA	ECN1882BAA ECN1882CAA ECN1882DAA	ECN1883BAA ④ ECN1883CAA ④ ECN1883DAA ④	ECN1888BAA ECN1888CAA ECN1888DAA	AN16VN0BB AN16VN0CB AN16VN0DB
9	240 480 600	800 1000 ⑥ 1000	120	⑤	ECN1891BAA ECN1891CAA ECN1891DAA	ECN1892BAA ECN1892CAA ECN1892DAA	ECN1893BAA ④ ECN1893CAA ④ ECN1893DAA ④	ECN1898BAA ECN1898CAA ECN1898DAA	AN16WN0B AN16WN0C AN16WN0D

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Other control power transformer primary and/or secondary voltages, see **Page 3-20**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order Mod 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 460V, consult Eaton.
⑦ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Features

- 3-Phase Magnetic
- 3-Pole Non-reversing or Reversing
- Standard Interchangeable Heater OLR
- Optional Electronic Overload
- 600V Maximum
- 100,000 RMS 480V, 25,000 RMS 600V

Product Selection

Table 3-38. Class ECN22 — Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	200	1 1-1/2	120	HMCPE 7A HMCPE 15A	**ECN22A1AAC** **ECN22A1AAD**	**ECN22A2AAC** **ECN22A2AAD**	**ECN22A4AAC** **ECN22A4AAD**	**ECN22A8AAC** **ECN22A8AAD**	**AN16AN0AC**
	230	1 1-1/2		HMCPE 7A HMCPE 15A	**ECN22A1AAC** **ECN22A1AAD**	**ECN22A2AAC** **ECN22A2AAD**	**ECN22A4AAC** **ECN22A4AAD**	**ECN22A8AAC** **ECN22A8AAD**	
	460	1 2		HMCPE 3A HMCPE 7A	**ECN22A1AAB** **ECN22A1AAC**	**ECN22A2AAB** **ECN22A2AAC**	**ECN22A4AAB** **ECN22A4AAC**	**ECN22A8AAB** **ECN22A8AAC**	
	575	1 2		HMCP 3A HMCP 7A	**ECN22A1AAB** **ECN22A1AAC**	**ECN22A2AAB** **ECN22A2AAC**	**ECN22A4AAB** **ECN22A4AAC**	**ECN22A8AAB** **ECN22A8AAC**	
0	200	1 3	120	HMCPE 7A HMCPE 15A	**ECN2201AAC** **ECN2201AAD**	**ECN2202AAC** **ECN2202AAD**	**ECN2204AAC** **ECN2204AAD**	**ECN2208AAC** **ECN2208AAD**	**AN16BN0AC**
	230	1 3		HMCPE 7A HMCPE 15A	**ECN2201AAC** **ECN2201AAD**	**ECN2202AAC** **ECN2202AAD**	**ECN2204AAC** **ECN2204AAD**	**ECN2208AAC** **ECN2208AAD**	
	460	1 3 5		HMCPE 3A HMCPE 7A HMCPE 15A	**ECN2201AAB** **ECN2201AAC** **ECN2201AAD**	**ECN2202AAB** **ECN2202AAC** **ECN2202AAD**	**ECN2204AAB** **ECN2204AAC** **ECN2204AAD**	**ECN2208AAB** **ECN2208AAC** **ECN2208AAD**	
	575	1 3 5		HMCP 3A HMCP 15A HMCP 7A	**ECN2201AAB** **ECN2201AAD** **ECN2201AAC**	**ECN2202AAB** **ECN2202AAD** **ECN2202AAC**	**ECN2204AAB** **ECN2204AAD** **ECN2204AAC**	**ECN2208AAB** **ECN2208AAD** **ECN2208AAC**	
1	200	1 3 5 7-1/2	120	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECN2211AAC** **ECN2211AAD** **ECN2211AAE** **ECN2211AAF**	**ECN2212AAC** **ECN2212AAD** **ECN2212AAE** **ECN2212AAF**	**ECN2214AAC** **ECN2214AAD** **ECN2214AAE** **ECN2214AAF**	**ECN2218AAC** **ECN2218AAD** **ECN2218AAE** **ECN2218AAF**	**AN16DN0AB**
	230	1 3 5 7-1/2		HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECN2211AAC** **ECN2211AAD** **ECN2211AAE** **ECN2211AAF**	**ECN2212AAC** **ECN2212AAD** **ECN2212AAE** **ECN2212AAF**	**ECN2214AAC** **ECN2214AAD** **ECN2214AAE** **ECN2214AAF**	**ECN2218AAC** **ECN2218AAD** **ECN2218AAE** **ECN2218AAF**	
	460	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN2211AAB** **ECN2211AAC** **ECN2211AAD** **ECN2211AAE**	**ECN2212AAB** **ECN2212AAC** **ECN2212AAD** **ECN2212AAE**	**ECN2214AAB** **ECN2214AAC** **ECN2214AAD** **ECN2214AAE**	**ECN2218AAB** **ECN2218AAC** **ECN2218AAD** **ECN2218AAE**	
	575	1 3 5 10		HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2211AAB** **ECN2211AAC** **ECN2211AAD** **ECN2211AAE**	**ECN2212AAB** **ECN2212AAC** **ECN2212AAD** **ECN2212AAE**	**ECN2214AAB** **ECN2214AAC** **ECN2214AAD** **ECN2214AAE**	**ECN2218AAB** **ECN2218AAC** **ECN2218AAD** **ECN2218AAE**	

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.

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

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

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-38. Class ECN22 — Combination Non-reversing Starter — Circuit Breaker (Continued)

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑤ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
2	200	10	120	HMCPE 50A	**ECN2221AAF**	**ECN2222AAF**	**ECN2224AAF**	**ECN2228AAF**	**AN16GN0AB**
	230	10 15		HMCPE 50A HMCPE 70A	**ECN2221AAF** **ECN2221AAW**	**ECN2222AAF** **ECN2222AAW**	**ECN2224AAF** **ECN2224AAW**	**ECN2228AAF** **ECN2228AAW**	
	460	25		HMCPE 50A	**ECN2221AAF**	**ECN2222AAF**	**ECN2224AAF**	**ECN2228AAF**	
	575	15 25		HMCP 30A HMCP 50A	**ECN2221AAE** **ECN2221AAF**	**ECN2222AAE** **ECN2222AAF**	**ECN2224AAE** **ECN2224AAF**	**ECN2228AAE** **ECN2228AAF**	
3	200	20 25	120	HMCPE 100A HMCPE 100A	**ECN2231AAG** **ECN2231AAX**	**ECN2232AAG** **ECN2232AAX**	**ECN2234AAG** **ECN2234AAX**	**ECN2238AAG** **ECN2238AAX**	**AN16KN0A**
	230	25 30		HMCPE 100A HMCPE 100A	**ECN2231AAG** **ECN2231AAX**	**ECN2232AAG** **ECN2232AAX**	**ECN2234AAG** **ECN2234AAX**	**ECN2238AAG** **ECN2238AAX**	
	460	50		HMCPE 100A	**ECN2231AAG**	**ECN2232AAG**	**ECN2234AAG**	**ECN2238AAG**	
	575	30 50		HMCP 50A HMCP 100A	**ECN2231AAF** **ECN2231AAG**	**ECN2232AAF** **ECN2232AAG**	**ECN2234AAF** **ECN2234AAG**	**ECN2238AAF** **ECN2238AAG**	
4	200 230 460 575	40 50 100 100	120	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**ECN2241AAH** **ECN2241AAH** **ECN2241AAH** **ECN2241AAH**	**ECN2242AAH** **ECN2242AAH** **ECN2242AAH** **ECN2242AAH**	**ECN2244AAH** **ECN2244AAH** **ECN2244AAH** **ECN2244AAH**	**ECN2248AAH** **ECN2248AAH** **ECN2248AAH** **ECN2248AAH**	**AN16NN0A**
5	200	50 75	120	HMCP 250A HMCP 400A	**ECN2251AAJ** **ECN2251AAK**	**ECN2252AAJ** **ECN2252AAK**	**ECN2254AAJ** **ECN2254AAK**	**ECN2258AAJ** **ECN2258AAK**	**AN16SN0AB**
	230	60 100		HMCP 250A HMCP 400A	**ECN2251AAJ** **ECN2251AAK**	**ECN2252AAJ** **ECN2252AAK**	**ECN2254AAJ** **ECN2254AAK**	**ECN2258AAJ** **ECN2258AAK**	
	460	125 200		HMCP 250A HMCP 400A	**ECN2251AAJ** **ECN2251AAK**	**ECN2252AAJ** **ECN2252AAK**	**ECN2254AAJ** **ECN2254AAK**	**ECN2258AAJ** **ECN2258AAK**	
	575	150 200		HMCP 250A HMCP 400A	**ECN2251AAJ** **ECN2251AAK**	**ECN2252AAJ** **ECN2252AAK**	**ECN2254AAJ** **ECN2254AAK**	**ECN2258AAJ** **ECN2258AAK**	
6	200	150	120	HMCP 600A	**ECN2261AAL**	**ECN2262AAL**	**ECN2263AAL** ④	**ECN2268AAL**	**AN16TN0AB**
	230	200		HMCP 600A	**ECN2261AAL**	**ECN2262AAL**	**ECN2263AAL** ④	**ECN2268AAL**	
	460	350 400		HMCP 600A HMCP 1200A	**ECN2261AAL** **ECN2261AAP**	**ECN2262AAL** **ECN2262AAP**	**ECN2263AAL** ④ **ECN2263AAP** ④	**ECN2268AAL** **ECN2268AAP**	
	575	400		HMCP 600A	**ECN2261AAL**	**ECN2262AAL**	**ECN2263AAL** ④	**ECN2268AAL**	
7	230 460 575	300 600 600	120	— — —	**ECN2271AAU** **ECN2271AAU** **ECN2271AAU**	**ECN2272AAU** **ECN2272AAU** **ECN2272AAU**	**ECN2273AAU** ④ **ECN2273AAU** ④ **ECN2273AAU** ④	**ECN2278AAU** **ECN2278AAU** **ECN2278AAU**	**AN16UN0AB**
8	230 460 575	450 900 900	120	— — —	**ECN2281AAU** **ECN2281AAU** **ECN2281AAU**	**ECN2282AAU** **ECN2282AAU** **ECN2282AAU**	**ECN2283AAU** ④ **ECN2283AAU** ④ **ECN2283AAU** ④	**ECN2288AAU** **ECN2288AAU** **ECN2288AAU**	**AN16VN0AB**
9	230 460 575	800 1600 1600	120	— — —	**ECN2291AAU** **ECN2291AAU** **ECN2291AAU**	**ECN2292AAU** **ECN2292AAU** **ECN2292AAU**	**ECN2293AAU** ④ **ECN2293AAU** ④ **ECN2293AAU** ④	**ECN2298AAU** **ECN2298AAU** **ECN2298AAU**	**AN16WN0A**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order Mod 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 The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN220**4**AAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-39. Class ECN22 — Special Enclosure Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 4X ② Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial ③		Component Starter (Open)
							External Reset	Internal Rest	
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Horizontal Enclosure									
1	200	1	120	HMCPE 7A	**ECN2211AAC-E13**	**ECN2212AAC-E13**	**ECN2214AAC-E13**	**ECN2218AAC-E13**	**AN16DN0AB**
		3		HMCPE 15A	**ECN2211AAD-E13**	**ECN2212AAD-E13**	**ECN2214AAD-E13**	**ECN2218AAD-E13**	
		5		HMCPE 30A	**ECN2211AAE-E13**	**ECN2212AAE-E13**	**ECN2214AAE-E13**	**ECN2218AAE-E13**	
		7-1/2		HMCPE 50A	**ECN2211AAF-E13**	**ECN2212AAF-E13**	**ECN2214AAF-E13**	**ECN2218AAF-E13**	
	230	1		HMCPE 7A	**ECN2211AAC-E13**	**ECN2212AAC-E13**	**ECN2214AAC-E13**	**ECN2218AAC-E13**	
		3		HMCPE 15A	**ECN2211AAD-E13**	**ECN2212AAD-E13**	**ECN2214AAD-E13**	**ECN2218AAD-E13**	
		5		HMCPE 30A	**ECN2211AAE-E13**	**ECN2212AAE-E13**	**ECN2214AAE-E13**	**ECN2218AAE-E13**	
		7-1/2		HMCPE 50A	**ECN2211AAF-E13**	**ECN2212AAF-E13**	**ECN2214AAF-E13**	**ECN2218AAF-E13**	
	460	1		HMCPE 3A	**ECN2211AAB-E13**	**ECN2212AAB-E13**	**ECN2214AAB-E13**	**ECN2218AAB-E13**	
		3		HMCPE 7A	**ECN2211AAC-E13**	**ECN2212AAC-E13**	**ECN2214AAC-E13**	**ECN2218AAC-E13**	
		5		HMCPE 15A	**ECN2211AAD-E13**	**ECN2212AAD-E13**	**ECN2214AAD-E13**	**ECN2218AAD-E13**	
		10		HMCPE 30A	**ECN2211AAE-E13**	**ECN2212AAE-E13**	**ECN2214AAE-E13**	**ECN2218AAE-E13**	
	575	1		HMCP 3A	**ECN2211AAB-E13**	**ECN2212AAB-E13**	**ECN2214AAB-E13**	**ECN2218AAB-E13**	
		3		HMCP 7A	**ECN2211AAC-E13**	**ECN2212AAC-E13**	**ECN2214AAC-E13**	**ECN2218AAC-E13**	
		5		HMCP 15A	**ECN2211AAD-E13**	**ECN2212AAD-E13**	**ECN2214AAD-E13**	**ECN2218AAD-E13**	
		10		HMCP 30A	**ECN2211AAE-E13**	**ECN2212AAE-E13**	**ECN2214AAE-E13**	**ECN2218AAE-E13**	
2	200	10	120	HMCPE 50A	**ECN2221AAF-E13**	**ECN2222AAF-E13**	**ECN2224AAF-E13**	**ECN2228AAF-E13**	**AN16GN0AB**
	230	10		HMCPE 50A	**ECN2221AAF-E13**	**ECN2222AAF-E13**	**ECN2224AAF-E13**	**ECN2228AAF-E13**	
		15		HMCPE 70A	**ECN2221AAW-E13**	**ECN2222AAW-E13**	**ECN2224AAW-E13**	**ECN2228AAW-E13**	
	460	25		HMCPE 50A	**ECN2221AAF-E13**	**ECN2222AAF-E13**	**ECN2224AAF-E13**	**ECN2228AAF-E13**	
	575	15		HMCP 30A	**ECN2221AAE-E13**	**ECN2222AAE-E13**	**ECN2224AAE-E13**	**ECN2228AAE-E13**	
		25		HMCP 50A	**ECN2221AAF-E13**	**ECN2222AAF-E13**	**ECN2224AAF-E13**	**ECN2228AAF-E13**	
Oversize Enclosure — without Control Transformer									
0	200	1	120	HMCPE 7A	**ECN2201AAC-E3**	**ECN2202AAC-E3**	**ECN2204AAC-E3**	**ECN2208AAC-E3**	**AN16BN0AC**
		3		HMCPE 15A	**ECN2201AAD-E3**	**ECN2202AAD-E3**	**ECN2204AAD-E3**	**ECN2208AAD-E3**	
	230	1		HMCPE 7A	**ECN2201AAC-E3**	**ECN2202AAC-E3**	**ECN2204AAC-E3**	**ECN2208AAC-E3**	
		3		HMCPE 15A	**ECN2201AAD-E3**	**ECN2202AAD-E3**	**ECN2204AAD-E3**	**ECN2208AAD-E3**	
	460	1		HMCPE 3A	**ECN2201AAB-E3**	**ECN2202AAB-E3**	**ECN2204AAB-E3**	**ECN2208AAB-E3**	
		3		HMCPE 7A	**ECN2201AAC-E3**	**ECN2202AAC-E3**	**ECN2204AAC-E3**	**ECN2208AAC-E3**	
		5		HMCPE 15A	**ECN2201AAD-E3**	**ECN2202AAD-E3**	**ECN2204AAD-E3**	**ECN2208AAD-E3**	
	575	1		HMCP 3A	**ECN2201AAB-E3**	**ECN2202AAB-E3**	**ECN2204AAB-E3**	**ECN2208AAB-E3**	
		3		HMCP 15A	**ECN2201AAD-E3**	**ECN2202AAD-E3**	**ECN2204AAD-E3**	**ECN2208AAD-E3**	
		5		HMCP 7A	**ECN2201AAC-E3**	**ECN2202AAC-E3**	**ECN2204AAC-E3**	**ECN2208AAC-E3**	
1	200	1	120	HMCPE 7A	**ECN2211AAC-E3**	**ECN2212AAC-E3**	**ECN2214AAC-E3**	**ECN2218AAC-E3**	**AN16DN0AB**
		3		HMCPE 15A	**ECN2211AAD-E3**	**ECN2212AAD-E3**	**ECN2214AAD-E3**	**ECN2218AAD-E3**	
		5		HMCPE 30A	**ECN2211AAE-E3**	**ECN2212AAE-E3**	**ECN2214AAE-E3**	**ECN2218AAE-E3**	
		7-1/2		HMCPE 50A	**ECN2211AAF-E3**	**ECN2212AAF-E3**	**ECN2214AAF-E3**	**ECN2218AAF-E3**	
	230	1		HMCPE 7A	**ECN2211AAC-E3**	**ECN2212AAC-E3**	**ECN2214AAC-E3**	**ECN2218AAC-E3**	
		3		HMCPE 15A	**ECN2211AAD-E3**	**ECN2212AAD-E3**	**ECN2214AAD-E3**	**ECN2218AAD-E3**	
		5		HMCPE 30A	**ECN2211AAE-E3**	**ECN2212AAE-E3**	**ECN2214AAE-E3**	**ECN2218AAE-E3**	
		7-1/2		HMCPE 50A	**ECN2211AAF-E3**	**ECN2212AAF-E3**	**ECN2214AAF-E3**	**ECN2218AAF-E3**	
	460	1		HMCPE 3A	**ECN2211AAB-E3**	**ECN2212AAB-E3**	**ECN2214AAB-E3**	**ECN2218AAB-E3**	
		3		HMCPE 7A	**ECN2211AAC-E3**	**ECN2212AAC-E3**	**ECN2214AAC-E3**	**ECN2218AAC-E3**	
		5		HMCPE 15A	**ECN2211AAD-E3**	**ECN2212AAD-E3**	**ECN2214AAD-E3**	**ECN2218AAD-E3**	
		10		HMCPE 30A	**ECN2211AAE-E3**	**ECN2212AAE-E3**	**ECN2214AAE-E3**	**ECN2218AAE-E3**	
	575	1		HMCP 3A	**ECN2211AAB-E3**	**ECN2212AAB-E3**	**ECN2214AAB-E3**	**ECN2218AAB-E3**	
		3		HMCP 7A	**ECN2211AAC-E3**	**ECN2212AAC-E3**	**ECN2214AAC-E3**	**ECN2218AAC-E3**	
		5		HMCP 15A	**ECN2211AAD-E3**	**ECN2212AAD-E3**	**ECN2214AAD-E3**	**ECN2218AAD-E3**	
		10		HMCP 30A	**ECN2211AAE-E3**	**ECN2212AAE-E3**	**ECN2214AAE-E3**	**ECN2218AAE-E3**	
2	200	10	120	HMCPE 50A	**ECN2221AAF-E3**	**ECN2222AAF-E3**	**ECN2224AAF-E3**	**ECN2228AAF-E3**	**AN16GN0AB**
	230	10		HMCPE 50A	**ECN2221AAF-E3**	**ECN2222AAF-E3**	**ECN2224AAF-E3**	**ECN2228AAF-E3**	
		15		HMCPE 70A	**ECN2221AAW-E3**	**ECN2222AAW-E3**	**ECN2224AAW-E3**	**ECN2228AAW-E3**	
	460	25		HMCPE 50A	**ECN2221AAF-E3**	**ECN2222AAF-E3**	**ECN2224AAF-E3**	**ECN2228AAF-E3**	
	575	15		HMCP 30A	**ECN2221AAE-E3**	**ECN2222AAE-E3**	**ECN2224AAE-E3**	**ECN2228AAE-E3**	
		25		HMCP 50A	**ECN2221AAF-E3**	**ECN2222AAF-E3**	**ECN2224AAF-E3**	**ECN2228AAF-E3**	

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.

② The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN2204AAC-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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

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

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-40. Class ECN23 — Combination Reversing Starter — Circuit Breaker ④

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑤ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	200	1 1-1/2	120	HMCPE 7A HMCPE 15A	**ECN23A1AAC** **ECN23A1AAD**	**ECN23A2AAC** **ECN23A2AAD**	**ECN23A4AAC** **ECN23A4AAD**	**ECN23A8AAC** **ECN23A8AAD**	**AN56AN0AC**
	230	1 1-1/2		HMCPE 7A HMCPE 15A	**ECN23A1AAC** **ECN23A1AAD**	**ECN23A2AAC** **ECN23A2AAD**	**ECN23A4AAC** **ECN23A4AAD**	**ECN23A8AAC** **ECN23A8AAD**	
	460	1 2		HMCPE 3A HMCPE 7A	**ECN23A1AAB** **ECN23A1AAC**	**ECN23A2AAB** **ECN23A2AAC**	**ECN23A4AAB** **ECN23A4AAC**	**ECN23A8AAB** **ECN23A8AAC**	
	575	1 2		HMCP 3A HMCP 7A	**ECN23A1AAB** **ECN23A1AAC**	**ECN23A2AAB** **ECN23A2AAC**	**ECN23A4AAB** **ECN23A4AAC**	**ECN23A8AAB** **ECN23A8AAC**	
0	200	1 3	120	HMCPE 7A HMCPE 15A	**ECN2301AAC** **ECN2301AAD**	**ECN2302AAC** **ECN2302AAD**	**ECN2304AAC** **ECN2304AAD**	**ECN2308AAC** **ECN2308AAD**	**AN56BN0AC**
	230	1 3		HMCPE 7A HMCPE 15A	**ECN2301AAC** **ECN2301AAD**	**ECN2302AAC** **ECN2302AAD**	**ECN2304AAC** **ECN2304AAD**	**ECN2308AAC** **ECN2308AAD**	
	460	1 3 5		HMCPE 3A HMCPE 7A HMCPE 15A	**ECN2301AAB** **ECN2301AAC** **ECN2301AAD**	**ECN2302AAB** **ECN2302AAC** **ECN2302AAD**	**ECN2304AAB** **ECN2304AAC** **ECN2304AAD**	**ECN2308AAB** **ECN2308AAC** **ECN2308AAD**	
	575	1 3 5		HMCP 3A HMCP 15A HMCP 7A	**ECN2301AAB** **ECN2301AAD** **ECN2301AAC**	**ECN2302AAB** **ECN2302AAD** **ECN2302AAC**	**ECN2304AAB** **ECN2304AAD** **ECN2304AAC**	**ECN2308AAB** **ECN2308AAD** **ECN2308AAC**	
1	200	1 3 5 7-1/2	120	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECN2311AAC** **ECN2311AAD** **ECN2311AAE** **ECN2311AAF**	**ECN2312AAC** **ECN2312AAD** **ECN2312AAE** **ECN2312AAF**	**ECN2314AAC** **ECN2314AAD** **ECN2314AAE** **ECN2314AAF**	**ECN2318AAC** **ECN2318AAD** **ECN2318AAE** **ECN2318AAF**	**AN56DN0AB**
	230	1 3 5 7-1/2		HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECN2311AAC** **ECN2311AAD** **ECN2311AAE** **ECN2311AAF**	**ECN2312AAC** **ECN2312AAD** **ECN2312AAE** **ECN2312AAF**	**ECN2314AAC** **ECN2314AAD** **ECN2314AAE** **ECN2314AAF**	**ECN2318AAC** **ECN2318AAD** **ECN2318AAE** **ECN2318AAF**	
	460	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN2311AAB** **ECN2311AAC** **ECN2311AAD** **ECN2311AAE**	**ECN2312AAB** **ECN2312AAC** **ECN2312AAD** **ECN2312AAE**	**ECN2314AAB** **ECN2314AAC** **ECN2314AAD** **ECN2314AAE**	**ECN2318AAB** **ECN2318AAC** **ECN2318AAD** **ECN2318AAE**	
	575	1 3 5 10		HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2311AAB** **ECN2311AAC** **ECN2311AAD** **ECN2311AAE**	**ECN2312AAB** **ECN2312AAC** **ECN2312AAD** **ECN2312AAE**	**ECN2314AAB** **ECN2314AAC** **ECN2314AAD** **ECN2314AAE**	**ECN2318AAB** **ECN2318AAC** **ECN2318AAD** **ECN2318AAE**	
2	200	10	120	HMCPE 50A	**ECN2321AAF**	**ECN2322AAF**	**ECN2324AAF**	**ECN2328AAF**	**AN56GN0AB**
	230	10 15		HMCPE 50A HMCPE 70A	**ECN2321AAF** **ECN2321AAW**	**ECN2322AAF** **ECN2322AAW**	**ECN2324AAF** **ECN2324AAW**	**ECN2328AAF** **ECN2328AAW**	
	460	25		HMCPE 50A	**ECN2321AAF**	**ECN2322AAF**	**ECN2324AAF**	**ECN2328AAF**	
	575	15 25		HMCP 30A HMCP 50A	**ECN2321AAE** **ECN2321AAF**	**ECN2322AAE** **ECN2322AAF**	**ECN2324AAE** **ECN2324AAF**	**ECN2328AAE** **ECN2328AAF**	

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.
③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
④ 100,000 RMS short-circuit – 480V
25,000 RMS short-circuit – 600V
⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-40. Class ECN23 — Combination Reversing Starter — Circuit Breaker ④ (Continued)

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ⑦ Watertight & Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) Catalog Number
3	200	20 25	120	HMCPE 100A HMCPE 100A	**ECN2331AAG** **ECN2331AAX**	**ECN2332AAG** **ECN2332AAX**	**ECN2334AAG** **ECN2334AAX**	**ECN2338AAG** **ECN2338AAX**	**AN56KN0A**
	230	25 30		HMCPE 100A HMCPE 100A	**ECN2331AAG** **ECN2331AAX**	**ECN2332AAG** **ECN2332AAX**	**ECN2334AAG** **ECN2334AAX**	**ECN2338AAG** **ECN2338AAX**	
	460	50		HMCPE 100A	**ECN2331AAG**	**ECN2332AAG**	**ECN2334AAG**	**ECN2338AAG**	
	575	30 50		HMCP 50A HMCP 100A	**ECN2331AAF** **ECN2331AAG**	**ECN2332AAF** **ECN2332AAG**	**ECN2334AAF** **ECN2334AAG**	**ECN2338AAF** **ECN2338AAG**	
4	200 230 460 575	40 50 100 100	120	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**ECN2341AAH** **ECN2341AAH** **ECN2341AAH** **ECN2341AAH**	**ECN2342AAH** **ECN2342AAH** **ECN2342AAH** **ECN2342AAH**	**ECN2344AAH** **ECN2344AAH** **ECN2344AAH** **ECN2344AAH**	**ECN2348AAH** **ECN2348AAH** **ECN2348AAH** **ECN2348AAH**	**AN56NN0A**
5	200	50 75	230	HMCP 250A HMCP 400A	**ECN2351AAJ** **ECN2351AAK**	**ECN2352AAJ** **ECN2352AAK**	**ECN2354AAJ** **ECN2354AAK**	**ECN2358AAJ** **ECN2358AAK**	**AN56SN0AB**
	230	60 100		HMCP 250A HMCP 400A	**ECN2351AAJ** **ECN2351AAK**	**ECN2352AAJ** **ECN2352AAK**	**ECN2354AAJ** **ECN2354AAK**	**ECN2358AAJ** **ECN2358AAK**	
	460	125 200		HMCP 250A HMCP 400A	**ECN2351AAJ** **ECN2351AAK**	**ECN2352AAJ** **ECN2352AAK**	**ECN2354AAJ** **ECN2354AAK**	**ECN2358AAJ** **ECN2358AAK**	
	575	150 200		HMCP 250A HMCP 400A	**ECN2351AAJ** **ECN2351AAK**	**ECN2352AAJ** **ECN2352AAK**	**ECN2354AAJ** **ECN2354AAK**	**ECN2358AAJ** **ECN2358AAK**	
6	200	150	120	HMCP 600A	**ECN2361AAL**	**ECN2362AAL**	**ECN2363AAL** ⑤	**ECN2368AAL**	**AN56TN0AB**
	230	200		HMCP 600A	**ECN2361AAL**	**ECN2362AAL**	**ECN2363AAL** ⑤	**ECN2368AAL**	
	460	350 400		HMCP 600A HMCP 1200A	**ECN2361AAL** **ECN2361AAP**	**ECN2362AAL** **ECN2362AAP**	**ECN2363AAL** ⑤ **ECN2363AAP** ⑤	**ECN2368AAL** **ECN2368AAP**	
	575	400		HMCP 600A	**ECN2361AAL**	**ECN2362AAL**	**ECN2363AAL** ⑤	**ECN2368AAL**	
7	230 460 575	300 600 600	120	— — —	**ECN2371AAU** ⑥ **ECN2371AAU** ⑥ **ECN2371AAU** ⑥	**ECN2372AAU** ⑥ **ECN2372AAU** ⑥ **ECN2372AAU** ⑥	**ECN2373AAU** ⑤⑥ **ECN2373AAU** ⑤⑥ **ECN2373AAU** ⑤⑥	**ECN2378AAU** ⑥ **ECN2378AAU** ⑥ **ECN2378AAU** ⑥	**AN56UN0AB**
8	230 460 575	450 900 900	120	— — —	**ECN2381AAU** ⑥ **ECN2381AAU** ⑥ **ECN2381AAU** ⑥	**ECN2382AAU** ⑥ **ECN2382AAU** ⑥ **ECN2382AAU** ⑥	**ECN2383AAU** ⑥⑥ **ECN2383AAU** ⑥⑥ **ECN2383AAU** ⑥⑥	**ECN2388AAU** ⑥ **ECN2388AAU** ⑥ **ECN2388AAU** ⑥	**AN56VN0AB**
9	230 460 575	800 1600 1600	120	— — —	**ECN2391AAU** ⑥ **ECN2391AAU** ⑥ **ECN2391AAU** ⑥	**ECN2392AAU** ⑥ **ECN2392AAU** ⑥ **ECN2392AAU** ⑥	**ECN2393AAU** ⑥⑥ **ECN2393AAU** ⑥⑥ **ECN2393AAU** ⑥⑥	**ECN2398AAU** ⑥ **ECN2398AAU** ⑥ **ECN2398AAU** ⑥	**AN56WN0A**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.

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

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

④ 100,000 RMS Short-circuit – 480V
25,000 RMS Short-circuit – 600V

⑤ Type 4 (Painted steel) Sizes 6 – 9.

⑥ Provide FLA to size disconnect properly.

⑦ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN230**4**AAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-41. Class ECN24 — Combination Non-reversing Starter — Circuit Breaker with CPT ④

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑤ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	200	1 1-1/2	120	HMCPE 7A HMCPE 15A	**ECN24A1EAC** **ECN24A1EAD**	**ECN24A2EAC** **ECN24A2EAD**	**ECN24A4EAC** **ECN24A4EAD**	**ECN24A8EAC** **ECN24A8EAD**	**AN16AN0AC**
	230	1 1-1/2		HMCPE 7A HMCPE 15A	**ECN24A1BAC** **ECN24A1BAD**	**ECN24A2BAC** **ECN24A2BAD**	**ECN24A4BAC** **ECN24A4BAD**	**ECN24A8BAC** **ECN24A8BAD**	
	460	1 2		HMCPE 3A HMCPE 7A	**ECN24A1CAB** **ECN24A1CAC**	**ECN24A2CAB** **ECN24A2CAC**	**ECN24A4CAB** **ECN24A4CAC**	**ECN24A8CAB** **ECN24A8CAC**	
	575	1 2		HMCP 3A HMCP 7A	**ECN24A1DAB** **ECN24A1DAC**	**ECN24A2DAB** **ECN24A2DAC**	**ECN24A4DAB** **ECN24A4DAC**	**ECN24A8DAB** **ECN24A8DAC**	
0	200	1 3	120	HMCPE 7A HMCPE 15A	**ECN2401EAC** **ECN2401EAD**	**ECN2402EAC** **ECN2402EAD**	**ECN2404EAC** **ECN2404EAD**	**ECN2408EAC** **ECN2408EAD**	**AN16BN0AC**
	230	1 3		HMCPE 7A HMCPE 15A	**ECN2401BAC** **ECN2401BAD**	**ECN2402BAC** **ECN2402BAD**	**ECN2404BAC** **ECN2404BAD**	**ECN2408BAC** **ECN2408BAD**	
	460	1 3 5		HMCPE 3A HMCPE 7A HMCPE 15A	**ECN2401CAB** **ECN2401CAC** **ECN2401CAD**	**ECN2402CAB** **ECN2402CAC** **ECN2402CAD**	**ECN2404CAB** **ECN2404CAC** **ECN2404CAD**	**ECN2408CAB** **ECN2408CAC** **ECN2408CAD**	
	575	1 3 5		HMCP 3A HMCP 15A HMCP 7A	**ECN2401DAB** **ECN2401DAD** **ECN2401DAC**	**ECN2402DAB** **ECN2402DAD** **ECN2402DAC**	**ECN2404DAB** **ECN2404DAD** **ECN2404DAC**	**ECN2408DAB** **ECN2408DAD** **ECN2408DAC**	
1	200	1 3 5 7-1/2	120	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECN2411EAC** **ECN2411EAD** **ECN2411EAE** **ECN2411EAF**	**ECN2412EAC** **ECN2412EAD** **ECN2412EAE** **ECN2412EAF**	**ECN2414EAC** **ECN2414EAD** **ECN2414EAE** **ECN2414EAF**	**ECN2418EAC** **ECN2418EAD** **ECN2418EAE** **ECN2418EAF**	**AN16DN0AB**
	230	1 3 5 7-1/2		HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECN2411BAC** **ECN2411BAD** **ECN2411BAE** **ECN2411BAF**	**ECN2412BAC** **ECN2412BAD** **ECN2412BAE** **ECN2412BAF**	**ECN2414BAC** **ECN2414BAD** **ECN2414BAE** **ECN2414BAF**	**ECN2418BAC** **ECN2418BAD** **ECN2418BAE** **ECN2418BAF**	
	460	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN2411CAB** **ECN2411CAC** **ECN2411CAD** **ECN2411CAE**	**ECN2412CAB** **ECN2412CAC** **ECN2412CAD** **ECN2412CAE**	**ECN2414CAB** **ECN2414CAC** **ECN2414CAD** **ECN2414CAE**	**ECN2418CAB** **ECN2418CAC** **ECN2418CAD** **ECN2418CAE**	
	575	1 3 5 10		HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2411DAB** **ECN2411DAC** **ECN2411DAD** **ECN2411DAE**	**ECN2412DAB** **ECN2412DAC** **ECN2412DAD** **ECN2412DAE**	**ECN2414DAB** **ECN2414DAC** **ECN2414DAD** **ECN2414DAE**	**ECN2418DAB** **ECN2418DAC** **ECN2418DAD** **ECN2418DAE**	
2	200	10	120	HMCPE 50A	**ECN2421EAF**	**ECN2422EAF**	**ECN2424EAF**	**ECN2428EAF**	**AN16GN0AB**
	230	10 15		HMCPE 50A HMCPE 70A	**ECN2421BAF** **ECN2421BAW**	**ECN2422BAF** **ECN2422BAW**	**ECN2424BAF** **ECN2424BAW**	**ECN2428BAF** **ECN2428BAW**	
	460	25		HMCPE 50A	**ECN2421CAF**	**ECN2422CAF**	**ECN2424CAF**	**ECN2428CAF**	
	575	15 25		HMCP 30A HMCP 50A	**ECN2421CAE** **ECN2421DAF**	**ECN2422CAE** **ECN2422DAF**	**ECN2424CAE** **ECN2424DAF**	**ECN2428CAE** **ECN2428DAF**	

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other control power transformer primary and/or secondary voltages, substitute the eighth digit with appropriate digit based on **Table 3-18**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.
③ Type 12 enclosure is without safety door interlock. When safety door interlock is required, add modification **E11**.
④ 100,000 RMS short-circuit – 480V
25,000 RMS short-circuit – 600V
⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN2404AAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-41. Class ECN24 — Combination Non-reversing Starter — Circuit Breaker with CPT ④ (Continued)

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑦ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
3	200	20 25	120	HMCPE 100A HMCPE 100A	**ECN2431EAG** **ECN2431EAX**	**ECN2432EAG** **ECN2432EAX**	**ECN2434EAG** **ECN2434EAX**	**ECN2438EAG** **ECN2438EAX**	**AN16KN0A**
	230	25 30		HMCPE 100A HMCPE 100A	**ECN2431BAG** **ECN2431BAX**	**ECN2432BAG** **ECN2432BAX**	**ECN2434BAG** **ECN2434BAX**	**ECN2438BAG** **ECN2438BAX**	
	460	50		HMCPE 100A	**ECN2431CAG**	**ECN2432CAG**	**ECN2434CAG**	**ECN2438CAG**	
	575	30 50		HMCP 50A HMCP 100A	**ECN2431DAF** **ECN2431DAG**	**ECN2432DAF** **ECN2432DAG**	**ECN2434DAF** **ECN2434DAG**	**ECN2438DAF** **ECN2438DAG**	
4	200 230 460 575	40 50 100 100	120	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**ECN2441EAH** **ECN2441BAH** **ECN2441CAH** **ECN2441DAH**	**ECN2442EAH** **ECN2442BAH** **ECN2442CAH** **ECN2442DAH**	**ECN2444EAH** **ECN2444BAH** **ECN2444CAH** **ECN2444DAH**	**ECN2448EAH** **ECN2448BAH** **ECN2448CAH** **ECN2448DAH**	**AN16NN0A**
5	200	50 75	120	HMCP 250A HMCP 400A	**ECN2451EAJ** **ECN2451EAK**	**ECN2452EAJ** **ECN2452EAK**	**ECN2454EAJ** **ECN2454EAK**	**ECN2458EAJ** **ECN2458EAK**	**AN16SN0AB**
	230	60 100		HMCP 250A HMCP 400A	**ECN2451BAJ** **ECN2451BAK**	**ECN2452BAJ** **ECN2452BAK**	**ECN2454BAJ** **ECN2454BAK**	**ECN2458BAJ** **ECN2458BAK**	
	460	125 200		HMCP 250A HMCP 400A	**ECN2451CAJ** **ECN2451CAK**	**ECN2452CAJ** **ECN2452CAK**	**ECN2454CAJ** **ECN2454CAK**	**ECN2458CAJ** **ECN2458CAK**	
	575	150 200		HMCP 250A HMCP 400A	**ECN2451DAJ** **ECN2451DAK**	**ECN2452DAJ** **ECN2452DAK**	**ECN2454DAJ** **ECN2454DAK**	**ECN2458DAJ** **ECN2458DAK**	
6	200	150	120	HMCP 600A	**ECN2461EAL**	**ECN2462EAL**	**ECN2463EAL** ⑤	**ECN2468EAL**	**AN16TN0AB**
	230	200		HMCP 600A	**ECN2461BAL**	**ECN2462BAL**	**ECN2463BAL** ⑤	**ECN2468BAL**	
	460	350 400		HMCP 600A HMCP 1200A	**ECN2461CAL** **ECN2461CAP**	**ECN2462CAL** **ECN2462CAP**	**ECN2463CAL** ⑤ **ECN2463CAP** ⑤	**ECN2468CAL** **ECN2468CAP**	
	575	400		HMCP 600A	**ECN2461DAL**	**ECN2462DAL**	**ECN2463DAL** ⑤	**ECN2468DAL**	
7	230 460 575	300 600 600	120	— — —	**ECN2471BAU** ⑥ **ECN2471CAU** ⑥ **ECN2471DAU** ⑥	**ECN2472BAU** ⑥ **ECN2472CAU** ⑥ **ECN2472DAU** ⑥	**ECN2473BAU** ⑤⑥ **ECN2473CAU** ⑤⑥ **ECN2473DAU** ⑤⑥	**ECN2478BAU** ⑥ **ECN2478CAU** ⑥ **ECN2478DAU** ⑥	**AN16UN0AB**
8	230 460 575	450 900 900	120	— — —	**ECN2481BAU** ⑥ **ECN2481CAU** ⑥ **ECN2481DAU** ⑥	**ECN2482BAU** ⑥ **ECN2482CAU** ⑥ **ECN2482DAU** ⑥	**ECN2483BAU** ⑤⑥ **ECN2483CAU** ⑤⑥ **ECN2483DAU** ⑤⑥	**ECN2488BAU** ⑥ **ECN2488CAU** ⑥ **ECN2488DAU** ⑥	**AN16VN0AB**
9	230 460 575	800 1600 1600	120	— — —	**ECN2491BAU** ⑥ **ECN2491CAU** ⑥ **ECN2491DAU** ⑥	**ECN2492BAU** ⑥ **ECN2492CAU** ⑥ **ECN2492DAU** ⑥	**ECN2493BAU** ⑤⑥ **ECN2493CAU** ⑤⑥ **ECN2493DAU** ⑤⑥	**ECN2498BAU** ⑥ **ECN2498CAU** ⑥ **ECN2498DAU** ⑥	**AN16WN0A**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other control power transformer primary and/or secondary voltages, substitute the eighth digit with appropriate digit based on **Table 3-18**.

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

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

④ 100,000 RMS short-circuit – 480V
25,000 RMS short-circuit – 600V

⑤ Type 4 (Painted steel) Sizes 6 – 9.

⑥ Provide FLA to size disconnect properly.

⑦ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN240**4**AAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Other Magnet Coils ..... **Page 3-20**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Wiring Diagrams

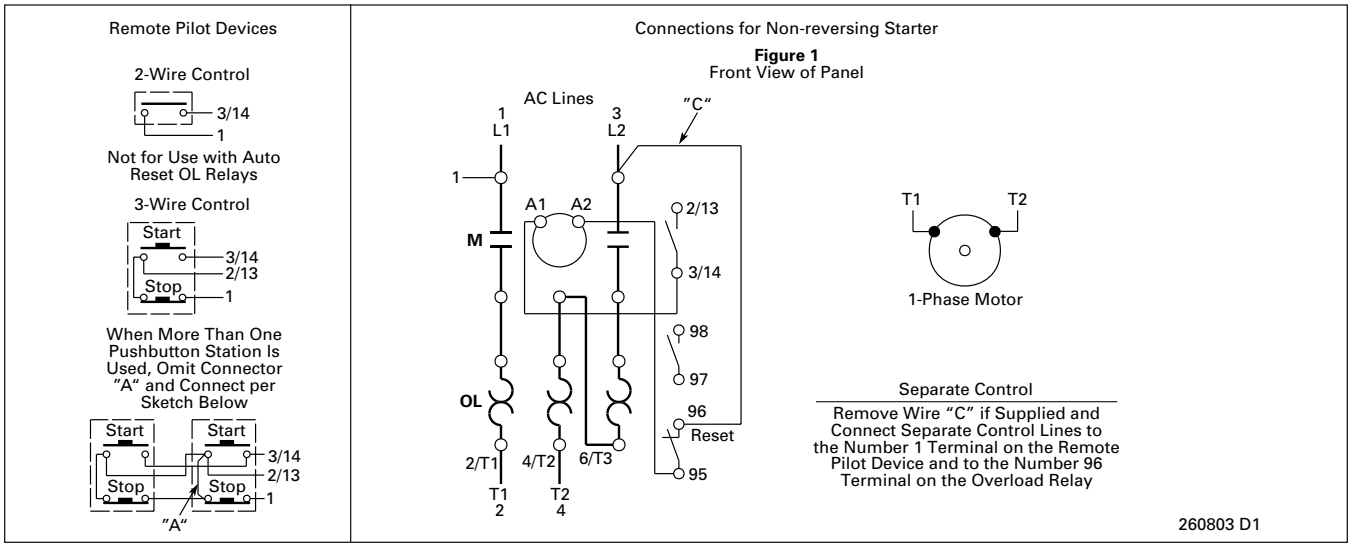


Figure 3-3. Non-reversing Starter — Single-Phase Non-combination

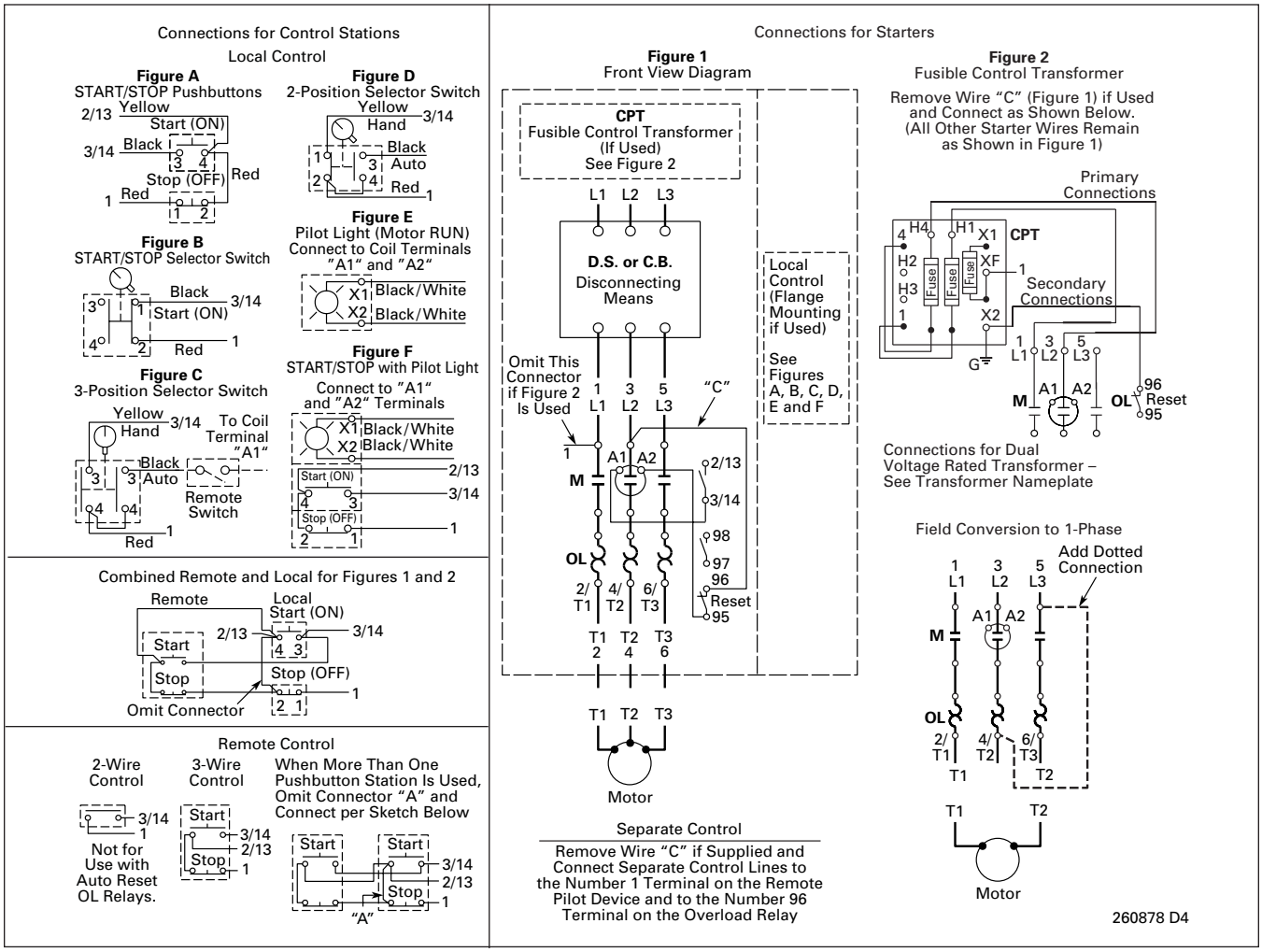


Figure 3-4. Non-reversing Starter — Combination

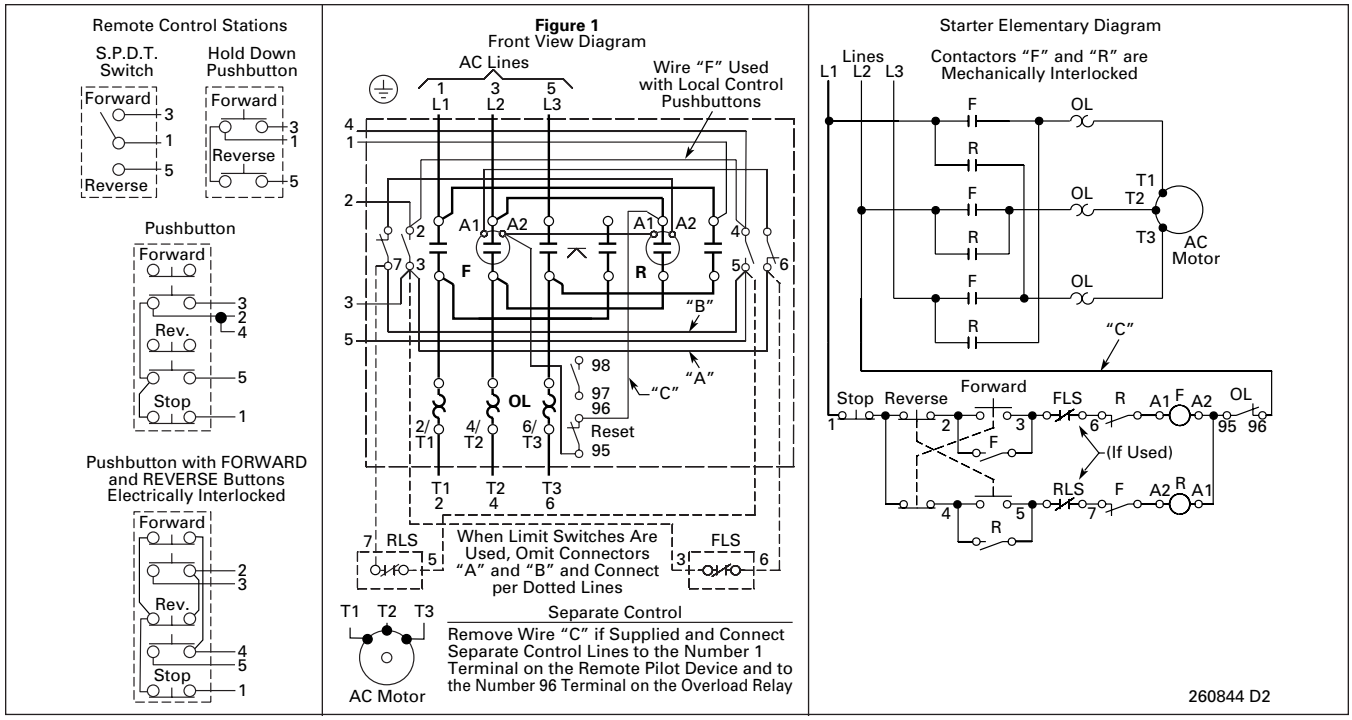


Figure 3-5. Reversing Starter — Non-combination

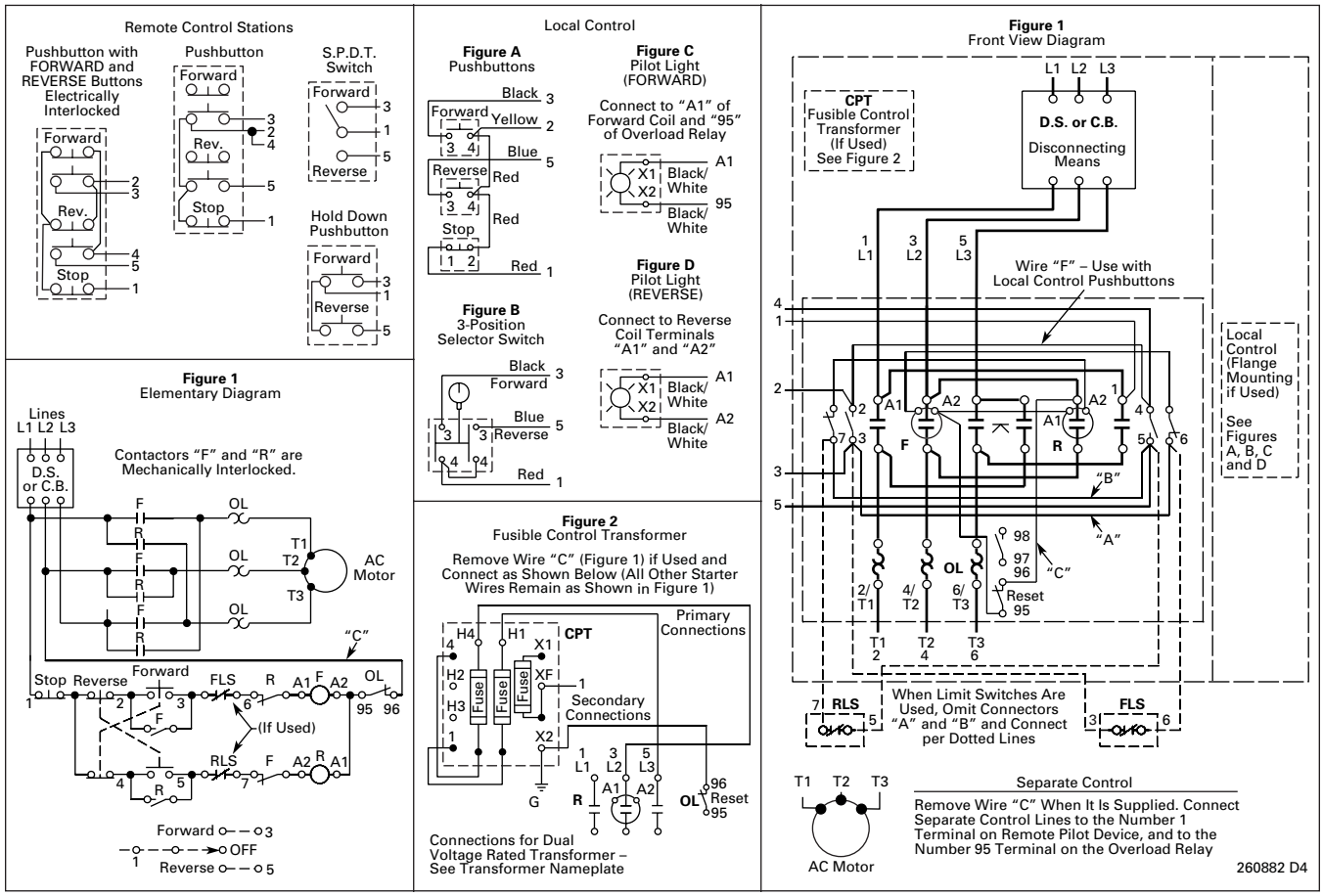


Figure 3-6. Reversing Starter — Combination

Non-reversing Cover Control

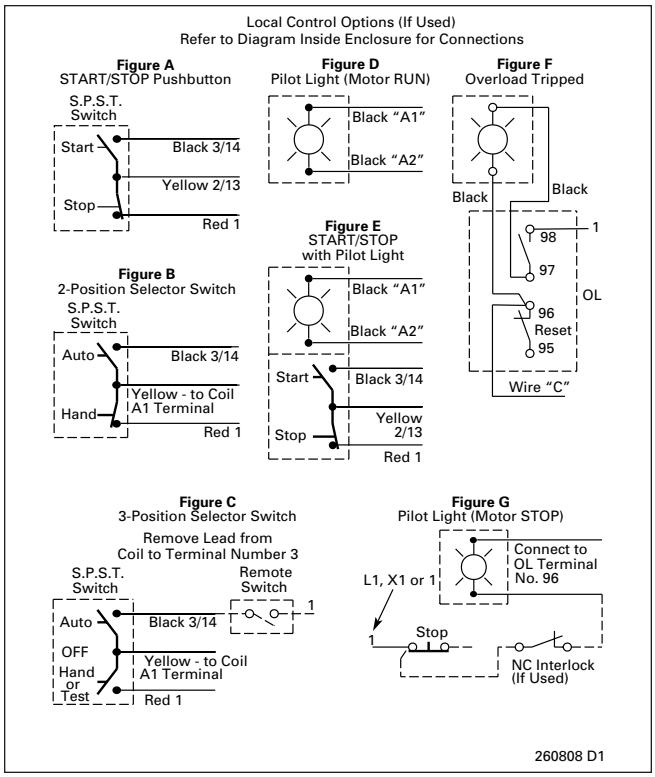


Figure 3-7. Type 1 C400GK Control Options

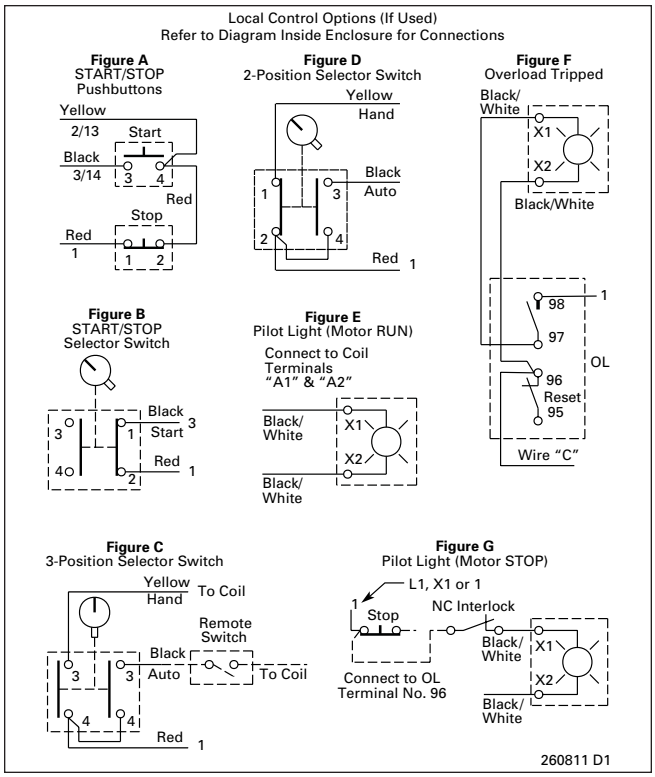


Figure 3-8. C400T Control Options

Reversing Cover Control

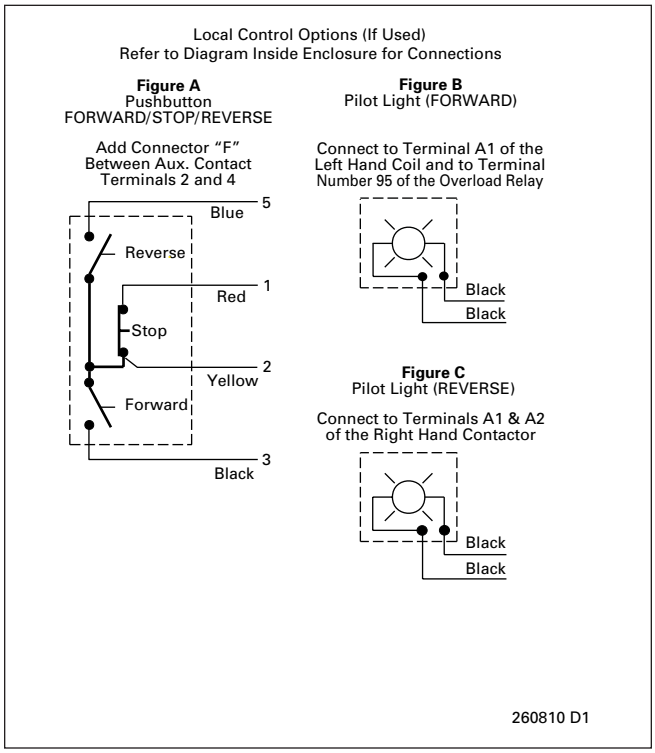


Figure 3-9. Type 1 C400GR Control Options

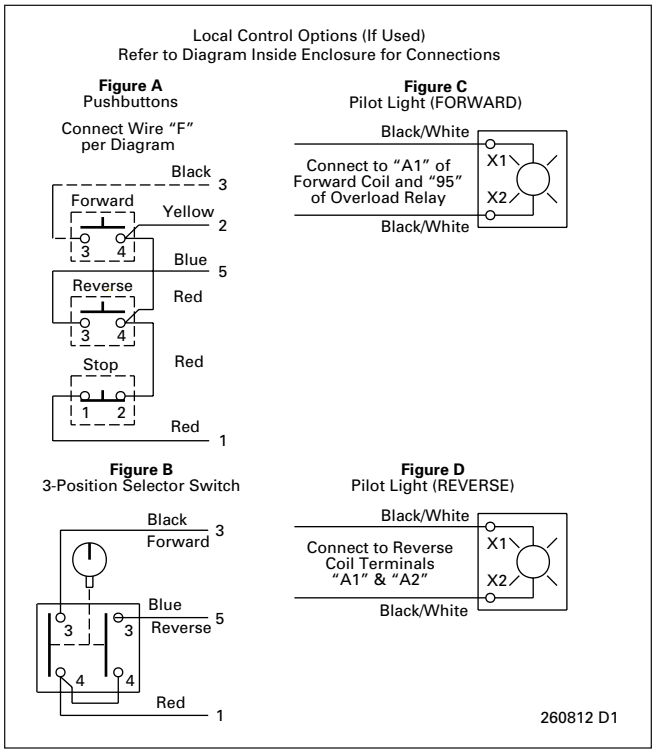


Figure 3-10. C400T Control Options

3

Product Selection

Table 3-42. Class EC216 — Combination Non-reversing Starter — Fusible Disconnect ①

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	30A	**EC216A1AAB**	**EC216A2AAB**	**EC216A4AAB**	**EC216A8AAB**	**A200MACAC**
	200	1-1/2	208		**EC216A1EAB**	**EC216A2EAB**	**EC216A4EAB**	**EC216A8EAB**	**A200MACB**
	230	1-1/2	240		**EC216A1BAB**	**EC216A2BAB**	**EC216A4BAB**	**EC216A8BAB**	**A200MACW**
	460	2	480		**EC216A1CAC**	**EC216A2CAC**	**EC216A4CAC**	**EC216A8CAC**	**A200MACX**
	575	2	600		**EC216A1DAC**	**EC216A2DAC**	**EC216A4DAC**	**EC216A8DAC**	**A200MACE**
0	—	—	120	30A	**EC21601AAB**	**EC21602AAB**	**EC21604AAB**	**EC21608AAB**	**A200M0CAC**
	200	3	208		**EC21601EAB**	**EC21602EAB**	**EC21604EAB**	**EC21608EAB**	**A200M0CB**
	230	3	240		**EC21601BAB**	**EC21602BAB**	**EC21604BAB**	**EC21608BAB**	**A200M0CW**
	460	5	480		**EC21601CAC**	**EC21602CAC**	**EC21604CAC**	**EC21608CAC**	**A200M0CX**
	575	5	600		**EC21601DAC**	**EC21602DAC**	**EC21604DAC**	**EC21608DAC**	**A200M0CE**
1	—	—	120	30A	**EC21611AAB**	**EC21612AAB**	**EC21614AAB**	**EC21618AAB**	**A200M1CAC**
	200	7-1/2	208		**EC21611EAB**	**EC21612EAB**	**EC21614EAB**	**EC21618EAB**	**A200M1CB**
	230	7-1/2	240		**EC21611BAB**	**EC21612BAB**	**EC21614BAB**	**EC21618BAB**	**A200M1CW**
	460	10	480		**EC21611CAC**	**EC21612CAC**	**EC21614CAC**	**EC21618CAC**	**A200M1CX**
	575	10	600		**EC21611DAC**	**EC21612DAC**	**EC21614DAC**	**EC21618DAC**	**A200M1CE**
2	—	—	120	60A	**EC21621AAD**	**EC21622AAD**	**EC21624AAD**	**EC21628AAD**	**A200M2CAC**
	200	10	208		**EC21621EAD**	**EC21622EAD**	**EC21624EAD**	**EC21628EAD**	**A200M2CB**
	230	15	240		**EC21621BAD**	**EC21622BAD**	**EC21624BAD**	**EC21628BAD**	**A200M2CW**
	460	25	480		**EC21621CAE**	**EC21622CAE**	**EC21624CAE**	**EC21628CAE**	**A200M2CX**
	575	25	600		**EC21621DAE**	**EC21622DAE**	**EC21624DAE**	**EC21628DAE**	**A200M2CE**
3	—	—	120	100A	**EC21631AAF**	**EC21632AAF**	**EC21634AAF**	**EC21638AAF**	**A200M3CAC**
	200	25	208		**EC21631EAF**	**EC21632EAF**	**EC21634EAF**	**EC21638EAF**	**A200M3CB**
	230	30	240		**EC21631BAF**	**EC21632BAF**	**EC21634BAF**	**EC21638BAF**	**A200M3CW**
	460	50	480		**EC21631CAG**	**EC21632CAG**	**EC21634CAG**	**EC21638CAG**	**A200M3CX**
	575	50	600		**EC21631DAG**	**EC21632DAG**	**EC21634DAG**	**EC21638DAG**	**A200M3CE**
4	—	—	120	200A	**EC21641AAH**	**EC21642AAH**	**EC21644AAH**	**EC21648AAH**	**A200M4CAC**
	200	40	208		**EC21641EAH**	**EC21642EAH**	**EC21644EAH**	**EC21648EAH**	**A200M4CB**
	230	50	240		**EC21641BAH**	**EC21642BAH**	**EC21644BAH**	**EC21648BAH**	**A200M4CW**
	460	100	480		**EC21641CAJ**	**EC21642CAJ**	**EC21644CAJ**	**EC21648CAJ**	**A200M4CX**
	575	100	600		**EC21641DAJ**	**EC21642DAJ**	**EC21644DAJ**	**EC21648DAJ**	**A200M4CE**

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.

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

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

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC2160**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Table 3-42. Class EC216 — Combination Non-reversing Starter — Fusible Disconnect (Continued) ①

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
5	—	—	120	400A	**EC21651AAK**	**EC21652AAK**	**EC21654AAK**	**EC21658AAK**	**A200M5CAC**
	200	75	208		**EC21651EAK**	**EC21652EAK**	**EC21654EAK**	**EC21658EAK**	**A200M5CB**
	230	100	240		**EC21651BAK**	**EC21652BAK**	**EC21654BAK**	**EC21658BAK**	**A200M5CW**
	460	200	480		**EC21651CAL**	**EC21652CAL**	**EC21654CAL**	**EC21658CAL**	**A200M5CX**
	575	200	600		**EC21651DAL**	**EC21652DAL**	**EC21654DAL**	**EC21658DAL**	**A200M5CE**
6	—	—	120	600A	**EC21661AAM**	**EC21662AAM**	**EC21663AAM** ④	**EC21668AAM**	**A200M6CAC**
	200	150	208		**EC21661EAM**	**EC21662EAM**	**EC21663EAM** ④	**EC21668EAM**	**A200M6CB**
	230	200	240		**EC21661BAM**	**EC21662BAM**	**EC21663BAM** ④	**EC21668BAM**	**A200M6CW**
	460	400	480		**EC21661CAN**	**EC21662CAN**	**EC21663CAN** ④	**EC21668CAN**	**A200M6CX**
	575	400	600		**EC21661DAN**	**EC21662DAN**	**EC21663DAN** ④	**EC21668DAN**	**A200M6CE**
7	—	—	120	⑤	**EC21671AAU**	**EC21672AAU**	**EC21673AAU** ④	**EC21678AAU**	**A200M7CJ**
	230	300	240		**EC21671BAU**	**EC21672BAU**	**EC21673BAU** ④	**EC21678BAU**	**A200M7CW**
	460	600	480		**EC21671CAU**	**EC21672CAU**	**EC21673CAU** ④	**EC21678CAU**	**A200M7CX**
	575	600	600		**EC21671DAU**	**EC21672DAU**	**EC21673DAU** ④	**EC21678DAU**	**A200M7CE**
8	—	—	120	⑤	**EC21681AAU**	**EC21682AAU**	**EC21683AAU** ④	**EC21688AAU**	**A200M8CJ**
	230	450	240		**EC21681BAU**	**EC21682BAU**	**EC21683BAU** ④	**EC21688BAU**	**A200M8CW**
	460	900	480		**EC21681CAU**	**EC21682CAU**	**EC21683CAU** ④	**EC21688CAU**	**A200M8CX**
	575	900	600		**EC21681DAU**	**EC21682DAU**	**EC21683DAU** ④	**EC21688DAU**	**A200M8CE**
9	—	—	120	⑤	**EC21691AAU**	**EC21692AAU**	**EC21693AAU** ④	**EC21698AAU**	**A200M9CJ**
	230	800	240		**EC21691BAU**	**EC21692BAU**	**EC21693BAU** ④	**EC21698BAU**	**A200M9CW**
	460	1000 ⑤	480		**EC21691CAU**	**EC21692CAU**	**EC21693CAU** ④	**EC21698CAU**	**A200M9CX**
	575	1000	600		**EC21691DAU**	**EC21692DAU**	**EC21693DAU** ④	**EC21698DAU**	**A200M9CE**

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order Mod 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 Contact Eaton.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC2160**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Table 3-43. Class EC218 — Combination Reversing Starter — Fusible Disconnect with CPT ①

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage	Fuse Clip Amps	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	—	—	120	30A	**EC218A1AAB**	**EC218A2AAB**	**EC218A4AAB**	**EC218A8AAB**	**A200MACAC**
	200	1-1/2	208		**EC218A1EAB**	**EC218A2EAB**	**EC218A4EAB**	**EC218A8EAB**	**A200MACB**
	230	1-1/2	240		**EC218A1BAB**	**EC218A2BAB**	**EC218A4BAB**	**EC218A8BAB**	**A200MACW**
	460	2	480		**EC218A1CAC**	**EC218A2CAC**	**EC218A4CAC**	**EC218A8CAC**	**A200MACX**
	575	2	600		**EC218A1DAC**	**EC218A2DAC**	**EC218A4DAC**	**EC218A8DAC**	**A200MACE**
0	—	—	120	30A	**EC21801AAB**	**EC21802AAB**	**EC21804AAB**	**EC21808AAB**	**A200M0CAC**
	200	3	208		**EC21801EAB**	**EC21802EAB**	**EC21804EAB**	**EC21808EAB**	**A200M0CB**
	230	3	240		**EC21801BAB**	**EC21802BAB**	**EC21804BAB**	**EC21808BAB**	**A200M0CW**
	460	5	480		**EC21801CAC**	**EC21802CAC**	**EC21804CAC**	**EC21808CAC**	**A200M0CX**
	575	5	600		**EC21801DAC**	**EC21802DAC**	**EC21804DAC**	**EC21808DAC**	**A200M0CE**
1	—	—	120	30A	**EC21811AAB**	**EC21812AAB**	**EC21814AAB**	**EC21818AAB**	**A200M1CAC**
	200	7-1/2	208		**EC21811EAB**	**EC21812EAB**	**EC21814EAB**	**EC21818EAB**	**A200M1CB**
	230	7-1/2	240		**EC21811BAB**	**EC21812BAB**	**EC21814BAB**	**EC21818BAB**	**A200M1CW**
	460	10	480		**EC21811CAC**	**EC21812CAC**	**EC21814CAC**	**EC21818CAC**	**A200M1CX**
	575	10	600		**EC21811DAC**	**EC21812DAC**	**EC21814DAC**	**EC21818DAC**	**A200M1CE**
2	—	—	120	60A	**EC21821AAD**	**EC21822AAD**	**EC21824AAD**	**EC21828AAD**	**A200M2CAC**
	200	10	208		**EC21821EAD**	**EC21822EAD**	**EC21824EAD**	**EC21828EAD**	**A200M2CB**
	230	15	240		**EC21821BAD**	**EC21822BAD**	**EC21824BAD**	**EC21828BAD**	**A200M2CW**
	460	25	480		**EC21821CAE**	**EC21822CAE**	**EC21824CAE**	**EC21828CAE**	**A200M2CX**
	575	25	600		**EC21821DAE**	**EC21822DAE**	**EC21824DAE**	**EC21828DAE**	**A200M2CE**
3	—	—	120	100A	**EC21831AAF**	**EC21832AAF**	**EC21834AAF**	**EC21838AAF**	**A200M3CAC**
	200	25	208		**EC21831EAF**	**EC21832EAF**	**EC21834EAF**	**EC21838EAF**	**A200M3CB**
	230	30	240		**EC21831BAF**	**EC21832BAF**	**EC21834BAF**	**EC21838BAF**	**A200M3CW**
	460	50	480		**EC21831CAG**	**EC21832CAG**	**EC21834CAG**	**EC21838CAG**	**A200M3CX**
	575	50	600		**EC21831DAG**	**EC21832DAG**	**EC21834DAG**	**EC21838DAG**	**A200M3CE**
4	—	—	120	200A	**EC21841AAH**	**EC21842AAH**	**EC21844AAH**	**EC21848AAH**	**A200M4CAC**
	200	40	208		**EC21841EAH**	**EC21842EAH**	**EC21844EAH**	**EC21848EAH**	**A200M4CB**
	230	50	240		**EC21841BAH**	**EC21842BAH**	**EC21844BAH**	**EC21848BAH**	**A200M4CW**
	460	100	480		**EC21841CAJ**	**EC21842CAJ**	**EC21844CAJ**	**EC21848CAJ**	**A200M4CX**
	575	100	600		**EC21841DAJ**	**EC21842DAJ**	**EC21844DAJ**	**EC21848DAJ**	**A200M4CE**

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.

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

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

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC2180**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Table 3-43. Class EC218 — Combination Reversing Starter — Fusible Disconnect with CPT (Continued) ①

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage 1	Fuse Clip Amps	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) Catalog Number
5	—	—	120	400A	EC21851AAK	EC21852AAK	EC21854AAK	EC21858AAK	A200M5CAC
	200	75	208		EC21851EAK	EC21852EAK	EC21854EAK	EC21858EAK	A200M5CB
	230	100	240		EC21851BAK	EC21852BAK	EC21854BAK	EC21858BAK	A200M5CW
	460	200	480		EC21851CAL	EC21852CAL	EC21854CAL	EC21858CAL	A200M5CX
	575	200	600		EC21851DAL	EC21852DAL	EC21854DAL	EC21858DAL	A200M5CE
6	—	—	120	600A	EC21861AAM	EC21862AAM	EC21863AAM ④	EC21868AAM	A200M6CAC
	200	150	208		EC21861EAM	EC21862EAM	EC21863EAM ④	EC21868EAM	A200M6CB
	230	200	240		EC21861BAM	EC21862BAM	EC21863BAM ④	EC21868BAM	A200M6CW
	460	400	480		EC21861CAN	EC21862CAN	EC21863CAN ④	EC21868CAN	A200M6CX
	575	400	600		EC21861DAN	EC21862DAN	EC21863DAN ④	EC21868DAN	A200M6CE
7	—	—	120	⑤	EC21871AAU	EC21872AAU	EC21873AAU ④	EC21878AAU	A200M7CJ
	230	300	240		EC21871BAU	EC21872BAU	EC21873BAU ④	EC21878BAU	A200M7CW
	460	600	480		EC21871CAU	EC21872CAU	EC21873CAU ④	EC21878CAU	A200M7CX
	575	600	600		EC21871DAU	EC21872DAU	EC21873DAU ④	EC21878DAU	A200M7CE
8	—	—	120	⑤	EC21881AAU	EC21882AAU	EC21883AAU ④	EC21888AAU	A200M8CJ
	230	450	240		EC21881BAU	EC21882BAU	EC21883BAU ④	EC21888BAU	A200M8CW
	460	900	480		EC21881CAU	EC21882CAU	EC21883CAU ④	EC21888CAU	A200M8CX
	575	900	600		EC21881DAU	EC21882DAU	EC21883DAU ④	EC21888DAU	A200M8CE
9	—	—	120	⑤	EC21891AAU	EC21892AAU	EC21893AAU ④	EC21898AAU	A200M9CJ
	230	800	240		EC21891BAU	EC21892BAU	EC21893BAU ④	EC21898BAU	A200M9CW
	460	1000 ⑤	480		EC21891CAU	EC21892CAU	EC21893CAU ④	EC21898CAU	A200M9CX
	575	1000	600		EC21891DAU	EC21892DAU	EC21893DAU ④	EC21898DAU	A200M9CE

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.
② All Type 12 enclosures are standardized with external reset. For internal reset, order Mod 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 Contact Eaton.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC2180**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

3

Table 3-44. Class EC222 — Combination Non-reversing Starter — Circuit Breaker ②

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑤ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	200	1 1-1/2	120	HMCPE 7A HMCPE 15A	**EC222A1AAC** **EC222A1AAD**	**EC222A2AAC** **EC222A2AAD**	**EC222A4AAC** **EC222A4AAD**	**EC222A8AAC** **EC222A8AAD**	**A200MACAC**
	230	1 1-1/2		HMCPE 7A HMCPE 15A	**EC222A1AAC** **EC222A1AAD**	**EC222A2AAC** **EC222A2AAD**	**EC222A4AAC** **EC222A4AAD**	**EC222A8AAC** **EC222A8AAD**	
	460	1 2		HMCPE 3A HMCPE 7A	**EC222A1AAB** **EC222A1AAC**	**EC222A2AAB** **EC222A2AAC**	**EC222A4AAB** **EC222A4AAC**	**EC222A8AAB** **EC222A8AAC**	
	575	1 2		HMCP 3A HMCP 7A	**EC222A1AAB** **EC222A1AAC**	**EC222A2AAB** **EC222A2AAC**	**EC222A4AAB** **EC222A4AAC**	**EC222A8AAB** **EC222A8AAC**	
0	200	1 3	120	HMCPE 7A HMCPE 15A	**EC22201AAC** **EC22201AAD**	**EC22202AAC** **EC22202AAD**	**EC22204AAC** **EC22204AAD**	**EC22208AAC** **EC22208AAD**	**A200M0CAC**
	230	1 3		HMCPE 7A HMCPE 15A	**EC22201AAC** **EC22201AAD**	**EC22202AAC** **EC22202AAD**	**EC22204AAC** **EC22204AAD**	**EC22208AAC** **EC22208AAD**	
	460	1 3 5		HMCPE 3A HMCPE 7A HMCPE 15A	**EC22201AAB** **EC22201AAC** **EC22201AAD**	**EC22202AAB** **EC22202AAC** **EC22202AAD**	**EC22204AAB** **EC22204AAC** **EC22204AAD**	**EC22208AAB** **EC22208AAC** **EC22208AAD**	
	575	1 3 5		HMCPE 3A HMCPE 15A HMCPE 7A	**EC22201AAB** **EC22201AAD** **EC22201AAC**	**EC22202AAB** **EC22202AAD** **EC22202AAC**	**EC22204AAB** **EC22204AAD** **EC22204AAC**	**EC22208AAB** **EC22208AAD** **EC22208AAC**	
1	200	1 3 5 7-1/2	120	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**EC22211AAC** **EC22211AAD** **EC22211AAE** **EC22211AAF**	**EC22212AAC** **EC22212AAD** **EC22212AAE** **EC22212AAF**	**EC22214AAC** **EC22214AAD** **EC22214AAE** **EC22214AAF**	**EC22218AAC** **EC22218AAD** **EC22218AAE** **EC22218AAF**	**A200M1CAC**
	230	1 3 5 7-1/2		HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**EC22211AAC** **EC22211AAD** **EC22211AAE** **EC22211AAF**	**EC22212AAC** **EC22212AAD** **EC22212AAE** **EC22212AAF**	**EC22214AAC** **EC22214AAD** **EC22214AAE** **EC22214AAF**	**EC22218AAC** **EC22218AAD** **EC22218AAE** **EC22218AAF**	
	460	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**EC22211AAB** **EC22211AAC** **EC22211AAD** **EC22211AAE**	**EC22212AAB** **EC22212AAC** **EC22212AAD** **EC22212AAE**	**EC22214AAB** **EC22214AAC** **EC22214AAD** **EC22214AAE**	**EC22218AAB** **EC22218AAC** **EC22218AAD** **EC22218AAE**	
	575	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**EC22211AAB** **EC22211AAC** **EC22211AAD** **EC22211AAE**	**EC22212AAB** **EC22212AAC** **EC22212AAD** **EC22212AAE**	**EC22214AAB** **EC22214AAC** **EC22214AAD** **EC22214AAE**	**EC22218AAB** **EC22218AAC** **EC22218AAD** **EC22218AAE**	

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.

② For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.

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. When safety door interlock is required, add modification **E11**.

⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC2220**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Table 3-44. Class EC222 — Combination Non-reversing Starter — Circuit Breaker (Continued) ②

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
2	200	10	120	HMCPE 50A	**EC22221AAF**	**EC22222AAF**	**EC22224AAF**	**EC22228AAF**	**A200M2CAC**
	230	10 15		HMCPE 50A HMCPE 70A	**EC22221AAF** **EC22221AAW**	**EC22222AAF** **EC22222AAW**	**EC22224AAF** **EC22224AAW**	**EC22228AAF** **EC22228AAW**	
	460	25		HMCPE 50A	**EC22221AAF**	**EC22222AAF**	**EC22224AAF**	**EC22228AAF**	
	575	15 25		HMCP 30A HMCP 50A	**EC22221AAE** **EC22221AAF**	**EC22222AAE** **EC22222AAF**	**EC22224AAE** **EC22224AAF**	**EC22228AAE** **EC22228AAF**	
3	200	20 25	120	HMCPE 100A HMCPE 100A	**EC22231AAG** **EC22231AAX**	**EC22232AAG** **EC22232AAX**	**EC22234AAG** **EC22234AAX**	**EC22238AAG** **EC22238AAX**	**A200M3CAC**
	230	25 30		HMCPE 100A HMCPE 100A	**EC22231AAG** **EC22231AAX**	**EC22232AAG** **EC22232AAX**	**EC22234AAG** **EC22234AAX**	**EC22238AAG** **EC22238AAX**	
	460	50		HMCPE 100A	**EC22231AAG**	**EC22232AAG**	**EC22234AAG**	**EC22238AAG**	
	575	30 50		HMCP 50A HMCP 100A	**EC22231AAF** **EC22231AAG**	**EC22232AAF** **EC22232AAG**	**EC22234AAF** **EC22234AAG**	**EC22238AAF** **EC22238AAG**	
4	200 230 460 575	40 50 100 100	120	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**EC22241AAH** **EC22241AAH** **EC22241AAH** **EC22241AAH**	**EC22242AAH** **EC22242AAH** **EC22242AAH** **EC22242AAH**	**EC22244AAH** **EC22244AAH** **EC22244AAH** **EC22244AAH**	**EC22248AAH** **EC22248AAH** **EC22248AAH** **EC22248AAH**	**A200M4CAC**
5	200	50 75	120	HMCP 250A HMCP 400A	**EC22251AAJ** **EC22251AAK**	**EC22252AAJ** **EC22252AAK**	**EC22254AAJ** **EC22254AAK**	**EC22258AAJ** **EC22258AAK**	**A200M5CAC**
	230	60 100		HMCP 250A HMCP 400A	**EC22251AAJ** **EC22251AAK**	**EC22252AAJ** **EC22252AAK**	**EC22254AAJ** **EC22254AAK**	**EC22258AAJ** **EC22258AAK**	
	460	125 200		HMCP 250A HMCP 400A	**EC22251AAJ** **EC22251AAK**	**EC22252AAJ** **EC22252AAK**	**EC22254AAJ** **EC22254AAK**	**EC22258AAJ** **EC22258AAK**	
	575	150 200		HMCP 250A HMCP 400A	**EC22251AAJ** **EC22251AAK**	**EC22252AAJ** **EC22252AAK**	**EC22254AAJ** **EC22254AAK**	**EC22258AAJ** **EC22258AAK**	
6	200	150	120	HMCP 600A	**EC22261AAL**	**EC22262AAL**	**EC22263AAL** ⑤	**EC22268AAL**	**A200M6CAC**
	230	200		HMCP 600A	**EC22261AAL**	**EC22262AAL**	**EC22263AAL** ⑤	**EC22268AAL**	
	460	350 400		HMCP 600A HMCP 1200A	**EC22261AAL** **EC22261AAP**	**EC22262AAL** **EC22262AAP**	**EC22263AAL** ⑤ **EC22263AAP** ⑤	**EC22268AAL** **EC22268AAP**	
	575	400		HMCP 600A	**EC22261AAL**	**EC22262AAL**	**EC22263AAL** ⑤	**EC22268AAL**	
Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.									

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.
② For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.
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. When safety door interlock is required, add modification **E11**.
⑤ Type 4 (Painted steel) Size 6.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC22204AAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Table 3-45. Class EC224 — Combination Non-reversing Starter — Circuit Breaker with CPT ②

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑤ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
00	200	1 1-1/2	120	HMCPE 7A HMCPE 15A	**EC224A1EAC** **EC224A1EAD**	**EC224A2EAC** **EC224A2EAD**	**EC224A4EAC** **EC224A4EAD**	**EC224A8EAC** **EC224A8EAD**	**A200MACAC**
	230	1 1-1/2		HMCPE 7A HMCPE 15A	**EC224A1BAC** **EC224A1BAD**	**EC224A2BAC** **EC224A2BAD**	**EC224A4BAC** **EC224A4BAD**	**EC224A8BAC** **EC224A8BAD**	
	460	1 2		HMCPE 3A HMCPE 7A	**EC224A1CAB** **EC224A1CAC**	**EC224A2CAB** **EC224A2CAC**	**EC224A4CAB** **EC224A4CAC**	**EC224A8CAB** **EC224A8CAC**	
	575	1 2		HMCP 3A HMCP 7A	**EC224A1DAB** **EC224A1DAC**	**EC224A2DAB** **EC224A2DAC**	**EC224A4DAB** **EC224A4DAC**	**EC224A8DAB** **EC224A8DAC**	
0	200	1 3	120	HMCPE 7A HMCPE 15A	**EC22401EAC** **EC22401EAD**	**EC22402EAC** **EC22402EAD**	**EC22404EAC** **EC22404EAD**	**EC22408EAC** **EC22408EAD**	**A200M0CAC**
	230	1 3		HMCPE 7A HMCPE 15A	**EC22401BAC** **EC22401BAD**	**EC22402BAC** **EC22402BAD**	**EC22404BAC** **EC22404BAD**	**EC22408BAC** **EC22408BAD**	
	460	1 3 5		HMCPE 3A HMCPE 7A HMCPE 15A	**EC22401CAB** **EC22401CAC** **EC22401CAD**	**EC22402CAB** **EC22402CAC** **EC22402CAD**	**EC22404CAB** **EC22404CAC** **EC22404CAD**	**EC22408CAB** **EC22408CAC** **EC22408CAD**	
	575	1 3 5		HMCP 3A HMCP 15A HMCP 7A	**EC22401DAB** **EC22401DAD** **EC22401DAC**	**EC22402DAB** **EC22402DAD** **EC22402DAC**	**EC22404DAB** **EC22404DAD** **EC22404DAC**	**EC22408DAB** **EC22408DAD** **EC22408DAC**	
1	200	1 3 5 7-1/2	120	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**EC22411EAC** **EC22411EAD** **EC22411EAE** **EC22411EAF**	**EC22412EAC** **EC22412EAD** **EC22412EAE** **EC22412EAF**	**EC22414EAC** **EC22414EAD** **EC22414EAE** **EC22414EAF**	**EC22418EAC** **EC22418EAD** **EC22418EAE** **EC22418EAF**	**A200M1CAC**
	230	1 3 5 7-1/2		HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**EC22411BAC** **EC22411BAD** **EC22411BAE** **EC22411BAF**	**EC22412BAC** **EC22412BAD** **EC22412BAE** **EC22412BAF**	**EC22414BAC** **EC22414BAD** **EC22414BAE** **EC22414BAF**	**EC22418BAC** **EC22418BAD** **EC22418BAE** **EC22418BAF**	
	460	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**EC22411CAB** **EC22411CAC** **EC22411CAD** **EC22411CAE**	**EC22412CAB** **EC22412CAC** **EC22412CAD** **EC22412CAE**	**EC22414CAB** **EC22414CAC** **EC22414CAD** **EC22414CAE**	**EC22418CAB** **EC22418CAC** **EC22418CAD** **EC22418CAE**	
	575	1 3 5 10		HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**EC22411DAB** **EC22411DAC** **EC22411DAD** **EC22411DAE**	**EC22412DAB** **EC22412DAC** **EC22412DAD** **EC22412DAE**	**EC22414DAB** **EC22414DAC** **EC22414DAD** **EC22414DAE**	**EC22418DAB** **EC22418DAC** **EC22418DAD** **EC22418DAE**	

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.

② For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.

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. When safety door interlock is required, add modification **E11**.

⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC2240**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Table 3-45. Class EC224 — Combination Non-reversing Starter — Circuit Breaker with CPT (Continued) ②

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
2	200	10	120	HMCPE 50A	**EC22421EAF**	**EC22422EAF**	**EC22424EAF**	**EC22428EAF**	**A200M2CAC**
	230	10 15		HMCPE 50A HMCPE 70A	**EC22421BAF** **EC22421BAW**	**EC22422BAF** **EC22422BAW**	**EC22424BAF** **EC22424BAW**	**EC22428BAF** **EC22428BAW**	
	460	25		HMCPE 50A	**EC22421CAF**	**EC22422CAF**	**EC22424CAF**	**EC22428CAF**	
	575	15 25		HMCPE 30A HMCPE 50A	**EC22421CAE** **EC22421DAF**	**EC22422CAE** **EC22422DAF**	**EC22424CAE** **EC22424DAF**	**EC22428CAE** **EC22428DAF**	
3	200	20 25	120	HMCPE 100A HMCPE 100A	**EC22431EAG** **EC22431EAX**	**EC22432EAG** **EC22432EAX**	**EC22434EAG** **EC22434EAX**	**EC22438EAG** **EC22438EAX**	**A200M3CAC**
	230	25 30		HMCPE 100A HMCPE 100A	**EC22431BAG** **EC22431BAX**	**EC22432BAG** **EC22432BAX**	**EC22434BAG** **EC22434BAX**	**EC22438BAG** **EC22438BAX**	
	460	50		HMCPE 100A	**EC22431CAG**	**EC22432CAG**	**EC22434CAG**	**EC22438CAG**	
	575	30 50		HMCP 50A HMCP 100A	**EC22431DAF** **EC22431DAG**	**EC22432DAF** **EC22432DAG**	**EC22434DAF** **EC22434DAG**	**EC22438DAF** **EC22438DAG**	
4	200 230 460 575	40 50 100 100	120	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**EC22441EAH** **EC22441BAH** **EC22441CAH** **EC22441DAH**	**EC22442EAH** **EC22442BAH** **EC22442CAH** **EC22442DAH**	**EC22444EAH** **EC22444BAH** **EC22444CAH** **EC22444DAH**	**EC22448EAH** **EC22448BAH** **EC22448CAH** **EC22448DAH**	**A200M4CAC**
5	200	50 75	120	HMCP 250A HMCP 400A	**EC22451EAJ** **EC22451EAK**	**EC22452EAJ** **EC22452EAK**	**EC22454EAJ** **EC22454EAK**	**EC22458EAJ** **EC22458EAK**	**A200M5CAC**
	230	60 100		HMCP 250A HMCP 400A	**EC22451BAJ** **EC22451BAK**	**EC22452BAJ** **EC22452BAK**	**EC22454BAJ** **EC22454BAK**	**EC22458BAJ** **EC22458BAK**	
	460	125 200		HMCP 250A HMCP 400A	**EC22451CAJ** **EC22451CAK**	**EC22452CAJ** **EC22452CAK**	**EC22454CAJ** **EC22454CAK**	**EC22458CAJ** **EC22458CAK**	
	575	150 200		HMCP 250A HMCP 400A	**EC22451DAJ** **EC22451DAK**	**EC22452DAJ** **EC22452DAK**	**EC22454DAJ** **EC22454DAK**	**EC22458DAJ** **EC22458DAK**	
6	200	150	120	HMCP 600A	**EC22461EAL**	**EC22462EAL**	**EC22463EAL** ⑤	**EC22468EAL**	**A200M6CAC**
	230	200		HMCP 600A	**EC22461BAL**	**EC22462BAL**	**EC22463BAL** ⑤	**EC22468BAL**	
	460	350 400		HMCP 600A HMCP 1200A	**EC22461CAL** **EC22461CAP**	**EC22462CAL** **EC22462CAP**	**EC22463CAL** ⑤ **EC22463CAP** ⑤	**EC22468CAL** **EC22468CAP**	
	575	400		HMCP 600A	**EC22461DAL**	**EC22462DAL**	**EC22463DAL** ⑤	**EC22468DAL**	

Starters do not include heater packs. Order quantity of 3 heater packs. For Heater Pack Selection, see **Page 16-19**.

① For other magnet coil voltages substitute the eighth digit with appropriate digit based on **Table 3-17**.
② For Ambient Compensated Overload Relay with Auto-Reset, add suffix **D**.
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. When safety door interlock is required, add modification **E11**.
⑤ Type 4 (Painted steel) Size 6.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: EC22404EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 3-21**
Dimensions ..... **Page 15-2**
Accessories ..... **Page 16-18**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-8**
Technical Data **CA08102001E**

Catalog Number ECH2211FAD

Product Description

Setting the Standard in Motor Control

Eaton's Cutler-Hammer® Advantage Motor Starters have extended operating life in a physical space requirement one half the size of conventional motor starters.

Offering motor overcurrent protection accurate to 2% at maximum FLC, Advantage also maintains constant coil power regardless of varying control circuit conditions, eliminating coil burnout, contact chatter and welding due to low voltage of fluttering control signals.

Advantage is designed with a full complement of features that make it the most versatile motor starter in the industry. Multifunction overload protection options provide application flexibility while reducing inventory. Communication capability extends benefits, allowing Advantage to be interactively linked to higher order control systems for monitoring, troubleshooting and control.

Technological advances incorporated in the Advantage design, such as prestart diagnostics, increased accuracy and the ability to communicate with other systems, are benefits not realized in traditional motor starters.

Features, Functions, Benefits

Advantage Breakthroughs

To achieve the level of benefits envisioned for Advantage controls at a competitive price, it was discovered early in the development process that simply improving existing design concepts would fall short of the mark. A new approach involving a higher level of technology was required. The result was the incorporation of three technical breakthroughs — new current sensing monitoring, an energy-balanced contact closure system that increased life by decreasing electrical and mechanical wear and an intelligent coil controller optimizing the contact closing process based on varying control circuit conditions. Coordinating these breakthroughs to provide enhanced motor control performance is concentrated in the SURE chip.

Advantage uses the right combination of brains and brawn in effecting a motor start. The power circuit of the contactor employs heavy-duty silver alloy contacts scientifically designed for long life. The addition of a uniquely developed application-specific microprocessor chip, regulates power supplied to the operating coil. The regulated closing profile is tailored to existing control circuit conditions. This results in an energy balanced system which reduces armature/magnet crash and contact bounce, extending mechanical and electrical life.

Improved Protection and Motor Utilization

The motor circuit monitoring and overload protection functions of Advantage starters are provided by three current sensors closely monitored by the microprocessor. This sensor/microprocessor combination yields a protection scheme closely paralleling that of the motor heating damage boundary expressed in terms of current and time. Accurate to 2%, Advantage allows full utilization of motor capability without motor damage or nuisance tripping.

No Heaters, Small Size

Advantage starters eliminate the need for costly heater elements and their associated installation expense. Standard overload protection functions include phase loss and unbalance protection, selectable trip class, automatic/manual reset and ground current protection.

Built-In Communications Capabilities Provide Two-Way Control

Advantage also offers low cost communication capability. ON-OFF commands, status and motor data can be linked to automated control systems without the addition of costly sensors, I/O modules and transducers, in a language compatible with many computer-based software systems in use today.

Protected by 22 patents and proven in many years of operating experience in harsh industrial applications, Advantage motor starters and contactors offer the user unprecedented value at a price competitive with traditional devices.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approved

3

Catalog Number Selection

Table 3-46. Advantage Line Enclosed Control Catalog Numbering System

E C A 22 2 1 A A F - __

Design
A = Advantage NEMA

Modification Codes
See **Page 16-40**

Class	Table
01 = Contactors	①
02 = Reversing Contactors	①
05 = Non-combination Non-reversing Starter	**3-50**
06 = Non-combination Reversing Starter	①
07 = Non-combination Non-reversing Starter, with CPT	①
16 = Combination Non-reversing Starter — Fusible Disconnect	**3-51**
17 = Combination Reversing Starter with Disconnect Switch	①
18 = Combination Reversing Starter — Fusible/ Non-fusible Disconnect with CPT	**3-52**
22 = Combination Non-reversing Starter — Circuit Breaker	**3-53**
23 = Reversing, Combination with HMCP/E	①
24 = Combination with HMCP/E with CPT	①
33 = Multispeed 2S2W Non-combination	①
34 = Multispeed 2S1W CT or VT Non-combination	①
35 = Multispeed 2S1W CH Non-combination	①
36 = Multispeed with Disconnect Switch, 2S2W	①
37 = Multispeed with Disconnect Switch, 2S1W CT or VT	①
38 = Multispeed with Disconnect Switch, 2S1W CH	①
39 = Multispeed with HMCP/E, 2S2W	①
40 = Multispeed with HMCP/E, 2S1W CT or VT	①
41 = Multispeed with HMCP/E, 2S1W CH	①
42 = Autotransformer, Non-combination	①
43 = Autotransformer, with Disconnect Switch	①
44 = Autotransformer, with HMCP/E	①
45 = Part-Winding, Non-combination	①
46 = Part-Winding, with Disconnect Switch	①
47 = Part-Winding, with HMCP/E	①
48 = Y-D, Open Transition, Non-combination	①
49 = Y-D, Open Transition, with Disconnect Switch	①
50 = Y-D, Open Transition, with HMCP/E	①
51 = Y-D, Closed Transition, Non-combination	①
52 = Y-D, Closed Transition, with Disconnect Switch	①
53 = Y-D, Closed Transition, with HMCP/E	①
54 = Std Width Pump Panel, with Disconnect Switch	①
55 = Std Width Pump Panel, with HMCP/E	①
62 = Autotransformer Pump Panel, Disconnect Switch	①
63 = Autotransformer Pump Panel, HMCP/E	①
64 = Part-Winding Pump Panel, Disconnect	①
65 = Part-Winding Pump Panel, Circuit Breaker	①
68 = Duplex, Non-combination	①
69 = Duplex, with Disconnect Switch	①
70 = Duplex, with HMCP/E	①

Cover Control — Starters
10250T and E22 style, see **Tables 3-19 – 3-21**
Flange-Mounted ACM, see **Table 3-49**

Contactors
3 = 3 Poles

Coil Voltage and/or Control Transformers
See **Tables 3-47** and **3-48**

Disconnect Fuse Clip Ratings

A = None	**G** = 100A/600V R	**N** = 600A/600V R
B = 30A/250V R	**H** = 200A/250V R	**P** = 800A/600V R
C = 30A/600V R	**J** = 200A/600V R	**Q** = 1200A/600V R
D = 60A/250V R	**K** = 400A/250V R	**R** = 1600A/600V R
E = 60A/600V R	**L** = 400A/600V R	**S** = 2000A/600V R
F = 100A/250V R	**M** = 600A/250V R	**T** = by Description

HMCP/E or Breaker Ratings

A = None	**H** = 150A	**R** = 3000A
B = 3A	**J** = 250A	**T** = by Description
C = 7A	**K** = 400A	**5** = 3A ②
D = 15A	**L** = 600A	**6** = 7A ②
E = 30A	**M** = 800A	**7** = 15A ②
F = 50A	**N** = 1000A	**8** = 30A ②
W = 70A	**P** = 1200A	**9** = 50A ②
G = 100A	**Q** = 2000A	**I** = 100A ②

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 (Nonmetallic)
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

NEMA Size

L = Lower 1	**4** = Size 4
1 = Size 1	**5** = Size 5
2 = Size 2	**6** = Size 6
3 = Size 3	

① Contact Eaton for more information.
② Use with Sizes L – 3, HMCP 600V applications only.

Table 3-47. Magnet Coil Codes (System Voltage) ③

Code	Magnet Coil	Code	Magnet Coil
F	120/60	**Z**	By Description
N	110/50		

③ When control power transformer modification codes (**C1** – **C11**) are used or when starter class includes CPT (i.e. ECN07, 18), see **Table 3-48** for system voltage code.

Table 3-48. Control Power Transformer Codes (System Voltage)

Code	Primary	Secondary	Code	Primary	Secondary
B	240/480 – 220/440 Wired for 240V	120/60 – 110/50	**H**	277/60	120/60
			L	380/50	110/50
C	240/480 – 220/440 Wired for 480V	120/60 – 110/50	**M**	415/50	110/50
			X	240/480/600 Wired for 480V	120
D	600/60 – 550/50	120/60 – 110/50			
E	208/60	120/60	**Z**	By Description	

Cover Control

Flange Mounted Pilot ACM Devices — NEMA 1, 12 Only

For **Factory Installed** flange mounted pilot devices using **Advantage Control Modules** (ACMs), change the 9th character from **A** to **Y** and add one of the following (**A49** through **A62**) Mod Code Suffixes to the Catalog Number. In addition, one **A63** Mod may be added if desired.

Table 3-49. Flange Mounted Pilot ACM Devices —

Flange Mounted Pilot Devices Description	Factory Installed	Field Installation Kits
	Mod Code Suffix	Catalog Number
Full Voltage		
Status Only with Reset	**A49**	**WPBFV1**
START/STOP	**A50**	**WPBFV2**
START/STOP/HOA	**A51**	**WPBFV3**
ON/OFF/AUTO	**A52**	**WPBFV4**
Reversing		
Status Only with Reset	**A53**	**WPBR1**
FWD/REV/STOP	**A54**	**WPBR2**
FWD/REV/STOP/HOA	**A55**	**WPBR3**
2-Speed		
Status Only with Reset	**A56**	**WPB2S1**
FAST/SLOW/STOP	**A57**	**WPB2S2**
FAST/SLOW/STOP/HOA	**A58**	**WPB2S3**
Reduced Voltage		
Status Only with Reset	**A59**	**WPBRV1**
START/STOP	**A60**	**WPBRV2**
START/STOP/HOA	**A61**	**WPBRV3**
ON/OFF/AUTO	**A62**	**WPBRV4**
Metering Module	**A63**	**WMETER** ①
10 ft. Interconnect Cable	—	**WACM10**
6 ft. Interconnect Cable	—	**WACM6**
3 ft. Interconnect Cable	—	**WACM3**
1 ft. Interconnect Jumper	—	**WACM1**

① This device is not compatible with Advantage Starters on DeviceNet via the WPONIDNA.

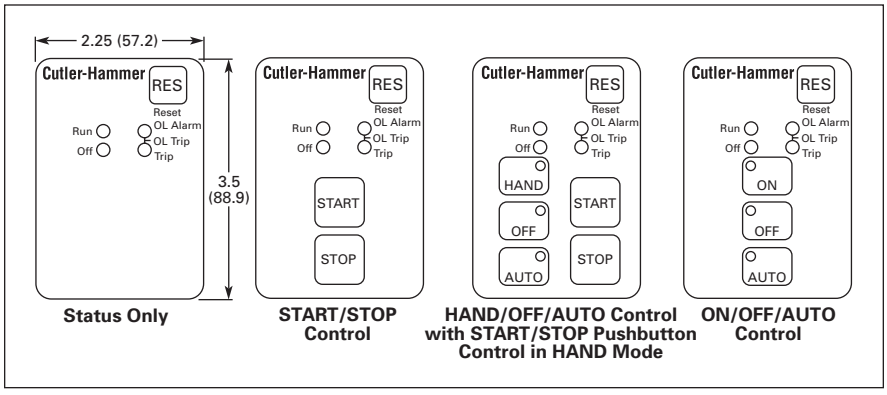


Figure 3-11. Flange Mounted Pilot ACM Devices

Other Cover Control Devices

See **Page 3-21** in NEMA Contactors & Starters, Freedom Line.

Features and Product Selection

- Full Voltage
- Solid-State Overload Relays
- 600V Maximum

3

Table 3-50. Class ECA05 — Non-combination Non-reversing Starter

NEMA Size	Motor Voltage ①	Maximum hp Rating ①	Magnet Coil Voltage ③④	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ⑤	Type 12 Dust-Tight Industrial ⑥	Component Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
1-L ②	200 230 460 575	1 1 2 2	120	**ECA05L2FAA**	**ECA05L4FAA**	**ECA05L8FAA**	**W200MLCFC**
1	200 230 460 575	7-1/2 7-1/2 10 10	120	**ECA0512FAA**	**ECA0514FAA**	**ECA0518FAA**	**W200M1CFC**
2	200 230 460 575	10 15 25 25	120	**ECA0522FAA**	**ECA0524FAA**	**ECA0528FAA**	**W200M2CFC**
3	200 230 460 575	25 30 50 50	120	**ECA0532FAA**	**ECA0534FAA**	**ECA0538FAA**	**W200M3CFC**
4	200 230 460 575	40 50 100 100	120	**ECA0542FAA**	**ECA0544FAA**	**ECA0548FAA**	**W200M4CFC**
5	200 230 460 575	75 100 200 200	120	**ECA0552FAA**	**ECA0554FAA**	**ECA0558FAA**	**W200M5CFC**
6	200 230 460 575	150 200 400 400	120 ⑦	**ECA0562EAA** **ECA0562BAA** **ECA0562CAA** **ECA0562DAA**	**ECA0564EAA** **ECA0564BAA** **ECA0564CAA** **ECA0564DAA**	**ECA0568EAA** **ECA0568BAA** **ECA0568CAA** **ECA0568DAA**	**W200M6CFC**

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

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

② For motor full load current (FLA) range of .47A – 3.81A with a 1.15 to 1.25 service factor and for motor hp range of 1/4 hp to 2 hp at 460V.

③ All starters provided with coils for separate control.

④ Starters for 50 Hz operation use 110V 50 Hz magnet coil. Change 8th character from **F** to **N**.

⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECA05L**4**FAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑥ Choose a Type 12 enclosure for Type 1 applications.

⑦ Size 6 includes control power transformer.

Cover Mounted Control – 10250T Series ..... **Page 3-21**
Cover Mounted Control – ACM Series ..... **Page 3-61**
Accessories ..... **Page 16-12**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-13**

Features and Product Selection

- Full Voltage
- Solid-State Overload Relays
- 600V Maximum
- 100,000 AIC Short Circuit — 600V Maximum

Table 3-51. Class ECA16 — Combination Non-reversing Starter — Fusible Disconnect

NEMA Size	Motor Voltage	Maximum hp Rating Dual Element Fuses	Magnet Coil Voltage ②③	Fuse Clip Amps. ⑦	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ⑥	Type 12 Dust-Tight Industrial ④⑤	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1-L ①	200 230	1	120	30A	**ECA16L1FAB**	**ECA16L2FAB**	**ECA16L4FAB**	**ECA16L8FAB**	**W200MLCFC**
	460 575	2	120	30A	**ECA16L1FAC**	**ECA16L2FAC**	**ECA16L4FAC**	**ECA16L8FAC**	**W200MLCFC**
1	200 230	7-1/2	120	30A	**ECA1611FAB**	**ECA1612FAB**	**ECA1614FAB**	**ECA1618FAB**	**W200M1CFC**
	460 575	10	120	30A	**ECA1611FAC**	**ECA1612FAC**	**ECA1614FAC**	**ECA1618FAC**	**W200M1CFC**
2	200 230	10 15	120	60A	**ECA1621FAD**	**ECA1622FAD**	**ECA1624FAD**	**ECA1628FAD**	**W200M2CFC**
	460 575	25	120	60A	**ECA1621FAE**	**ECA1622FAE**	**ECA1624FAE**	**ECA1628FAE**	**W200M2CFC**
3	200 230	25 30	120	100A	**ECA1631FAF**	**ECA1632FAF**	**ECA1634FAF**	**ECA1638FAF**	**W200M3CFC**
	460 575	50	120	100A	**ECA1631FAG**	**ECA1632FAG**	**ECA1634FAG**	**ECA1638FAG**	**W200M3CFC**
4	200 230	40 50	120	200A	**ECA1641FAH**	**ECA1642FAH**	**ECA1644FAH**	**ECA1648FAH**	**W200M4CFC**
	460 575	100	120	200A	**ECA1641FAJ**	**ECA1642FAJ**	**ECA1644FAJ**	**ECA1648FAJ**	**W200M4CFC**
5	200 230	75 100	120	400A	**ECA1651FAK**	**ECA1652FAK**	**ECA1654FAK**	**ECA1658FAK**	**W200M5CFC**
	460 575	200	120	400A	**ECA1651FAL**	**ECA1652FAL**	**ECA1654FAL**	**ECA1658FAL**	**W200M5CFC**
6	200 230	150 200	120 ⑧	600A	**ECA1661EAM** **ECA1661BAM**	**ECA1662EAM** **ECA1662BAM**	**ECA1663EAM** **ECA1663BAM**	**ECA1668EAM** **ECA1668BAM**	**W200M6CFC**
	460 575	400		600A	**ECA1661CAN** **ECA1661DAN**	**ECA1662CAN** **ECA1662DAN**	**ECA1663CAN** **ECA1663DAN**	**ECA1668CAN** **ECA1668DAN**	**W200M6CFC**

① For motor full load current (FLA) range of .47A – 3.81A with a 1.15 to 1.25 service factor and for motor hp range of 1/4 hp to 2 hp at 460V.
② All starters provided with coils for separate control.
③ Starters for 50 Hz operation use 110V 50 Hz magnet coil. Change 8th character from **F** to **N**.
④ All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.
⑤ Type 12 enclosure is without safety door interlock. When safety door interlock is required, change seventh character from **8** to **9**, i.e. ECA161**8**FAC would become ECA161**9**FAC.
⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECA16L**4**FAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑦ Fuse clips are for Class R fuses only. For H and J fuses see mods, **Page 16-42**.
⑧ Size 6 includes control power transformer.

ECA1611FAA

Cover Mounted Control – 10250T Series . . . . . **Page 3-21**
Cover Mounted Control – ACM Series . . . . . **Page 3-61**
Accessories . . . . . **Page 16-12**
Modifications . . . . . **Page 16-40**
Technical Data . . . . . **Page 18-13**

Table 3-52. Class ECA18 — Combination Reversing Starter — Fusible/Non-fusible Disconnect with CPT

NEMA Size	Primary Voltage ②	Max. hp Rating Dual Element Fuses	Secondary Voltage / Magnet Coil Voltage	Fuse Clip Amps. ⑥	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ⑤	Type 12 Dust-Tight Industrial ③④	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Fusible ⑦									
1-L ①	208 240	1	120	30A	**ECA18L1EAB** **ECA18L1BAB**	**ECA18L2EAB** **ECA18L2BAB**	**ECA18L4EAB** **ECA18L4BAB**	**ECA18L8EAB** **ECA18L8BAB**	**W200MLCFC**
	480 600	2	120	30A	**ECA18L1CAC** **ECA18L1DAC**	**ECA18L2CAC** **ECA18L2DAC**	**ECA18L4CAC** **ECA18L4DAC**	**ECA18L8CAC** **ECA18L8DAC**	**W200MLCFC**
1	208 240	7-1/2	120	30A	**ECA1811EAB** **ECA1811BAB**	**ECA1812EAB** **ECA1812BAB**	**ECA1814EAB** **ECA1814BAB**	**ECA1818EAB** **ECA1818BAB**	**W200M1CFC**
	480 600	10	120	30A	**ECA1811CAC** **ECA1811DAC**	**ECA1812CAC** **ECA1812DAC**	**ECA1814CAC** **ECA1814DAC**	**ECA1818CAC** **ECA1818DAC**	**W200M1CFC**
2	208 240	10 15	120	60A	**ECA1821EAD** **ECA1821BAD**	**ECA1822EAD** **ECA1822BAD**	**ECA1824EAD** **ECA1824BAD**	**ECA1828EAD** **ECA1828BAD**	**W200M2CFC**
	480 600	25	120	60A	**ECA1821CAE** **ECA1821DAE**	**ECA1822CAE** **ECA1822DAE**	**ECA1824CAE** **ECA1824DAE**	**ECA1828CAE** **ECA1828DAE**	**W200M2CFC**
3	208 240	25 30	120	100A	**ECA1831EAF** **ECA1831BAF**	**ECA1832EAF** **ECA1832BAF**	**ECA1834EAF** **ECA1834BAF**	**ECA1838EAF** **ECA1838BAF**	**W200M3CFC**
	480 600	50	120	100A	**ECA1831CAG** **ECA1831DAG**	**ECA1832CAG** **ECA1832DAG**	**ECA1834CAG** **ECA1834DAG**	**ECA1838CAG** **ECA1838DAG**	**W200M3CFC**
4	208 240	40 50	120	200A	**ECA1841EAH** **ECA1841BAH**	**ECA1842EAH** **ECA1842BAH**	**ECA1844EAH** **ECA1844BAH**	**ECA1848EAH** **ECA1848BAH**	**W200M4CFC**
	480 600	100	120	200A	**ECA1841CAJ** **ECA1841DAJ**	**ECA1842CAJ** **ECA1842DAJ**	**ECA1844CAJ** **ECA1844DAJ**	**ECA1848CAJ** **ECA1848DAJ**	**W200M4CFC**
Non-fusible									
1-L ①	208 240 480 600	1 1 2 2	120	30A	**ECA18L1EAA** **ECA18L1BAA** **ECA18L1CAA** **ECA18L1DAA**	**ECA18L2EAA** **ECA18L2BAA** **ECA18L2CAA** **ECA18L2DAA**	**ECA18L4EAA** **ECA18L4BAA** **ECA18L4CAA** **ECA18L4DAA**	**ECA18L8EAA** **ECA18L8BAA** **ECA18L8CAA** **ECA18L8DAA**	**W200MLCFC**
1	208 240 480 600	7-1/2 7-1/2 10 10	120	30A	**ECA1811EAA** **ECA1811BAA** **ECA1811CAA** **ECA1811DAA**	**ECA1812EAA** **ECA1812BAA** **ECA1812CAA** **ECA1812DAA**	**ECA1814EAA** **ECA1814BAA** **ECA1814CAA** **ECA1814DAA**	**ECA1818EAA** **ECA1818BAA** **ECA1818CAA** **ECA1818DAA**	**W200M1CFC**
2	208 240 480 600	10 15 25 25	120	60A	**ECA1821EAA** **ECA1821BAA** **ECA1821CAA** **ECA1821DAA**	**ECA1822EAA** **ECA1822BAA** **ECA1822CAA** **ECA1822DAA**	**ECA1824EAA** **ECA1824BAA** **ECA1824CAA** **ECA1824DAA**	**ECA1828EAA** **ECA1828BAA** **ECA1828CAA** **ECA1828DAA**	**W200M2CFC**
3	208 240 480 600	25 30 50 50	120	100A	**ECA1831EAA** **ECA1831BAA** **ECA1831CAA** **ECA1831DAA**	**ECA1832EAA** **ECA1832BAA** **ECA1832CAA** **ECA1832DAA**	**ECA1834EAA** **ECA1834BAA** **ECA1834CAA** **ECA1834DAA**	**ECA1838EAA** **ECA1838BAA** **ECA1838CAA** **ECA1838DAA**	**W200M3CFC**
4	208 240 480 600	40 50 100 100	120	200A	**ECA1841EAA** **ECA1841BAA** **ECA1841CAA** **ECA1841DAA**	**ECA1842EAA** **ECA1842BAA** **ECA1842CAA** **ECA1842DAA**	**ECA1844EAA** **ECA1844BAA** **ECA1844CAA** **ECA1844DAA**	**ECA1848EAA** **ECA1848BAA** **ECA1848CAA** **ECA1848DAA**	**W200M4CFC**

① For motor full load current (FLA) range of .47A – 3.81A with a 1.15 to 1.25 service factor and for motor hp range of 1/4 hp to 2 hp at 460V.

② Other control power transformer primary and/or secondary voltages, see **Page 3-60**.

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. When safety door interlock is required, change seventh character from **8** to **9**, i.e. ECA181**8**EAA would become ECA181**9**EAA.

⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECA16L**4**EAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑥ Fuse clips are for Class R fuses only. For H and J Fuses see mods, **Page 16-42**.

⑦ 100,000 AIC short circuit.

Cover Mounted Control – 10250T Series ..... **Page 3-21**
Cover Mounted Control – ACM Series ..... **Page 3-61**
Accessories ..... **Page 16-12**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-13**

Features and Product Selection

- Full Voltage
- Solid-State Overload Relays
- 600V Maximum

Table 3-53. Class ECA22 — Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ②③	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ④	Type 12 Dust-Tight Industrial ⑤	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1-L ①	200	1	120	HMCPE 7A	ECA22L1FAC	ECA22L2FAC	ECA22L4FAC	ECA22L8FAC	W200MLCFC
	230	1		HMCPE 7A	ECA22L1FAC	ECA22L2FAC	ECA22L4FAC	ECA22L8FAC	
	460	1		HMCPE 3A	ECA22L1FAB	ECA22L2FAB	ECA22L4FAB	ECA22L8FAB	
		3		HMCPE 7A	ECA22L1FAC	ECA22L2FAC	ECA22L4FAC	ECA22L8FAC	
	575	1		HMCP 3A	ECA22L1FA5	ECA22L2FA5	ECA22L4FA5	ECA22L8FA5	
		3		HMCP 7A	ECA22L1FA6	ECA22L2FA6	ECA22L4FA6	ECA22L8FA6	
1	200	1	120	HMCPE 7A	ECA2211FAC	ECA2212FAC	ECA2214FAC	ECA2218FAC	W200M1CFC
		3		HMCPE 15A	ECA2211FAD	ECA2212FAD	ECA2214FAD	ECA2218FAD	
		5		HMCPE 30A	ECA2211FAE	ECA2212FAE	ECA2214FAE	ECA2218FAE	
		7-1/2		HMCPE 50A	ECA2211FAF	ECA2212FAF	ECA2214FAF	ECA2218FAF	
	230	1	120	HMCPE 7A	ECA2211FAC	ECA2212FAC	ECA2214FAC	ECA2218FAC	W200M1CFC
		3		HMCPE 15A	ECA2211FAD	ECA2212FAD	ECA2214FAD	ECA2218FAD	
		5		HMCPE 30A	ECA2211FAE	ECA2212FAE	ECA2214FAE	ECA2218FAE	
		7-1/2		HMCPE 50A	ECA2211FAF	ECA2212FAF	ECA2214FAF	ECA2218FAF	
	460	1	120	HMCPE 3A	ECA2211FAB	ECA2212FAB	ECA2214FAB	ECA2218FAB	W200M1CFC
		3		HMCPE 7A	ECA2211FAC	ECA2212FAC	ECA2214FAC	ECA2218FAC	
		5		HMCPE 15A	ECA2211FAD	ECA2212FAD	ECA2214FAD	ECA2218FAD	
		10		HMCPE 30A	ECA2211FAE	ECA2212FAE	ECA2214FAE	ECA2218FAE	
	575	1	120	HMCP 3A	ECA2211FA5	ECA2212FA5	ECA2214FA5	ECA2218FA5	W200M1CFC
		3		HMCP 7A	ECA2211FA6	ECA2212FA6	ECA2214FA6	ECA2218FA6	
		5		HMCP 15A	ECA2211FA7	ECA2212FA7	ECA2214FA7	ECA2218FA7	
		10		HMCP 30A	ECA2211FA8	ECA2212FA8	ECA2214FA8	ECA2218FA8	
2	200	10	120	HMCPE 50A	ECA2221FAF	ECA2222FAF	ECA2224FAF	ECA2228FAF	W200M2CFC
	230	10		HMCPE 50A	ECA2221FAF	ECA2222FAF	ECA2224FAF	ECA2228FAF	
		15		HMCPE 70A	ECA2221FAW	ECA2222FAW	ECA2224FAW	ECA2228FAW	
	460	25		HMCPE 50A	ECA2221FAF	ECA2222FAF	ECA2224FAF	ECA2228FAF	
	575	15		HMCP 30A	ECA2221FA8	ECA2222FA8	ECA2224FA8	ECA2228FA8	
		25		HMCP 50A	ECA2221FA9	ECA2222FA9	ECA2224FA9	ECA2228FA9	
3	200	20	120	HMCPE 100A	ECA2231FAG	ECA2232FAG	ECA2234FAG	ECA2238FAG	W200M3CFC
		25		HMCPE 100A	ECA2231FAX	ECA2232FAX	ECA2234FAX	ECA2238FAX	
	230	25		HMCPE 100A	ECA2231FAG	ECA2232FAG	ECA2234FAG	ECA2238FAG	
		30		HMCPE 100A	ECA2231FAX	ECA2232FAX	ECA2234FAX	ECA2238FAX	
	460	50		HMCPE 100A	ECA2231FAG	ECA2232FAG	ECA2234FAG	ECA2238FAG	
	575	30		HMCP 50A	ECA2231FA9	ECA2232FA9	ECA2234FA9	ECA2238FA9	
		50		HMCP 100A	ECA2231FAI	ECA2232FAI	ECA2234FAI	ECA2238FAI	
4	200	40	120	HMCP 150A	ECA2241FAH	ECA2242FAH	ECA2244FAH	ECA2248FAH	W200M4CFC
	230	50		HMCP 150A					
	460	100		HMCP 150A					
	575	100		HMCP 150A					
5	200	50	120	HMCP 250A	ECA2251FAJ	ECA2252FAJ	ECA2254FAJ	ECA2258FAJ	W200M5CFC
		75		HMCP 400A	ECA2251FAK	ECA2252FAK	ECA2254FAK	ECA2258FAK	
	230	60		HMCP 250A	ECA2251FAJ	ECA2252FAJ	ECA2254FAJ	ECA2258FAJ	
		100		HMCP 400A	ECA2251FAK	ECA2252FAK	ECA2254FAK	ECA2258FAK	
	460	125		HMCP 250A	ECA2251FAJ	ECA2252FAJ	ECA2254FAJ	ECA2258FAJ	
		200		HMCP 400A	ECA2251FAK	ECA2252FAK	ECA2254FAK	ECA2258FAK	
	575	150		HMCP 250A	ECA2251FAJ	ECA2252FAJ	ECA2254FAJ	ECA2258FAJ	
		200		HMCP 400A	ECA2251FAK	ECA2252FAK	ECA2254FAK	ECA2258FAK	
6	200	150	120 ⑥	HMCP 600A	ECA2261EAL	ECA2262EAL	ECA2264EAL	ECA2268EAL	W200M6CFC
	230	200		HMCP 600A	ECA2261BAL	ECA2262BAL	ECA2264BAL	ECA2268BAL	
	460	350		HMCP 600A	ECA2261CAL	ECA2262CAL	ECA2264CAL	ECA2268CAL	
		400		HMCP 1200A	ECA2261FAP	ECA2262FAP	ECA2264FAP	ECA2268FAP	
	575	400		HMCP 600A	ECA2261DAL	ECA2262DAL	ECA2264DAL	ECA2268DAL	

① For motor full load current (FLA) range of .47A – 3.81A with a 1.15 to 1.25 service factor and for motor hp range of 1/4 hp to 2 hp at 460V.

② All starters provided with coils for separate control.

③ Starters for 50 Hz operation use 110V 50 Hz magnet coil. Change 8th character from **F** to **N**.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECA22L**4**FAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ All Type 12 enclosures are standardized with external reset. For internal reset, order Mod Code **R5**.

⑥ Size 6 includes control power transformer.

Cover Mounted Control – 10250T Series . . . . . **Page 3-21**
Cover Mounted Control – ACM Series . . . . . **Page 3-61**
Accessories . . . . . **Page 16-12**
Modifications . . . . . **Page 16-40**
Technical Data . . . . . **Page 18-13**

3

Wiring Diagrams

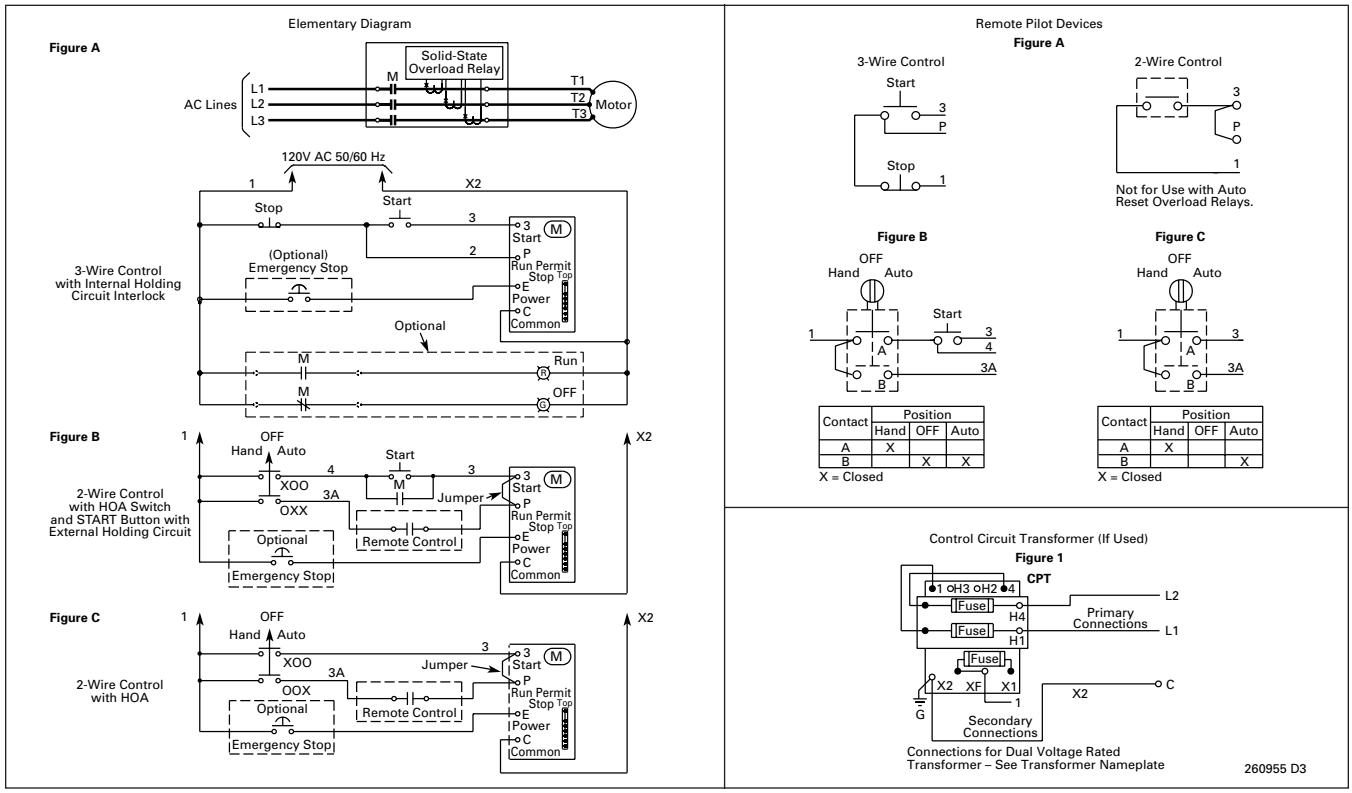


Figure 3-12. Advantage Non-reversing — Non-combination

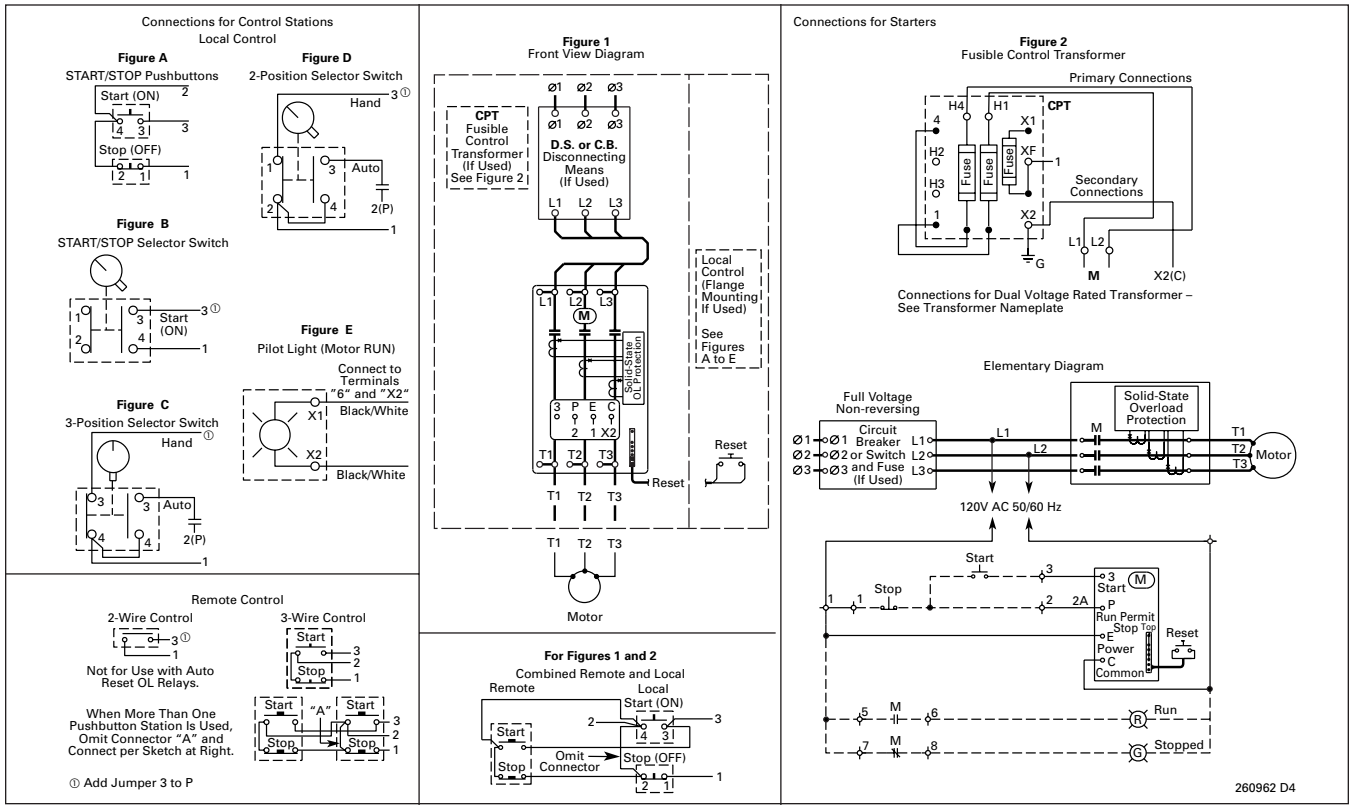


Figure 3-13. Advantage Non-reversing — Combination

Catalog Number Selection

Note: For Catalog Number Selection for Freedom Multispeed Starters, see **Page 3-20**.

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 9th 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 2 red pilot lights, change the **A** to **J**, i.e. ECN3414C**J**A.

Table 3-54. 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	All Others ②
				Catalog Number	Catalog Number
No Cover Mounted Pilot Devices	**A**	■	■	**C400GK0**	—
FAST/SLOW/STOP Pushbuttons	**B**	■	■	**C400GK9** ④	**C400T7**
with 2 Red Pilot Lights	**C**	■	■	**C400GK94** ③	—
with 2 Red/1 Green Pilot Lights	**D**	—	■	—	—
HIGH/LOW/STOP Pushbuttons	**E**	—	■	—	**C400T8**
with 2 Red Pilot Lights	**F**	—	■	—	—
with 2 Red/1 Green Pilot Lights	**G**	—	■	—	—
FAST/OFF/SLOW Selector Switch	**H**	—	■	—	**C400T17**
with 2 Red Pilot Lights	**J**	—	■	—	—
with 2 Red/1 Green Pilot Lights	**K**	—	■	—	—
Two Red Pilot Lights	**P**	■	■	**C400GK44** ③	⑤
One Green Pilot Light	**Q**	■	■	**C400GK41** ③	**C400T10** ③
Two Red/One Green Pilot Lights	**R**	■	■	—	—
HIGH/OFF/LOW Selector Switch	**V**	—	■	—	**C400T18**
with 2 Red Pilot Lights	**W**	—	■	—	—
with 2 Red/1 Green Pilot Lights	**X**	—	■	—	—

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 Add Code Letter from table below to Catalog Number for voltage — Kits only. Example: C400GK94B.

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 Uses a FAST/SLOW/OFF pushbutton.
⑤ Order quantity 2 of **C400T9** ③.

Features

- 3-Phase Magnetic, 3-Pole
- Interchangeable Heater OLR
- 600V Maximum

3

Product Selection

Table 3-55. Class ECN33 — Non-combination 2-Speed 2-Winding Starter

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower		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
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 ②	ECN3368EAA	AN700TN022E
	230	200	150	240	ECN3361BAA	ECN3362BAA	ECN3363BAA ②	ECN3368BAA	AN700TN022B
	460	400	300	480	ECN3361CAA	ECN3362CAA	ECN3363CAA ②	ECN3368CAA	AN700TN022C
	575	400	300	600	ECN3361DAA	ECN3362DAA	ECN3363DAA ②	ECN3368DAA	AN700TN022D
7	230	300	225	240	ECN3371BAA	ECN3372BAA	ECN3373BAA ②	ECN3378BAA	AN700UN022B
	460	600	450	480	ECN3371CAA	ECN3372CAA	ECN3373CAA ②	ECN3378CAA	AN700UN022C
	575	600	450	600	ECN3371DAA	ECN3372DAA	ECN3373DAA ②	ECN3378DAA	AN700UN022D

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, **Page 16-6**.

① Maximum horsepower rating of starters for 380V 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 Type 4 (Painted steel) Sizes 6 – 7.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN330**4**AAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-56. Class ECN34 — Non-combination 2-Speed 1-Winding Starter (CT or VT)

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
				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** ②	**ECN3468EAA**	**AN700TN0218E**
	230	200	240	**ECN3461BAA**	**ECN3462BAA**	**ECN3463BAA** ②	**ECN3468BAA**	**AN700TN0218B**
	460	400	480	**ECN3461CAA**	**ECN3462CAA**	**ECN3463CAA** ②	**ECN3468CAA**	**AN700TN0218C**
	575	400	600	**ECN3461DAA**	**ECN3462DAA**	**ECN3463DAA** ②	**ECN3468DAA**	**AN700TN0218D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, see **Page 16-6**.

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

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

② Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN340**4**AAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-57. Class ECN35 — Non-combination 2-Speed 1-Winding Starter (Constant Horsepower)

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	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** ②	**ECN3568EAA**	**AN700TN0218E**
	230	150	240	**ECN3561BAA**	**ECN3562BAA**	**ECN3563BAA** ②	**ECN3568BAA**	**AN700TN0218B**
	460	300	480	**ECN3561CAA**	**ECN3562CAA**	**ECN3563CAA** ②	**ECN3568CAA**	**AN700TN0218C**
	575	300	600	**ECN3561DAA**	**ECN3562DAA**	**ECN3563DAA** ②	**ECN3568DAA**	**AN700TN0218D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, see **Page 16-6**.

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

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

② Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN350**4**AAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils . . . . . **Page 3-20**
Cover Control . . . . . **Page 3-67**
Dimensions . . . . . **Page 15-4**
Accessories . . . . . **Page 16-4**
Modifications . . . . . **Page 16-40**
Technical Data . . . . . **Page 18-7**

Features

- Choice of Fusible/Non-fusible Combination with Disconnect Switch or Combination HMCP or Magnetic Trip Circuit Breaker
- 3-Phase Magnetic, 3-Pole
- Interchangeable Heater OLR
- 600V Maximum

Product Selection

Table 3-58. Class ECN36 — Combination 2-Speed 2-Winding Starter — Fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Fuse Clip Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	—	120	30A	ECN3601AAB	ECN3602AAB	ECN3604AAB	ECN3608AAB	AN700BN022A
	200	3	2	208		ECN3601EAB	ECN3602EAB	ECN3604EAB	ECN3608EAB	AN700BN022E
	230	3	2	240		ECN3601BAB	ECN3602BAB	ECN3604BAB	ECN3608BAB	AN700BN022B
	460	5	3	480		ECN3601CAC	ECN3602CAC	ECN3604CAC	ECN3608CAC	AN700BN022C
	575	5	3	600		ECN3601DAC	ECN3602DAC	ECN3604DAC	ECN3608DAC	AN700BN022D
1	—	—	—	120	30A	ECN3611AAB	ECN3612AAB	ECN3614AAB	ECN3618AAB	AN700DN022A
	200	7-1/2	5	208		ECN3611EAB	ECN3612EAB	ECN3614EAB	ECN3618EAB	AN700DN022E
	230	7-1/2	5	240		ECN3611BAB	ECN3612BAB	ECN3614BAB	ECN3618BAB	AN700DN022B
	460	10	7-1/2	480		ECN3611CAC	ECN3612CAC	ECN3614CAC	ECN3618CAC	AN700DN022C
	575	10	7-1/2	600		ECN3611DAC	ECN3612DAC	ECN3614DAC	ECN3618DAC	AN700DN022D
2	—	—	—	120	60A	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	25	20	600		ECN3621DAE	ECN3622DAE	ECN3624DAE	ECN3628DAE	AN700GN022D
3	—	—	—	120	100A	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	50	40	600		ECN3631DAG	ECN3632DAG	ECN3634DAG	ECN3638DAG	AN700KN022D
4	—	—	—	120	200A	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	400A	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	600A	ECN3661EAM	ECN3662EAM	ECN3663EAM ②	ECN3668EAM	AN700TN022E
	230	200	150	240		ECN3661BAM	ECN3662BAM	ECN3663BAM ②	ECN3668BAM	AN700TN022B
	460	400	300	480		ECN3661CAN	ECN3662CAN	ECN3663CAN ②	ECN3668CAN	AN700TN022C
	575	400	300	600		ECN3661DAN	ECN3662DAN	ECN3663DAN ②	ECN3668DAN	AN700TN022D

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, **Page 16-6**.

① Maximum horsepower rating of starters for 380V 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 Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN3604AAB. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-59. Class ECN36 — Combination 2-Speed 2-Winding Starter — Non-fusible Disconnect

NEMA Size	Motor Voltage ①	Maximum hp Rating		Magnet Coil Voltage	Disconnect Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	—	120	30A	**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	30A	**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	60A	**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	100A	**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	200A	**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	400A	**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	600A	**ECN3661EAA**	**ECN3662EAA**	**ECN3663EAA** ②	**ECN3668EAA**	**AN700TN022E**
	230	200	150	240		**ECN3661BAA**	**ECN3662BAA**	**ECN3663BAA** ②	**ECN3668BAA**	**AN700TN022B**
	460	400	300	480		**ECN3661CAA**	**ECN3662CAA**	**ECN3663CAA** ②	**ECN3668CAA**	**AN700TN022C**
	575	400	300	600		**ECN3661DAA**	**ECN3662DAA**	**ECN3663DAA** ②	**ECN3668DAA**	**AN700TN022D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, **Page 16-6**.

① Maximum horsepower rating of starters for 380V 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 Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils . . . . . **Page 3-20**
Cover Control . . . . . **Page 3-67**
Dimensions . . . . . **Page 15-4**
Accessories . . . . . **Page 16-4**
Modifications . . . . . **Page 16-40**
Technical Data . . . . . **Page 18-7**

Table 3-60. Class ECN37 — Combination 2-Speed 1-Winding Starter (CT or VT) — Fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage	Fuse Clip Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30A	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	30A	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	60A	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	100A	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	200A	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	400A	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	600A	ECN3761EAM	ECN3762EAM	ECN3763EAM ②	ECN3768EAM	AN700TN0218E
	230	200	240		ECN3761BAM	ECN3762BAM	ECN3763BAM ②	ECN3768BAM	AN700TN0218B
	460	400	480		ECN3761CAN	ECN3762CAN	ECN3763CAN ②	ECN3768CAN	AN700TN0218C
	575	400	600		ECN3761DAN	ECN3762DAN	ECN3763DAN ②	ECN3768DAN	AN700TN0218D

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, see **Page 16-6**.

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

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

② Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN370**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-61. Class ECN37 — Combination 2-Speed 1-Winding Starter (CT or VT) — Non-fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage	Disconnect Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30A	**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	30A	**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	60A	**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	100A	**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	200A	**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	400A	**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	600A	**ECN3761EAA**	**ECN3762EAA**	**ECN3763EAA** ②	**ECN3768EAA**	**AN700TN0218E**
	230	200	240		**ECN3761BAA**	**ECN3762BAA**	**ENC3763BAA** ②	**ECN3768BAA**	**AN700TN0218B**
	460	400	480		**ECN3761CAA**	**ECN3762CAA**	**ENC3763CAA** ②	**ECN3768CAA**	**AN700TN0218C**
	575	400	600		**ECN3761DAA**	**ECN3762DAA**	**ENC3763DAA** ②	**ECN3768DAA**	**AN700TN0218D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, see **Page 16-6**.

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

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

② Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils . . . . . **Page 3-20**
Cover Control . . . . . **Page 3-67**
Dimensions . . . . . **Page 15-4**
Accessories . . . . . **Page 16-4**
Modifications . . . . . **Page 16-40**
Technical Data . . . . . **Page 18-7**

Table 3-62. Class ECN38 — Combination 2-Speed 1-Winding Starter (Constant Horsepower) — Fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage	Fuse Clip Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30A	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	30A	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	60A	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	100A	ECN3831AAF	ECN3832AAF	ECN3834AAF	ECN3838AAF	AN700KN0218A
	200	20	208		ECN3831EAF	ECN3832EAF	ECN3834EAF	ECN3838EAF	AN700KN0218E
	230	25	240		ECN3831BAF	ECN3832BAF	ECN3834BAF	ECN3838BAF	AN700KN0218B
	460	40	480		ECN3831CAG	ECN3832CAG	ECN3834CAG	ECN3838CAG	AN700KN0218C
	575	40	600		ECN3831DAG	ECN3832DAG	ECN3834DAG	ECN3838DAG	AN700KN0218D
4	—	—	120	200A	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	400A	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	600A	ECN3861EAM	ECN3862EAM	ECN3863EAM ②	ECN3868EAM	AN700TN0218E
	230	150	240		ECN3861BAM	ECN3862BAM	ECN3863BAM ②	ECN3868BAM	AN700TN0218B
	460	300	480		ECN3861CAN	ECN3862CAL	ECN3863CAN ②	ECN3868CAN	AN700TN0218C
	575	300	600		ECN3861DAN	ECN3862DAL	ECN3863DAN ②	ECN3868DAN	AN700TN0218D

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, see **Page 16-6**.

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

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

② Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN380**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-63. Class ECN38 — Combination 2-Speed 1-Winding Starter (Constant Horsepower) — Non-fusible Disconnect

NEMA Size	Motor Voltage ①	Max. hp Rating	Magnet Coil Voltage	Disconnect Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ③ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	30A	**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	30A	**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	60A	**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	100A	**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	200A	**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	400A	**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	600A	**ECN3861EAA**	**ECN3862EAA**	**ECN3863EAA** ②	**ECN3868EAA**	**AN700TN0218E**
	230	150	240		**ECN3861BAA**	**ECN3862BAA**	**ECN3863BAA** ②	**ECN3868BAA**	**AN700TN0218B**
	460	300	480		**ECN3861CAA**	**ECN3862CAA**	**ECN3863CAA** ②	**ECN3868CAA**	**AN700TN0218C**
	575	300	600		**ECN3861DAA**	**ECN3862DAA**	**ECN3863DAA** ②	**ECN3868DAA**	**AN700TN0218D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, see **Page 16-6**.

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

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

② Type 4 (Painted steel) Size 6.

③ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils . . . . . **Page 3-20**
Cover Control . . . . . **Page 3-67**
Dimensions . . . . . **Page 15-4**
Accessories . . . . . **Page 16-4**
Modifications . . . . . **Page 16-40**
Technical Data . . . . . **Page 18-7**

Table 3-64. Class ECN39 — Combination 2-Speed 2-Winding Starter — Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating		Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
		Constant or Variable Torque	Constant Horsepower			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	200	1 3	1 2	208	HMCPE 7A HMCPE 15A	**ECN3901EAC** **ECN3901EAD**	**ECN3902EAC** **ECN3902EAD**	**ECN3904EAC** **ECN3904EAD**	**ECN3908EAC** **ECN3908EAD**	**AN700BN022E**
	230	1 3	1 2	240	HMCPE 7A HMCPE 15A	**ECN3901BAC** **ECN3901BAD**	**ECN3902BAC** **ECN3902BAD**	**ECN3904BAC** **ECN3904BAD**	**ECN3908BAC** **ECN3908BAD**	**AN700BN022B**
	460	3/4 2 5	3/4 2 3	480	HMCPE 3A HMCPE 7A HMCPE 15A	**ECN3901CAB** **ECN3901CAC** **ECN3901CAD**	**ECN3902CAB** **ECN3902CAC** **ECN3902CAD**	**ECN3904CAB** **ECN3904CAC** **ECN3904CAD**	**ECN3908CAB** **ECN3908CAC** **ECN3908CAD**	**AN700BN022C**
	575	1 3 5	1 3 —	600	HMCP 3A HMCP 7A HMCP 15A	**ECN3901DA5** **ECN3901DA6** **ECN3901DA7**	**ECN3902DA5** **ECN3902DA6** **ECN3902DA7**	**ECN3904DA5** **ECN3904DA6** **ECN3904DA7**	**ECN3908DA5** **ECN3908DA6** **ECN3908DA7**	**AN700BN022D**
1	200	1 2 7-1/2	1 2 5	208	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN3911EAC** **ECN3911EAD** **ECN3911EAE**	**ECN3912EAC** **ECN3912EAD** **ECN3912EAE**	**ECN3914EAC** **ECN3914EAD** **ECN3914EAE**	**ECN3918EAC** **ECN3918EAD** **ECN3918EAE**	**AN700DN022E**
	230	1 2 7-1/2	1 2 5	240	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN3911BAC** **ECN3911BAD** **ECN3911BAE**	**ECN3912BAC** **ECN3912BAD** **ECN3912BAE**	**ECN3914BAC** **ECN3914BAD** **ECN3914BAE**	**ECN3918BAC** **ECN3918BAD** **ECN3918BAE**	**AN700DN022B**
	460	3/4 2 5 10	3/4 2 5 7-1/2	480	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN3911CAB** **ECN3911CAC** **ECN3911CAD** **ECN3911CAE**	**ECN3912CAB** **ECN3912CAC** **ECN3912CAD** **ECN3912CAE**	**ECN3914CAB** **ECN3914CAC** **ECN3914CAD** **ECN3914CAE**	**ECN3918CAB** **ECN3918CAC** **ECN3918CAD** **ECN3918CAE**	**AN700DN022C**
	575	1 3 7-1/2 10	1 3 7-1/2 —	600	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN3911DA5** **ECN3911DA6** **ECN3911DA7** **ECN3911DA8**	**ECN3912DA5** **ECN3912DA6** **ECN3912DA7** **ECN3912DA8**	**ECN3914DA5** **ECN3914DA6** **ECN3914DA7** **ECN3914DA8**	**ECN3918DA5** **ECN3918DA6** **ECN3918DA7** **ECN3918DA8**	**AN700DN022D**
2	200 230 460	10 15 25	7-1/2 10 20	208 240 480	HMCPE 50A	**ECN3921EAF** **ECN3921BAF** **ECN3921CAF**	**ECN3922EAF** **ECN3922BAF** **ECN3922CAF**	**ECN3924EAF** **ECN3924BAF** **ECN3924CAF**	**ECN3928EAF** **ECN3928BAF** **ECN3928CAF**	**AN700GN022E** **AN700GN022B** **AN700GN022C**
	575	25	20	600	HMCP 50A	**ECN3921DA9**	**ECN3922DA9**	**ECN3924DA9**	**ECN3928DA9**	**AN700GN022D**
3	200 230 460	25 30 50	20 25 40	208 240 480	HMCPE 100A	**ECN3931EAG** **ECN3931BAG** **ECN3931CAG**	**ECN3932EAG** **ECN3932BAG** **ECN3932CAG**	**ECN3934EAG** **ECN3934BAG** **ECN3934CAG**	**ECN3938EAG** **ECN3938BAG** **ECN3938CAG**	**AN700KN022E** **AN700KN022B** **AN700KN022C**
	575	50	40	600	HMCP 100A	**ECN3931DAI**	**ECN3932DAI**	**ECN3934DAI**	**ECN3938DAI**	**AN700KN022D**
4	200 230 460 575	40 50 100 100	30 40 75 75	208 240 480 600	HMCP 150A	**ECN3941EAH** **ECN3941BAH** **ECN3941CAH** **ECN3941DAH**	**ECN3942EAH** **ECN3942BAH** **ECN3942CAH** **ECN3942DAH**	**ECN3944EAH** **ECN3944BAH** **ECN3944CAH** **ECN3944DAH**	**ECN3948EAH** **ECN3948BAH** **ECN3948CAH** **ECN3948DAH**	**AN700NN022E** **AN700NN022B** **AN700NN022C** **AN700NN022D**
5	200	60 75	60 —	208	HMCP 250A HMCP 400A	**ECN3951EAJ** **ECN3951EAK**	**ECN3952EAJ** **ECN3952EAK**	**ECN3954EAJ** **ECN3954EAK**	**ECN3958EAJ** **ECN3958EAK**	**AN700SN022E**
	230	75 100	75 —	240	HMCP 250A HMCP 400A	**ECN3951BAJ** **ECN3951BAK**	**ECN3952BAJ** **ECN3952BAK**	**ECN3954BAJ** **ECN3954BAK**	**ECN3958BAJ** **ECN3958BAK**	**AN700SN022B**
	460	150 200	150 —	480	HMCP 250A HMCP 400A	**ECN3951CAJ** **ECN3951CAK**	**ECN3952CAJ** **ECN3952CAK**	**ECN3954CAJ** **ECN3954CAK**	**ECN3958CAJ** **ECN3958CAK**	**AN700SN022C**
	575	200	150	600	HMCP 250A	**ECN3951DAJ**	**ECN3952DAJ**	**ECN3954DAJ**	**ECN3958DAJ**	**AN700SN022D**
6	200	150	100	208	⑤	**ECN3961EAU**	**ECN3962EAU**	**ECN3963EAU** ④	**ECN3968EAU**	**AN700TN022E**
	230	200	150	240	⑤	**ECN3961BAU**	**ECN3962BAU**	**ECN3963BAU** ④	**ECN3968BAU**	**AN700TN022B**
	460	400	300	480	⑤	**ECN3961CAU**	**ECN3962CAU**	**ECN3963CAU** ④	**ECN3968CAU**	**AN700TN022C**
	575	400	300	600	⑤	**ECN3961DAU**	**ECN3962DAU**	**ECN3963DAU** ④	**ECN3968DAU**	**AN700TN022D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, **Page 16-6**.

① Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the 8th character of the listed Catalog Number.

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

③ Type 12 enclosure is without safety door interlock.

④ Type 4 (Painted steel) Size 6.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN390**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-65. Class ECN40 — Combination 2-Speed 1-Winding Starter (CT or VT) — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	200	1 3	208	HMCPE 7A HMCPE 15A	**ECN4001EAC** **ECN4001EAD**	**ECN4002EAC** **ECN4002EAD**	**ECN4004EAC** **ECN4004EAD**	**ECN4008EAC** **ECN4008EAD**	**AN700BN0218E**
	230	1 3	240	HMCPE 7A HMCPE 15A	**ECN4001BAC** **ECN4001BAD**	**ECN4002BAC** **ECN4002BAD**	**ECN4004BAC** **ECN4004BAD**	**ECN4008BAC** **ECN4008BAD**	**AN700BN0218B**
	460	3/4 2 5	480	HMCPE 3A HMCPE 7A HMCPE 15A	**ECN4001CAB** **ECN4001CAC** **ECN4001CAD**	**ECN4002CAB** **ECN4002CAC** **ECN4002CAD**	**ECN4004CAB** **ECN4004CAC** **ECN4004CAD**	**ECN4008CAB** **ECN4008CAC** **ECN4008CAD**	**AN700BN0218C**
	575	1 3 5	600	HMCP 3A HMCP 7A HMCP 15A	**ECN4001DA5** **ECN4001DA6** **ECN4001DA7**	**ECN4002DA5** **ECN4002DA6** **ECN4002DA7**	**ECN4004DA5** **ECN4004DA6** **ECN4004DA7**	**ECN4008DA5** **ECN4008DA6** **ECN4008DA7**	**AN700BN0218D**
1	200	1 2 7-1/2	208	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN4011EAC** **ECN4011EAD** **ECN4011EAE**	**ECN4012EAC** **ECN4012EAD** **ECN4012EAE**	**ECN4014EAC** **ECN4014EAD** **ECN4014EAE**	**ECN4018EAC** **ECN4018EAD** **ECN4018EAE**	**AN700DN0218E**
	230	1 2 7-1/2	240	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN4011BAC** **ECN4011BAD** **ECN4011BAE**	**ECN4012BAC** **ECN4012BAD** **ECN4012BAE**	**ECN4014BAC** **ECN4014BAD** **ECN4014BAE**	**ECN4018BAC** **ECN4018BAD** **ECN4018BAE**	**AN700DN0218B**
	460	3/4 2 5 10	480	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN4011CAB** **ECN4011CAC** **ECN4011CAD** **ECN4011CAE**	**ECN4012CAB** **ECN4012CAC** **ECN4012CAD** **ECN4012CAE**	**ECN4014CAB** **ECN4014CAC** **ECN4014CAD** **ECN4014CAE**	**ECN4018CAB** **ECN4018CAC** **ECN4018CAD** **ECN4018CAE**	**AN700DN0218C**
	575	1 3 7-1/2 10	600	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN4011DA5** **ECN4011DA6** **ECN4011DA7** **ECN4011DA8**	**ECN4012DA5** **ECN4012DA6** **ECN4012DA7** **ECN4012DA8**	**ECN4014DA5** **ECN4014DA6** **ECN4014DA7** **ECN4014DA8**	**ECN4018DA5** **ECN4018DA6** **ECN4018DA7** **ECN4018DA8**	**AN700DN0218D**
2	200 230 460	10 15 25	208 240 480	HMCPE 50A	**ECN4021EAF** **ECN4021BAF** **ECN4021CAF**	**ECN4022EAF** **ECN4022BAF** **ECN4022CAF**	**ECN4024EAF** **ECN4024BAF** **ECN4024CAF**	**ECN4028EAF** **ECN4028BAF** **ECN4028CAF**	**AN700GN0218E** **AN700GN0218B** **AN700GN0218C**
	575	25	600	HMCP 50A	**ECN4021DA9**	**ECN4022DA9**	**ECN4024DA9**	**ECN4028DA9**	**AN700GN0218D**
3	200 230 460	25 30 50	208 240 480	HMCPE 100A	**ECN4031EAG** **ECN4031BAG** **ECN4031CAG**	**ECN4032EAG** **ECN4032BAG** **ECN4032CAG**	**ECN4034EAG** **ECN4034BAG** **ECN4034CAG**	**ECN4038EAG** **ECN4038BAG** **ECN4038CAG**	**AN700KN0218E** **AN700KN0218B** **AN700KN0218C**
	575	50	600	HMCP 100A	**ECN4031DAI**	**ECN4032DAI**	**ECN4034DAI**	**ECN4038DAI**	**AN700KN0218D**
4	200 230 460 575	40 50 100 100	208 240 480 600	HMCP 150A	**ECN4041EAH** **ECN4041BAH** **ECN4041CAH** **ECN4041DAH**	**ECN4042EAH** **ECN4042BAH** **ECN4042CAH** **ECN4042DAH**	**ECN4044EAH** **ECN4044BAH** **ECN4044CAH** **ECN4044DAH**	**ECN4048EAH** **ECN4048BAH** **ECN4048CAH** **ECN4048DAH**	**AN700NN0218E** **AN700NN0218B** **AN700NN0218C** **AN700NN0218D**
5	200	60 75	208	HMCP 250A HMCP 400A	**ECN4051EAJ** **ECN4051EAK**	**ECN4052EAJ** **ECN4052EAK**	**ECN4054EAJ** **ECN4054EAK**	**ECN4058EAJ** **ECN4058EAK**	**AN700SN0218E**
	230	75 100	240	HMCP 250A HMCP 400A	**ECN4051BAJ** **ECN4051BAK**	**ECN4052BAJ** **ECN4052BAK**	**ECN4054BAJ** **ECN4054BAK**	**ECN4058BAJ** **ECN4058BAK**	**AN700SN0218B**
	460	150 200	480	HMCP 250A HMCP 400A	**ECN4051CAJ** **ECN4051CAK**	**ECN4052CAJ** **ECN4052CAK**	**ECN4054CAJ** **ECN4054CAK**	**ECN4058CAJ** **ECN4058CAK**	**AN700SN0218C**
	575	200	600	HMCP 250A	**ECN4051DAJ**	**ECN4052DAJ**	**ECN4054DAJ**	**ECN4058DAJ**	**AN700SN0218D**
6	200	150	208	⑤	**ECN4061EAU**	**ECN4062EAU**	**ECN4063EAU** ④	**ECN4068EAU**	**AN700TN0218E**
	230	200	240	⑤	**ECN4061BAU**	**ECN4062BAU**	**ECN4063BAU** ④	**ECN4068BAU**	**AN700TN0218B**
	460	400	480	⑤	**ECN4061CAU**	**ECN4062CAU**	**ECN4063CAU** ④	**ECN4068CAU**	**AN700TN0218C**
	575	400	600	⑤	**ECN4061DAU**	**ECN4062DAU**	**ECN4063DAU** ④	**ECN4068DAU**	**AN700TN0218D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays – 1 for each speed). Heater Pack Selection, see **Page 16-6**.

① Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the 8th character of the listed Catalog Number.

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

③ Type 12 enclosure is without safety door interlock.

④ Type 4 (Painted steel) Size 6.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN400**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 3-66. Class ECN41 — Combination 2-Speed 1-Winding Starter (Constant Horsepower) — Circuit Breaker

NEMA Size	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
		Constant Horsepower			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	200	1 2	208	HMCPE 7A HMCPE 15A	**ECN4101EAC** **ECN4101EAD**	**ECN4102EAC** **ECN4102EAD**	**ECN4104EAC** **ECN4104EAD**	**ECN4108EAC** **ECN4108EAD**	**AN700BN0218E**
	230	1 2	240	HMCPE 7A HMCPE 15A	**ECN4101BAC** **ECN4101BAD**	**ECN4102BAC** **ECN4102BAD**	**ECN4104BAC** **ECN4104BAD**	**ECN4108BAC** **ECN4108BAD**	**AN700BN0218B**
	460	3/4 2 3	480	HMCPE 3A HMCPE 7A HMCPE 15A	**ECN4101CAB** **ECN4101CAC** **ECN4101CAD**	**ECN4102CAB** **ECN4102CAC** **ECN4102CAD**	**ECN4104CAB** **ECN4104CAC** **ECN4104CAD**	**ECN4108CAB** **ECN4108CAC** **ECN4108CAD**	**AN700BN0218C**
	575	1 3	600	HMCP 3A HMCP 7A	**ECN4101DA5** **ECN4101DA6**	**ECN4102DA5** **ECN4102DA6**	**ECN4104DA5** **ECN4104DA6**	**ECN4108DA5** **ECN4108DA6**	**AN700BN0218D**
1	200	1 2 5	208	HMCPE 7A HMCPE 5A HMCPE 30A	**ECN4111EAC** **ECN4111EAD** **ECN4111EAE**	**ECN4112EAC** **ECN4112EAD** **ECN4112EAE**	**ECN4114EAC** **ECN4114EAD** **ECN4114EAE**	**ECN4118EAC** **ECN4118EAD** **ECN4118EAE**	**AN700DN0218E**
	230	1 2 5	240	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN4111BAC** **ECN4111BAD** **ECN4111BAE**	**ECN4112BAC** **ECN4112BAD** **ECN4112BAE**	**ECN4114BAC** **ECN4114BAD** **ECN4114BAE**	**ECN4118BAC** **ECN4118BAD** **ECN4118BAE**	**AN700DN0218B**
	460	3/4 2 5 7-1/2	480	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN4111CAB** **ECN4111CAC** **ECN4111CAD** **ECN4111CAE**	**ECN4112CAB** **ECN4112CAC** **ECN4112CAD** **ECN4112CAE**	**ECN4114CAB** **ECN4114CAC** **ECN4114CAD** **ECN4114CAE**	**ECN4118CAB** **ECN4118CAC** **ECN4118CAD** **ECN4118CAE**	**AN700DN0218C**
	575	1 3 7-1/2	600	HMCP 3A HMCP 7A HMCP 15A	**ECN4111DA5** **ECN4111DA6** **ECN4111DA7**	**ECN4112DA5** **ECN4112DA6** **ECN4112DA7**	**ECN4114DA5** **ECN4114DA6** **ECN4114DA7**	**ECN4118DA5** **ECN4118DA6** **ECN4118DA7**	**AN700DN0218D**
2	200 230 460	7-1/2 10 20	208 240 480	HMCPE 50A	**ECN4121EAF** **ECN4121BAF** **ECN4121CAF**	**ECN4122EAF** **ECN4122BAF** **ECN4122CAF**	**ECN4124EAF** **ECN4124BAF** **ECN4124CAF**	**ECN4128EAF** **ECN4128BAF** **ECN4128CAF**	**AN700GN0218E** **AN700GN0218B** **AN700GN0218C**
	575	20	600	HMCP 50A	**ECN4121DA9**	**ECN4122DA9**	**ECN4124DA9**	**ECN4128DA9**	**AN700GN0218D**
3	200 230 460	20 25 40	208 240 480	HMCPE 100A	**ECN4131EAG** **ECN4131BAG** **ECN4131CAG**	**ECN4132EAG** **ECN4132BAG** **ECN4132CAG**	**ECN4134EAG** **ECN4134BAG** **ECN4134CAG**	**ECN4138EAG** **ECN4138BAG** **ECN4138CAG**	**AN700KN0218E** **AN700KN0218B** **AN700KN0218C**
	575	40	600	HMCP 100A	**ECN4131DAI**	**ECN4132DAI**	**ECN4134DAI**	**ECN4138DAI**	**AN700KN0218D**
4	200 230 460 575	30 40 75 75	208 240 480 600	HMCP 150A	**ECN4141EAH** **ECN4141BAH** **ECN4141CAH** **ECN4141DAH**	**ECN4142EAH** **ECN4142BAH** **ECN4142CAH** **ECN4142DAH**	**ECN4144EAH** **ECN4144BAH** **ECN4144CAH** **ECN4144DAH**	**ECN4148EAH** **ECN4148BAH** **ECN4148CAH** **ECN4148DAH**	**AN700NN0218E** **AN700NN0218B** **AN700NN0218C** **AN700NN0218D**
5	200	60	208	HMCP 250A	**ECN4151EAJ**	**ECN4152EAJ**	**ECN4154EAJ**	**ECN4158EAJ**	**AN700SN0218E**
	230	75	240	HMCP 250A	**ECN4151BAJ**	**ECN4152BAJ**	**ECN4154BAJ**	**ECN4158BAJ**	**AN700SN0218B**
	460	150	480	HMCP 250A	**ECN4151CAJ**	**ECN4152CAJ**	**ECN4154CAJ**	**ECN4158CAJ**	**AN700SN0218C**
	575	150	600	HMCP 250A	**ECN4151DAJ**	**ECN4152DAJ**	**ECN4154DAJ**	**ECN4158DAJ**	**AN700SN0218D**
6	200	100	208	⑤	**ECN4161EAU**	**ECN4162EAU**	**ECN4163EAU** ④	**ECN4168EAU**	**AN700TN0218E**
	230	150	240	⑤	**ECN4161BAU**	**ECN4162BAU**	**ECN4163BAU** ④	**ECN4168BAU**	**AN700TN0218B**
	460	300	480	⑤	**ECN4161CAU**	**ECN4162CAU**	**ECN4163CAU** ④	**ECN4168CAU**	**AN700TN0218C**
	575	300	600	⑤	**ECN4161DAU**	**ECN4162DAU**	**ECN4163DAU** ④	**ECN4168DAU**	**AN700TN0218D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each speed). Heater Pack Selection, **Page 16-6**.

① Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the 8th character of the listed Catalog Number.

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

③ Type 12 enclosure is without safety door interlock.

④ Type 4 (Painted steel) Size 6.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN410**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Other Magnet Coils ..... **Page 3-20**
Cover Control ..... **Page 3-67**
Dimensions ..... **Page 15-4**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Wiring Diagrams

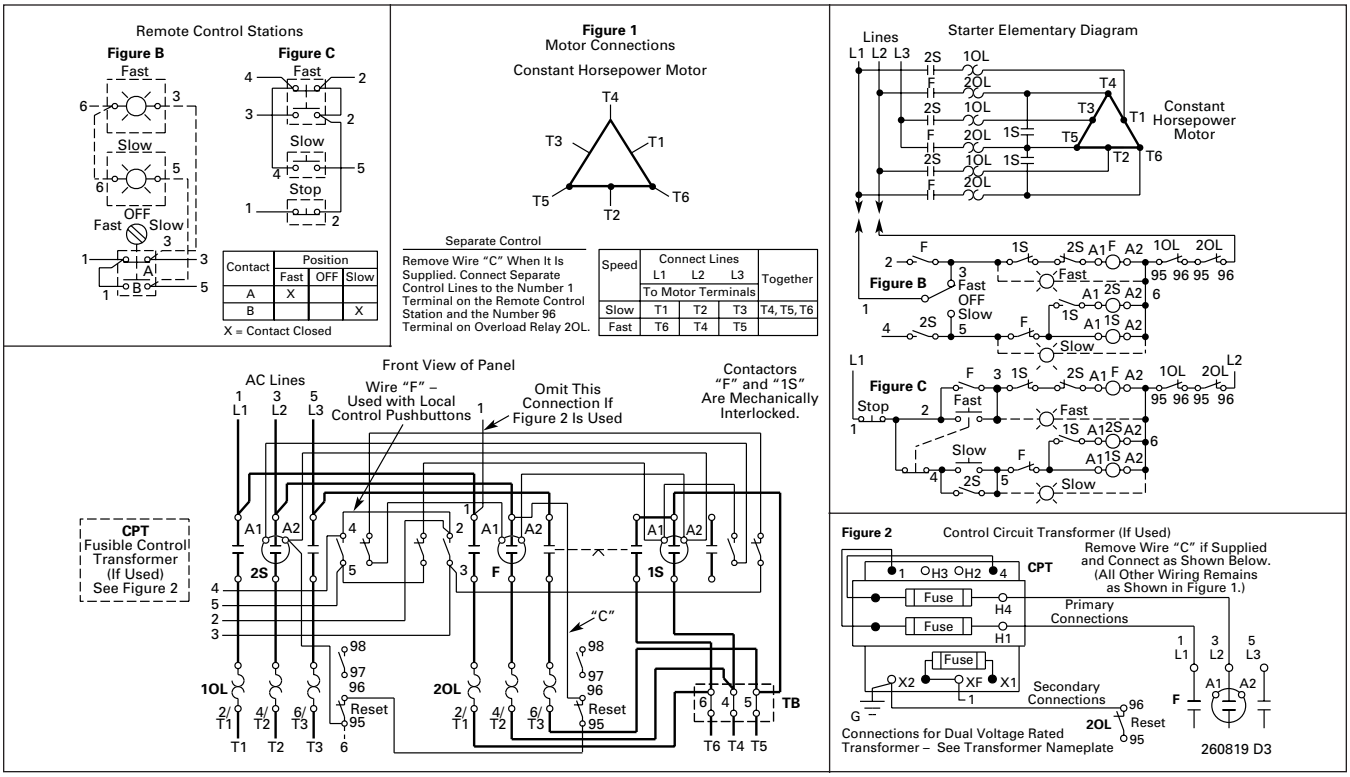


Figure 3-14. Multispeed — 2-Speed 1-Winding Constant Horsepower

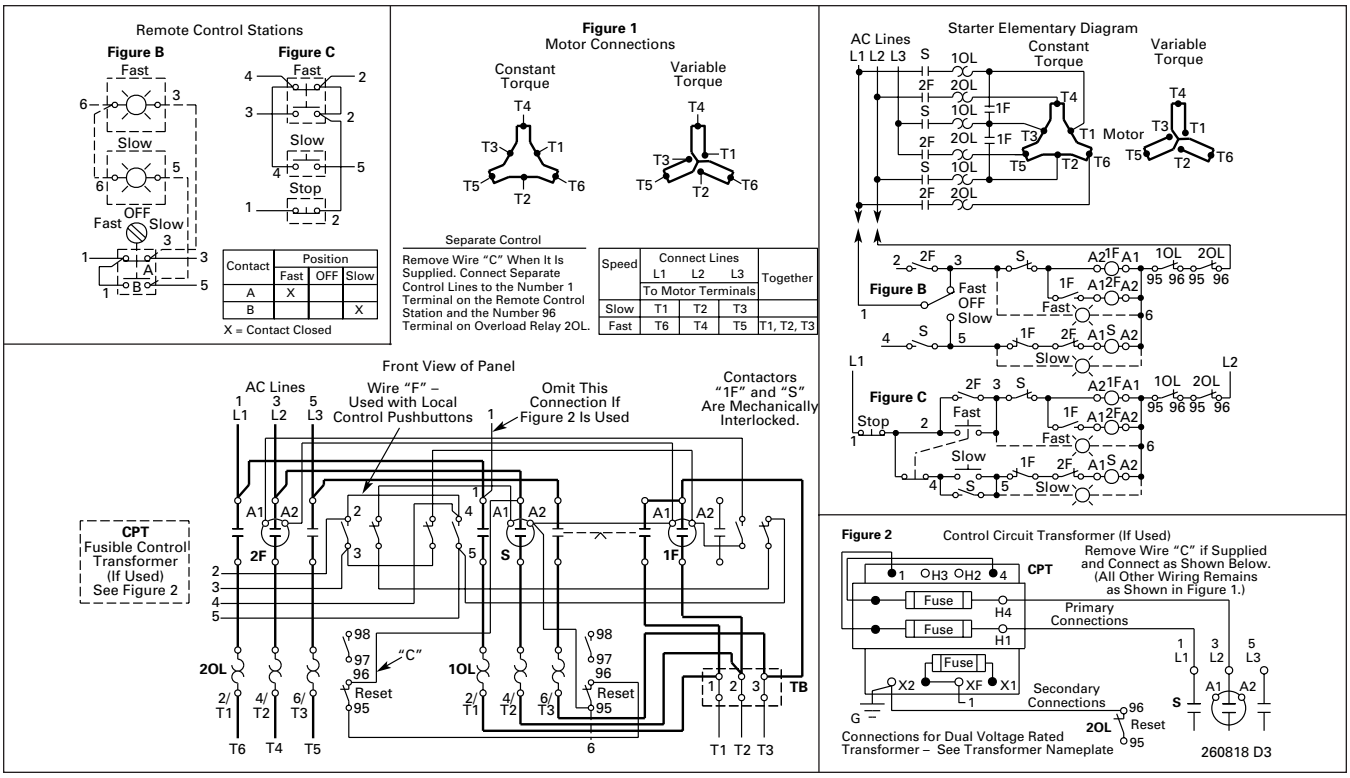


Figure 3-15. Multispeed — 2-Speed 1-Winding Constant or Variable Torque

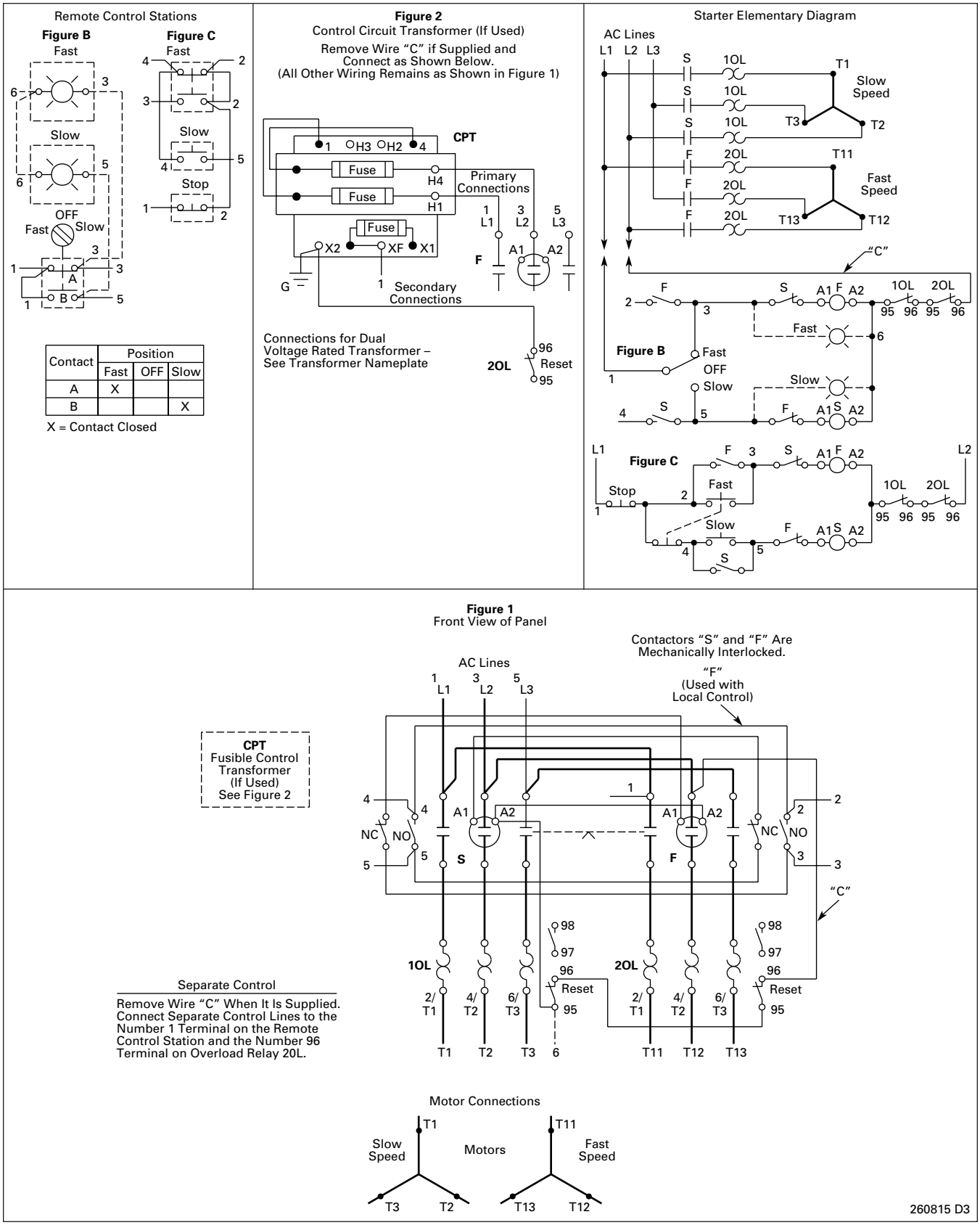


Figure 3-16. Multispeed — 2-Speed 2-Winding

3

Multispeed Cover Control

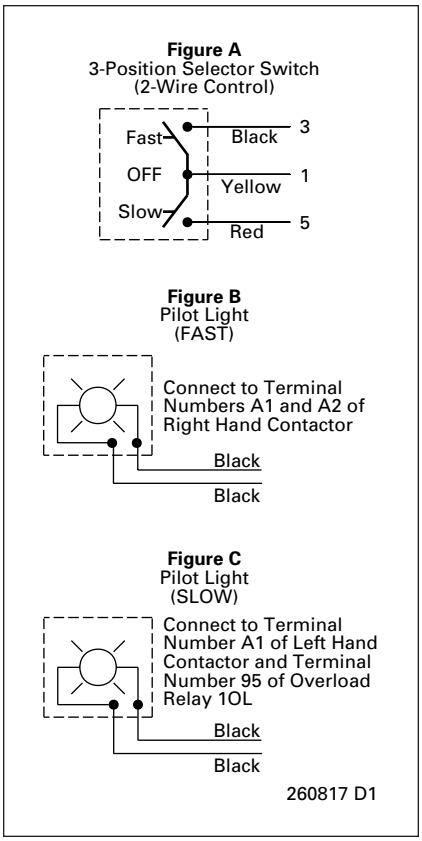


Figure 3-17. 2-Speed 2-Winding C400GK Control Options

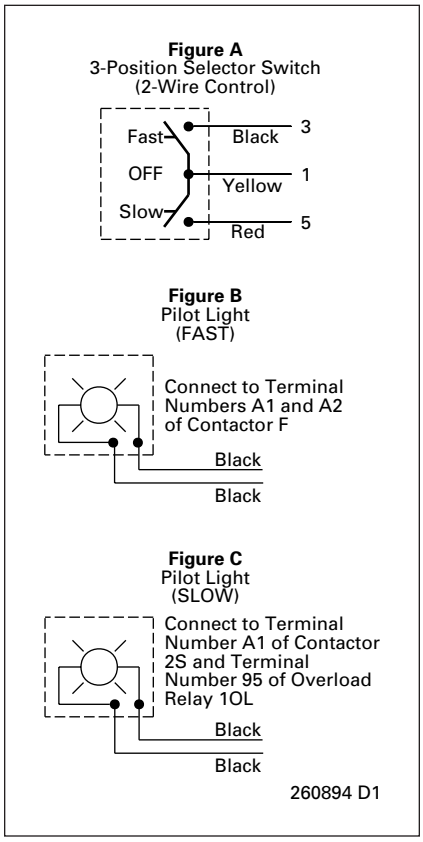


Figure 3-18. 2-Speed 1-Winding CH C400GK Control Options

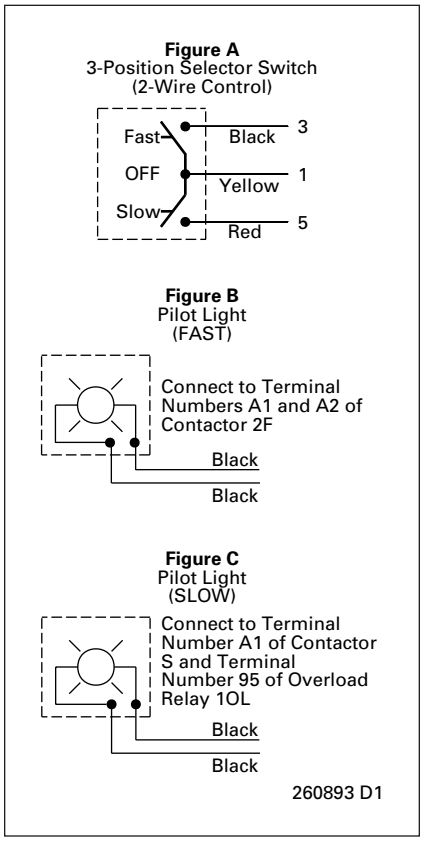


Figure 3-19. 2-Speed 1-Winding CT, VT C400GK Control Options

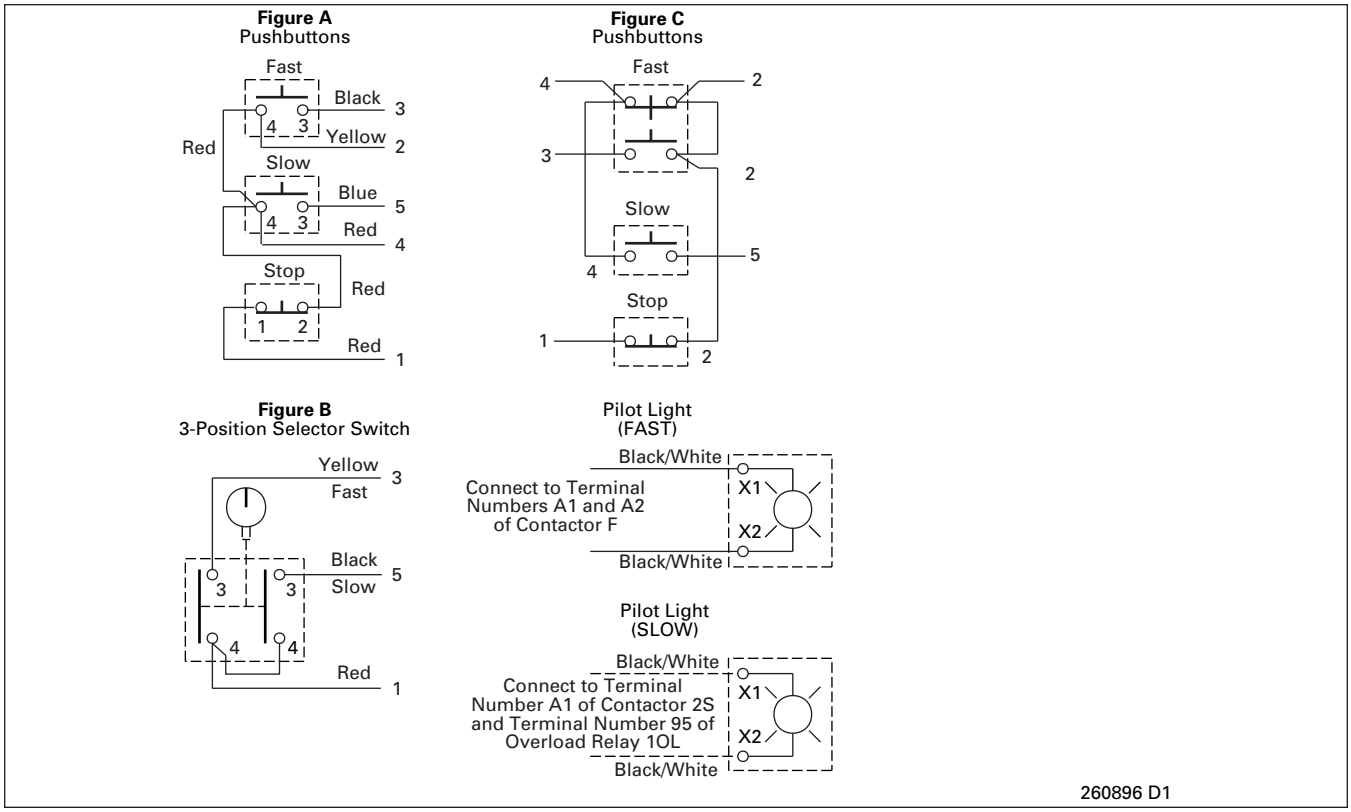


Figure 3-20. 2-Speed 1-Winding CH C400T Control Options

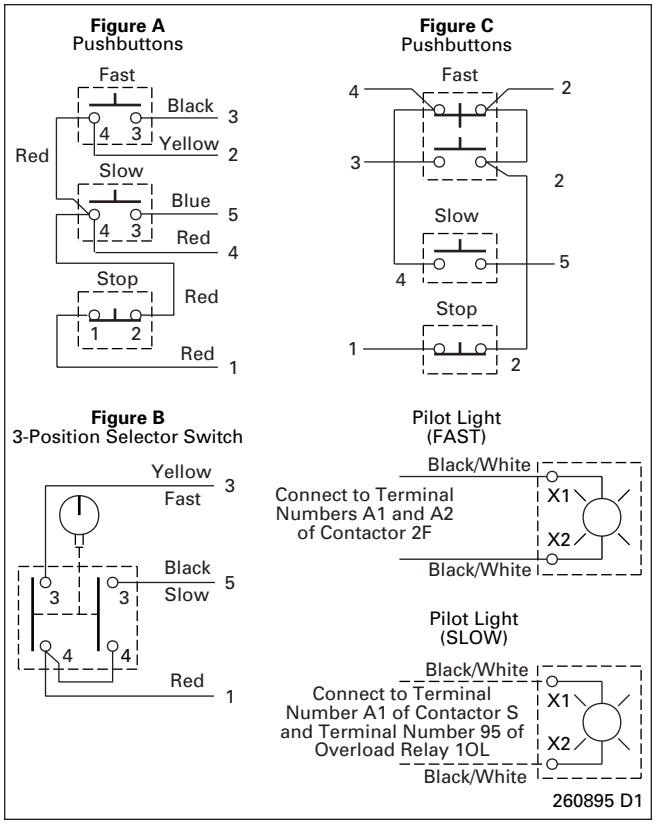


Figure 3-21. 2-Speed 1-Winding CT, VT C400T Control Options

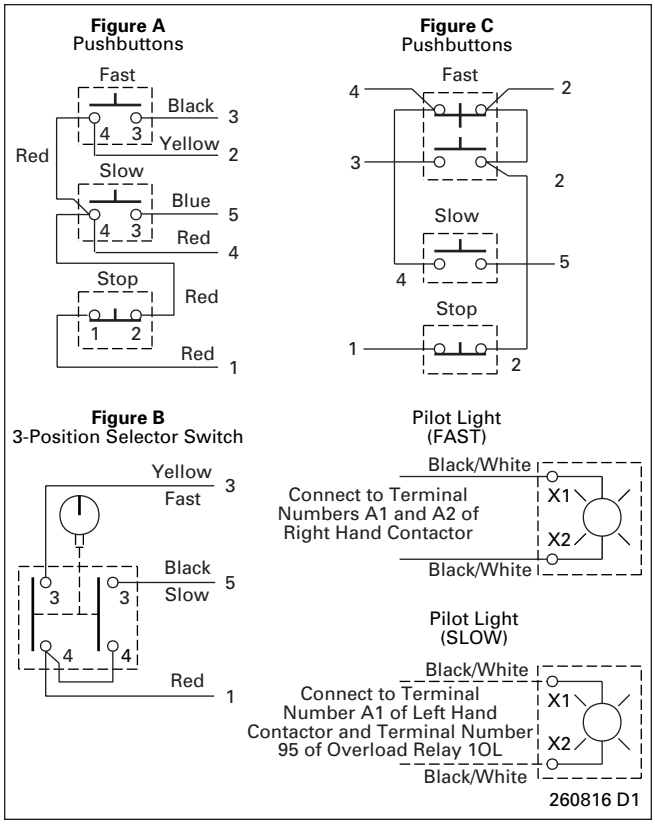


Figure 3-22. 2-Speed 2-Winding C400T Control Options

IEC Contactors & Starters

Contents

IEC Starters

ECX Enclosed Control

Product Description

Eaton's Cutler-Hammer® ***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 12V to 600V 50/60 Hz
- DC control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or non-reversing contactors and starters
- AC-3 contactor ratings to 1000A and AC-1 contactor ratings to 2000A
- Non-reversing starters to 650A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Large ambient temperature range, -25 to 50°C [-13 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 32A
- Plug-in accessories for reduced installation time
- Nonmetallic and metallic enclosures in 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 nonmetallic Halyester enclosure option

Short Circuit Ratings

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

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

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

① cUL Listing indicates appropriate CSA standard investigation.

Catalog Number Selection

Table 4-1. IEC *XT* Line Enclosed Control Catalog Numbering System

EC X 25 E 5 A A A -

Design
X = *XT* IEC

Class		Table
09 =	Non-combination Non-reversing Starter	**4-6**
10 =	Non-combination Reversing Starter	**4-7**
11 =	Non-combination Non-reversing Starter with CPT	**4-8**
19 =	Combination Non-reversing Starter — Fusible/Non-fusible Disconnect	**4-9**
20 =	Combination Reversing Starter — Fusible/Non-fusible Disconnect	**4-10**
25 =	Combination Non-reversing Starter — Circuit Breaker	**4-11**
26 =	Combination Reversing Starter — Circuit Breaker	**4-12**

Frame Size

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

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

Coil Voltage

A =	120V	**H** =	277V
B =	240V	**L** =	380V/50 Hz
C =	480V	**Q** =	24V DC
D =	600V	**T** =	24V AC
E =	208V		

Cover Control
Type 1 Non-comb. Starters see **Table 4-3**
All Other Starters see **Table 4-4**
E22 Style Comb. Starters see **Table 4-5**

Disconnect Fuse Clip Ratings
A = None
C = 30A J
E = 60A J
G = 100A J

HMCP Ratings
A = None
B = 3A
C = 7A
D = 15A
E = 30A
F = 50A
W = 70A
G = 100A
H = 150A
J = 250A

Overload Range
See **Table 4-2**

Modification Codes
See **Page 16-40**

① See **Table 1-2** on **Page 1-4** for Enclosure Type/IP Rating Cross-Reference.

Table 4-2. XTOB Overload Relays for Enclosed XT

FLA Ratings	Size B – E 7 – 15A	Size F – H 18 – 32A	Size J – L 40 – 65A	Size M – N 80 – 95A	Size P – Q 115 – 150A
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**	—	—
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**

② Size B – E is 10 – 16A.

Cover Control

Non-combination Starters

Control Power Transformer (CPT) may be required.

Combination Starters

4

- Cover control for Combination Starters uses 10250T style devices as standard.
- E22 style cover control options are available (**Table 4-5**).
- 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, **Page 16-40**.

Type 1 Cover Control

Table 4-3. Type 1 Non-combination Cover Control

Description	Factory Installed Flange Control ①	Field Installation Kits
	Position 9 Code	Catalog Number
Non-reversing		
No Cover Mounted Pilot Devices	A	C400GK0
START/STOP 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 2 Red Pilot Lights	C	C400GR14 ②
UP/STOP/DOWN Pushbuttons	E	C400GR2
with 2 Red Pilot Lights	F	C400GR24 ②
Two Red Pilot Lights	P	C400GK44 ②
One Green Pilot Light	Q	C400GK41 ②

① For more available factory installed flange control, see **Table 4-4**.

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

10250T Selector Switch

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

Description	Factory Installed Flange Control	Field Installation Kits
	Position 9 Code	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 ④
Green OFF	Q	C400T10 ④
Red RUN/Green OFF Pilot Lights	R	C400T11 ④
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 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	C400T15
with 2 Red Pilot Lights	J	—
with 2 Red/1 Green Pilot Lights	K	—
Two Red Pilot Lights	P	⑤
One Green Pilot Light	Q	C400T10 ④
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	—

③ For Type 1 Non-combination field installation kits, see **Table 4-3**.

④ 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	277V 60 Hz	H	480V 60 Hz	C
208V 60 Hz	E	380V 50 Hz	L	600V 60 Hz	D
240V 60 Hz	B				

⑤ Order Quantity (2) of **C400T10**.

E22 Selector Switch

Table 4-5. Type 1, 3R, 4X and 12 E22 Style Combination Starter Cover Control

Description	Factory Installed ① Position 9 Cover Control Code	Field Installation Kits Combination Only Catalog Number
Non-reversing		
No Cover Mounted Pilot Devices	**A**	**—**
START/STOP Pushbuttons (PB)	**B**	**CE400T01**
START/STOP PB & Red RUN Light	**C**	**CE400T02** ②
START/STOP PB, Red RUN, & Green STOPPED Light	**D**	**CE400T03** ②
HAND/OFF/AUTO Selector Switch (SS)	**H**	**CE400T04**
H-O-A SS & Red RUN Light	**J**	**CE400T05** ②
H-O-A SS, Red RUN, & Green STOPPED Light	**K**	**CE400T06** ②
Red RUN Pilot Light	**P**	**CE400T10** ②
Green Off Pilot Light	**Q**	**CE400T11** ②
Red RUN/Green OFF Pilot Light	**R**	**CE400T12** ②
ON/OFF Selector Switch (SS)	**S**	**CE400T07**
ON/OFF SS, Red RUN Light	**T**	**CE400T08** ②
ON/OFF SS, Red RUN, & Green STOPPED Light	**U**	**CE400T09** ②
Reversing		
No Cover Mounted Pilot Devices	**A**	**—**
FWD/REV/STOP Pushbuttons (PB)	**B**	**CE400T50**
FWD/REV/STOP PB + Red FWD & REV Lights	**C**	**CE400T51** ②
FWD/REV/STOP PB, Red FWD/REV, & Green STOPPED	**D**	**CE400T52** ②
FOR/OFF/REV Selector Switch (SS)	**H**	**CE400T53**
FOR/OFF/REV SS + Red FWD & REV Lights	**J**	**CE400T54** ②
FOR/OFF/REV SS, Red FWD/REV, & Green STOPPED	**K**	**CE400T55** ②
OPEN/OFF/CLOSE Selector Switch (SS)	**V**	**CE400T56**
OPEN/OFF/CLOSE SS + Red FWD & REV Lights	**W**	**CE400T57** ②
OPEN/OFF/CLOSE SS, Red FWD/REV, & Green STOPPED	**X**	**CE400T58** ②

① To include any of the above cover controls, place the control code character in position 9 of your Catalog Number and add Mod Code **C29**.
Example: EXE19B4A**D**A_-**C29**.
Full voltage non-reversing fusible starter with START/STOP pushbutton with red RUN and green OFF pilot lights.

② Suffix for lights (required for field installed kits only) in the table below:

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

Product Selection

Table 4-6. Class ECX09 — Non-combination Non-reversing Starter

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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	—	10	600	ECX09G1DAA-_	ECX09G4DAA-_	ECX09G8DAA-_	XTAE025C10D_
Frame 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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX09B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-6. Class ECX09 — Non-combination Non-reversing Starter (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX09B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-7. Class ECX10 — Non-combination Reversing Starter

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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_
Frame 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	—	10	600	ECX10G1DAA-_	ECX10G4DAA-_	ECX10G8DAA-_	XTAR025C10D_
Frame 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_

① 1 hp = 0.746 kW.

② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.

③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX10B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-7. Class ECX10 — Non-combination Reversing Starter (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame 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_**
Frame 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_**
Frame 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_**
Frame 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_**
Frame 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_**
Frame 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_**
Frame 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_**

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX10B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-8. Class ECX11 — Non-combination Non-reversing Starter with CPT

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame B								
7	115	1/4	—	120	ECX11B1AAA-_	ECX11B4AAA-_	ECX11B8AAA-_	XTAE007B10A_
	208	3/4	1-1/2	208	ECX11B1EAA-_	ECX11B4EAA-_	ECX11B8EAA-_	XTAE007B10E_
	230	1	2	240	ECX11B1BAA-_	ECX11B4BAA-_	ECX11B8BAA-_	XTAE007B10B_
	380	—	3	380/50 Hz	ECX11B1LAA-_	ECX11B4LAA-_	ECX11B8LAA-_	XTAE007B10L_
	460	—	3	480	ECX11B1CAA-_	ECX11B4CAA-_	ECX11B8CAA-_	XTAE007B10C_
	575	—	5	600	ECX11B1DAA-_	ECX11B4DAA-_	ECX11B8DAA-_	XTAE007B10D_
Frame C								
9	115	1/2	—	120	ECX11C1AAA-_	ECX11C4AAA-_	ECX11C8AAA-_	XTAE009B10A_
	208	1	2	208	ECX11C1EAA-_	ECX11C4EAA-_	ECX11C8EAA-_	XTAE009B10E_
	230	1-1/2	3	240	ECX11C1BAA-_	ECX11C4BAA-_	ECX11C8BAA-_	XTAE009B10B_
	380	—	5	380/50 Hz	ECX11C1LAA-_	ECX11C4LAA-_	ECX11C8LAA-_	XTAE009B10L_
	460	—	5	480	ECX11C1CAA-_	ECX11C4CAA-_	ECX11C8CAA-_	XTAE009B10C_
	575	—	7-1/2	600	ECX11C1DAA-_	ECX11C4DAA-_	ECX11C8DAA-_	XTAE009B10D_
Frame D								
12	115	1/2	—	120	ECX11D1AAA-_	ECX11D4AAA-_	ECX11D8AAA-_	XTAE012B10A_
	208	1-1/2	3	208	ECX11D1EAA-_	ECX11D4EAA-_	ECX11D8EAA-_	XTAE012B10E_
	230	2	3	240	ECX11D1BAA-_	ECX11D4BAA-_	ECX11D8BAA-_	XTAE012B10B_
	380	—	5	380/50 Hz	ECX11D1LAA-_	ECX11D4LAA-_	ECX11D8LAA-_	XTAE012B10L_
	460	—	7-1/2	480	ECX11D1CAA-_	ECX11D4CAA-_	ECX11D8CAA-_	XTAE012B10C_
	575	—	10	600	ECX11D1DAA-_	ECX11D4DAA-_	ECX11D8DAA-_	XTAE012B10D_
Frame E								
15	115	3/4	—	120	ECX11E1AAA-_	ECX11E4AAA-_	ECX11E8AAA-_	XTAE015B10A_
	208	2	3	208	ECX11E1EAA-_	ECX11E4EAA-_	ECX11E8EAA-_	XTAE015B10E_
	230	2	3	240	ECX11E1BAA-_	ECX11E4BAA-_	ECX11E8BAA-_	XTAE015B10B_
	380	—	5	380/50 Hz	ECX11E1LAA-_	ECX11E4LAA-_	ECX11E8LAA-_	XTAE015B10L_
	460	—	7-1/2	480	ECX11E1CAA-_	ECX11E4CAA-_	ECX11E8CAA-_	XTAE015B10C_
	575	—	10	600	ECX11E1DAA-_	ECX11E4DAA-_	ECX11E8DAA-_	XTAE015B10D_
Frame F								
18	115	2	—	120	ECX11F1AAA-_	ECX11F4AAA-_	ECX11F8AAA-_	XTAE018C10A_
	208	2	5	208	ECX11F1EAA-_	ECX11F4EAA-_	ECX11F8EAA-_	XTAE018C10E_
	230	3	5	240	ECX11F1BAA-_	ECX11F4BAA-_	ECX11F8BAA-_	XTAE018C10B_
	380	—	7-1/2	380/50 Hz	ECX11F1LAA-_	ECX11F4LAA-_	ECX11F8LAA-_	XTAE018C10L_
	460	—	10	480	ECX11F1CAA-_	ECX11F4CAA-_	ECX11F8CAA-_	XTAE018C10C_
	575	—	15	600	ECX11F1DAA-_	ECX11F4DAA-_	ECX11F8DAA-_	XTAE018C10D_
Frame G								
25	115	2	—	120	ECX11G1AAA-_	ECX11G4AAA-_	ECX11G8AAA-_	XTAE025C10A_
	208	3	7-1/2	208	ECX11G1EAA-_	ECX11G4EAA-_	ECX11G8EAA-_	XTAE025C10E_
	230	5	7-1/2	240	ECX11G1BAA-_	ECX11G4BAA-_	ECX11G8BAA-_	XTAE025C10B_
	380	—	10	380/50 Hz	ECX11G1LAA-_	ECX11G4LAA-_	ECX11G8LAA-_	XTAE025C10L_
	460	—	15	480	ECX11G1CAA-_	ECX11G4CAA-_	ECX11G8CAA-_	XTAE025C10C_
	575	—	20	600	ECX11G1DAA-_	ECX11G4DAA-_	ECX11G8DAA-_	XTAE025C10D_
Frame H								
32	115	3	—	120	ECX11H1AAA-_	ECX11H4AAA-_	ECX11H8AAA-_	XTAE032C10A_
	208	5	10	208	ECX11H1EAA-_	ECX11H4EAA-_	ECX11H8EAA-_	XTAE032C10E_
	230	5	10	240	ECX11H1BAA-_	ECX11H4BAA-_	ECX11H8BAA-_	XTAE032C10B_
	380	—	15	380/50 Hz	ECX11H1LAA-_	ECX11H4LAA-_	ECX11H8LAA-_	XTAE032C10L_
	460	—	20	480	ECX11H1CAA-_	ECX11H4CAA-_	ECX11H8CAA-_	XTAE032C10C_
	575	—	25	600	ECX11H1DAA-_	ECX11H4DAA-_	ECX11H8DAA-_	XTAE032C10D_

① 1 hp = 0.746 kW.

② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.

③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX11B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-8. Class ECX11 — Non-combination Non-reversing Starter with CPT (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame J								
40	115	3	—	120	**ECX11J1AAA-_**	**ECX11J4AAA-_**	**ECX11J8AAA-_**	**XTAE040D00A_**
	208	5	10	208	**ECX11J1EAA-_**	**ECX11J4EAA-_**	**ECX11J8EAA-_**	**XTAE040D00E_**
	230	7-1/2	15	240	**ECX11J1BAA-_**	**ECX11J4BAA-_**	**ECX11J8BAA-_**	**XTAE040D00B_**
	380	—	15	380/50 Hz	**ECX11J1LAA-_**	**ECX11J4LAA-_**	**ECX11J8LAA-_**	**XTAE040D00L_**
	460	—	30	480	**ECX11J1CAA-_**	**ECX11J4CAA-_**	**ECX11J8CAA-_**	**XTAE040D00C_**
	575	—	40	600	**ECX11J1DAA-_**	**ECX11J4DAA-_**	**ECX11J8DAA-_**	**XTAE040D00D_**
Frame K								
50	115	3	—	120	**ECX11K1AAA-_**	**ECX11K4AAA-_**	**ECX11K8AAA-_**	**XTAE050D00A_**
	208	7-1/2	15	208	**ECX11K1EAA-_**	**ECX11K4EAA-_**	**ECX11K8EAA-_**	**XTAE050D00E_**
	230	10	20	240	**ECX11K1BAA-_**	**ECX11K4BAA-_**	**ECX11K8BAA-_**	**XTAE050D00B_**
	380	—	20	380/50 Hz	**ECX11K1LAA-_**	**ECX11K4LAA-_**	**ECX11K8LAA-_**	**XTAE050D00L_**
	460	—	40	480	**ECX11K1CAA-_**	**ECX11K4CAA-_**	**ECX11K8CAA-_**	**XTAE050D00C_**
	575	—	50	600	**ECX11K1DAA-_**	**ECX11K4DAA-_**	**ECX11K8DAA-_**	**XTAE050D00D_**
Frame L								
65	115	5	—	120	**ECX11L1AAA-_**	**ECX11L4AAA-_**	**ECX11L8AAA-_**	**XTAE065D00A_**
	208	10	20	208	**ECX11L1EAA-_**	**ECX11L4EAA-_**	**ECX11L8EAA-_**	**XTAE065D00E_**
	230	15	25	240	**ECX11L1BAA-_**	**ECX11L4BAA-_**	**ECX11L8BAA-_**	**XTAE065D00B_**
	380	—	30	380/50 Hz	**ECX11L1LAA-_**	**ECX11L4LAA-_**	**ECX11L8LAA-_**	**XTAE065D00L_**
	460	—	50	480	**ECX11L1CAA-_**	**ECX11L4CAA-_**	**ECX11L8CAA-_**	**XTAE065D00C_**
	575	—	60	600	**ECX11L1DAA-_**	**ECX11L4DAA-_**	**ECX11L8DAA-_**	**XTAE065D00D_**
Frame M								
80	115	7-1/2	—	120	**ECX11M1AAA-_**	**ECX11M4AAA-_**	**ECX11M8AAA-_**	**XTAE080F00A_**
	208	15	25	208	**ECX11M1EAA-_**	**ECX11M4EAA-_**	**ECX11M8EAA-_**	**XTAE080F00E_**
	230	15	30	240	**ECX11M1BAA-_**	**ECX11M4BAA-_**	**ECX11M8BAA-_**	**XTAE080F00B_**
	380	—	50	380/50 Hz	**ECX11M1LAA-_**	**ECX11M4LAA-_**	**ECX11M8LAA-_**	**XTAE080F00L_**
	460	—	60	480	**ECX11M1CAA-_**	**ECX11M4CAA-_**	**ECX11M8CAA-_**	**XTAE080F00C_**
	575	—	75	600	**ECX11M1DAA-_**	**ECX11M4DAA-_**	**ECX11M8DAA-_**	**XTAE080F00D_**
Frame N								
95	115	7-1/2	—	120	**ECX11N1AAA-_**	**ECX11N4AAA-_**	**ECX11N8AAA-_**	**XTAE095F00A_**
	208	15	25	208	**ECX11N1EAA-_**	**ECX11N4EAA-_**	**ECX11N8EAA-_**	**XTAE095F00E_**
	230	15	40	240	**ECX11N1BAA-_**	**ECX11N4BAA-_**	**ECX11N8BAA-_**	**XTAE095F00B_**
	380	—	60	380/50 Hz	**ECX11N1LAA-_**	**ECX11N4LAA-_**	**ECX11N8LAA-_**	**XTAE095F00L_**
	460	—	75	480	**ECX11N1CAA-_**	**ECX11N4CAA-_**	**ECX11N8CAA-_**	**XTAE095F00C_**
	575	—	100	600	**ECX11N1DAA-_**	**ECX11N4DAA-_**	**ECX11N8DAA-_**	**XTAE095F00D_**
Frame P								
115	115	10	—	120	**ECX11P1AAA-_**	**ECX11P4AAA-_**	**ECX11P8AAA-_**	**XTAE115G00A_**
	208	25	40	208	**ECX11P1EAA-_**	**ECX11P4EAA-_**	**ECX11P8EAA-_**	**XTAE115G00E_**
	230	25	50	240	**ECX11P1BAA-_**	**ECX11P4BAA-_**	**ECX11P8BAA-_**	**XTAE115G00B_**
	380	—	60	380/50 Hz	**ECX11P1LAA-_**	**ECX11P4LAA-_**	**ECX11P8LAA-_**	**XTAE115G00L_**
	460	—	100	480	**ECX11P1CAA-_**	**ECX11P4CAA-_**	**ECX11P8CAA-_**	**XTAE115G00C_**
	575	—	125	600	**ECX11P1DAA-_**	**ECX11P4DAA-_**	**ECX11P8DAA-_**	**XTAE115G00D_**
Frame Q								
150	115	15	—	120	**ECX11Q1AAA-_**	**ECX11Q4AAA-_**	**ECX11Q8AAA-_**	**XTAE150G00A_**
	208	25	40	208	**ECX11Q1EAA-_**	**ECX11Q4EAA-_**	**ECX11Q8EAA-_**	**XTAE150G00E_**
	230	30	60	240	**ECX11Q1BAA-_**	**ECX11Q4BAA-_**	**ECX11Q8BAA-_**	**XTAE150G00B_**
	380	—	60	380/50 Hz	**ECX11Q1LAA-_**	**ECX11Q4LAA-_**	**ECX11Q8LAA-_**	**XTAE150G00L_**
	460	—	125	480	**ECX11Q1CAA-_**	**ECX11Q4CAA-_**	**ECX11Q8CAA-_**	**XTAE150G00C_**
	575	—	150	600	**ECX11Q1DAA-_**	**ECX11Q4DAA-_**	**ECX11Q8DAA-_**	**XTAE150G00D_**

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX11B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

4

Table 4-9. Class ECX19 — Combination Non-reversing Starter — Fusible/Non-fusible Disconnect

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame B									
7	—	—	—	—	30A	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_
Frame C									
9	—	—	—	—	30A	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_
Frame D									
12	—	—	—	—	30A	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_
Frame E									
15	—	—	—	—	30A	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_
Frame F									
18	—	—	—	—	30A	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_
Frame G									
25	—	—	—	—	30A	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	—	10	600		ECX19G1DAC-_	ECX19G4DAC-_	ECX19G8DAC-_	XTAE025C10D_
Frame H									
32	—	—	—	—	60A	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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX19B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-9. Class ECX19 — Combination Non-reversing Starter — Fusible/Non-fusible Disconnect (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame J									
40	—	—	—	—	60A	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_
Frame K									
50	—	—	—	—	100A	ECX19K1AAA-_	ECX19K4AAA-_	ECX19K8AAA-_	XTAE050D00A_
	115	3	—	120		ECX19K1AAG-_	ECX19K4AAG-_	ECX19K8AAG-_	XTAE050D00A_
	208	7-1/2	15	208		ECX19K1EAG-_	ECX19K4EAG-_	ECX19K8EAG-_	XTAE050D00E_
	230	10	20	240		ECX19K1BAG-_	ECX19K4BAG-_	ECX19K8BAG-_	XTAE050D00B_
	380	—	20	380/50 Hz		ECX19K1LAG-_	ECX19K4LAG-_	ECX19K8LAG-_	XTAE050D00L_
	460	—	40	480		ECX19K1CAG-_	ECX19K4CAG-_	ECX19K8CAG-_	XTAE050D00C_
	575	—	50	600		ECX19K1DAG-_	ECX19K4DAG-_	ECX19K8DAG-_	XTAE050D00D_
Frame L									
65	—	—	—	—	100A	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_
Frame M									
80	—	—	—	—	100A	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_
Frame N ⑥									
95	—	—	—	—	⑥	ECX19N1AAA-_	ECX19N4AAA-_	ECX19N8AAA-_	XTAE095F00A_
	115	7-1/2	—	120		ECX19N1AAA-_	ECX19N4AAA-_	ECX19N8AAA-_	XTAE095F00A_
	208	15	25	208		ECX19N1EAA-_	ECX19N4EAA-_	ECX19N8EAA-_	XTAE095F00E_
	230	15	40	240		ECX19N1BAA-_	ECX19N4BAA-_	ECX19N8BAA-_	XTAE095F00B_
	380	—	60	380/50 Hz		ECX19N1LAA-_	ECX19N4LAA-_	ECX19N8LAA-_	XTAE095F00L_
	460	—	75	480		ECX19N1CAA-_	ECX19N4CAA-_	ECX19N8CAA-_	XTAE095F00C_
	575	—	100	600		ECX19N1DAA-_	ECX19N4DAA-_	ECX19N8DAA-_	XTAE095F00D_
Frame P ⑥									
105	—	—	—	—	⑥	ECX19P1AAA-_	ECX19P4AAA-_	ECX19P8AAA-_	XTAE115G00A_
	115	10	—	120		ECX19P1AAA-_	ECX19P4AAA-_	ECX19P8AAA-_	XTAE115G00A_
	208	25	30	208		ECX19P1EAA-_	ECX19P4EAA-_	ECX19P8EAA-_	XTAE115G00E_
	230	25	40	240		ECX19P1BAA-_	ECX19P4BAA-_	ECX19P8BAA-_	XTAE115G00B_
	380	—	60	380/50 Hz		ECX19P1LAA-_	ECX19P4LAA-_	ECX19P8LAA-_	XTAE115G00L_
	460	—	75	480		ECX19P1CAA-_	ECX19P4CAA-_	ECX19P8CAA-_	XTAE115G00C_
	575	—	100	600		ECX19P1DAA-_	ECX19P4DAA-_	ECX19P8DAA-_	XTAE115G00D_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX19B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.
⑥ Non-fused Disconnect only.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-10. Class ECX20 — Combination Reversing Starter — Fusible/Non-fusible Disconnect

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame B									
7	—	—	—	—	30A	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_
Frame C									
9	—	—	—	—	30A	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_
Frame D									
12	—	—	—	—	30A	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_
Frame E									
15	—	—	—	—	30A	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_
Frame F									
18	—	—	—	—	30A	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_
Frame G									
25	—	—	—	—	30A	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	—	10	600		ECX20G1DAC-_	ECX20G4DAC-_	ECX20G8DAC-_	XTAR025C10D_
Frame H									
32	—	—	—	—	60A	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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX20B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Table 4-10. Class ECX20 — Combination Reversing Starter — Fusible/Non-fusible Disconnect (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame J									
40	—	—	—	—	60A	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_
Frame K									
50	—	—	—	—	100A	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_
Frame L									
65	—	—	—	—	100A	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_
Frame M									
80	—	—	—	—	100A	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_
Frame 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_
Frame 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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX20B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.
⑥ Non-fused Disconnect only.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

4

Table 4-11. Class ECX25 — Combination Non-reversing Starter — Circuit Breaker

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	HMCP	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame B									
7	115	1/4	—	120	7A	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_
Frame C									
9	115	1/2	—	120	15A	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_
Frame D									
12	115	1/2	—	120	15A	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_
Frame E									
15	115	3/4	—	120	30A	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_
Frame F									
18	115	2	—	120	30A	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_
Frame G									
25	115	2	—	120	50A	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	—	10	600		ECX25G1DAF-_	ECX25G4DAF-_	ECX25G8DAF-_	XTAE025C10D_
Frame H									
32	115	3	—	120	50A	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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX25B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-11. Class ECX25 — Combination Non-reversing Starter — Circuit Breaker (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	HMCP	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame J									
40	115	3	—	120	50A	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_
Frame K									
50	115	3	—	120	70A	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_
Frame L									
65	115	5	—	120	70A	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_
Frame M									
80	115	7-1/2	—	120	100A	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_
Frame N									
95	115	7-1/2	—	120	100A	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_
Frame P									
115	115	10	—	120	150A	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_
Frame Q									
125	115	15	—	120	150A	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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX25B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

4

Table 4-12. Class ECX26 — Combination Reversing Starter — Circuit Breaker

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	HMCP	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame B									
7	115	1/4	—	120	7A	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_
Frame C									
9	115	1/2	—	120	15A	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_
Frame D									
12	115	1/2	—	120	15A	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_
Frame E									
15	115	3/4	—	120	30A	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_
Frame F									
18	115	2	—	120	30A	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_
Frame G									
25	115	2	—	120	50A	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	—	10	600		ECX26G1DAF-_	ECX26G4DAF-_	ECX26G8DAF-_	XTAR025C10D_
Frame H									
32	115	3	—	120	50A	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_

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX26B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

Table 4-12. Class ECX26 — Combination Reversing Starter — Circuit Breaker (Continued)

Amps	Maximum hp ①			Coil Voltage @ 60 Hz ②	HMCP	Type 1/IP23	Type 4X/IP66 ④	Type 12/IP65	Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Frame J									
40	115	3	—	120	50A	**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_**
Frame K									
50	115	3	—	120	70A	**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_**
Frame L									
65	115	5	—	120	100A	**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_**
Frame M									
80	115	7-1/2	—	120	100A	**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_**
Frame N									
95	115	7-1/2	—	120	100A	**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_**
Frame P									
115	115	10	—	120	150A	**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_**

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 4-2**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX26B**4**AAA-_. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
⑤ Contact factory for other voltage options.

Cover Control ..... **Page 4-4**
Wiring Diagrams ..... **Page 4-20**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-23**
Modification Codes ..... **Page 16-40**
Technical Data ..... **Page 18-19**

4

Wiring Diagrams

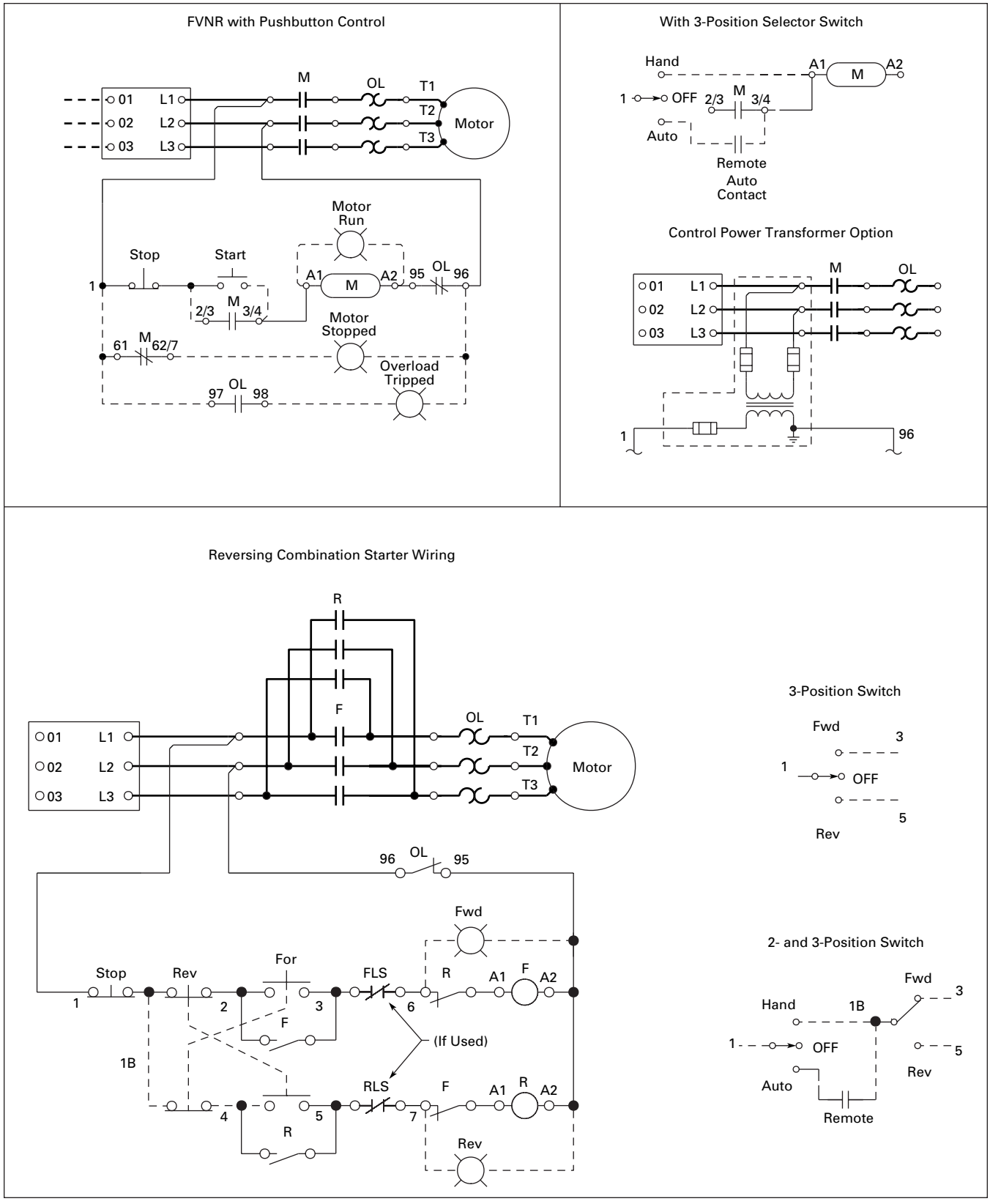


Figure 4-1. Typical Wiring Diagram

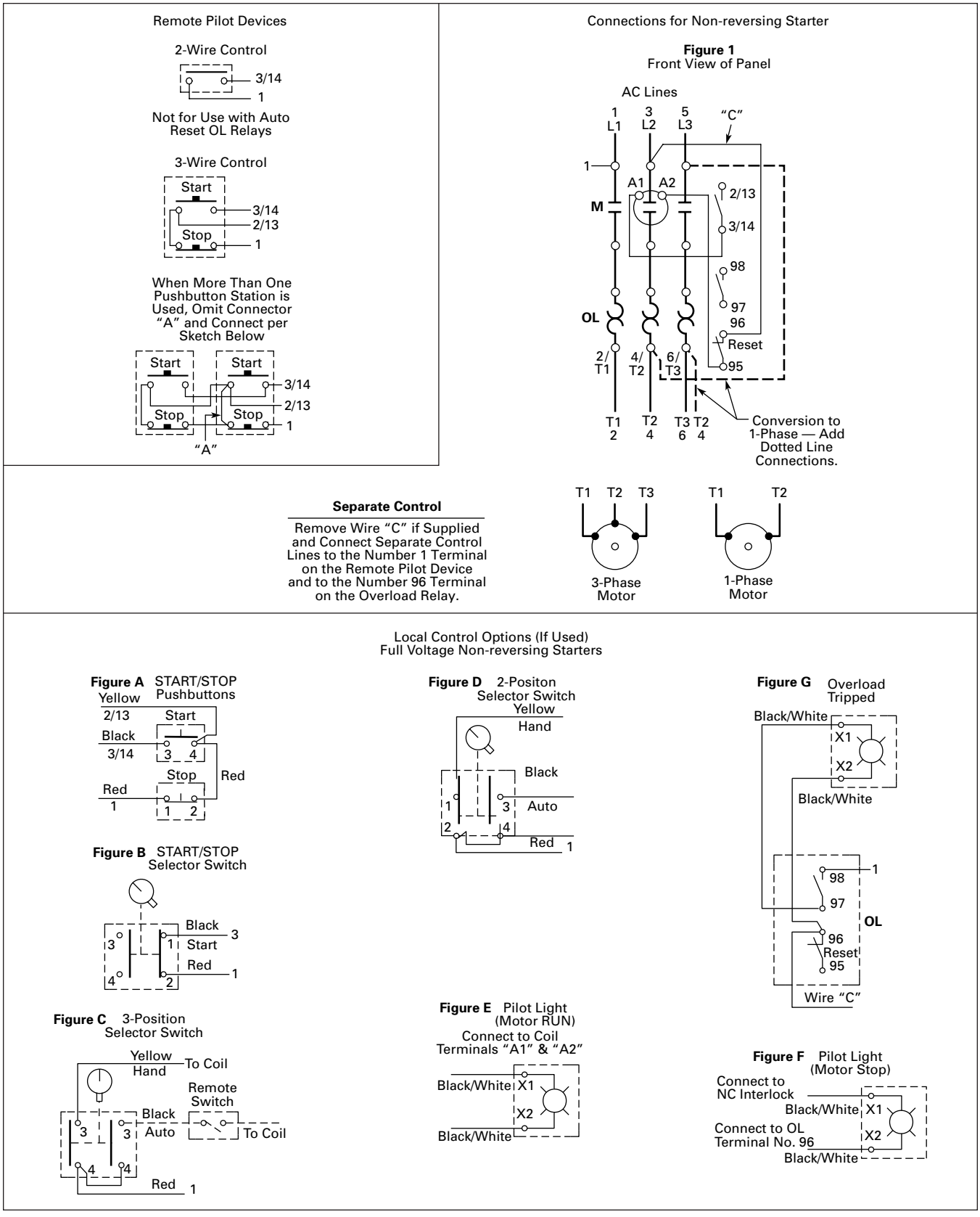


Figure 4-2. Typical Wiring Diagram — Non-combination Starters (Non-reversing)

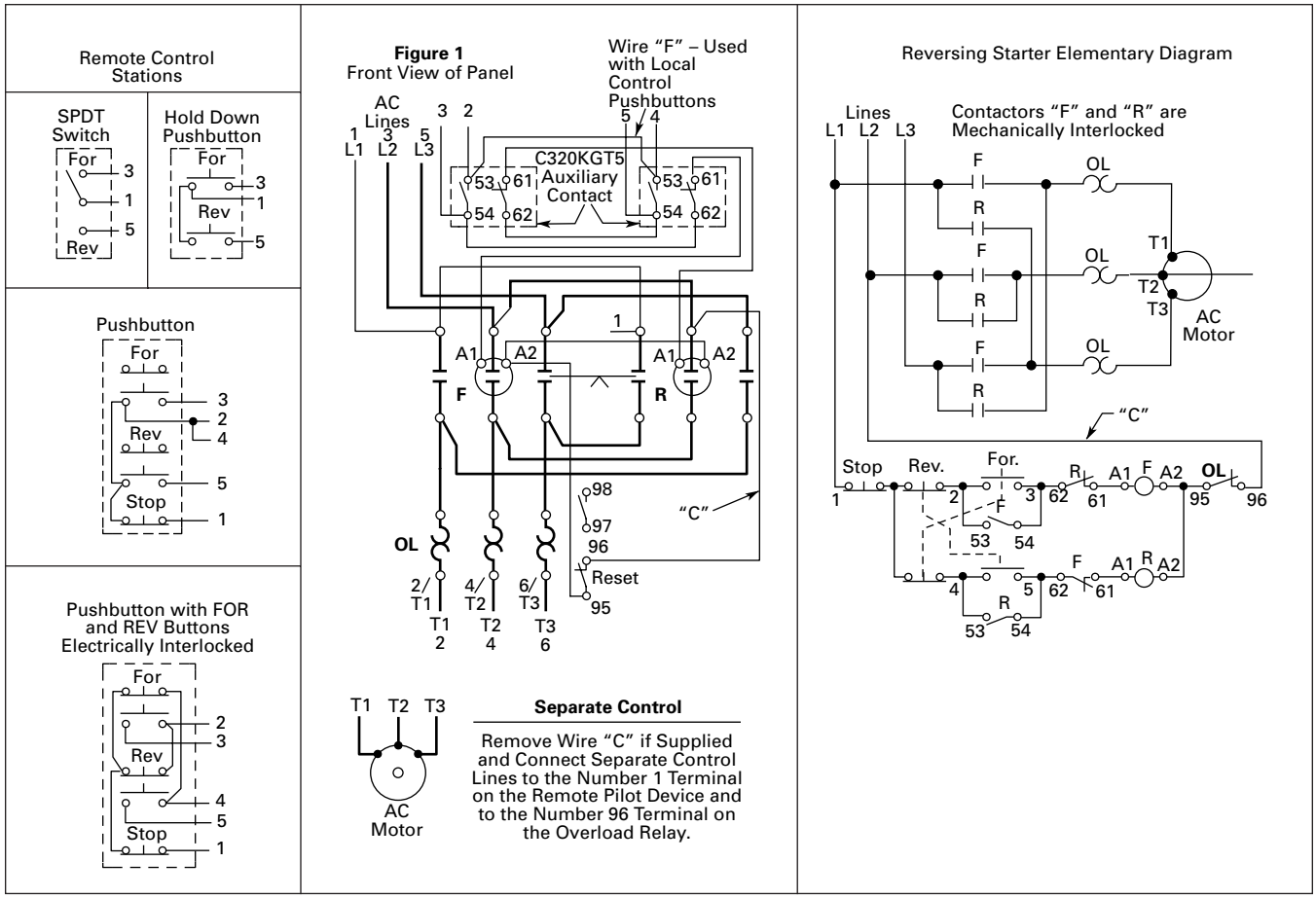


Figure 4-3. Typical Wiring Diagram — Non-combination Starters (Reversing)

Enclosed XT CMC

Product Description

Eaton's Cutler-Hammer® ***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 0.11A to 32A
- 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**.
- Nonmetallic and metallic enclosures in Types 1 (IP23), 4 (IP66), 4X (IP66) and 12 (IP65)
- Opaque (standard) or clear covers available on nonmetallic Halyester enclosure

Short Circuit Ratings

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

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

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

4

Catalog Number Selection

Table 4-13. Combination Motor Controllers — Enclosed Control Catalog Numbering System

EC X 76 D 4 B A A -

Design
X = *XT* IEC

Class	Table
76 = Combination Motor Controller (CMC) — Non-reversing Starter	**4-17**
77 = Combination Motor Controller (CMC) — Non-reversing Starter with CPT	**4-18**
78 = Combination Motor Controller (CMC) — Reversing Starter	**4-19**

Frame Size
D = 12A
H = 32A

Enclosure Type/IP Ratings ①
1 = Type 1 — General Purpose
3 = Type 4 — Painted Steel
4 = Type 4X — Watertight (304-Grade SS)
5 = Type 4X — Watertight Nonmetallic
8 = Type 12 — Dust-Tight

Coil Voltage
A = 120V
B = 240V
C = 480V
D = 600V
E = 208V
L = 380V/50 Hz

Cover Control
See **Table 4-15**

Disconnect Ratings
A = None

MMP Overload Range
See **Table 4-14**

Modification Codes
See **Page 16-40**

① See **Table 1-2** on **Page 1-4** for Enclosure Type/IP Rating Cross-Reference.

Table 4-14. XTPR MMP Amperage Ranges

XT MMP Catalog Number	Overload Amp Range	Enclosed Control Suffix Code
Frame B Rotary MMP		
XTPRP16BC1	.1 – .16	**A**
XTPRP25BC1	.16 – .25	**B**
XTPRP40BC1	.25 – .4	**C**
XTPRP63BC1	.4 – .63	**D**
XTPR001BC1	.63 – 1	**E**
XTPR1P6BC1	1 – 1.6	**F**
XTPR2P5BC1	1.6 – 2.5	**G**
XTPR004BC1	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**

Cover Control

- Cover control for Combination Motor Control Starters uses the 10250T (30 mm) family.
- E22 style cover control is an available option
- 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, **Page 16-40**.

Table 4-15. 10250T Style Combination Cover Control

Description	Factory Installed Flange Control	Field Installation 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**	—
Reversing		
No Cover Mounted Pilot Devices	**A**	—
FOR/REV/STOP Pushbuttons	**B**	**C400T6**
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**	**C400T15**
with 2 Red Pilot Lights	**J**	—
with 2 Red/1 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 2 Red Pilot Lights	**W**	—
with 2 Red/1 Green Pilot Lights	**X**	—

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**

② Order Quantity (2) of **C400T10**.

Table 4-16. E22 Style Combination Motor Controller Cover Control

Description	Factory Installed ① Position 9 Cover Control Code	Field Kits Combination Only Catalog Number
Non-reversing		
START/STOP Pushbuttons (PB)	**B**	**CE400T01**
START/STOP PB & Red RUN Light	**C**	**CE400T02** ②
START/STOP PB, Red RUN, & Green STOPPED Light	**D**	**CE400T03** ②
HAND/OFF/AUTO Selector Switch (SS)	**H**	**CE400T04**
H-O-A SS & Red RUN Light	**J**	**CE400T05** ②
H-O-A SS, Red RUN, & Green STOPPED Light	**K**	**CE400T06** ②
Red RUN Pilot Light	**P**	**CE400T10** ②
Green Off Pilot Light	**Q**	**CE400T11** ②
Red RUN/Green OFF Pilot Light	**R**	**CE400T12** ②
ON/OFF Selector Switch (SS)	**S**	**CE400T07**
ON/OFF SS, Red RUN Light	**T**	**CE400T08** ②
ON/OFF SS, Red RUN, & Green STOPPED Light	**U**	**CE400T09** ②
Reversing		
FWD/REV/STOP Pushbuttons (PB)	**B**	**CE400T50**
FWD/REV/STOP PB + Red FWD & REV Lights	**C**	**CE400T51** ②
FWD/REV/STOP PB, Red FWD/REV, & Green STOPPED	**D**	**CE400T52** ②
FOR/OFF/REV Selector Switch (SS)	**H**	**CE400T53**
FOR/OFF/REV SS + Red FWD & REV Lights	**J**	**CE400T54** ②
FOR/OFF/REV SS, Red FWD/REV, & Green STOPPED	**K**	**CE400T55** ②
OPEN/OFF/CLOSE Selector Switch (SS)	**V**	**CE400T56**
OPEN/OFF/CLOSE SS + Red FWD & REV Lights	**W**	**CE400T57** ②
OPEN/OFF/CLOSE SS, Red FWD/REV, & Green STOPPED	**X**	**CE400T58** ②

① To include any of the above cover controls, place the control code character in position 9 of your Catalog Number and add Mod Code **P74**. Example: ECX77H1A**D**A-**P74**. Full voltage non-reversing fusible starter with interchangeable heater OLR and START/STOP pushbutton with red RUN and green OFF pilot lights.

② Suffix for lights (required for field installed kits only) in the table below:

Rating	Catalog Suffix	Rating	Catalog Suffix
120V 60 Hz	**A**	277V 60 Hz	**H**
208V 60 Hz	**E**	380V 50 Hz	**L**
240V 60 Hz	**B**	460V 60 Hz	**C**
		600V 60 Hz	**D**

Note: All CMC design built in enclosure Size 5 do not contain a CPT. In order to supply internal power for cover control, the enclosure must increase to Size 6. If control power is to be supplied from a source outside of the enclosure, there is no need to oversize. Note that 32A and less FVNR designs permit room for a 24V DC power supply to be installed.

Product Selection

Table 4-17. Class ECX76 — Combination Motor Controller (CMC) — Non-reversing Starter

Size	Amps	Maximum hp ①			Coil voltage @ 60 Hz ②	Type 1/IP23 General Purpose	Type 4X/IP66 ④⑤ Watertight	Component ③
		Motor Voltage	1-phase	3-phase		Catalog Number	Catalog Number	Catalog Number
D	12	115	1/2	—	120	ECX76D1AAA-_	ECX76D4AAA-_	XTPR_ _ _BC1
		208	1-1/2	3	208	ECX76D1EAA-_	ECX76D4EAA-_	
		230	2	3	240	ECX76D1BAA-_	ECX76D4BAA-_	
		380	—	5	380/50 Hz	ECX76D1LAA-_	ECX76D4LAA-_	
		460	—	7-1/2	480	ECX76D1CAA-_	ECX76D4CAA-_	
		575	—	10	600	ECX76D1DAA-_	ECX76D4DAA-_	
H	32	115	3	—	120	ECX76H1AAA-_	ECX76H4AAA-_	XTPR_ _ _BC1
		208	5	10	208	ECX76H1EAA-_	ECX76H4EAA-_	
		230	5	10	240	ECX76H1BAA-_	ECX76H4BAA-_	
		380	—	15	380/50 Hz	ECX76H1LAA-_	ECX76H4LAA-_	
		460	—	20	480	ECX76H1CAA-_	ECX76H4CAA-_	
		575	—	25	600	ECX76H1DAA-_	ECX76H4DAA-_	

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 4-24**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX76D**4**AAA-_. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.

Table 4-17. Class ECX76 — Combination Motor Controller (CMC) — Non-reversing Starter (Continued)

Size	Amps	Maximum hp ⑥			Coil voltage @ 60 Hz ⑦	Type 4X Nonmetallic/ IP66 ⑨ Watertight	Type 12/IP65 Dust-Tight	Component ⑧
		Motor Voltage	1-phase	3-phase		Catalog Number	Catalog Number	Catalog Number
D	12	115	1/2	—	120	ECX76D5AAA-_	ECX76D8AAA-_	XTPR_ _ _BC1
		208	1-1/2	3	208	ECX76D5EAA-_	ECX76D8EAA-_	
		230	2	3	240	ECX76D5BAA-_	ECX76D8BAA-_	
		380	—	5	380/50 Hz	ECX76D5LAA-_	ECX76D8LAA-_	
		460	—	7-1/2	480	ECX76D5CAA-_	ECX76D8CAA-_	
		575	—	10	600	ECX76D5DAA-_	ECX76D8DAA-_	
H	32	115	3	—	120	ECX76H5AAA-_	ECX76H8AAA-_	XTPR_ _ _BC1
		208	5	10	208	ECX76H5EAA-_	ECX76H8EAA-_	
		230	5	10	240	ECX76H5BAA-_	ECX76H8BAA-_	
		380	—	15	380/50 Hz	ECX76H5LAA-_	ECX76H8LAA-_	
		460	—	20	480	ECX76H5CAA-_	ECX76H8CAA-_	
		575	—	25	600	ECX76H5DAA-_	ECX76H8DAA-_	

⑥ 1 hp = 0.746 kW.
⑦ Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
⑧ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 4-24**.
⑨ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.

Cover Control ..... **Page 4-25**
Dimensions..... **Page 15-5**
Modifications Codes ..... **Page 16-40**
Technical Data, MMPs **CA08102001E**
Technical Data, Contactors ..... **Page 18-19**

4

Table 4-18. Class ECX77 — Combination Motor Controller (CMC) — Non-reversing Starter with CPT

Size	Amps	Maximum hp ①			Coil voltage @ 60 Hz ②	Type 1/IP23 General Purpose	Type 4X/IP66 ④⑤ Watertight	Component ③
		Motor Voltage	1-phase	3-phase		Catalog Number	Catalog Number	Catalog Number
D	12	115	1/2	—	120	ECX77D1AAA-_	ECX77D4AAA-_	XTPR_ _ _BC1
		208	1-1/2	3	208	ECX77D1EAA-_	ECX77D4EAA-_	
		230	2	3	240	ECX77D1BAA-_	ECX77D4BAA-_	
		380	—	5	380/50 Hz	ECX77D1LAA-_	ECX77D4LAA-_	
		460	—	7-1/2	480	ECX77D1CAA-_	ECX77D4CAA-_	
		575	—	10	600	ECX77D1DAA-_	ECX77D4DAA-_	
H	32	115	3	—	120	ECX77H1AAA-_	ECX77H4AAA-_	XTPR_ _ _BC1
		208	5	10	208	ECX77H1EAA-_	ECX77H4EAA-_	
		230	5	10	240	ECX77H1BAA-_	ECX77H4BAA-_	
		380	—	15	380/50 Hz	ECX77H1LAA-_	ECX77H4LAA-_	
		460	—	20	480	ECX77H1CAA-_	ECX77H4CAA-_	
		575	—	25	600	ECX77H1DAA-_	ECX77H4DAA-_	

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 4-24**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX77D**4**AAA-_. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.

Table 4-18. Class ECX77 — Combination Motor Controller (CMC) — Non-reversing Starter with CPT (Continued)

Size	Amps	Maximum hp ⑥			Coil voltage @ 60 Hz ⑦	Type 4X Nonmetallic/ IP66 ⑨ Watertight	Type 12/IP65 Dust-Tight	Component ⑧
		Motor Voltage	1-phase	3-phase		Catalog Number	Catalog Number	Catalog Number
D	12	115	1/2	—	120	ECX77D5AAA-_	ECX77D8AAA-_	XTPR_ _ _BC1
		208	1-1/2	3	208	ECX77D5EAA-_	ECX77D8EAA-_	
		230	2	3	240	ECX77D5BAA-_	ECX77D8BAA-_	
		380	—	5	380/50 Hz	ECX77D5LAA-_	ECX77D8LAA-_	
		460	—	7-1/2	480	ECX77D5CAA-_	ECX77D8CAA-_	
		575	—	10	600	ECX77D5DAA-_	ECX77D8DAA-_	
H	32	115	3	—	120	ECX77H5AAA-_	ECX77H8AAA-_	XTPR_ _ _BC1
		208	5	10	208	ECX77H5EAA-_	ECX77H8EAA-_	
		230	5	10	240	ECX77H5BAA-_	ECX77H8BAA-_	
		380	—	15	380/50 Hz	ECX77H5LAA-_	ECX77H8LAA-_	
		460	—	20	480	ECX77H5CAA-_	ECX77H8CAA-_	
		575	—	25	600	ECX77H5DAA-_	ECX77H8DAA-_	

⑥ 1 hp = 0.746 kW.
⑦ Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
⑧ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 4-24**.
⑨ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.

Cover Control . . . . . **Page 4-25**
Dimensions . . . . . **Page 15-5**
Modifications Codes . . . . . **Page 16-40**
Technical Data, MMPs **CA08102001E**
Technical Data, Contactors . . . . . **Page 18-19**

Table 4-19. Class ECX78 — Combination Motor Controller (CMC) — Reversing Starter

Size	Amps	Maximum hp ①			Coil voltage @ 60 Hz ②	Type 1/IP23 General Purpose	Type 4X/IP66 ④⑤ Watertight	Component ③
		Motor Voltage	1-phase	3-phase		Catalog Number	Catalog Number	Catalog Number
D	12	115	1/2	—	120	ECX78D1AAA-_	ECX78D4AAA-_	XTPR_ _ _BC1
		208	1-1/2	3	208	ECX78D1EAA-_	ECX78D4EAA-_	
		230	2	3	240	ECX78D1BAA-_	ECX78D4BAA-_	
		380	—	5	380/50 Hz	ECX78D1LAA-_	ECX78D4LAA-_	
		460	—	7-1/2	480	ECX78D1CAA-_	ECX78D4CAA-_	
		575	—	10	600	ECX78D1DAA-_	ECX78D4DAA-_	
H	32	115	3	—	120	ECX78H1AAA-_	ECX78H4AAA-_	XTPR_ _ _BC1
		208	5	10	208	ECX78H1EAA-_	ECX78H4EAA-_	
		230	5	10	240	ECX78H1BAA-_	ECX78H4BAA-_	
		380	—	15	380/50 Hz	ECX78H1LAA-_	ECX78H4LAA-_	
		460	—	20	480	ECX78H1CAA-_	ECX78H4CAA-_	
		575	—	25	600	ECX78H1DAA-_	ECX78H4DAA-_	

① 1 hp = 0.746 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 4-24**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX78D**4**AAA-_. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.

Table 4-19. Class ECX78 — Combination Motor Controller (CMC) — Reversing Starter (Continued)

Size	Amps	Maximum hp ⑥			Coil voltage @ 60 Hz ⑦	Type 4X Nonmetallic/ IP66 ⑨ Watertight	Type 12/IP65 Dust-Tight	Component ⑧
		Motor Voltage	1-phase	3-phase		Catalog Number	Catalog Number	Catalog Number
D	12	115	1/2	—	120	ECX78D5AAA-_	ECX78D8AAA-_	XTPR_ _ _BC1
		208	1-1/2	3	208	ECX78D5EAA-_	ECX78D8EAA-_	
		230	2	3	240	ECX78D5BAA-_	ECX78D8BAA-_	
		380	—	5	380/50 Hz	ECX78D5LAA-_	ECX78D8LAA-_	
		460	—	7-1/2	480	ECX78D5CAA-_	ECX78D8CAA-_	
		575	—	10	600	ECX78D5DAA-_	ECX78D8DAA-_	
H	32	115	3	—	120	ECX78H5AAA-_	ECX78H8AAA-_	XTPR_ _ _BC1
		208	5	10	208	ECX78H5EAA-_	ECX78H8EAA-_	
		230	5	10	240	ECX78H5BAA-_	ECX78H8BAA-_	
		380	—	15	380/50 Hz	ECX78H5LAA-_	ECX78H8LAA-_	
		460	—	20	480	ECX78H5CAA-_	ECX78H8CAA-_	
		575	—	25	600	ECX78H5DAA-_	ECX78H8DAA-_	

⑥ 1 hp = 0.746 kW.
⑦ Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
⑧ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 4-24**.
⑨ Handle mechanism is rated Type 1 or 12. Contact local sales office for availability of Type 4X versions.

Cover Control ..... **Page 4-25**
Dimensions..... **Page 15-5**
Modifications Codes ..... **Page 16-40**
Technical Data, MMPs **CA08102001E**
Technical Data, Contactors ..... **Page 18-19**

April 2008

Lighting Contactors

Contents

Lighting Contactors

Product Description

Eaton's Cutler-Hammer® 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 — 600V maximum.

Filament Lamps — Incandescent, Infrared, Heating — 480V maximum, line to line; 277V maximum line to neutral.

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

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed
- ABS Type Approved

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 12V, 5 mA.

CN35 Electrically Held Contactors — Include a NO maintaining auxiliary contact mounted on the right side of the contactor. The 10 – 60A devices will accept additional auxiliary contacts on the top (front) and/or sides. The 100 – 400A 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 (30A 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.

2-Wire or 3-Wire Control Module for C30CN

A mechanical latch with a 2- or 3-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 2-wire control.

IMPORTANT: Add the **C18** Modification code to get 3-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 24V AC to 600V AC.

2-Wire Control Relay for A202

The 2-wire control relay is designed to field convert 3-wire magnetically latched lighting contactors to operate controls such as photocells and timers. Terminal blocks included for fast wiring installation.

Enclosed Lighting Contactors

Table 5-1. Type 1 2-Wire Control Relay

Description	Magnetic Coil Voltage	Type 1 Catalog Number	Type 3R Catalog Number
2-Wire Control Relay	120 208 240	**ECLC201A** **ECLC201E** **ECLC201B**	**ECLC202A** **ECLC202E** **ECLC202B**
	277 480	**ECLC201H** **ECLC201C**	**ECLC202H** **ECLC202C**

Catalog Number Selection

Table 5-2. Enclosed Lighting Contactor Catalog Numbering System

E C L 12 D 1 A 3 E - X

Design
L = CN35 or A202 Lighting Contactor
C = C30CN Lighting Contactor

Class		Table
03 =	Non-combination Electrically Held Lighting Contactor	**5-4**, **5-6**
04 =	Non-combination Mechanically Held/ Magnetically Latched Lighting Contactor	**5-5**, **5-7**
12 =	Combination Electrically Held Lighting Contactor — Fusible Disconnect	**5-8**
13 =	Combination Magnetically Latched Lighting Contactor — Fusible Disconnect	**5-8**
14 =	Combination Electrically Held Lighting Contactor — Thermal Magnetic Circuit Breaker	**5-9**
15 =	Combination Magnetically Latched Lighting Contactor — Thermal Magnetic Circuit Breaker	**5-9**

Ampere Size ②		
A = 10A	**D** = 60A	**G** = 300A
B = 20A	**E** = 100A	**H** = 400A
C = 30A	**F** = 200A	**J** = 600A

Enclosure Types
1 = Type 1 — General Purpose
2 = Type 3R — Rainproof
3 = Type 4 — Watertight (Painted)
4 = Type 4X — Watertight (304-Grade Stainless Steel)
6 = Type 7/9 — Explosion Proof
8 = Type 12 — Dust-Tight
9 = Type 4X — Watertight (316-Grade Stainless Steel)

Coil Voltage		
A = 120/60 110/50	**K** = 240/50	**T** = 24/60
B = 240/60 220/50	**L** = 380/50	**U** = 24/50
C = 480/60 440/50	**M** = 415/50	**V** = 32/50
D = 600/60 550/50	**P** = 12V DC	**W** = 48/60
E = 208/60	**Q** = 24V DC	**X** = 104 – 120/60
G = 550/50	**R** = 48V DC	**Y** = 48/50
H = 277/60	**S** = 125V DC	**Z** = By Description
J = 208 – 240/60		

Number of Poles ①
1, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9** = Poles Required
A = 10 Poles
B = 12 Poles
C = 20 Poles
Combination Devices = 3-Pole Only

Modification Codes
(See **Page 5-4** and **Page 16-40**)

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

Thermal-Magnetic Breaker Ratings			
A = None	**F** = 60A	**J** = 300A	**M** = 800A
D = 20A	**G** = 100A	**K** = 400A	**T** = By Description
E = 30A	**H** = 200A	**L** = 600A	

① For normally closed poles see **Page 16-43**.
② C30CN available in 30A only.

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.

Cover Control

Table 5-3. Cover Mounted Pilot Devices

Description	For use with Lighting Contactor	Factory Installed Cover Control		Field Installation Kits	
		Type 1, 3R, 4X & 12	Type 7/9	Type 1 ①⑤	Type 3R, 4X, 12 Combination & Non-combination ②⑤
		Modification Code Suffix	Modification Code Suffix	Catalog Number	Catalog Number
ON/OFF Pushbuttons with Red RUN Pilot Light with Red RUN/GREEN off lights	Electrical 3-wire C30CN; CN35; A202	**P8** **P8P23** **P8P23P25**	**P8** **P8P23** **P8P23P25**	**C400GK18** **C400GK19_** **C400GK1A_**	**C400T2** **—** **—**
ON/OFF Pushbuttons with Red RUN Pilot Light with Red RUN/GREEN off lights	Mechanical 3-wire C30CN	**P8** **P8P23** **P8P23P25**	**P8** **P8P23** **P8P23P25**	**C400GK4** **C400GK48_** **C400GK49_**	**C400T201** **—** **—**
ON/OFF Pushbuttons with Red RUN Pilot Light with Red RUN/GREEN off lights	Elec. & Mech. 2-wire C30CN; CN35; A202	**P8** **P8P23** **P8P23P25**	**P8** **P8P23** **P8P23P25**	**C400GK5** **C400GK52_** **C400GK55_**	**C400T14** ③ **—** **—**
Start/Stop Pushbuttons with Red RUN Pilot Light with Red RUN/GREEN off lights	Mechanical 3-wire C30CN	**P7** **P7P23** **P7P23P25**	**P7** **P7P23** **P7P23P25**	**C400GK7** **C400GK72_** **C400GK75_**	**C400T200** **—** **—**
Start/Stop Pushbuttons with Red RUN Pilot Light with Red RUN/GREEN off lights	Elec. & Mech. 2-wire C30CN	**P7** **P7P23** **P7P23P25**	**P7** **P7P23** **P7P23P25**	**C400GK6** **C400GK62_** **C400GK65_**	**C400T13** ③ **—** **—**
HAND/OFF/AUTO Cover Control with Red RUN Pilot Light with Red RUN/GREEN off lights	Elec. & Mech. 2-wire C30CN; CN35; A202	**S3** **S3P23** **S3P23P25**	**S3** ④ **S3P23** ④ **S3P23P25** ④	**C400GK3** **C400GK32_** **C400GK35_**	**C400T12** ③ **—** **—**
Red RUN Pilot Light Green OFF Pilot Light Red RUN/Green OFF Pilot Light	All	**P23** **P25** **P23P25**	**P23** **P25** **P23P25**	**C400GK42_** **C400GK41_** **C400GK46_**	**C400T9_** **C400T10_** **C400T11_**

① For use with Non-combination units (Box sizes 1 – 4).

② For use with Type 1 Combination units as well.

③ Selector Switch.

④ With 3-position selector switch, Mod **C20** (2-wire control relay) must be used with magnetically latched contactor (ECL04, ECL13, ECL15).

⑤ Add Code Letter from table below to Catalog Number for Voltage in place of _.

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

Product Selection

2-Wire and 3-Wire Control Wiring Options — 2-Wire Control Standard

Enclosed Electrically Held Lighting Contactor

Enclosed Mechanically Held Lighting Contactor

Table 5-4. Class ECC03 — Non-combination Electrically Held Lighting Contactor — 2 or 3-Wire Control

Number of Poles	Type 1	Type 3R	Type 4X ①	Type 7/9	Type 12	Component Contactor (Open)
	Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②
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

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

② For first open position (Coil Voltage), use the table below.

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

Table 5-5. Class ECC04 — Non-combination Mechanically Held Lighting Contactor — 2-Wire Control ③

Number of Poles	Type 1	Type 3R	Type 4X ④	Type 7/9	Type 12	Component Contactor (Open)
	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤
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_

③ Add **C18** Modification Code for 3-wire control.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECC04C4A2A. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ For first open position (Coil Voltage), use the table below.

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

Note: To get the C30CN Lighting Contactor with normally closed power poles, see **Page 16-43**, section L, for Modification Codes.

Accessories ..... **Pages 5-2, 16-30**
Cover Control ..... **Page 5-4**
Dimensions ..... **Page 15-5**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-37**

5

Product Selection

Table 5-6. Class ECL03 — Non-combination Electrically Held Lighting Contactor

No. of Poles	Frame Size	Type 1 General Purpose	Type 3R Rainproof	Type 4X ② Watertight & Dust-Tight Stainless Steel	Type 7/9 Hazardous Location	Type 12 Dust-Tight Industrial	Component Contactor (Open)
		Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Maximum Ampere Rating — 10 ①							
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	45 mm	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 ①							
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	45 mm	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 ①							
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	45 mm	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 ①							
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	65 mm	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	—

① Ampere ratings are based on a maximum load voltage of 480V for tungsten lamp applications and 600V for ballast or mercury vapor type applications.

② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECL03B**4**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ For open position (Coil Voltage), use the table below:

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

Type 1 Electrically Held 4-Pole Lighting Contactor

Cover Control ..... **Page 5-4**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-30**
Modifications ..... **Page 16-40**

Table 5-6. Class ECL03 — Non-combination Electrically Held Lighting Contactor (Continued)

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

① Ampere ratings are based on a maximum load voltage of 480V for tungsten lamp applications and 600V for ballast or mercury vapor type applications.

② UL ballast and resistive ratings only.

③ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECL03B**4**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

④ For open position (Coil Voltage), use the table below:

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

Cover Control ..... **Page 5-4**
Dimensions ..... **Page 15-5**
Accessories ..... **Page 16-30**
Modifications ..... **Page 16-40**

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.

5

Product Selection

Table 5-7. Class ECL04 — Non-combination Magnetically Latched Lighting Contactor

No. of Poles	Type 1 General Purpose	Type 3R Rainproof	Type 4X ② Watertight & Dust-Tight Stainless Steel	Type 7/9 Hazardous Location	Type 12 Dust-Tight Industrial	Component Contactor (Open)
	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Maximum Ampere Rating — 30 ①						
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 ①						
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	—
Maximum Ampere Rating — 100 ①						
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	—

① Ampere ratings are based on a maximum load voltage of 480V for tungsten lamp applications and 600V for ballast or mercury vapor type applications.

② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECL04C**4**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ For open position (Coil Voltage), use the table below:

Enclosed Suffix	Open Suffix	Coil Voltage
A	A	120/60 or 110/50
B	W	240/60 or 220/50
C	X	480/60 or 440/50
D	E	600/60
E	B	208/60
H	Z	277/60

Type 1 Non-combination Magnetically Latched Lighting Contactor

Accessories ..... **Pages 5-2, 16-34**
Cover Control ..... **Page 5-4**
Dimensions ..... **Page 15-5**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-37**

Table 5-7. Class ECL04 — Non-combination Magnetically Latched Lighting Contactor (Continued)

No. of Poles	Type 1 General Purpose	Type 3R Rainproof	Type 4X ② Watertight & Dust-Tight Stainless Steel	Type 7/9 Hazardous Location	Type 12 Dust-Tight Industrial	Component Contactor (Open)
	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Maximum Ampere Rating — 200 ①						
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 ①						
2	ECL04G1_2A	ECL04G2_2A	ECL04G4_2A	ECL04G6_2A	ECL04G8_2A	A202K5B_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 ①						
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	—

① Ampere ratings are based on a maximum load voltage of 480V for tungsten lamp applications and 600V for ballast or mercury vapor type applications.

② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECL04C**4**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ For open position (Coil Voltage), use the table below:

Enclosed Suffix	Open Suffix	Coil Voltage
A	**A**	120/60 or 110/50
B	**W**	240/60 or 220/50
C	**X**	480/60 or 440/50
D	**E**	600/60
E	**B**	208/60
H	**Z**	277/60

Accessories ..... **Pages 5-2, 16-34**
Cover Control ..... **Page 5-4**
Dimensions ..... **Page 15-5**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-37**

Product Selection

Table 5-8. Class ECL12 & ECL13 — Combination Lighting Contactor — Fusible Disconnect

Max. Amp Rating ①	No. of Poles	Fuse Clips Amps/Volts ③	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight SS	Type 7/9 Hazardous Location	Type 12 Dust-Tight Industrial	Component Contactor (Open)
			Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②
Electrically Held — Class ECL12								
30	3	30/250V 30/600V	ECL12C1_3B ECL12C1_3C	ECL12C2_3B ECL12C2_3C	ECL12C4_3B ECL12C4_3C	ECL12C6_3B ECL12C6_3C	ECL12C8_3B ECL12C8_3C	CN35DN3_B
60	3	60/250V 60/600V	ECL12D1_3D ECL12D1_3E	ECL12D2_3D ECL12D2_3E	ECL12D4_3D ECL12D4_3E	ECL12D6_3D ECL12D6_3E	ECL12D8_3D ECL12D8_3E	CN35GN3_B
100	3	100/250V 100/600V	ECL12E1_3F ECL12E1_3G	ECL12E2_3F ECL12E2_3G	ECL12E4_3F ECL12E4_3G	ECL12E6_3F ECL12E6_3G	ECL12E8_3F ECL12E8_3G	CN35KN3_
200	3	200/250V 200/600V	ECL12F1_3H ECL12F1_3J	ECL12F2_3H ECL12F2_3J	ECL12F4_3H ECL12F4_3J	ECL12F6_3H ECL12F6_3J	ECL12F8_3H ECL12F8_3J	CN35NN3_
300	3	400/250V 400/600V	ECL12G1_3K ECL12G1_3L	ECL12G2_3K ECL12G2_3L	ECL12G4_3K ECL12G4_3L	ECL12G6_3K ECL12G6_3L	ECL12G8_3K ECL12G8_3L	CN35SN3_
400	3	400/250V 400/600V	ECL12H1_3K ECL12H1_3L	ECL12H2_3K ECL12H2_3L	ECL12H4_3K ECL12H4_3L	ECL12H6_3K ECL12H6_3L	ECL12H8_3K ECL12H8_3L	CN35TN3_
Magnetically Latched — Class ECL13								
30	3	30/250V 30/600V	ECL13C1_3B ECL13C1_3C	ECL13C2_3B ECL13C2_3C	ECL13C4_3B ECL13C4_3C	ECL13C6_3B ECL13C6_3C	ECL13C8_3B ECL13C8_3C	A202K1C_M
60	3	60/250V 60/600V	ECL13D1_3D ECL13D1_3E	ECL13D2_3D ECL13D2_3E	ECL13D4_3D ECL13D4_3E	ECL13D6_3D ECL13D6_3E	ECL13D8_3D ECL13D8_3E	A202K2C_M
100	3	100/250V 100/600V	ECL13E1_3F ECL13E1_3G	ECL13E2_3F ECL13E2_3G	ECL13E4_3F ECL13E4_3G	ECL13E6_3F ECL13E6_3G	ECL13E8_3F ECL13E8_3G	A202K3C_M
200	3	200/250V 200/600V	ECL13F1_3H ECL13F1_3J	ECL13F2_3H ECL13F2_3J	ECL13F4_3H ECL13F4_3J	ECL13F6_3H ECL13F6_3J	ECL13F8_3H ECL13F8_3J	A202K4C_M

① The listed ampere ratings are based on a maximum load voltage of 480V for tungsten lamp applications and 600V for ballasts or mercury vapor type applications.

② The underscore (_) indicates missing Code letter for Coil Selection — see **Table 5-10**. Example: Magnet coils with 120/110V coils — change 8th character to **A**. ECL12C1**A**3B.

③ Power fuses are not included.

Table 5-9. Class ECL14 & ECL15 — Combination Lighting Contactor — Thermal Magnetic Circuit Breaker

Max. Amp Rating ④	No. of Poles	Continuous Ampere Rating @ 40°C	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight SS	Type 7/9 Hazardous Location	Type 12 Dust-Tight Industrial	Component Contactor (Open)
			Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤	Catalog Number ⑤
Electrically Held — Class ECL14								
30 60 100	3	30 60 100	ECL14C1_3E ECL14D1_3F ECL14E1_3G	ECL14C2_3E ECL14D2_3F ECL14E2_3G	ECL14C4_3E ECL14D4_3F ECL14E4_3G	ECL14C6_3E ECL14D6_3F ECL14E6_3G	ECL14C8_3E ECL14D8_3F ECL14E8_3G	CN35DN3_B CN35GN3_B CN35KN3_
200 300 400	3	200 300 400	ECL14F1_3H ECL14G1_3J ECL14H1_3K	ECL14F2_3H ECL14G2_3J ECL14H2_3K	ECL14F4_3H ECL14G4_3J ECL14H4_3K	ECL14F6_3H ECL14G6_3J ECL14H6_3K	ECL14F8_3H ECL14G8_3J ECL14H8_3K	CN35NN3_ CN35SN3_ CN35TN3_
Magnetically Latched — Class ECL15								
30 60 100 200	3	30 60 100 200	ECL15C1_3E ECL15D1_3F ECL15E1_3G ECL15F1_3H	ECL15C2_3E ECL15D2_3F ECL15E2_3G ECL15F2_3H	ECL15C4_3E ECL15D4_3F ECL15E4_3G ECL15F4_3H	ECL15C6_3E ECL15D6_3F ECL15E6_3G ECL15F6_3H	ECL15C8_3E ECL15D8_3F ECL15E8_3G ECL15F8_3H	A202K1C_M A202K2C_M A202K3C_M A202K4C_M

④ The listed ampere ratings are based on a maximum load voltage of 480V for tungsten lamp applications and 600V for ballasts or mercury vapor type applications.

⑤ The underscore (_) indicates missing Code letter for Coil Selection — see **Table 5-10**. Example: Magnet coils with 120/110V coils — change 8th character to **A**. ECL12C1**A**3B.

Table 5-10. Coil Voltage

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

Note: The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Additional Common Modifications are available for outside lighting for ballfields, parks, etc.:

- **E7** — Service Entrance
- **E5** — Enclosure with pole mounting brackets
- **P70** — Photocell
- **T1 – T25** — Timers

See **Page 16-40** for details.

Accessories — Magnetically Held ..... **Page 5-2, Page 16-34**
Cover Control ..... **Page 5-4**
Dimensions ..... **Page 15-5**
Accessories — Electrically Held ..... **Page 16-30**
Modifications ..... **Page 16-40**

Wiring Diagrams

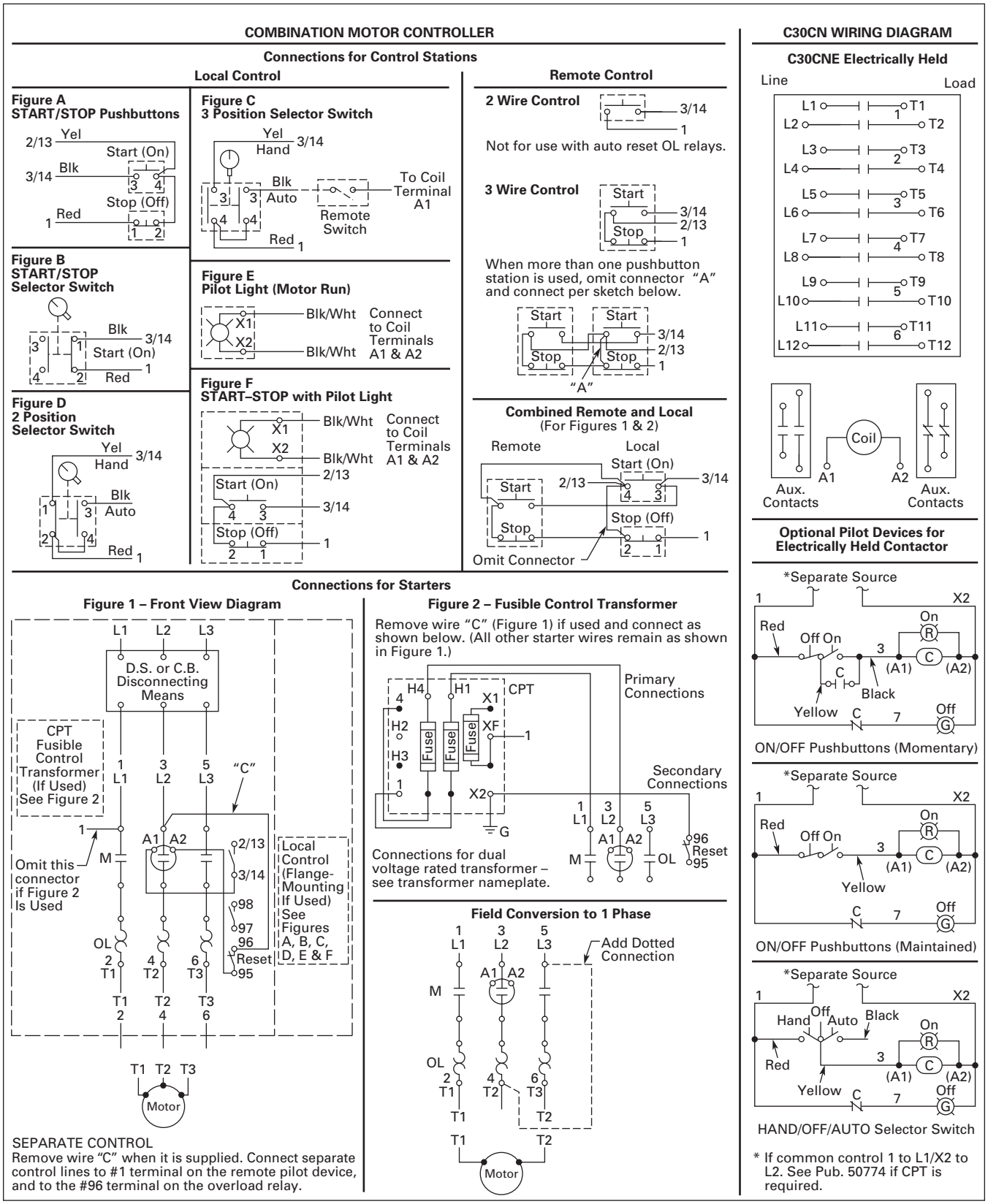
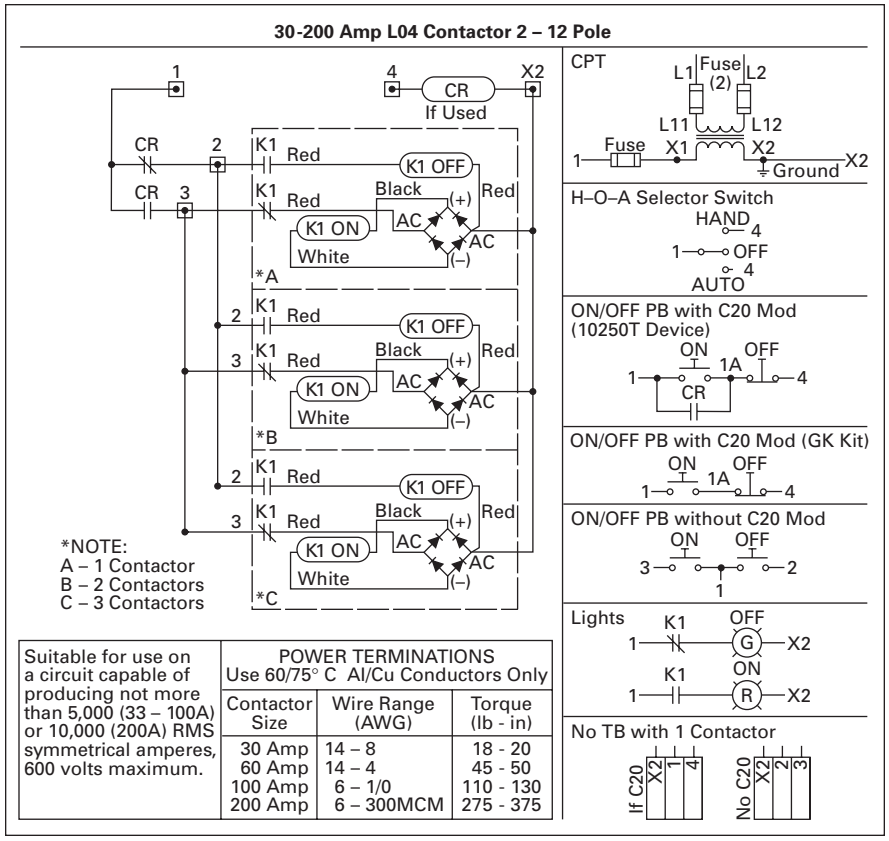
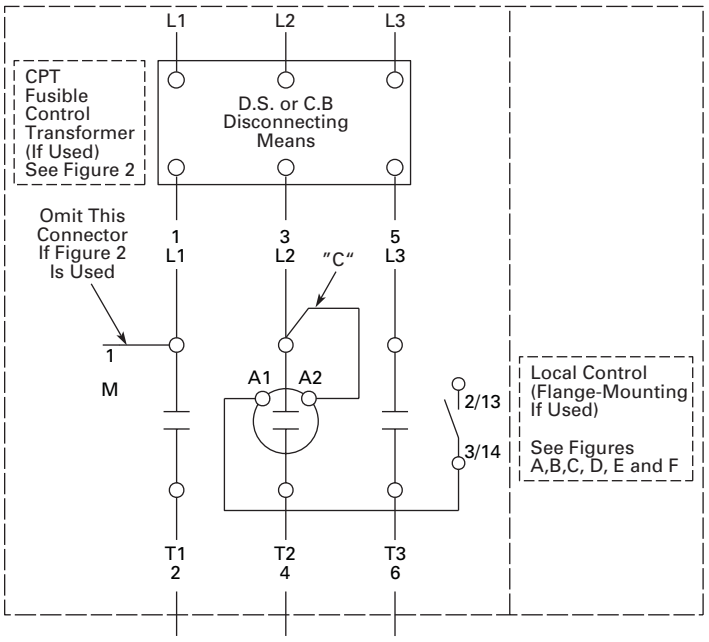


Figure 5-1. Typical Wiring Diagram — C30CN



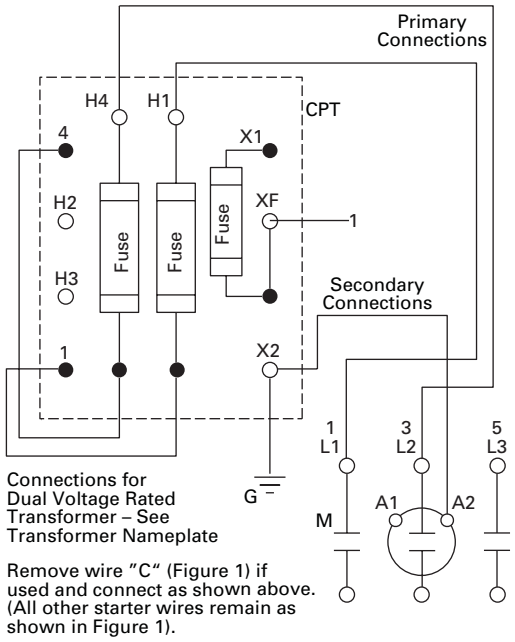
Suitable for use on a circuit capable of producing not more than 5,000 (33 – 100A) or 10,000 (200A) RMS symmetrical amperes, 600 volts maximum.	POWER TERMINATIONS Use 60/75° C Al/Cu Conductors Only		
	Contactor Size	Wire Range (AWG)	Torque (lb - in)
	30 Amp	14 – 8	18 - 20
	60 Amp	14 – 4	45 - 50
	100 Amp	6 – 1/0	110 - 130
	200 Amp	6 – 300MCM	275 - 375

Figure 5-2. Typical Wiring Diagram — Magnetically Latched



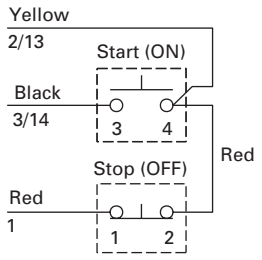
Front View Diagram

Figure 1



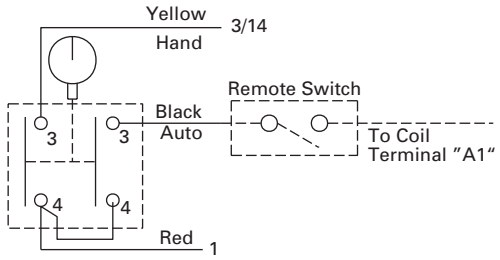
Fusible Control Transformer

Figure 2



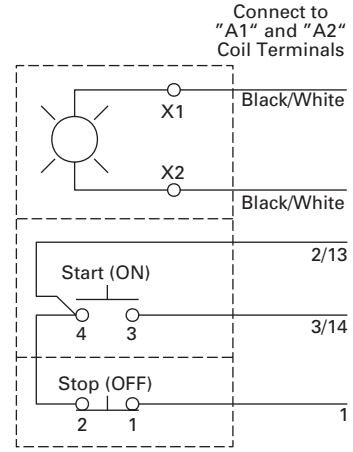
START/STOP Pushbuttons

Figure A



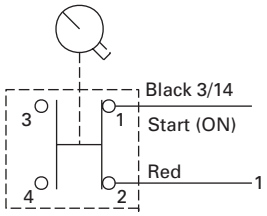
3-Position Selector Switch

Figure C



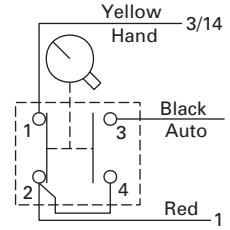
STOP/START with Pilot Light

Figure F



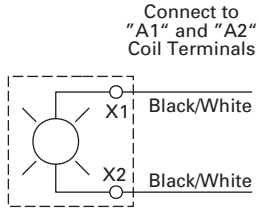
START/STOP Selector Switch

Figure B



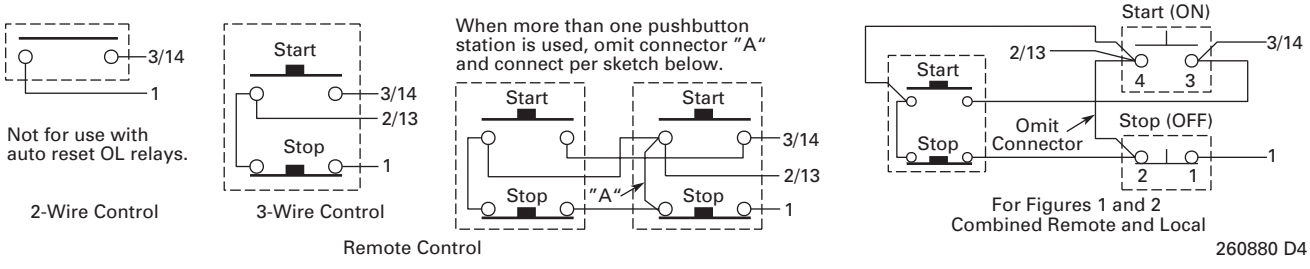
2-Position Selector Switch

Figure D



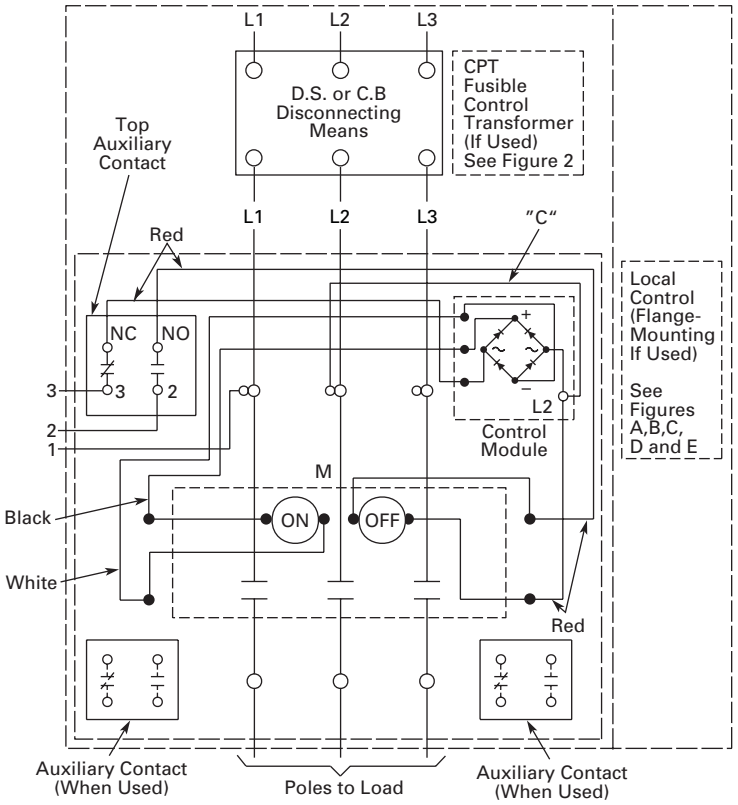
Pilot Light (Motor RUN)

Figure E



260880 D4

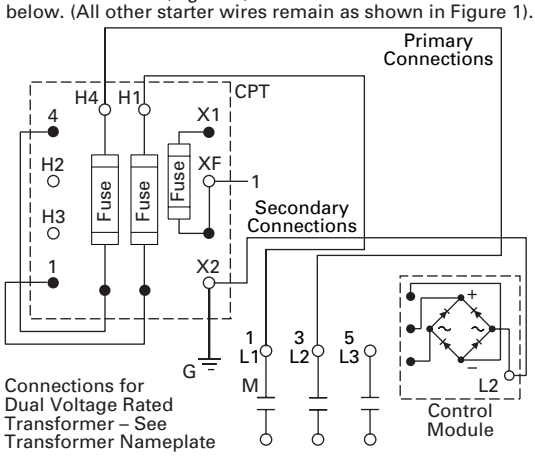
Figure 5-3. Electrically Held Combination Contactors — CN35



Front View Diagram

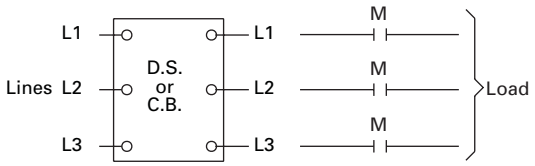
Figure 1

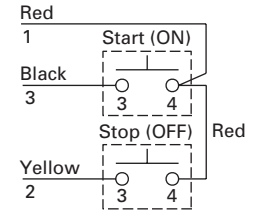
Remove wire "C" (Figure 1) if used and connect as shown below. (All other starter wires remain as shown in Figure 1).



Fusible Control Transformer

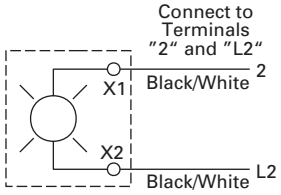
Figure 2





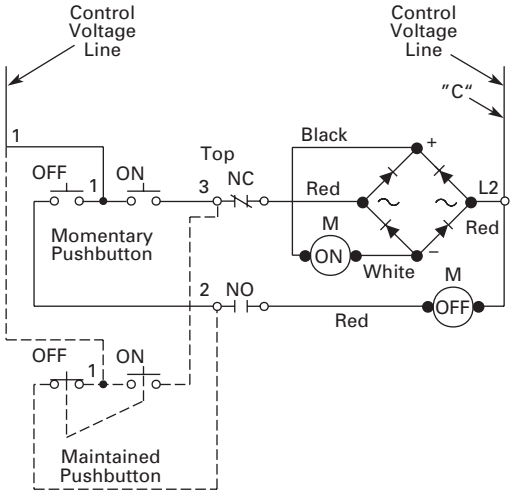
START/STOP Pushbuttons

Figure A

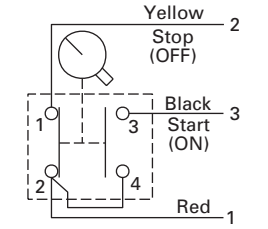


Pilot Light (OFF)

Figure D

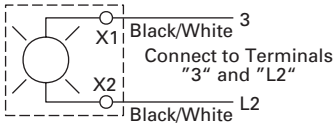


Elementary Diagram



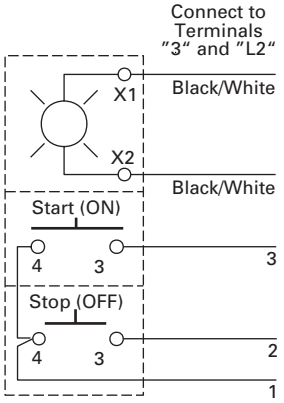
START/STOP Selector Switch

Figure B



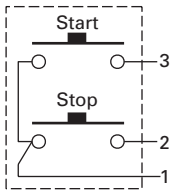
Pilot Light (ON)

Figure C



START/STOP with Pilot Light

Figure E



3-Wire Control
Remote Control

Local Control

260887 D4

Figure 5-4. Magnetically Latched Combination Contactors

April 2008

Reduced Voltage Starters

Contents

Reduced Voltage Starter

Enclosed 40 hp Soft Starter

Product Description

Eaton's revolutionary design for soft starters is shown in the S752, S801 and S811 soft starter products which are members of the Cutler-Hammer® 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 24V DC 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 .25 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
  - 30 – 100% FLA adjustment
  - 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

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 brown-out conditions.
- 24V DC advantages
  - Offers improved personnel safety by eliminating the need for 120V AC in the enclosure.
  - Soft Starter able to ride through 50% voltage conditions indefinitely due to 24V DC 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.

Digital Interface Module (DIM)

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.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- IEC 947-4-2
- EN 60947.2 (for motor controller)
- cUL (indicates appropriate CSA Standard investigation)
- ABS Type Approved

Options

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

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

Table 6-1. Options

Description	Modification Code
Pump Control Option	**P42**
LCD Display	**K5**
Extended Ramp	**R1**

6

Catalog Number Selection

Table 6-2. Solid-State Enclosed Control Catalog Numbering System

E C S 90 S 1 C A A

Type
S = Solid-State

Class	Table
90 = Non-combination Reduced Voltage Soft-Starter — S752	**6-4**
Non-combination Reduced Voltage Soft-Starter — S801	**6-5**
91 = Combination Reduced Voltage Soft-Starter — Fusible Disconnect — S752	**6-7**
Combination Reduced Voltage Soft-Starter — Fusible Disconnect — S801	**6-8**
92 = Combination Reduced Voltage Soft-Starter — Circuit Breaker — S752	**6-10**
Combination Reduced Voltage Soft-Starter — Circuit Breaker — S801	**6-11**
93 = Non-combination Reduced Voltage Soft-Starter — S811	**6-6**
94 = Combination Reduced Voltage Soft-Starter — Fusible Disconnect — S811	**6-9**
95 = Combination Reduced Voltage Soft-Starter — Circuit Breaker — S811	**6-12**

Amps			
S752	**S801/S811**		
J = .8	**Q** = 37	**Z** = 240	**5** = 650
K = 1.9	**S** = 66	**1** = 304	**6** = 720
L = 4.4	**V** = 105	**2** = 360	**7** = 850
M = 9	**W** = 135	**3** = 420	**8** = 1000
N = 16	**Y** = 180	**4** = 500	
P = 27			
R = 50			

Enclosure Type
1 = Type 1
2 = Type 3R
3 = Type 4
4 = Type 4X (304-Grade SS)
6 = Type 7/9
8 = Type 12
9 = Type 4X (316-Grade SS)

Voltage	
B = 230V	**E** = 200V
C = 460V	**Q** = 24V DC
D = 575V	

Cover Control
See **Table 6-3** for Options

Disconnect Fuse Clip Ratings		
A = None	**G** = 100A/600V R	**N** = 600A/600V R
B = 30A/250V R	**H** = 200A/250V R	**P** = 800A/600V L
C = 30A/600V R	**J** = 200A/600V R	**Q** = 1200A/600V L
D = 60A/250V R	**K** = 400A/250V R	**R** = 1600A/600V L
E = 60A/600V R	**L** = 400A/600V R	**S** = 2000A/600V L
F = 100A/250V R	**M** = 600A/250V R	**T** = by Description
Breaker		
A = None	**F** = 50A	**K** = 400A
B = 3A	**W** = 70A	**L** = 600A
C = 7A	**G** = 100A	**P** = 1200A
D = 15A	**H** = 150A	**Q** = 1600A
E = 30A	**J** = 250A	

Cover Control

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4, 4X and 12 enclosed starters. Knock-outs 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 9th 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**, i.e. ECS90J4C**C**A.

Table 6-3. 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**	**—**

Description	Factory Installed Flange Control Position 9 Alpha	Field Installation Kits Catalog Number
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**	**—**

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**

6

Product Selection

Table 6-4. Class ECS90 — Non-combination Reduced Voltage Soft-Starter — S752

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Type 1	Type 3R	Type 4X ④	Type 7/9	Type 12	Component Soft Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 54 mm									
.8A	200V 230V 460V 575V	1/8 1/6 1/3 1/3	24V DC	**ECS90J1EAA** **ECS90J1BAA** **ECS90J1CAA** **ECS90J1DAA**	**ECS90J2EAA** **ECS90J2BAA** **ECS90J2CAA** **ECS90J2DAA**	**ECS90J4EAA** **ECS90J4BAA** **ECS90J4CAA** **ECS90J4DAA**	**ECS90J6EAA** **ECS90J6BAA** **ECS90J6CAA** **ECS90J6DAA**	**ECS90J8EAA** **ECS90J8BAA** **ECS90J8CAA** **ECS90J8DAA**	**S752L01N3S**
1.9A	200V 230V 460V 575V	1/3 1/3 3/4 1	24V DC	**ECS90K1EAA** **ECS90K1BAA** **ECS90K1CAA** **ECS90K1DAA**	**ECS90K2EAA** **ECS90K2BAA** **ECS90K2CAA** **ECS90K2DAA**	**ECS90K4EAA** **ECS90K4BAA** **ECS90K4CAA** **ECS90K4DAA**	**ECS90K6EAA** **ECS90K6BAA** **ECS90K6CAA** **ECS90K6DAA**	**ECS90K8EAA** **ECS90K8BAA** **ECS90K8CAA** **ECS90K8DAA**	**S752L02N3S**
4.4A	200V 230V 460V 575V	3/4 1 2 3	24V DC	**ECS90L1EAA** **ECS90L1BAA** **ECS90L1CAA** **ECS90L1DAA**	**ECS90L2EAA** **ECS90L2BAA** **ECS90L2CAA** **ECS90L2DAA**	**ECS90L4EAA** **ECS90L4BAA** **ECS90L4CAA** **ECS90L4DAA**	**ECS90L6EAA** **ECS90L6BAA** **ECS90L6CAA** **ECS90L6DAA**	**ECS90L8EAA** **ECS90L8BAA** **ECS90L8CAA** **ECS90L8DAA**	**S752L04N3S**
9A	200V 230V 460V 575V	2 2 5 7-1/2	24V DC	**ECS90M1EAA** **ECS90M1BAA** **ECS90M1CAA** **ECS90M1DAA**	**ECS90M2EAA** **ECS90M2BAA** **ECS90M2CAA** **ECS90M2DAA**	**ECS90M4EAA** **ECS90M4BAA** **ECS90M4CAA** **ECS90M4DAA**	**ECS90M6EAA** **ECS90M6BAA** **ECS90M6CAA** **ECS90M6DAA**	**ECS90M8EAA** **ECS90M8BAA** **ECS90M8CAA** **ECS90M8DAA**	**S752L09N3S**
16A	200V 230V 460V 575V	3 5 10 10	24V DC	**ECS90N1EAA** **ECS90N1BAA** **ECS90N1CAA** **ECS90N1DAA**	**ECS90N2EAA** **ECS90N2BAA** **ECS90N2CAA** **ECS90N2DAA**	**ECS90N4EAA** **ECS90N4BAA** **ECS90N4CAA** **ECS90N4DAA**	**ECS90N6EAA** **ECS90N6BAA** **ECS90N6CAA** **ECS90N6DAA**	**ECS90N8EAA** **ECS90N8BAA** **ECS90N8CAA** **ECS90N8DAA**	**S752L16N3S**
27A	200V 230V 460V 575V	7-1/2 7-1/2 20 25	24V DC	**ECS90P1EAA** **ECS90P1BAA** **ECS90P1CAA** **ECS90P1DAA**	**ECS90P2EAA** **ECS90P2BAA** **ECS90P2CAA** **ECS90P2DAA**	**ECS90P4EAA** **ECS90P4BAA** **ECS90P4CAA** **ECS90P4DAA**	**ECS90P6EAA** **ECS90P6BAA** **ECS90P6CAA** **ECS90P6DAA**	**ECS90P8EAA** **ECS90P8BAA** **ECS90P8CAA** **ECS90P8DAA**	**S752L27N3S**
50A	200V 230V 460V 575V	10 10 30 40	24V DC	**ECS90R1EAA** **ECS90R1BAA** **ECS90R1CAA** **ECS90R1DAA**	**ECS90R2EAA** **ECS90R2BAA** **ECS90R2CAA** **ECS90R2DAA**	**ECS90R4EAA** **ECS90R4BAA** **ECS90R4CAA** **ECS90R4DAA**	**ECS90R6EAA** **ECS90R6BAA** **ECS90R6CAA** **ECS90R6DAA**	**ECS90R8EAA** **ECS90R8BAA** **ECS90R8CAA** **ECS90R8DAA**	**S752L50N3S**

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② hp Ratings are based on 40°C Ambient and:
- 25 sec. ramp — 2 starts/hr
- 15 sec. ramp — 4 starts/hr
- 10 sec. ramp — 6 starts/hr
- 7.5 sec. ramp — 8 starts/hr
- 3 sec. ramp — 15 starts/hr

For other ratings, consult your Eaton Representative.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS90J**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Table 6-5. Class ECS90 — Non-combination Reduced Voltage Soft-Starter — S801

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Type 1	Type 3R	Type 4X ④	Type 7/9	Type 12	Component Soft Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 65 mm									
37A	200V	10	24V DC	ECS90Q1EAA	ECS90Q2EAA	ECS90Q4EAA	ECS90Q6EAA	ECS90Q8EAA	S801N37N3S
	230V	10		ECS90Q1BAA	ECS90Q2BAA	ECS90Q4BAA	ECS90Q6BAA	ECS90Q8BAA	
	460V	25		ECS90Q1CAA	ECS90Q2CAA	ECS90Q4CAA	ECS90Q6CAA	ECS90Q8CAA	
	575V	30		ECS90Q1DAA	ECS90Q2DAA	ECS90Q4DAA	ECS90Q6DAA	ECS90Q8DAA	
66A	200V	20	24V DC	ECS90S1EAA	ECS90S2EAA	ECS90S4EAA	ECS90S6EAA	ECS90S8EAA	S801N66N3S
	230V	20		ECS90S1BAA	ECS90S2BAA	ECS90S4BAA	ECS90S6BAA	ECS90S8BAA	
	460V	50		ECS90S1CAA	ECS90S2CAA	ECS90S4CAA	ECS90S6CAA	ECS90S8CAA	
	575V	60		ECS90S1DAA	ECS90S2DAA	ECS90S4DAA	ECS90S6DAA	ECS90S8DAA	
Frame Size — 110 mm									
105A	200V	30	24V DC	ECS90V1EAA	ECS90V2EAA	ECS90V4EAA	ECS90V6EAA	ECS90V8EAA	S801R10N3S
	230V	40		ECS90V1BAA	ECS90V2BAA	ECS90V4BAA	ECS90V6BAA	ECS90V8BAA	
	460V	75		ECS90V1CAA	ECS90V2CAA	ECS90V4CAA	ECS90V6CAA	ECS90V8CAA	
	575V	100		ECS90V1DAA	ECS90V2DAA	ECS90V4DAA	ECS90V6DAA	ECS90V8DAA	
135A	200V	40	24V DC	ECS90W1EAA	ECS90W2EAA	ECS90W4EAA	ECS90W6EAA	ECS90W8EAA	S801R13N3S
	230V	50		ECS90W1BAA	ECS90W2BAA	ECS90W4BAA	ECS90W6BAA	ECS90W8BAA	
	460V	100		ECS90W1CAA	ECS90W2CAA	ECS90W4CAA	ECS90W6CAA	ECS90W8CAA	
	575V	125		ECS90W1DAA	ECS90W2DAA	ECS90W4DAA	ECS90W6DAA	ECS90W8DAA	
Frame Size — 200 mm									
180A	200V	60	24V DC	ECS90Y1EAA	ECS90Y2EAA	ECS90Y4EAA	ECS90Y6EAA	ECS90Y8EAA	S801T18N3S
	230V	60		ECS90Y1BAA	ECS90Y2BAA	ECS90Y4BAA	ECS90Y6BAA	ECS90Y8BAA	
	460V	150		ECS90Y1CAA	ECS90Y2CAA	ECS90Y4CAA	ECS90Y6CAA	ECS90Y8CAA	
	575V	150		ECS90Y1DAA	ECS90Y2DAA	ECS90Y4DAA	ECS90Y6DAA	ECS90Y8DAA	
240A	200V	75	24V DC	ECS90Z1EAA	ECS90Z2EAA	ECS90Z4EAA	ECS90Z6EAA	ECS90Z8EAA	S801T24N3S
	230V	75		ECS90Z1BAA	ECS90Z2BAA	ECS90Z4BAA	ECS90Z6BAA	ECS90Z8BAA	
	460V	200		ECS90Z1CAA	ECS90Z2CAA	ECS90Z4CAA	ECS90Z6CAA	ECS90Z8CAA	
	575V	200		ECS90Z1DAA	ECS90Z2DAA	ECS90Z4DAA	ECS90Z6DAA	ECS90Z8DAA	
304A	200V	100	24V DC	ECS9011EAA	ECS9012EAA	ECS9014EAA	ECS9016EAA	ECS9018EAA	S801T30N3S
	230V	100		ECS9011BAA	ECS9012BAA	ECS9014BAA	ECS9016BAA	ECS9018BAA	
	460V	250		ECS9011CAA	ECS9012CAA	ECS9014CAA	ECS9016CAA	ECS9018CAA	
	575V	300		ECS9011DAA	ECS9012DAA	ECS9014DAA	ECS9016DAA	ECS9018DAA	
Frame Size — 290 mm									
360A	200V	125	24V DC	ECS9021EAA	ECS9022EAA	ECS9024EAA	ECS9026EAA	ECS9028EAA	S801V36N3S
	230V	150		ECS9021BAA	ECS9022BAA	ECS9024BAA	ECS9026BAA	ECS9028BAA	
	460V	300		ECS9021CAA	ECS9022CAA	ECS9024CAA	ECS9026CAA	ECS9028CAA	
	575V	350		ECS9021DAA	ECS9022DAA	ECS9024DAA	ECS9026DAA	ECS9028DAA	
420A	200V	150	24V DC	ECS9031EAA	ECS9032EAA	ECS9034EAA	ECS9036EAA	ECS9038EAA	S801V42N3S
	230V	175		ECS9031BAA	ECS9032BAA	ECS9034BAA	ECS9036BAA	ECS9038BAA	
	460V	350		ECS9031CAA	ECS9032CAA	ECS9034CAA	ECS9036CAA	ECS9038CAA	
	575V	450		ECS9031DAA	ECS9032DAA	ECS9034DAA	ECS9036DAA	ECS9038DAA	
500A	200V	150	24V DC	ECS9041EAA	ECS9042EAA	ECS9044EAA	ECS9046EAA	ECS9048EAA	S801V50N3S
	230V	200		ECS9041BAA	ECS9042BAA	ECS9044BAA	ECS9046BAA	ECS9048BAA	
	460V	400		ECS9041CAA	ECS9042CAA	ECS9044CAA	ECS9046CAA	ECS9048CAA	
	575V	500		ECS9041DAA	ECS9042DAA	ECS9044DAA	ECS9046DAA	ECS9048DAA	
650A	200V	250	24V DC	ECS9051EAA	ECS9052EAA	ECS9054EAA	ECS9056EAA	ECS9058EAA	S801V65N3S
	230V	250		ECS9051BAA	ECS9052BAA	ECS9054BAA	ECS9056BAA	ECS9058BAA	
	460V	500		ECS9051CAA	ECS9052CAA	ECS9054CAA	ECS9056CAA	ECS9058CAA	
	575V	600		ECS9051DAA	ECS9052DAA	ECS9054DAA	ECS9056DAA	ECS9058DAA	
720A	230V	300	24V DC	ECS9061BAA	ECS9062BAA	ECS9064BAA	ECS9066BAA	ECS9068BAA	S801V72N3S
	460V	600		ECS9061CAA	ECS9062CAA	ECS9064CAA	ECS9066CAA	ECS9068CAA	
	575V	700		ECS9061DAA	ECS9062DAA	ECS9064DAA	ECS9066DAA	ECS9068DAA	
850A	230V	350	24V DC	ECS9071BAA	ECS9072BAA	ECS9074BAA	ECS9076BAA	ECS9078BAA	S801V85N3S
	460V	700		ECS9071CAA	ECS9072CAA	ECS9074CAA	ECS9076CAA	ECS9078CAA	
	575V	900		ECS9071DAA	ECS9072DAA	ECS9074DAA	ECS9076DAA	ECS9078DAA	
1000A	230V	400	24V DC	ECS9081BAA	ECS9082BAA	ECS9084BAA	ECS9086BAA	ECS9088BAA	S801V10N3S
	460V	800		ECS9081CAA	ECS9082CAA	ECS9084CAA	ECS9086CAA	ECS9088CAA	
	575V	1000		ECS9081DAA	ECS9082DAA	ECS9084DAA	ECS9086DAA	ECS9088DAA	

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS90S**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Table 6-6. Class ECS93 — Non-combination Reduced Voltage Soft-Starter — S811 ⑤

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Type 1	Type 3R	Type 4X ④	Type 7/9	Type 12	Component Soft Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 65 mm									
37A	200V	10	24V DC	**ECS93Q1EAA**	**ECS93Q2EAA**	**ECS93Q4EAA**	**ECS93Q6EAA**	**ECS93Q8EAA**	**S811N37N3S**
	230V	10		**ECS93Q1BAA**	**ECS93Q2BAA**	**ECS93Q4BAA**	**ECS93Q6BAA**	**ECS93Q8BAA**	
	460V	25		**ECS93Q1CAA**	**ECS93Q2CAA**	**ECS93Q4CAA**	**ECS93Q6CAA**	**ECS93Q8CAA**	
	575V	30		**ECS93Q1DAA**	**ECS93Q2DAA**	**ECS93Q4DAA**	**ECS93Q6DAA**	**ECS93Q8DAA**	
66A	200V	20	24V DC	**ECS93S1EAA**	**ECS93S2EAA**	**ECS93S4EAA**	**ECS93S6EAA**	**ECS93S8EAA**	**S811N66N3S**
	230V	20		**ECS93S1BAA**	**ECS93S2BAA**	**ECS93S4BAA**	**ECS93S6BAA**	**ECS93S8BAA**	
	460V	50		**ECS93S1CAA**	**ECS93S2CAA**	**ECS93S4CAA**	**ECS93S6CAA**	**ECS93S8CAA**	
	575V	60		**ECS93S1DAA**	**ECS93S2DAA**	**ECS93S4DAA**	**ECS93S6DAA**	**ECS93S8DAA**	
Frame Size — 110 mm									
105A	200V	30	24V DC	**ECS93V1EAA**	**ECS93V2EAA**	**ECS93V4EAA**	**ECS93V6EAA**	**ECS93V8EAA**	**S811R10N3S**
	230V	40		**ECS93V1BAA**	**ECS93V2BAA**	**ECS93V4BAA**	**ECS93V6BAA**	**ECS93V8BAA**	
	460V	75		**ECS93V1CAA**	**ECS93V2CAA**	**ECS93V4CAA**	**ECS93V6CAA**	**ECS93V8CAA**	
	575V	100		**ECS93V1DAA**	**ECS93V2DAA**	**ECS93V4DAA**	**ECS93V6DAA**	**ECS93V8DAA**	
135A	200V	40	24V DC	**ECS93W1EAA**	**ECS93W2EAA**	**ECS93W4EAA**	**ECS93W6EAA**	**ECS93W8EAA**	**S811R13N3S**
	230V	50		**ECS93W1BAA**	**ECS93W2BAA**	**ECS93W4BAA**	**ECS93W6BAA**	**ECS93W8BAA**	
	460V	100		**ECS93W1CAA**	**ECS93W2CAA**	**ECS93W4CAA**	**ECS93W6CAA**	**ECS93W8CAA**	
	575V	125		**ECS93W1DAA**	**ECS93W2DAA**	**ECS93W4DAA**	**ECS93W6DAA**	**ECS93W8DAA**	
Frame Size — 200 mm									
180A	200V	60	24V DC	**ECS93Y1EAA**	**ECS93Y2EAA**	**ECS93Y4EAA**	**ECS93Y6EAA**	**ECS93Y8EAA**	**S811T18N3S**
	230V	60		**ECS93Y1BAA**	**ECS93Y2BAA**	**ECS93Y4BAA**	**ECS93Y6BAA**	**ECS93Y8BAA**	
	460V	150		**ECS93Y1CAA**	**ECS93Y2CAA**	**ECS93Y4CAA**	**ECS93Y6CAA**	**ECS93Y8CAA**	
	575V	150		**ECS93Y1DAA**	**ECS93Y2DAA**	**ECS93Y4DAA**	**ECS93Y6DAA**	**ECS93Y8DAA**	
240A	200V	75	24V DC	**ECS93Z1EAA**	**ECS93Z2EAA**	**ECS93Z4EAA**	**ECS93Z6EAA**	**ECS93Z8EAA**	**S811T24N3S**
	230V	75		**ECS93Z1BAA**	**ECS93Z2BAA**	**ECS93Z4BAA**	**ECS93Z6BAA**	**ECS93Z8BAA**	
	460V	200		**ECS93Z1CAA**	**ECS93Z2CAA**	**ECS93Z4CAA**	**ECS93Z6CAA**	**ECS93Z8CAA**	
	575V	200		**ECS93Z1DAA**	**ECS93Z2DAA**	**ECS93Z4DAA**	**ECS93Z6DAA**	**ECS93Z8DAA**	
304A	200V	100	24V DC	**ECS9311EAA**	**ECS9312EAA**	**ECS9314EAA**	**ECS9316EAA**	**ECS9318EAA**	**S811T30N3S**
	230V	100		**ECS9311BAA**	**ECS9312BAA**	**ECS9314BAA**	**ECS9316BAA**	**ECS9318BAA**	
	460V	250		**ECS9311CAA**	**ECS9312CAA**	**ECS9314CAA**	**ECS9316CAA**	**ECS9318CAA**	
	575V	300		**ECS9311DAA**	**ECS9312DAA**	**ECS9314DAA**	**ECS9316DAA**	**ECS9318DAA**	
Frame Size — 290 mm									
360A	200V	125	24V DC	**ECS9321EAA**	**ECS9322EAA**	**ECS9324EAA**	**ECS9326EAA**	**ECS9328EAA**	**S811V36N3S**
	230V	150		**ECS9321BAA**	**ECS9322BAA**	**ECS9324BAA**	**ECS9326BAA**	**ECS9328BAA**	
	460V	300		**ECS9321CAA**	**ECS9322CAA**	**ECS9324CAA**	**ECS9326CAA**	**ECS9328CAA**	
	575V	350		**ECS9321DAA**	**ECS9322DAA**	**ECS9324DAA**	**ECS9326DAA**	**ECS9328DAA**	
420A	200V	150	24V DC	**ECS9331EAA**	**ECS9332EAA**	**ECS9334EAA**	**ECS9336EAA**	**ECS9338EAA**	**S811V42N3S**
	230V	175		**ECS9331BAA**	**ECS9332BAA**	**ECS9334BAA**	**ECS9336BAA**	**ECS9338BAA**	
	460V	350		**ECS9331CAA**	**ECS9332CAA**	**ECS9334CAA**	**ECS9336CAA**	**ECS9338CAA**	
	575V	450		**ECS9331DAA**	**ECS9332DAA**	**ECS9334DAA**	**ECS9336DAA**	**ECS9338DAA**	
500A	200V	150	24V DC	**ECS9341EAA**	**ECS9342EAA**	**ECS9344EAA**	**ECS9346EAA**	**ECS9348EAA**	**S811V50N3S**
	230V	200		**ECS9341BAA**	**ECS9342BAA**	**ECS9344BAA**	**ECS9346BAA**	**ECS9348BAA**	
	460V	400		**ECS9341CAA**	**ECS9342CAA**	**ECS9344CAA**	**ECS9346CAA**	**ECS9348CAA**	
	575V	500		**ECS9341DAA**	**ECS9342DAA**	**ECS9344DAA**	**ECS9346DAA**	**ECS9348DAA**	
650A	200V	250	24V DC	**ECS9351EAA**	**ECS9352EAA**	**ECS9354EAA**	**ECS9356EAA**	**ECS9358EAA**	**S811V65N3S**
	230V	250		**ECS9351BAA**	**ECS9352BAA**	**ECS9354BAA**	**ECS9356BAA**	**ECS9358BAA**	
	460V	500		**ECS9351CAA**	**ECS9352CAA**	**ECS9354CAA**	**ECS9356CAA**	**ECS9358CAA**	
	575V	600		**ECS9351DAA**	**ECS9352DAA**	**ECS9354DAA**	**ECS9356DAA**	**ECS9358DAA**	
720A	230V	300	24V DC	**ECS9361BAA**	**ECS9362BAA**	**ECS9364BAA**	**ECS9366BAA**	**ECS9368BAA**	**S811V72N3S**
	460V	600		**ECS9361CAA**	**ECS9362CAA**	**ECS9364CAA**	**ECS9366CAA**	**ECS9368CAA**	
	575V	700		**ECS9361DAA**	**ECS9362DAA**	**ECS9364DAA**	**ECS9366DAA**	**ECS9368DAA**	
850A	230V	350	24V DC	**ECS9371BAA**	**ECS9372BAA**	**ECS9374BAA**	**ECS9376BAA**	**ECS9378BAA**	**S811V85N3S**
	460V	700		**ECS9371CAA**	**ECS9372CAA**	**ECS9374CAA**	**ECS9376CAA**	**ECS9378CAA**	
	575V	900		**ECS9371DAA**	**ECS9372DAA**	**ECS9374DAA**	**ECS9376DAA**	**ECS9378DAA**	
1000A	230V	400	24V DC	**ECS9381BAA**	**ECS9382BAA**	**ECS9384BAA**	**ECS9386BAA**	**ECS9388BAA**	**S811V10N3S**
	460V	800		**ECS9381CAA**	**ECS9382CAA**	**ECS9384CAA**	**ECS9386CAA**	**ECS9388CAA**	
	575V	1000		**ECS9381DAA**	**ECS9382DAA**	**ECS9384DAA**	**ECS9386DAA**	**ECS9388DAA**	

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS93S**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Digital Interface Module (DIM) is mounted on door as standard.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Type 3R Fused S801 IT. Soft Starter

Product Selection

Table 6-7. Class ECS91 — Combination Reduced Voltage Soft-Starter — Fusible Disconnect — S752

Amps	Motor Voltage	hp ②	Coil Voltage ①	Switch Rating	Type 1	Type 3R	Type 4X ③	Type 7/9	Type 12	Component Soft Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 54 mm										
.8A	200V 230V 460V 575V	1/8 1/6 1/3 1/3	24V DC	30A	**ECS91J1EAB** **ECS91J1BAB** **ECS91J1CAC** **ECS91J1DAC**	**ECS91J2EAB** **ECS91J2BAB** **ECS91J2CAC** **ECS91J2DAC**	**ECS91J4EAB** **ECS91J4BAB** **ECS91J4CAC** **ECS91J4DAC**	**ECS91J6EAB** **ECS91J6BAB** **ECS91J6CAC** **ECS91J6DAC**	**ECS91J8EAB** **ECS91J8BAB** **ECS91J8CAC** **ECS91J8DAC**	**S752L01N3S**
1.9A	200V 230V 460V 575V	1/3 1/3 3/4 1	24V DC	30A	**ECS91K1EAB** **ECS91K1BAB** **ECS91K1CAC** **ECS91K1DAC**	**ECS91K2EAB** **ECS91K2BAB** **ECS91K2CAC** **ECS91K2DAC**	**ECS91K4EAB** **ECS91K4BAB** **ECS91K4CAC** **ECS91K4DAC**	**ECS91K6EAB** **ECS91K6BAB** **ECS91K6CAC** **ECS91K6DAC**	**ECS91K8EAB** **ECS91K8BAB** **ECS91K8CAC** **ECS91K8DAC**	**S752L02N3S**
4.4A	200V 230V 460V 575V	3/4 3/4 2 3	24V DC	30A	**ECS91L1EAB** **ECS91L1BAB** **ECS91L1CAC** **ECS91L1DAC**	**ECS91L2EAB** **ECS91L2BAB** **ECS91L2CAC** **ECS91L2DAC**	**ECS91L4EAB** **ECS91L4BAB** **ECS91L4CAC** **ECS91L4DAC**	**ECS91L6EAB** **ECS91L6BAB** **ECS91L6CAC** **ECS91L6DAC**	**ECS91L8EAB** **ECS91L8BAB** **ECS91L8CAC** **ECS91L8DAC**	**S752L04N3S**
9A	200V 230V 460V 575V	2 2 5 5	24V DC	30A	**ECS91M1EAB** **ECS91M1BAB** **ECS91M1CAC** **ECS91M1DAC**	**ECS91M2EAB** **ECS91M2BAB** **ECS91M2CAC** **ECS91M2DAC**	**ECS91M4EAB** **ECS91M4BAB** **ECS91M4CAC** **ECS91M4DAC**	**ECS91M6EAB** **ECS91M6BAB** **ECS91M6CAC** **ECS91M6DAC**	**ECS91M8EAB** **ECS91M8BAB** **ECS91M8CAC** **ECS91M8DAC**	**S752L09N3S**
16A	200V 230V 460V 575V	3 3 7-1/2 10	24V DC	30A	**ECS91N1EAB** **ECS91N1BAB** **ECS91N1CAC** **ECS91N1DAC**	**ECS91N2EAB** **ECS91N2BAB** **ECS91N2CAC** **ECS91N2DAC**	**ECS91N4EAB** **ECS91N4BAB** **ECS91N4CAC** **ECS91N4DAC**	**ECS91N6EAB** **ECS91N6BAB** **ECS91N6CAC** **ECS91N6DAC**	**ECS91N8EAB** **ECS91N8BAB** **ECS91N8CAC** **ECS91N8DAC**	**S752L16N3S**
27A	200V 230V 460V 575V	5 7-1/2 15 20	24V DC	60A	**ECS91P1EAD** **ECS91P1BAD** **ECS91P1CAE** **ECS91P1DAE**	**ECS91P2EAD** **ECS91P2BAD** **ECS91P2CAE** **ECS91P2DAE**	**ECS91P4EAD** **ECS91P4BAD** **ECS91P4CAE** **ECS91P4DAE**	**ECS91P6EAD** **ECS91P6BAD** **ECS91P6CAE** **ECS91P6DAE**	**ECS91P8EAD** **ECS91P8BAD** **ECS91P8CAE** **ECS91P8DAE**	**S752L27N3S**
50A	200V 230V 460V 575V	10 10 30 40	24V DC	60A	**ECS91R1EAD** **ECS91R1BAD** **ECS91R1CAE** **ECS91R1DAE**	**ECS91R2EAD** **ECS91R2BAD** **ECS91R2CAE** **ECS91R2DAE**	**ECS91R4EAD** **ECS91R4BAD** **ECS91R4CAE** **ECS91R4DAE**	**ECS91R6EAD** **ECS91R6BAD** **ECS91R6CAE** **ECS91R6DAE**	**ECS91R8EAD** **ECS91R8BAD** **ECS91R8CAE** **ECS91R8DAE**	**S752L50N3S**

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② hp Ratings are based on 40°C Ambient and:
- 25 sec. ramp — 2 starts/hr
- 15 sec. ramp — 4 starts/hr
- 10 sec. ramp — 6 starts/hr
- 7.5 sec. ramp — 8 starts/hr
- 3 sec. ramp — 15 starts/hr

For other ratings, consult your Eaton Representative.

③ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS91J**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-38**

Table 6-8. Class ECS91 — Combination Reduced Voltage Soft-Starter — Fusible Disconnect — S801

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Switch Rating	Type 1	Type 3R	Type 4X ④	Type 12	Component Soft Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 65 mm									
37A	200V	3 10	24V DC	30A 60A	**ECS91Q1EAB** **ECS91Q1EAD**	**ECS91Q2EAB** **ECS91Q2EAD**	**ECS91Q4EAB** **ECS91Q4EAD**	**ECS91Q8EAB** **ECS91Q8EAD**	**S801N37N3S**
	230V	7-1/2 10		30A 60A	**ECS91Q1BAB** **ECS91Q1BAD**	**ECS91Q2BAB** **ECS91Q2BAD**	**ECS91Q4BAB** **ECS91Q4BAD**	**ECS91Q8BAB** **ECS91Q8BAD**	**S801N37N3S**
	460V	15 25		30A 60A	**ECS91Q1CAC** **ECS91Q1CAE**	**ECS91Q2CAC** **ECS91Q2CAE**	**ECS91Q4CAC** **ECS91Q4CAE**	**ECS91Q8CAC** **ECS91Q8CAE**	**S801N37N3S**
	575V	20 30		30A 60A	**ECS91Q1DAC** **ECS91Q1DAE**	**ECS91Q2DAC** **ECS91Q2DAE**	**ECS91Q4DAC** **ECS91Q4DAE**	**ECS91Q8DAC** **ECS91Q8DAE**	**S801N37N3S**
66A	200V	10 20	24V DC	60A 100A	**ECS91S1EAD** **ECS91S1EAF**	**ECS91S2EAD** **ECS91S2EAF**	**ECS91S4EAD** **ECS91S4EAF**	**ECS91S8EAD** **ECS91S8EAF**	**S801N66N3S**
	230V	15 20		60A 100A	**ECS91S1BAD** **ECS91S1BAF**	**ECS91S2BAD** **ECS91S2BAF**	**ECS91S4BAD** **ECS91S4BAF**	**ECS91S8BAD** **ECS91S8BAF**	**S801N66N3S**
	460V	50		100A	**ECS91S1CAG**	**ECS91S2CAG**	**ECS91S4CAG**	**ECS91S8CAG**	**S801N66N3S**
	575V	40 60		60A 100A	**ECS91S1DAE** **ECS91S1DAG**	**ECS91S2DAE** **ECS91S2DAG**	**ECS91S4DAE** **ECS91S4DAG**	**ECS91S8DAE** **ECS91S8DAG**	**S801N66N3S**
Frame Size — 110 mm									
105A	200V 230V 460V 575V	30 40 75 100	24V DC	200A 200A 200A 200A	**ECS91V1EAH** **ECS91V1BAH** **ECS91V1CAJ** **ECS91V1DAJ**	**ECS91V2EAH** **ECS91V2BAH** **ECS91V2CAJ** **ECS91V2DAJ**	**ECS91V4EAH** **ECS91V4BAH** **ECS91V4CAJ** **ECS91V4DAJ**	**ECS91V8EAH** **ECS91V8BAH** **ECS91V8CAJ** **ECS91V8DAJ**	**S801R10N3S**
135A	200V 230V 460V 575V	40 50 100 125	24V DC	200A 200A 200A 200A	**ECS91W1EAH** **ECS91W1BAH** **ECS91W1CAJ** **ECS91W1DAJ**	**ECS91W2EAH** **ECS91W2BAH** **ECS91W2CAJ** **ECS91W2DAJ**	**ECS91W4EAH** **ECS91W4BAH** **ECS91W4CAJ** **ECS91W4DAJ**	**ECS91W8EAH** **ECS91W8BAH** **ECS91W8CAJ** **ECS91W8DAJ**	**S801R13N3S**
Frame Size — 200 mm									
180A	200V 230V 460V 575V	60 60 150 150	24V DC	400A 400A 400A 400A	**ECS91Y1EAK** **ECS91Y1BAK** **ECS91Y1CAL** **ECS91Y1DAL**	**ECS91Y2EAK** **ECS91Y2BAK** **ECS91Y2CAL** **ECS91Y2DAL**	**ECS91Y4EAK** **ECS91Y4BAK** **ECS91Y4CAL** **ECS91Y4DAL**	**ECS91Y8EAK** **ECS91Y8BAK** **ECS91Y8CAL** **ECS91Y8DAL**	**S801T18N3S**
240A	200V 230V 460V 575V	75 75 200 200	24V DC	400A 400A 400A 400A	**ECS91Z1EAK** **ECS91Z1BAK** **ECS91Z1CAL** **ECS91Z1DAL**	**ECS91Z2EAK** **ECS91Z2BAK** **ECS91Z2CAL** **ECS91Z2DAL**	**ECS91Z4EAK** **ECS91Z4BAK** **ECS91Z4CAL** **ECS91Z4DAL**	**ECS91Z8EAK** **ECS91Z8BAK** **ECS91Z8CAL** **ECS91Z8DAL**	**S801T24N3S**
304A	200V 230V 460V 575V	100 100 250 300	24V DC	400A 400A 400A 400A	**ECS9111EAK** **ECS9111BAK** **ECS9111CAL** **ECS9111DAL**	**ECS9112EAK** **ECS9112BAK** **ECS9112CAL** **ECS9112DAL**	**ECS9114EAK** **ECS9114BAK** **ECS9114CAL** **ECS9114DAL**	**ECS9118EAK** **ECS9118BAK** **ECS9118CAL** **ECS9118DAL**	**S801T30N3S**
Frame Size — 290 mm									
360A	200V 230V 460V 575V	125 125 300 350	24V DC	600A 600A 600A 600A	**ECS9121EAM** **ECS9121BAM** **ECS9121CAN** **ECS9121DAN**	**ECS9122EAM** **ECS9122BAM** **ECS9122CAN** **ECS9122DAN**	**ECS9124EAM** **ECS9124BAM** **ECS9124CAN** **ECS9124DAN**	**ECS9128EAM** **ECS9128BAM** **ECS9128CAN** **ECS9128DAN**	**S801V36N3S**
420A	200V 230V 460V 575V	150 150 350 450	24V DC	600A 600A 600A 600A	**ECS9131EAM** **ECS9131BAM** **ECS9131CAN** **ECS9131DAN**	**ECS9132EAM** **ECS9132BAM** **ECS9132CAN** **ECS9132DAN**	**ECS9134EAM** **ECS9134BAM** **ECS9134CAN** **ECS9134DAN**	**ECS9138EAM** **ECS9138BAM** **ECS9138CAN** **ECS9138DAN**	**S801V42N3S**
500A	200V 230V 460V 575V	150 200 400 500	24V DC	800A 800A 800A 800A	**ECS9141EAP** **ECS9141BAP** **ECS9141CAP** **ECS9141DAP**	**ECS9142EAP** **ECS9142BAP** **ECS9142CAP** **ECS9142DAP**	**ECS9144EAP** **ECS9144BAP** **ECS9144CAP** **ECS9144DAP**	**ECS9148EAP** **ECS9148BAP** **ECS9148CAP** **ECS9148DAP**	**S801V50N3S**
650A	460V 575V	500 600	24V DC	800A 800A	**ECS9151CAP** **ECS9151DAP**	**ECS9152CAP** **ECS9152DAP**	**ECS9154CAP** **ECS9154DAP**	**ECS9158CAP** **ECS9158DAP**	**S801V65N3S**
720A	460V 575V	600 700	24V DC	1200A 1200A	**ECS9161CAQ** **ECS9161DAQ**	**ECS9162CAQ** **ECS9162DAQ**	**ECS9164CAQ** **ECS9164DAQ**	**ECS9168CAQ** **ECS9168DAQ**	**S801V72N3S**
850A	460V 575V	700 800	24V DC	1600A 1600A	**ECS9171CAR** **ECS9171DAR**	**ECS9172CAR** **ECS9172DAR**	**ECS9174CAR** **ECS9174DAR**	**ECS9178CAR** **ECS9178DAR**	**S801V85N3S**
1000A	230V 460V 575V	400 800 1000	24V DC	⑤ ⑤ ⑤	**ECS9181BA_** ⑤ **ECS9181CA_** ⑤ **ECS9181DA_** ⑤	**ECS9182BA_** ⑤ **ECS9182CA_** ⑤ **ECS9182DA_** ⑤	**ECS9184BA_** ⑤ **ECS9184CA_** ⑤ **ECS9184DA_** ⑤	**ECS9188BA_** ⑤ **ECS9188CA_** ⑤ **ECS9188DA_** ⑤	**S801V10N3S**

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS91S**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Consult Eaton.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Table 6-9. Class ECS94 — Combination Reduced Voltage Soft-Starter — Fusible Disconnect — S811 ⑥

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Switch Rating	Type 1	Type 3R	Type 4X ④	Type 12	Component Soft Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 65 mm									
37A	200V	3 10	24V DC	30A 60A	**ECS94Q1EAB** **ECS94Q1EAD**	**ECS94Q2EAB** **ECS94Q2EAD**	**ECS94Q4EAB** **ECS94Q4EAD**	**ECS94Q8EAB** **ECS94Q8EAD**	**S811N37N3S**
	230V	7-1/2 10		30A 60A	**ECS94Q1BAB** **ECS94Q1BAD**	**ECS94Q2BAB** **ECS94Q2BAD**	**ECS94Q4BAB** **ECS94Q4BAD**	**ECS94Q8BAB** **ECS94Q8BAD**	**S811N37N3S**
	460V	15 25		30A 60A	**ECS94Q1CAC** **ECS94Q1CAE**	**ECS94Q2CAC** **ECS94Q2CAE**	**ECS94Q4CAC** **ECS94Q4CAE**	**ECS94Q8CAC** **ECS94Q8CAE**	**S811N37N3S**
	575V	20 30		30A 60A	**ECS94Q1DAC** **ECS94Q1DAE**	**ECS94Q2DAC** **ECS94Q2DAE**	**ECS94Q4DAC** **ECS94Q4DAE**	**ECS94Q8DAC** **ECS94Q8DAE**	**S811N37N3S**
66A	200V	10 20	24V DC	60A 100A	**ECS94S1EAD** **ECS94S1EAF**	**ECS94S2EAD** **ECS94S2EAF**	**ECS94S4EAD** **ECS94S4EAF**	**ECS94S8EAD** **ECS94S8EAF**	**S811N66N3S**
	230V	15 20		60A 100A	**ECS94S1BAD** **ECS94S1BAF**	**ECS94S2BAD** **ECS94S2BAF**	**ECS94S4BAD** **ECS94S4BAF**	**ECS94S8BAD** **ECS94S8BAF**	**S811N66N3S**
	460V	50		100A	**ECS94S1CAG**	**ECS94S2CAG**	**ECS94S4CAG**	**ECS94S8CAG**	**S811N66N3S**
	575V	40 60		60A 100A	**ECS94S1DAE** **ECS94S1DAG**	**ECS94S2DAE** **ECS94S2DAG**	**ECS94S4DAE** **ECS94S4DAG**	**ECS94S8DAE** **ECS94S8DAG**	**S811N66N3S**
Frame Size — 110 mm									
105A	200V 230V 460V 575V	30 40 75 100	24V DC	200A 200A 200A 200A	**ECS94V1EAH** **ECS94V1BAH** **ECS94V1CAJ** **ECS94V1DAJ**	**ECS94V2EAH** **ECS94V2BAH** **ECS94V2CAJ** **ECS94V2DAJ**	**ECS94V4EAH** **ECS94V4BAH** **ECS94V4CAJ** **ECS94V4DAJ**	**ECS94V8EAH** **ECS94V8BAH** **ECS94V8CAJ** **ECS94V8DAJ**	**S811R10N3S**
135A	200V 230V 460V 575V	40 50 100 125	24V DC	200A 200A 200A 200A	**ECS94W1EAH** **ECS94W1BAH** **ECS94W1CAJ** **ECS94W1DAJ**	**ECS94W2EAH** **ECS94W2BAH** **ECS94W2CAJ** **ECS94W2DAJ**	**ECS94W4EAH** **ECS94W4BAH** **ECS94W4CAJ** **ECS94W4DAJ**	**ECS94W8EAH** **ECS94W8BAH** **ECS94W8CAJ** **ECS94W8DAJ**	**S811R13N3S**
Frame Size — 200 mm									
180A	200V 230V 460V 575V	60 60 150 150	24V DC	400A 400A 400A 400A	**ECS94Y1EAK** **ECS94Y1BAK** **ECS94Y1CAL** **ECS94Y1DAL**	**ECS94Y2EAK** **ECS94Y2BAK** **ECS94Y2CAL** **ECS94Y2DAL**	**ECS94Y4EAK** **ECS94Y4BAK** **ECS94Y4CAL** **ECS94Y4DAL**	**ECS94Y8EAK** **ECS94Y8BAK** **ECS94Y8CAL** **ECS94Y8DAL**	**S811T18N3S**
240A	200V 230V 460V 575V	75 75 200 200	24V DC	400A 400A 400A 400A	**ECS94Z1EAK** **ECS94Z1BAK** **ECS94Z1CAL** **ECS94Z1DAL**	**ECS94Z2EAK** **ECS94Z2BAK** **ECS94Z2CAL** **ECS94Z2DAL**	**ECS94Z4EAK** **ECS94Z4BAK** **ECS94Z4CAL** **ECS94Z4DAL**	**ECS94Z8EAK** **ECS94Z8BAK** **ECS94Z8CAL** **ECS94Z8DAL**	**S811T24N3S**
304A	200V 230V 460V 575V	100 100 250 300	24V DC	400A 400A 400A 400A	**ECS9411EAK** **ECS9411BAK** **ECS9411CAL** **ECS9411DAL**	**ECS9412EAK** **ECS9412BAK** **ECS9412CAL** **ECS9412DAL**	**ECS9414EAK** **ECS9414BAK** **ECS9414CAL** **ECS9414DAL**	**ECS9418EAK** **ECS9418BAK** **ECS9418CAL** **ECS9418DAL**	**S811T30N3S**
Frame Size — 290 mm									
360A	200V 230V 460V 575V	125 125 300 350	24V DC	600A 600A 600A 600A	**ECS9421EAM** **ECS9421BAM** **ECS9421CAN** **ECS9421DAN**	**ECS9422EAM** **ECS9422BAM** **ECS9422CAN** **ECS9422DAN**	**ECS9424EAM** **ECS9424BAM** **ECS9424CAN** **ECS9424DAN**	**ECS9428EAM** **ECS9428BAM** **ECS9428CAN** **ECS9428DAN**	**S811V36N3S**
420A	200V 230V 460V 575V	150 150 350 450	24V DC	600A 600A 600A 600A	**ECS9431EAM** **ECS9431BAM** **ECS9431CAN** **ECS9431DAN**	**ECS9432EAM** **ECS9432BAM** **ECS9432CAN** **ECS9432DAN**	**ECS9434EAM** **ECS9434BAM** **ECS9434CAN** **ECS9434DAN**	**ECS9438EAM** **ECS9438BAM** **ECS9438CAN** **ECS9438DAN**	**S811V42N3S**
500A	200V 230V 460V 575V	150 200 400 500	24V DC	800A 800A 800A 800A	**ECS9441EAP** **ECS9441BAP** **ECS9441CAP** **ECS9441DAP**	**ECS9442EAP** **ECS9442BAP** **ECS9442CAP** **ECS9442DAP**	**ECS9444EAP** **ECS9444BAP** **ECS9444CAP** **ECS9444DAP**	**ECS9448EAP** **ECS9448BAP** **ECS9448CAP** **ECS9448DAP**	**S811V50N3S**
650A	460V 575V	500 600	24V DC	800A 800A	**ECS9451CAP** **ECS9451DAP**	**ECS9452CAP** **ECS9452DAP**	**ECS9454CAP** **ECS9454DAP**	**ECS9458CAP** **ECS9458DAP**	**S811V65N3S**
720A	460V 575V	600 700	24V DC	1200A 1200A	**ECS9461CAQ** **ECS9461DAQ**	**ECS9462CAQ** **ECS9462DAQ**	**ECS9464CAQ** **ECS9464DAQ**	**ECS9468CAQ** **ECS9468DAQ**	**S811V72N3S**
850A	460V 575V	700 800	24V DC	1600A 1600A	**ECS9471CAR** **ECS9471DAR**	**ECS9472CAR** **ECS9472DAR**	**ECS9474CAR** **ECS9474DAR**	**ECS9478CAR** **ECS9478DAR**	**S811V85N3S**
1000A	230V 460V 575V	400 800 1000	24V DC	⑤ ⑤ ⑤	**ECS9481BA_** ⑤ **ECS9481CA_** ⑤ **ECS9481DA_** ⑤	**ECS9482BA_** ⑤ **ECS9482CA_** ⑤ **ECS9482DA_** ⑤	**ECS9484BA_** ⑤ **ECS9484CA_** ⑤ **ECS9484DA_** ⑤	**ECS9488BA_** ⑤ **ECS9488CA_** ⑤ **ECS9488DA_** ⑤	**S811V10N3S**

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS94Q**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Consult Eaton.

⑥ Digital Interface Module (DIM) is mounted on door as standard.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Type 12 HMCP Combination
IT. S801 Soft Starter

Product Selection

Table 6-10. Class ECS92 — Combination Reduced Voltage Soft-Starter — Circuit Breaker — S752

Amps	Motor Voltage	hp ②	Coil Voltage ①	Circuit Breaker	Type 1	Type 3R	Type 4X ③	Type 7/9	Type 12	Component Soft Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Frame Size — 54 mm										
.8A	200V	1/8	24V DC	3A	**ECS92J1EAB**	**ECS92J2EAB**	**ECS92J4EAB**	**ECS92J6EAB**	**ECS92J8EAB**	**S752L01N3S**
	230V	1/6		3A	**ECS92J1BAB**	**ECS92J2BAB**	**ECS92J4BAB**	**ECS92J6BAB**	**ECS92J8BAB**	
	460V	1/3		3A	**ECS92J1CAB**	**ECS92J2CAB**	**ECS92J4CAB**	**ECS92J6CAB**	**ECS92J8CAB**	
	575V	1/3		3A	**ECS92J1DAB**	**ECS92J2DAB**	**ECS92J4DAB**	**ECS92J6DAB**	**ECS92J8DAB**	
1.9A	200V	1/3	24V DC	3A	**ECS92K1EAB**	**ECS92K2EAB**	**ECS92K4EAB**	**ECS92K6EAB**	**ECS92K8EAB**	**S752L02N3S**
	230V	1/3		3A	**ECS92K1BAB**	**ECS92K2BAB**	**ECS92K4BAB**	**ECS92K6BAB**	**ECS92K8BAB**	
	460V	3/4		3A	**ECS92K1CAB**	**ECS92K2CAB**	**ECS92K4CAB**	**ECS92K6CAB**	**ECS92K8CAB**	
	575V	1		3A	**ECS92K1DAB**	**ECS92K2DAB**	**ECS92K4DAB**	**ECS92K6DAB**	**ECS92K8DAB**	
4.4A	200V	3/4	24V DC	7A	**ECS92L1EAC**	**ECS92L2EAC**	**ECS92L4EAC**	**ECS92L6EAC**	**ECS92L8EAC**	**S752L04N3S**
	230V	3/4		7A	**ECS92L1BAC**	**ECS92L2BAC**	**ECS92L4BAC**	**ECS92L6BAC**	**ECS92L8BAC**	
	460V	2		7A	**ECS92L1CAC**	**ECS92L2CAC**	**ECS92L4CAC**	**ECS92L6CAC**	**ECS92L8CAC**	
	575V	3		7A	**ECS92L1DAC**	**ECS92L2DAC**	**ECS92L4DAC**	**ECS92L6DAC**	**ECS92L8DAC**	
9A	200V	2	24V DC	15A	**ECS92M1EAD**	**ECS92M2EAD**	**ECS92M4EAD**	**ECS92M6EAD**	**ECS92M8EAD**	**S752L09N3S**
	230V	2		15A	**ECS92M1BAD**	**ECS92M2BAD**	**ECS92M4BAD**	**ECS92M6BAD**	**ECS92M8BAD**	
	460V	5		15A	**ECS92M1CAD**	**ECS92M2CAD**	**ECS92M4CAD**	**ECS92M6CAD**	**ECS92M8CAD**	
	575V	5		15A	**ECS92M1DAD**	**ECS92M2DAD**	**ECS92M4DAD**	**ECS92M6DAD**	**ECS92M8DAD**	
16A	200V	3	24V DC	15A	**ECS92N1EAD**	**ECS92N2EAD**	**ECS92N4EAD**	**ECS92N6EAD**	**ECS92N8EAD**	**S752L16N3S**
	230V	3		15A	**ECS92N1BAD**	**ECS92N2BAD**	**ECS92N4BAD**	**ECS92N6BAD**	**ECS92N8BAD**	
	460V	7-1/2		30A	**ECS92N1CAE**	**ECS92N2CAE**	**ECS92N4CAE**	**ECS92N6CAE**	**ECS92N8CAE**	
	575V	10		30A	**ECS92N1DAE**	**ECS92N2DAE**	**ECS92N4DAE**	**ECS92N6DAE**	**ECS92N8DAE**	
27A	200V	5	24V DC	30A	**ECS92P1EAE**	**ECS92P2EAE**	**ECS92P4EAE**	**ECS92P6EAE**	**ECS92P8EAE**	**S752L27N3S**
	230V	7-1/2		30A	**ECS92P1BAE**	**ECS92P2BAE**	**ECS92P4BAE**	**ECS92P6BAE**	**ECS92P8BAE**	
	460V	15		50A	**ECS92P1CAF**	**ECS92P2CAF**	**ECS92P4CAF**	**ECS92P6CAF**	**ECS92P8CAF**	
	575V	20		50A	**ECS92P1DAF**	**ECS92P2DAF**	**ECS92P4DAF**	**ECS92P6DAF**	**ECS92P8DAF**	
50A	200V	10	24V DC	100A	**ECS92R1EAG**	**ECS92R2EAG**	**ECS92R4EAG**	**ECS92R6EAG**	**ECS92R8EAG**	**S752L50N3S**
	230V	10		100A	**ECS92R1BAG**	**ECS92R2BAG**	**ECS92R4BAG**	**ECS92R6BAG**	**ECS92R8BAG**	
	460V	30		100A	**ECS92R1CAG**	**ECS92R2CAG**	**ECS92R4CAG**	**ECS92R6CAG**	**ECS92R8CAG**	
	575V	40		100A	**ECS92R1DAG**	**ECS92R2DAG**	**ECS92R4DAG**	**ECS92R6DAG**	**ECS92R8DAG**	

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **0** (i.e. ECS90S1**E**AA becomes ECS90S1**0**AA-**C35**).

② hp Ratings are based on 40°C Ambient and:
- 25 sec. ramp — 2 starts/hr
- 15 sec. ramp — 4 starts/hr
- 10 sec. ramp — 6 starts/hr
- 7.5 sec. ramp — 8 starts/hr
- 3 sec. ramp — 15 starts/hr

For other ratings, consult your Eaton Representative.

③ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS92J**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Table 6-11. Class ECS92 — Combination Reduced Voltage Soft-Starter — Circuit Breaker — S801

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	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 1 3 10	24V DC	7A 15A 30A 50A	ECS92Q1EAC ECS92Q1EAD ECS92Q1EAE ECS92Q1EAF	ECS92Q2EAC ECS92Q2EAD ECS92Q2EAE ECS92Q2EAF	ECS92Q4EAC ECS92Q4EAD ECS92Q4EAE ECS92Q4EAF	ECS92Q6EAC ECS92Q6EAD ECS92Q6EAE ECS92Q6EAF	ECS92Q8EAC ECS92Q8EAD ECS92Q8EAE ECS92Q8EAF	S801N37N3S
	230V	1 2 3 10	24V DC	7A 15A 30A 50A	ECS92Q1BAC ECS92Q1BAD ECS92Q1BAE ECS92Q1BAF	ECS92Q2BAC ECS92Q2BAD ECS92Q2BAE ECS92Q2BAF	ECS92Q4BAC ECS92Q4BAD ECS92Q4BAE ECS92Q4BAF	ECS92Q6BAC ECS92Q6BAD ECS92Q6BAE ECS92Q6BAF	ECS92Q8BAC ECS92Q8BAD ECS92Q8BAE ECS92Q8BAF	S801N37N3S
	460V	3/4 2 5 10 25	24V DC	3A 7A 15A 30A 50A	ECS92Q1CAB ECS92Q1CAC ECS92Q1CAD ECS92Q1CAE ECS92Q1CAF	ECS92Q2CAB ECS92Q2CAC ECS92Q2CAD ECS92Q2CAE ECS92Q2CAF	ECS92Q4CAB ECS92Q4CAC ECS92Q4CAD ECS92Q4CAE ECS92Q4CAF	ECS92Q6CAB ECS92Q6CAC ECS92Q6CAD ECS92Q6CAE ECS92Q6CAF	ECS92Q8CAB ECS92Q8CAC ECS92Q8CAD ECS92Q8CAE ECS92Q8CAF	S801N37N3S
	575V	1 3 7-1/2 15 30	24V DC	3A 7A 15A 30A 50A	ECS92Q1DAB ECS92Q1DAC ECS92Q1DAD ECS92Q1DAE ECS92Q1DAF	ECS92Q2DAB ECS92Q2DAC ECS92Q2DAD ECS92Q2DAE ECS92Q2DAF	ECS92Q4DAB ECS92Q4DAC ECS92Q4DAD ECS92Q4DAE ECS92Q4DAF	ECS92Q6DAB ECS92Q6DAC ECS92Q6DAD ECS92Q6DAE ECS92Q6DAF	ECS92Q8DAB ECS92Q8DAC ECS92Q8DAD ECS92Q8DAE ECS92Q8DAF	S801N37N3S
66A	200V	20	24V DC	100A	ECS92S1EAG	ECS92S2EAG	ECS92S4EAG	ECS92S6EAG	ECS92S8EAG	S801N66N3S
	230V	15 20	24V DC	70A 100A	ECS92S1BAW ECS92S1BAG	ECS92S2BAW ECS92S2BAG	ECS92S4BAW ECS92S4BAG	ECS92S6BAW ECS92S6BAG	ECS92S8BAW ECS92S8BAG	S801N66N3S
	460V	50	24V DC	100A	ECS92S1CAG	ECS92S2CAG	ECS92S4CAG	ECS92S6CAG	ECS92S8CAG	S801N66N3S
	575V	60	24V DC	100A	ECS92S1DAG	ECS92S2DAG	ECS92S4DAG	ECS92S6DAG	ECS92S8DAG	S801N66N3S
Frame Size — 110 mm										
105A	200V	30	24V DC	150A	ECS92V1EAH	ECS92V2EAH	ECS92V4EAH	ECS92V6EAH	ECS92V8EAH	S801R10N3S
	230V	40	24V DC	150A	ECS92V1BAH	ECS92V2BAH	ECS92V4BAH	ECS92V6BAH	ECS92V8BAH	S801R10N3S
	460V	75	24V DC	150A	ECS92V1CAH	ECS92V2CAH	ECS92V4CAH	ECS92V6CAH	ECS92V8CAH	S801R10N3S
	575V	100	24V DC	150A	ECS92V1DAH	ECS92V2DAH	ECS92V4DAH	ECS92V6DAH	ECS92V8DAH	S801R10N3S
135A	200V 230V 460V 575V	40 50 100 125	24V DC	150A 150A 150A 150A	ECS92W1EAH ECS92W1BAH ECS92W1CAH ECS92W1DAH	ECS92W2EAH ECS92W2BAH ECS92W2CAH ECS92W2DAH	ECS92W4EAH ECS92W4BAH ECS92W4CAH ECS92W4DAH	ECS92W6EAH ECS92W6BAH ECS92W6CAH ECS92W6DAH	ECS92W8EAH ECS92W8BAH ECS92W8CAH ECS92W8DAH	S801R13N3S
Frame Size — 200 mm										
180A	200V 230V 460V 575V	60 60 150 150	24V DC	250A 250A 250A 250A	ECS92Y1EAJ ECS92Y1BAJ ECS92Y1CAJ ECS92Y1DAJ	ECS92Y2EAJ ECS92Y2BAJ ECS92Y2CAJ ECS92Y2DAJ	ECS92Y4EAJ ECS92Y4BAJ ECS92Y4CAJ ECS92Y4DAJ	ECS92Y6EAJ ECS92Y6BAJ ECS92Y6CAJ ECS92Y6DAJ	ECS92Y8EAJ ECS92Y8BAJ ECS92Y8CAJ ECS92Y8DAJ	S801T18N3S
240A	200V 230V 460V 575V	75 75 200 200	24V DC	400A 250A 400A 250A	ECS92Z1EAK ECS92Z1BAJ ECS92Z1CAK ECS92Z1DAJ	ECS92Z2EAK ECS92Z2BAJ ECS92Z2CAK ECS92Z2DAJ	ECS92Z4EAK ECS92Z4BAJ ECS92Z4CAK ECS92Z4DAJ	ECS92Z6EAK ECS92Z6BAJ ECS92Z6CAK ECS92Z6DAJ	ECS92Z8EAK ECS92Z8BAJ ECS92Z8CAK ECS92Z8DAJ	S801T24N3S
304A	200V 230V 460V 575V	100 100 250 300	24V DC	400A 400A 400A 400A	ECS9211EAK ECS9211BAK ECS9211CAK ECS9211DAK	ECS9212EAK ECS9212BAK ECS9212CAK ECS9212DAK	ECS9214EAK ECS9214BAK ECS9214CAK ECS9214DAK	ECS9216EAK ECS9216BAK ECS9216CAK ECS9216DAK	ECS9218EAK ECS9218BAK ECS9218CAK ECS9218DAK	S801T30N3S

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS92Q**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Table 6-11. Class ECS92 — Combination Reduced Voltage Soft-Starter — Circuit Breaker — S801 (Continued)

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	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 230V 460V 575V	125 150 300 350	24V DC	HMCP 600A HMCP 400A HMCP 600A HMCP 400A	**ECS9221EAL** **ECS9221BAK** **ECS9221CAL** **ECS9221DAK**	**ECS9222EAL** **ECS9222BAK** **ECS9222CAL** **ECS9222DAK**	**ECS9224EAL** **ECS9224BAK** **ECS9224CAL** **ECS9224DAK**	— — — —	**ECS9228EAL** **ECS9228BAK** **ECS9228CAL** **ECS9228DAK**	**S801V36N3S**
420A	200V 460V 575V	150 350 450	24V DC	HMCP 600A HMCP 600A HMCP 600A	**ECS9231EAL** **ECS9231CAL** **ECS9231DAL**	**ECS9232EAL** **ECS9232CAL** **ECS9232DAL**	**ECS9234EAL** **ECS9234CAL** **ECS9234DAL**	— — —	**ECS9238EAL** **ECS9238CAL** **ECS9238DAL**	**S801V42N3S**
500A	230V 460V 575V	200 400 500	24V DC	HMCP 600A HMCP 600A HMCP 600A	**ECS9241BAL** **ECS9241CAL** **ECS9241DAL**	**ECS9242BAL** **ECS9242CAL** **ECS9242DAL**	**ECS9244BAL** **ECS9244CAL** **ECS9244DAL**	— — —	**ECS9248BAL** **ECS9248CAL** **ECS9248DAL**	**S801V50N3S**
650A	200V 230V 460V 460V 575V	200 250 450 500 600	24V DC	HMCP 1200A HMCP 1200A HMCP 600A HMCP 1200A HMCP 1200A	**ECS9251EAP** **ECS9251BAP** **ECS9251CAL** **ECS9251CAP** **ECS9251DAP**	**ECS9252EAP** **ECS9252BAP** **ECS9252CAL** **ECS9252CAP** **ECS9252DAP**	**ECS9254EAP** **ECS9254BAP** **ECS9254CAL** **ECS9254CAP** **ECS9254DAP**	— — — — —	**ECS9258EAP** **ECS9258BAP** **ECS9258CAL** **ECS9258CAP** **ECS9258DAP**	**S801V65N3S**
720A	230V 460V 575V	300 600 700	24V DC	HMCP 1200A HMCP 1200A HMCP 1200A	**ECS9261BAP** **ECS9261CAP** **ECS9261DAP**	**ECS9262BAP** **ECS9262CAP** **ECS9262DAP**	**ECS9264BAP** **ECS9264CAP** **ECS9264DAP**	— — —	**ECS9268BAP** **ECS9268CAP** **ECS9268DAP**	**S801V72N3S**
850A	460V 575V	700 800	24V DC	HMCP 1200A HMCP 1200A	**ECS9271CAP** **ECS9271DAP**	**ECS9272CAP** **ECS9272DAP**	**ECS9274CAP** **ECS9274DAP**	— —	**ECS9278CAP** **ECS9278DAP**	**S801V85N3S**
1000A	230V 460V 575V	400 800 1000	24V DC	RD 1600 RD 1600 RD 1600	**ECS9281BAQ** **ECS9281CAQ** **ECS9281DAQ**	**ECS9282BAQ** **ECS9282CAQ** **ECS9282DAQ**	**ECS9284BAQ** **ECS9284CAQ** **ECS9284DAQ**	— — —	**ECS9288BAQ** **ECS9288CAQ** **ECS9288DAQ**	**S801V10N3S**

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS92S1**E**AF becomes ECS92S1**Q**AF-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS92Q**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Table 6-12. Class ECS95 — Combination Reduced Voltage Soft-Starter — Circuit Breaker — S811 ⑤

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	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 1 3 10	24V DC	7A 15A 30A 50A	ECS95Q1EAC ECS95Q1EAD ECS95Q1EAE ECS95Q1EAF	ECS95Q2EAC ECS95Q2EAD ECS95Q2EAE ECS95Q2EAF	ECS95Q4EAC ECS95Q4EAD ECS95Q4EAE ECS95Q4EAF	ECS95Q6EAC ECS95Q6EAD ECS95Q6EAE ECS95Q6EAF	ECS95Q8EAC ECS95Q8EAD ECS95Q8EAE ECS95Q8EAF	S811N37N3S
	230V	1 2 3 10	24V DC	7A 15A 30A 50A	ECS95Q1BAC ECS95Q1BAD ECS95Q1BAE ECS95Q1BAF	ECS95Q2BAC ECS95Q2BAD ECS95Q2BAE ECS95Q2BAF	ECS95Q4BAC ECS95Q4BAD ECS95Q4BAE ECS95Q4BAF	ECS95Q6BAC ECS95Q6BAD ECS95Q6BAE ECS95Q6BAF	ECS95Q8BAC ECS95Q8BAD ECS95Q8BAE ECS95Q8BAF	S811N37N3S
	460V	3/4 2 5 10 25	24V DC	3A 7A 15A 30A 50A	ECS95Q1CAB ECS95Q1CAC ECS95Q1CAD ECS95Q1CAE ECS95Q1CAF	ECS95Q2CAB ECS95Q2CAC ECS95Q2CAD ECS95Q2CAE ECS95Q2CAF	ECS95Q4CAB ECS95Q4CAC ECS95Q4CAD ECS95Q4CAE ECS95Q4CAF	ECS95Q6CAB ECS95Q6CAC ECS95Q6CAD ECS95Q6CAE ECS95Q6CAF	ECS95Q8CAB ECS95Q8CAC ECS95Q8CAD ECS95Q8CAE ECS95Q8CAF	S811N37N3S
	575V	1 3 7-1/2 15 30	24V DC	3A 7A 15A 30A 50A	ECS95Q1DAB ECS95Q1DAC ECS95Q1DAD ECS95Q1DAE ECS95Q1DAF	ECS95Q2DAB ECS95Q2DAC ECS95Q2DAD ECS95Q2DAE ECS95Q2DAF	ECS95Q4DAB ECS95Q4DAC ECS95Q4DAD ECS95Q4DAE ECS95Q4DAF	ECS95Q6DAB ECS95Q6DAC ECS95Q6DAD ECS95Q6DAE ECS95Q6DAF	ECS95Q8DAB ECS95Q8DAC ECS95Q8DAD ECS95Q8DAE ECS95Q8DAF	S811N37N3S
66A	200V	10 20	24V DC	50A 100A	ECS95S1EAF ECS95S1EAG	ECS95S2EAF ECS95S2EAG	ECS95S4EAF ECS95S4EAG	ECS95S6EAF ECS95S6EAG	ECS95S8EAF ECS95S8EAG	S811N66N3S
	230V	15 20	24V DC	70A 100A	ECS95S1BAW ECS95S1BAG	ECS95S2BAW ECS95S2BAG	ECS95S4BAW ECS95S4BAG	ECS95S6BAW ECS95S6BAG	ECS95S8BAW ECS95S8BAG	S811N66N3S
	460V	50	24V DC	100A	ECS95S1CAG	ECS95S2CAG	ECS95S4CAG	ECS95S6CAG	ECS95S8CAG	S811N66N3S
	575V	60	24V DC	100A	ECS95S1DAG	ECS95S2DAG	ECS95S4DAG	ECS95S6DAG	ECS95S8DAG	S811N66N3S
Frame Size — 110 mm										
105A	200V	30	24V DC	150A	ECS95V1EAH	ECS95V2EAH	ECS95V4EAH	ECS95V6EAH	ECS95V8EAH	S811R10N3S
	230V	40	24V DC	150A	ECS95V1BAH	ECS95V2BAH	ECS95V4BAH	ECS95V6BAH	ECS95V8BAH	S811R10N3S
	460V	75	24V DC	150A	ECS95V1CAH	ECS95V2CAH	ECS95V4CAH	ECS95V6CAH	ECS95V8CAH	S811R10N3S
	575V	100	24V DC	150A	ECS95V1DAH	ECS95V2DAH	ECS95V4DAH	ECS95V6DAH	ECS95V8DAH	S811R10N3S
135A	200V 230V 460V 575V	40 50 100 125	24V DC	150A 150A 150A 150A	ECS95W1EAH ECS95W1BAH ECS95W1CAH ECS95W1DAH	ECS95W2EAH ECS95W2BAH ECS95W2CAH ECS95W2DAH	ECS95W4EAH ECS95W4BAH ECS95W4CAH ECS95W4DAH	ECS95W6EAH ECS95W6BAH ECS95W6CAH ECS95W6DAH	ECS95W8EAH ECS95W8BAH ECS95W8CAH ECS95W8DAH	S811R13N3S
Frame Size — 200 mm										
180A	200V 230V 460V 575V	60 60 150 150	24V DC	250A 250A 250A 250A	ECS95Y1EAJ ECS95Y1BAJ ECS95Y1CAJ ECS95Y1DAJ	ECS95Y2EAJ ECS95Y2BAJ ECS95Y2CAJ ECS95Y2DAJ	ECS95Y4EAJ ECS95Y4BAJ ECS95Y4CAJ ECS95Y4DAJ	ECS95Y6EAJ ECS95Y6BAJ ECS95Y6CAJ ECS95Y6DAJ	ECS95Y8EAJ ECS95Y8BAJ ECS95Y8CAJ ECS95Y8DAJ	S811T18N3S
240A	200V 230V 460V 575V	75 75 200 200	24V DC	400A 250A 400A 250A	ECS95Z1EAK ECS95Z1BAJ ECS95Z1CAK ECS95Z1DAJ	ECS95Z2EAK ECS95Z2BAJ ECS95Z2CAK ECS95Z2DAJ	ECS95Z4EAK ECS95Z4BAJ ECS95Z4CAK ECS95Z4DAJ	ECS95Z6EAK ECS95Z6BAJ ECS95Z6CAK ECS95Z6DAJ	ECS95Z8EAK ECS95Z8BAJ ECS95Z8CAK ECS95Z8DAJ	S811T24N3S
304A	200V 230V 460V 575V	100 100 250 300	24V DC	400A 400A 400A 400A	ECS9511EAK ECS9511BAK ECS9511CAK ECS9511DAK	ECS9512EAK ECS9512BAK ECS9512CAK ECS9512DAK	ECS9514EAK ECS9514BAK ECS9514CAK ECS9514DAK	ECS9516EAK ECS9516BAK ECS9516CAK ECS9516DAK	ECS9518EAK ECS9518BAK ECS9518CAK ECS9518DAK	S811T30N3S

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS90S1**E**AA becomes ECS90S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS95Q**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Digital Interface Module (DIM) is mounted on door as standard.

Options ..... **Page 6-3**
Cover Control ..... **Page 6-5**
Dimensions ..... **Page 6-16**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Table 6-12. Class ECS95 — Combination Reduced Voltage Soft-Starter — Circuit Breaker — S811 ⑤ (Continued)

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	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	125	24V DC	HMCP 600A	**ECS9521EAL**	**ECS9522EAL**	**ECS9524EAL**	—	**ECS9528EAL**	**S811V36N3S**
	230V	150		HMCP 400A	**ECS9521BAK**	**ECS9522BAK**	**ECS9524BAK**	—	**ECS9528BAK**	
	460V	300		HMCP 600A	**ECS9521CAL**	**ECS9522CAL**	**ECS9524CAL**	—	**ECS9528CAL**	
	575V	350		HMCP 400A	**ECS9521DAK**	**ECS9522DAK**	**ECS9524DAK**	—	**ECS9528DAK**	
420A	200V	150	24V DC	HMCP 600A	**ECS9531EAL**	**ECS9532EAL**	**ECS9534EAL**	—	**ECS9538EAL**	**S811V42N3S**
	460V	350		HMCP 600A	**ECS9531CAL**	**ECS9532CAL**	**ECS9534CAL**	—	**ECS9538CAL**	
	575V	450		HMCP 600A	**ECS9531DAL**	**ECS9532DAL**	**ECS9534DAL**	—	**ECS9538DAL**	
500A	230V	200	24V DC	HMCP 600A	**ECS9541BAL**	**ECS9542BAL**	**ECS9544BAL**	—	**ECS9548BAL**	**S811V50N3S**
	460V	400		HMCP 600A	**ECS9541CAL**	**ECS9542CAL**	**ECS9544CAL**	—	**ECS9548CAL**	
	575V	500		HMCP 600A	**ECS9541DAL**	**ECS9542DAL**	**ECS9544DAL**	—	**ECS9548DAL**	
650A	200V	200	24V DC	HMCP 1200A	**ECS9551EAP**	**ECS9552EAP**	**ECS9554EAP**	—	**ECS9558EAP**	**S811V65N3S**
	230V	250		HMCP 1200A	**ECS9551BAP**	**ECS9552BAP**	**ECS9554BAP**	—	**ECS9558BAP**	
	460V	450		HMCP 600A	**ECS9551CAL**	**ECS9552CAL**	**ECS9554CAL**	—	**ECS9558CAL**	
	460V	500		HMCP 1200A	**ECS9551CAP**	**ECS9552CAP**	**ECS9554CAP**	—	**ECS9558CAP**	
	575V	600		HMCP 1200A	**ECS9551DAP**	**ECS9552DAP**	**ECS9554DAP**	—	**ECS9558DAP**	
720A	230V	300	24V DC	HMCP 1200A	**ECS9561BAP**	**ECS9562BAP**	**ECS9564BAP**	—	**ECS9568BAP**	**S811V72N3S**
	460V	600		HMCP 1200A	**ECS9561CAP**	**ECS9562CAP**	**ECS9564CAP**	—	**ECS9568CAP**	
	575V	700		HMCP 1200A	**ECS9561DAP**	**ECS9562DAP**	**ECS9564DAP**	—	**ECS9568DAP**	
850A	460V	700	24V DC	HMCP 1200A	**ECS9571CAP**	**ECS9572CAP**	**ECS9574CAP**	—	**ECS9578CAP**	**S811V85N3S**
	575V	800		HMCP 1200A	**ECS9571DAP**	**ECS9572DAP**	**ECS9574DAP**	—	**ECS9578DAP**	
1000A	230V	400	24V DC	RD 1600	**ECS9581BAQ**	**ECS9582BAQ**	**ECS9584BAQ**	—	**ECS9588BAQ**	**S811V10N3S**
	460V	800		RD 1600	**ECS9581CAQ**	**ECS9582CAQ**	**ECS9584CAQ**	—	**ECS9588CAQ**	
	575V	1000		RD 1600	**ECS9581DAQ**	**ECS9582DAQ**	**ECS9584DAQ**	—	**ECS9588DAQ**	

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS92S1**E**AF becomes ECS92S1**Q**AF-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS95Q**4**EAC. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Digital Interface Module (DIM) is mounted on door as standard.

Dimensions

Table 6-13. Minimum Enclosure Box Numbers

Rating	SSRV	Non-combination Box No. ⑥	Combination with Fuses Box No. ⑥	Combination with HMCP Box No. ⑥
.8 – 27A	S752	6A ⑦	B1 ⑧	A1 ⑨
37A	S801/S811	7A	B1	A1 ⑨
50A	S752	6A ⑦	C	A1 ⑨
66A	S801/S811	7A	C	A1 ⑨
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

⑥ Enclosure space will also accommodate for an ***IT.*** Power Supply, two 4-pole relays, CPT, and terminal blocks. Also includes space for a DNA module or MOV.

⑦ Same as footnote ⑥, but CPT is not included. Upsize to 7A enclosure to include space for a CPT and a full voltage bypass contactor.

⑧ Enclosure may be reduced to an A1, with all space for all items as in footnote ⑥, excluding relays and CPTs.

⑨ Same as footnote ⑥, but CPT is not included. Upsize to B1 enclosure to include space for a CPT and a full voltage bypass contactor.

Note: See **Tab 15** for Box Dimensions for Type 1, 3R, 4X and 12. See **Page 11-19** for Box Dimensions for Type 7/9.

Options ..... **Page 6-3**
Cover Control ..... **Page 6-5**
Wiring Diagrams ..... **Page 6-17**
Accessories ..... **Page 16-36**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-41**

Wiring Diagrams

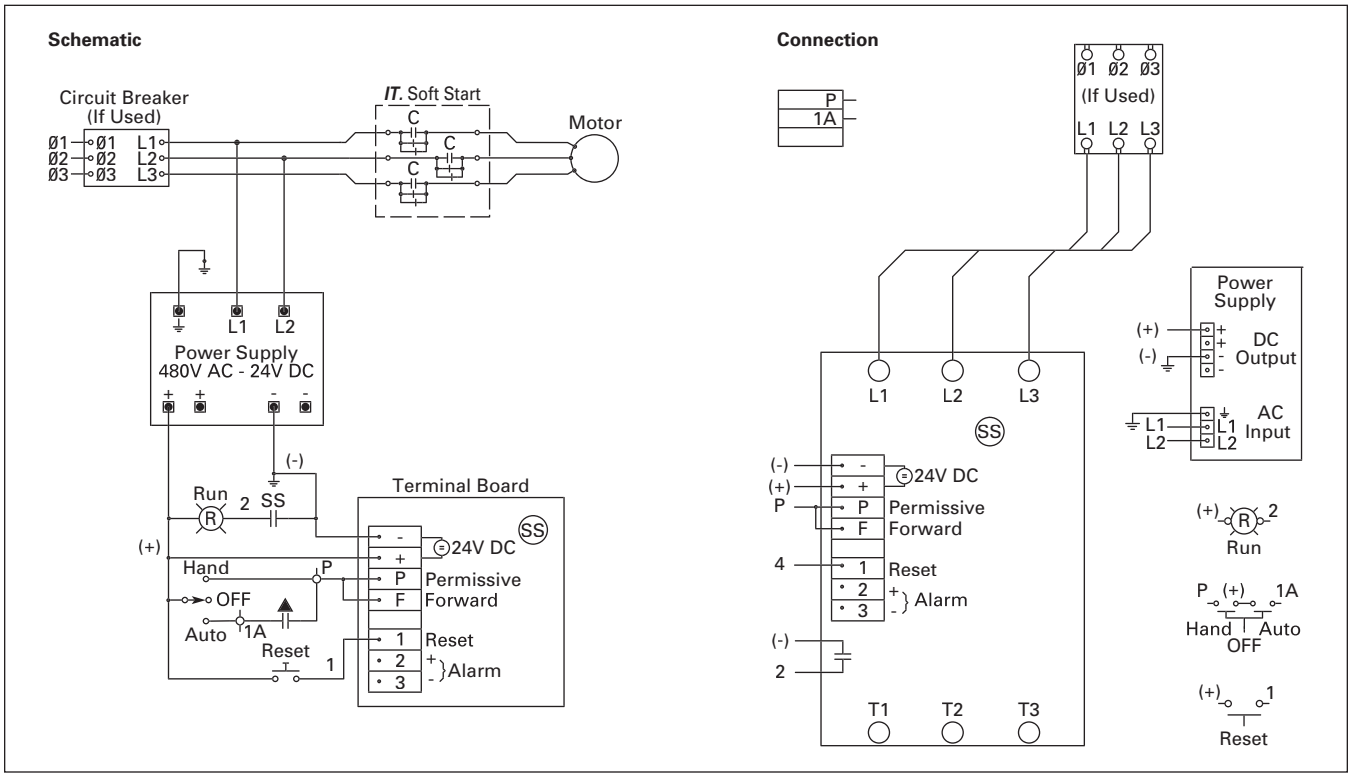


Figure 6-1. S752 Wiring Diagram

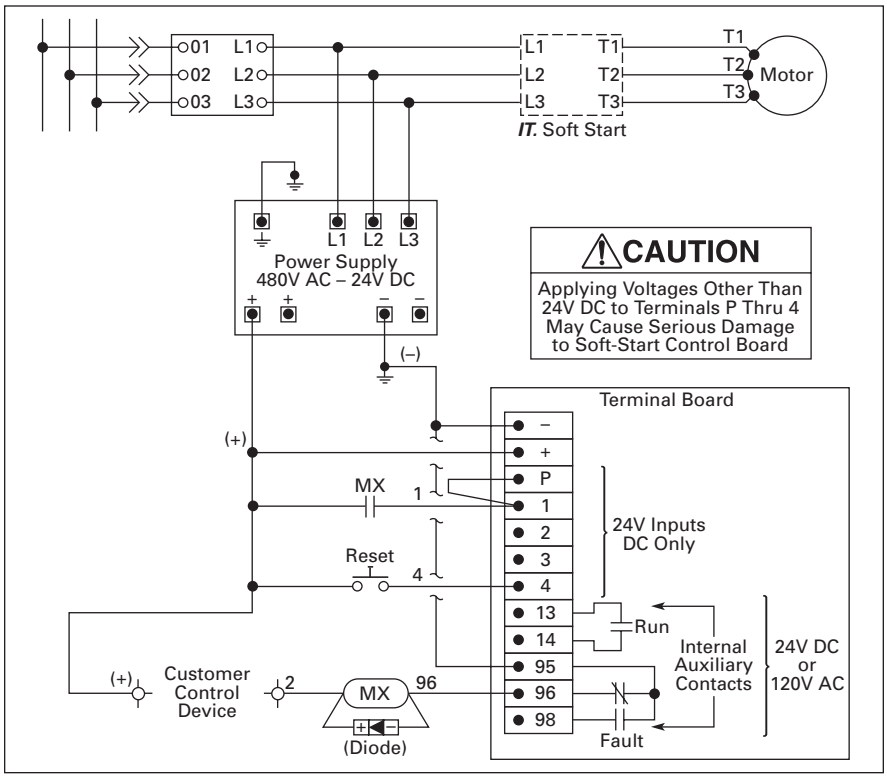


Figure 6-2. S801/S811 Wiring Diagram

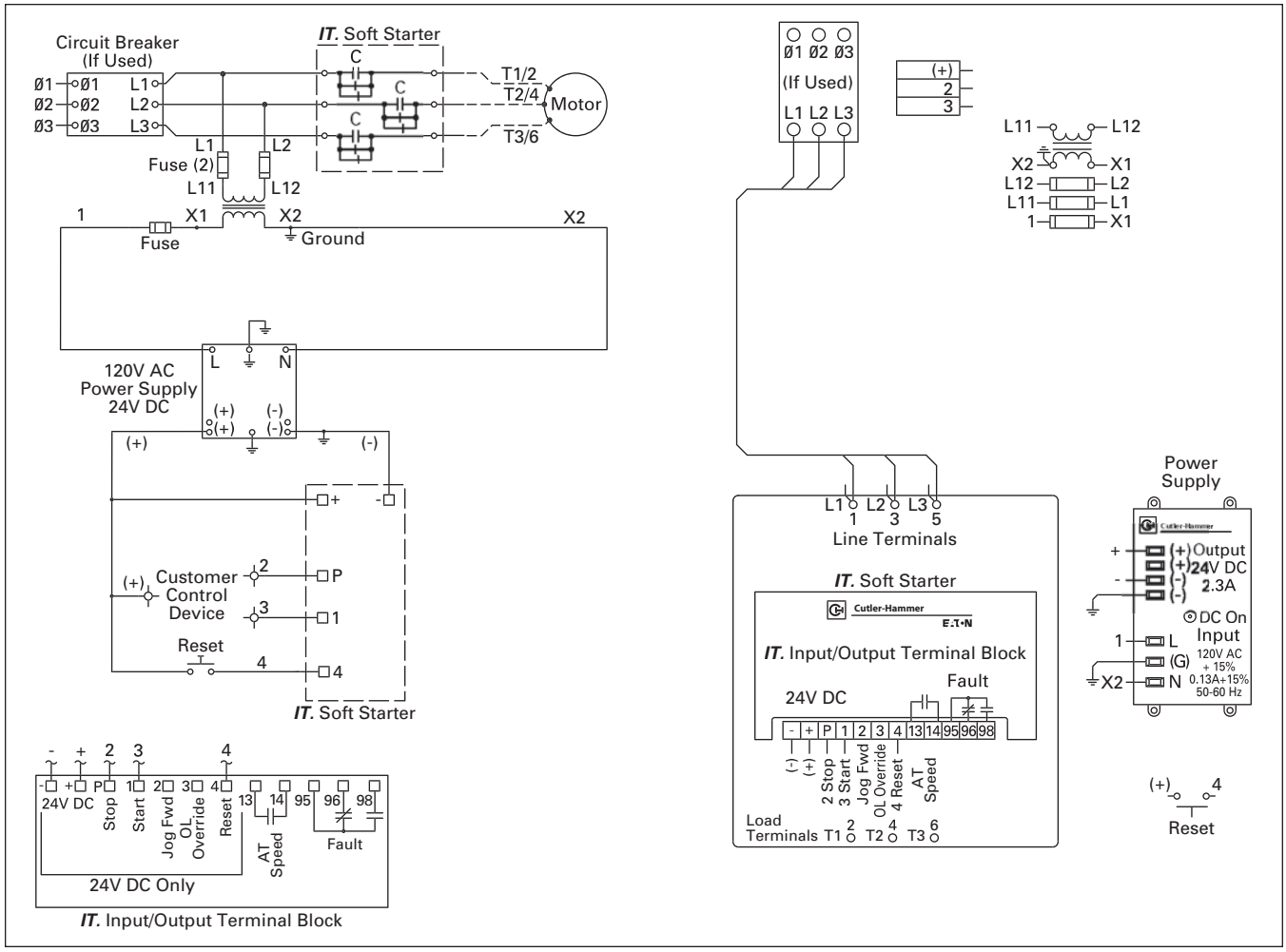


Figure 6-3. S801/S811 with CPT and Power Supply

Catalog Number Selection

Table 6-14. Freedom Reduced Voltage Starters Catalog Numbering System

E C N 4 2 2 1 A A F - __

Design
N = Freedom NEMA

Class		Table
42 =	Non-combination Autotransformer Starter	**6-18**
43 =	Combination Autotransformer Starter — Fusible Disconnect	**6-19**
	Combination Autotransformer Starter — Non-fusible Disconnect	**6-20**
44 =	Combination Autotransformer Starter — Circuit Breaker	**6-21**
45 =	Non-combination Part Winding Starter	**6-22**
46 =	Combination Part Winding Starter — Fusible Disconnect	**6-23**
	Combination Part Winding Starter — Non-fusible Disconnect	**6-24**
47 =	Combination Part Winding Starter — Circuit Breaker	**6-25**
48 =	Non-combination Open Transition Wye Delta Starter	**6-26**
49 =	Combination Open Transition Wye Delta Starter — Fusible Disconnect	**6-27**
	Combination Open Transition Wye Delta Starter — Non-fusible Disconnect	**6-28**
50 =	Combination Open Transition Wye Delta Starter — Circuit Breaker	**6-29**
51 =	Non-combination Closed Transition Wye Delta Starter	**6-30**
52 =	Combination Closed Transition Wye Delta Starter — Fusible Disconnect	**6-31**
	Combination Closed Transition Wye Delta Starter — Non-fusible Disconnect	**6-32**
53 =	Combination Closed Transition Wye Delta Starter — Circuit Breaker	**6-33**
64 =	Combination Part Winding Pump Control Starter — Fusible	**6-34**
65 =	Combination Part Winding Pump Control Starter — Circuit Breaker	**6-35**

NEMA Size
2 = Size 2
3 = Size 3
4 = Size 4
5 = Size 5
6 = Size 6
7 = Size 7
8 = Size 8
9 = Size 9

Cover Control
See **Table 6-17**

Coil Voltage and/or Control Transformers
(See Tables Below)

Modification Codes
(See **Page 16-40**)

Disconnect Fuse Clip Ratings

A = None	**H** = 200A/250V R	**Q** = 1200A/600V L
B = 30A/250V R	**J** = 200A/600V R	**R** = 1600A/600V L
C = 30A/600V R	**K** = 400A/250V R	**S** = 2000A/600V L
D = 60A/250V R	**L** = 400A/600V R	**T** = by Description
E = 60A/600V R	**M** = 600A/250V R	
F = 100A/250V R	**N** = 600A/600V R	
G = 100A/600V R	**P** = 800A/600V L	

HMCP/E or Breaker Ratings

A = None	**K** = 400A	**5** = 3A ①
B = 3A	**L** = 600A	**6** = 7A ①
C = 7A	**M** = 800A	**7** = 15A ①
D = 15A	**N** = 1000A	**8** = 30A ①
E = 30A	**P** = 1200A	**9** = 50A ①
F = 50A	**Q** = 2000A	**I** = 100A ①
G = 100A	**R** = 3000A	**2** = 70A
H = 150A	**T** = by Description	
J = 250A		

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 Resistant (Nonmetallic)
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

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

Table 6-15. 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**	12V DC	**X**	104 – 120/60
E	208/60	**Q**	24V DC	**Y**	48/50
G	550/50	**R**	48V DC	**Z**	By Description
H	277/60	**S**	125V DC		
J	208 – 240/60	**T**	24/60		

② When control power transformer modification codes (**C1** – **C11**) are used or when starter class includes CPT (i.e. ECN07, 18) see table to the right for system voltage code.

Table 6-16. 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	

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 9th character of the Catalog Number to the alpha shown in the table to the right. Example: to order an **ECN0514CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, i.e. ECN0514C**C**A.

Figure 6-4.

Figure 6-5.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL (indicates appropriate CSA Standard investigation)
- ABS Type Approved

Table 6-17. Non-reversing Cover Control

Description	Factory Installed Flange Control			Field Installation Kits	
	Position 9 Alpha	Type 1 Non-combination ① See Figure 6-4	All Others ② See Figure 6-5	Type 1 Non-combination ① See Figure 6-4	All Others ② See Figure 6-5
				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**
	J	■	■	**C400GK32** ③	—
with Red RUN Pilot Light	**K**	■	■	**C400GK36** ③	—
with Red RUN/Green OFF Lights					
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**	—	■	—	—

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**

Features

- Non-combination and Combination Designs
- 3-Phase Magnetic, 3-Pole
- Interchangeable Heater OLR
- 600V Maximum

Product Selection

Table 6-18. Class ECN42 — Non-combination Autotransformer Starter

NEMA Size	Motor Voltage	hp Rating	Magnet Coil Voltage ①	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 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
	230	10 15		ECN4221BAA-A8/B2 ECN4221BAA-A8/B7	ECN4222BAA-A8/B2 ECN4222BAA-A8/B7	ECN4223BAA-A8/B2 ECN4223BAA-A8/B7	ECN4228BAA-A8/B2 ECN4228BAA-A8/B7
	460	10 15 20 25		ECN4221CAA-A8/B4 ECN4221CAA-A8/B9 ECN4221CAA-A8/B14 ECN4221CAA-A8/B19	ECN4222CAA-A8/B4 ECN4222CAA-A8/B9 ECN4222CAA-A8/B14 ECN4222CAA-A8/B19	ECN4223CAA-A8/B4 ECN4223CAA-A8/B9 ECN4223CAA-A8/B14 ECN4223CAA-A8/B19	ECN4228CAA-A8/B4 ECN4228CAA-A8/B9 ECN4228CAA-A8/B14 ECN4228CAA-A8/B19
	575	10 15 20 25		ECN4221DAA-A8/B5 ECN4221DAA-A8/B10 ECN4221DAA-A8/B15 ECN4221DAA-A8/B20	ECN4222DAA-A8/B5 ECN4222DAA-A8/B10 ECN4222DAA-A8/B15 ECN4222DAA-A8/B20	ECN4223DAA-A8/B5 ECN4223DAA-A8/B10 ECN4223DAA-A8/B15 ECN4223DAA-A8/B20	ECN4228DAA-A8/B5 ECN4228DAA-A8/B10 ECN4228DAA-A8/B15 ECN4228DAA-A8/B20
3 (90A)	200	15 20 25	120	ECN4231EAA-A8/B6 ECN4231EAA-A8/B11 ECN4231EAA-A8/B16	ECN4232EAA-A8/B6 ECN4232EAA-A8/B11 ECN4232EAA-A8/B16	ECN4233EAA-A8/B6 ECN4233EAA-A8/B11 ECN4233EAA-A8/B16	ECN4238EAA-A8/B6 ECN4238EAA-A8/B11 ECN4238EAA-A8/B16
	230	20 25 30		ECN4231BAA-A8/B12 ECN4231BAA-A8/B17 ECN4231BAA-A8/B22	ECN4232BAA-A8/B12 ECN4232BAA-A8/B17 ECN4232BAA-A8/B22	ECN4233BAA-A8/B12 ECN4233BAA-A8/B17 ECN4233BAA-A8/B22	ECN4238BAA-A8/B12 ECN4238BAA-A8/B17 ECN4238BAA-A8/B22
	460	30 40 50		ECN4231CAA-A8/B24 ECN4231CAA-A8/B29 ECN4231CAA-A8/B34	ECN4232CAA-A8/B24 ECN4232CAA-A8/B29 ECN4232CAA-A8/B34	ECN4233CAA-A8/B24 ECN4233CAA-A8/B29 ECN4233CAA-A8/B34	ECN4238CAA-A8/B24 ECN4238CAA-A8/B29 ECN4238CAA-A8/B34
	575	30 40 50		ECN4231DAA-A8/B25 ECN4231DAA-A8/B30 ECN4231DAA-A8/B35	ECN4232DAA-A8/B25 ECN4232DAA-A8/B30 ECN4232DAA-A8/B35	ECN4233DAA-A8/B25 ECN4233DAA-A8/B30 ECN4233DAA-A8/B35	ECN4238DAA-A8/B25 ECN4238DAA-A8/B30 ECN4238DAA-A8/B35
4 (135A)	200	30 40	120	ECN4241EAA-A8/B21 ECN4241EAA-A8/B26	ECN4242EAA-A8/B21 ECN4242EAA-A8/B26	ECN4243EAA-A8/B21 ECN4243EAA-A8/B26	ECN4248EAA-A8/B21 ECN4248EAA-A8/B26
	230	40 50		ECN4241BAA-A8/B27 ECN4241BAA-A8/B32	ECN4242BAA-A8/B27 ECN4242BAA-A8/B32	ECN4243BAA-A8/B27 ECN4243BAA-A8/B32	ECN4248BAA-A8/B27 ECN4248BAA-A8/B32
	460	75 100		ECN4241CAA-A8/B39 ECN4241CAA-A8/B44	ECN4242CAA-A8/B39 ECN4242CAA-A8/B44	ECN4243CAA-A8/B39 ECN4243CAA-A8/B44	ECN4248CAA-A8/B39 ECN4248CAA-A8/B44
	575	75 100		ECN4241DAA-A8/B40 ECN4241DAA-A8/B45	ECN4242DAA-A8/B40 ECN4242DAA-A8/B45	ECN4243DAA-A8/B40 ECN4243DAA-A8/B45	ECN4248DAA-A8/B40 ECN4248DAA-A8/B45
5 (270A)	200	50 75	120	ECN4251EAA-A8/B31 ECN4251EAA-A8/B36	ECN4252EAA-A8/B31 ECN4252EAA-A8/B36	ECN4253EAA-A8/B31 ECN4253EAA-A8/B36	ECN4258EAA-A8/B31 ECN4258EAA-A8/B36
	230	75 100		ECN4251BAA-A8/B37 ECN4251BAA-A8/B42	ECN4252BAA-A8/B37 ECN4252BAA-A8/B42	ECN4253BAA-A8/B37 ECN4253BAA-A8/B42	ECN4258BAA-A8/B37 ECN4258BAA-A8/B42
	460	125 150 200		ECN4251CAA-A8/B49 ECN4251CAA-A8/B54 ECN4251CAA-A8/B59	ECN4252CAA-A8/B49 ECN4252CAA-A8/B54 ECN4252CAA-A8/B59	ECN4253CAA-A8/B49 ECN4253CAA-A8/B54 ECN4253CAA-A8/B59	ECN4258CAA-A8/B49 ECN4258CAA-A8/B54 ECN4258CAA-A8/B59
	575	125 150 200		ECN4251DAA-A8/B50 ECN4251DAA-A8/B55 ECN4251DAA-A8/B60	ECN4252DAA-A8/B50 ECN4252DAA-A8/B55 ECN4252DAA-A8/B60	ECN4253DAA-A8/B50 ECN4253DAA-A8/B55 ECN4253DAA-A8/B60	ECN4258DAA-A8/B50 ECN4258DAA-A8/B55 ECN4258DAA-A8/B60

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-18. Class ECN42 — Non-combination Autotransformer Starter (Continued)

NEMA Size	Motor Voltage	hp Rating	Magnet Coil Voltage ①	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
6 (540A)	200	100 125 150	120	ECN4261EAA-A8/B41 ECN4261EAA-A8/B46 ECN4261EAA-A8/B51	ECN4262EAA-A8/B41 ECN4262EAA-A8/B46 ECN4262EAA-A8/B51	ECN4263EAA-A8/B41 ECN4263EAA-A8/B46 ECN4263EAA-A8/B51	ECN4268EAA-A8/B41 ECN4268EAA-A8/B46 ECN4268EAA-A8/B51
	230	125 150 200		ECN4261BAA-A8/B47 ECN4261BAA-A8/B52 ECN4261BAA-A8/B57	ECN4262BAA-A8/B47 ECN4262BAA-A8/B52 ECN4262BAA-A8/B57	ECN4263BAA-A8/B47 ECN4263BAA-A8/B52 ECN4263BAA-A8/B57	ECN4268BAA-A8/B47 ECN4268BAA-A8/B52 ECN4268BAA-A8/B57
	460	250 300 400		ECN4261CAA-A8/B64 ECN4261CAA-A8/B69 ECN4261CAA-A8/B74	ECN4262CAA-A8/B64 ECN4262CAA-A8/B69 ECN4262CAA-A8/B74	ECN4263CAA-A8/B64 ECN4263CAA-A8/B69 ECN4263CAA-A8/B74	ECN4268CAA-A8/B64 ECN4268CAA-A8/B69 ECN4268CAA-A8/B74
	575	250 300 400		ECN4261DAA-A8/B65 ECN4261DAA-A8/B70 ECN4261DAA-A8/B75	ECN4262DAA-A8/B65 ECN4262DAA-A8/B70 ECN4262DAA-A8/B75	ECN4263DAA-A8/B65 ECN4263DAA-A8/B70 ECN4263DAA-A8/B75	ECN4268DAA-A8/B65 ECN4268DAA-A8/B70 ECN4268DAA-A8/B75
7 (810A)	230	250 300	120	ECN4271BAA-A8/B62 ECN4271BAA-A8/B67	ECN4272BAA-A8/B62 ECN4272BAA-A8/B67	ECN4273BAA-A8/B62 ECN4273BAA-A8/B67	ECN4278BAA-A8/B62 ECN4278BAA-A8/B67
	460	450 500 600		ECN4271CAA-A8/B78 ECN4271CAA-A8/B81 ECN4271CAA-A8/B84	ECN4272CAA-A8/B78 ECN4272CAA-A8/B81 ECN4272CAA-A8/B84	ECN4273CAA-A8/B78 ECN4273CAA-A8/B81 ECN4273CAA-A8/B84	ECN4278CAA-A8/B78 ECN4278CAA-A8/B81 ECN4278CAA-A8/B84
	575	450 500 600		ECN4271DAA-A8/B79 ECN4271DAA-A8/B82 ECN4271DAA-A8/B85	ECN4272DAA-A8/B79 ECN4272DAA-A8/B82 ECN4272DAA-A8/B85	ECN4273DAA-A8/B79 ECN4273DAA-A8/B82 ECN4273DAA-A8/B85	ECN4278DAA-A8/B79 ECN4278DAA-A8/B82 ECN4278DAA-A8/B85
8 (1215A)	230	400 450	120	ECN4281BAA-A8/B72 ECN4281BAA-A8/B76	ECN4282BAA-A8/B72 ECN4282BAA-A8/B76	ECN4283BAA-A8/B72 ECN4283BAA-A8/B76	ECN4288BAA-A8/B72 ECN4288BAA-A8/B76
	460	700 800 900		ECN4281CAA-A8/B87 ECN4281CAA-A8/B91 ECN4281CAA-A8/B94	ECN4282CAA-A8/B87 ECN4282CAA-A8/B91 ECN4282CAA-A8/B94	ECN4283CAA-A8/B87 ECN4283CAA-A8/B91 ECN4283CAA-A8/B94	ECN4288CAA-A8/B87 ECN4288CAA-A8/B91 ECN4288CAA-A8/B94
	575	700 800 900		ECN4281DAA-A8/B88 ECN4281DAA-A8/B92 ECN4281DAA-A8/B95	ECN4282DAA-A8/B88 ECN4282DAA-A8/B92 ECN4282DAA-A8/B95	ECN4283DAA-A8/B88 ECN4283DAA-A8/B92 ECN4283DAA-A8/B95	ECN4288DAA-A8/B88 ECN4288DAA-A8/B92 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 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-19. Class ECN43 — Combination Autotransformer Starter — Fusible Disconnect

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②③
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 2 (45A)							
200	10	120	60A	ECN4321EAD-A8/B1	ECN4322EAD-A8/B1	ECN4323EAD-A8/B1	ECN4328EAD-A8/B1
230	10 15			ECN4321BAD-A8/B2 ECN4321BAD-A8/B7	ECN4322BAD-A8/B2 ECN4322BAD-A8/B7	ECN4323BAD-A8/B2 ECN4323BAD-A8/B7	ECN4328BAD-A8/B2 ECN4328BAD-A8/B7
460	10 15 20 25			ECN4321CAE-A8/B4 ECN4321CAE-A8/B9 ECN4321CAE-A8/B14 ECN4321CAE-A8/B19	ECN4322CAE-A8/B4 ECN4322CAE-A8/B9 ECN4322CAE-A8/B14 ECN4322CAE-A8/B19	ECN4323CAE-A8/B4 ECN4323CAE-A8/B9 ECN4323CAE-A8/B14 ECN4323CAE-A8/B19	ECN4328CAE-A8/B4 ECN4328CAE-A8/B9 ECN4328CAE-A8/B14 ECN4328CAE-A8/B19
575	10 15 20 25			ECN4321DAE-A8/B5 ECN4321DAE-A8/B10 ECN4321DAE-A8/B15 ECN4321DAE-A8/B20	ECN4322DAE-A8/B5 ECN4322DAE-A8/B10 ECN4322DAE-A8/B15 ECN4322DAE-A8/B20	ECN4323DAE-A8/B5 ECN4323DAE-A8/B10 ECN4323DAE-A8/B15 ECN4323DAE-A8/B20	ECN4328DAE-A8/B5 ECN4328DAE-A8/B10 ECN4328DAE-A8/B15 ECN4328DAE-A8/B20
NEMA Size 3 (90A)							
200	15 20 25	120	100A	ECN4331EAF-A8/B6 ECN4331EAF-A8/B11 ECN4331EAF-A8/B16	ECN4332EAF-A8/B6 ECN4332EAF-A8/B11 ECN4332EAF-A8/B16	ECN4333EAF-A8/B6 ECN4333EAF-A8/B11 ECN4333EAF-A8/B16	ECN4338EAF-A8/B6 ECN4338EAF-A8/B11 ECN4338EAF-A8/B16
230	20 25 30			ECN4331BAF-A8/B12 ECN4331BAF-A8/B17 ECN4331BAF-A8/B22	ECN4332BAF-A8/B12 ECN4332BAF-A8/B17 ECN4332BAF-A8/B22	ECN4333BAF-A8/B12 ECN4333BAF-A8/B17 ECN4333BAF-A8/B22	ECN4338BAF-A8/B12 ECN4338BAF-A8/B17 ECN4338BAF-A8/B22
460	30 40 50			ECN4331CAG-A8/B24 ECN4331CAG-A8/B29 ECN4331CAG-A8/B34	ECN4332CAG-A8/B24 ECN4332CAG-A8/B29 ECN4332CAG-A8/B34	ECN4333CAG-A8/B24 ECN4333CAG-A8/B29 ECN4333CAG-A8/B34	ECN4338CAG-A8/B24 ECN4338CAG-A8/B29 ECN4338CAG-A8/B34
575	30 40 50			ECN4331DAG-A8/B25 ECN4331DAG-A8/B30 ECN4331DAG-A8/B35	ECN4332DAG-A8/B25 ECN4332DAG-A8/B30 ECN4332DAG-A8/B35	ECN4333DAG-A8/B25 ECN4333DAG-A8/B30 ECN4333DAG-A8/B35	ECN4338DAG-A8/B25 ECN4338DAG-A8/B30 ECN4338DAG-A8/B35
NEMA Size 4 (135A)							
200	30 40	120	200A	ECN4341EAH-A8/B21 ECN4341EAH-A8/B26	ECN4342EAH-A8/B21 ECN4342EAH-A8/B26	ECN4343EAH-A8/B21 ECN4343EAH-A8/B26	ECN4348EAH-A8/B21 ECN4348EAH-A8/B26
230	40 50			ECN4341BAH-A8/B27 ECN4341BAH-A8/B32	ECN4342BAH-A8/B27 ECN4342BAH-A8/B32	ECN4343BAH-A8/B27 ECN4343BAH-A8/B32	ECN4348BAH-A8/B27 ECN4348BAH-A8/B32
460	75 100			ECN4341CAJ-A8/B39 ECN4341CAJ-A8/B44	ECN4342CAJ-A8/B39 ECN4342CAJ-A8/B44	ECN4343CAJ-A8/B39 ECN4343CAJ-A8/B44	ECN4348CAJ-A8/B39 ECN4348CAJ-A8/B44
575	75 100			ECN4341DAJ-A8/B40 ECN4341DAJ-A8/B45	ECN4342DAJ-A8/B40 ECN4342DAJ-A8/B45	ECN4343DAJ-A8/B40 ECN4343DAJ-A8/B45	ECN4348DAJ-A8/B40 ECN4348DAJ-A8/B45
NEMA Size 5 (270A)							
200	50 75	120	400A	ECN4351EAK-A8/B31 ECN4351EAK-A8/B36	ECN4352EAK-A8/B31 ECN4352EAK-A8/B36	ECN4353EAK-A8/B31 ECN4353EAK-A8/B36	ECN4358EAK-A8/B31 ECN4358EAK-A8/B36
230	75 100			ECN4351BAK-A8/B37 ECN4351BAK-A8/B42	ECN4352BAK-A8/B37 ECN4352BAK-A8/B42	ECN4353BAK-A8/B37 ECN4353BAK-A8/B42	ECN4358BAK-A8/B37 ECN4358BAK-A8/B42
460	125 150 200			ECN4351CAL-A8/B49 ECN4351CAL-A8/B54 ECN4351CAL-A8/B59	ECN4352CAL-A8/B49 ECN4352CAL-A8/B54 ECN4352CAL-A8/B59	ECN4353CAL-A8/B49 ECN4353CAL-A8/B54 ECN4353CAL-A8/B59	ECN4358CAL-A8/B49 ECN4358CAL-A8/B54 ECN4358CAL-A8/B59
575	125 150 200			ECN4351DAL-A8/B50 ECN4351DAL-A8/B55 ECN4351DAL-A8/B60	ECN4352DAL-A8/B50 ECN4352DAL-A8/B55 ECN4352DAL-A8/B60	ECN4353DAL-A8/B50 ECN4353DAL-A8/B55 ECN4353DAL-A8/B60	ECN4358DAL-A8/B50 ECN4358DAL-A8/B55 ECN4358DAL-A8/B60

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-19. Class ECN43 — Combination Autotransformer Starter — Fusible Disconnect (Continued)

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Fuse Clip Amp.	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②③
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 6 (540A)							
200	100 125 150	120	600A	ECN4361EAM-A8/B41 ECN4361EAM-A8/B46 ECN4361EAM-A8/B51	ECN4362EAM-A8/B41 ECN4362EAM-A8/B46 ECN4362EAM-A8/B51	ECN4363EAM-A8/B41 ECN4363EAM-A8/B46 ECN4363EAM-A8/B51	ECN4368EAM-A8/B41 ECN4368EAM-A8/B46 ECN4368EAM-A8/B51
230	125 150 200			ECN4361BAM-A8/B47 ECN4361BAM-A8/B52 ECN4361BAM-A8/B57	ECN4362BAM-A8/B47 ECN4362BAM-A8/B52 ECN4362BAM-A8/B57	ECN4363BAM-A8/B47 ECN4363BAM-A8/B52 ECN4363BAM-A8/B57	ECN4368BAM-A8/B47 ECN4368BAM-A8/B52 ECN4368BAM-A8/B57
460	250 300 400			ECN4361CAN-A8/B64 ECN4361CAN-A8/B69 ECN4361CAN-A8/B74	ECN4362CAN-A8/B64 ECN4362CAN-A8/B69 ECN4362CAN-A8/B74	ECN4363CAN-A8/B64 ECN4363CAN-A8/B69 ECN4363CAN-A8/B74	ECN4368CAN-A8/B64 ECN4368CAN-A8/B69 ECN4368CAN-A8/B74
575	250 300 400			ECN4361DAN-A8/B65 ECN4361DAN-A8/B70 ECN4361DAN-A8/B75	ECN4362DAN-A8/B65 ECN4362DAN-A8/B70 ECN4362DAN-A8/B75	ECN4363DAN-A8/B65 ECN4363DAN-A8/B70 ECN4363DAN-A8/B75	ECN4368DAN-A8/B65 ECN4368DAN-A8/B70 ECN4368DAN-A8/B75
NEMA Size 7 (810A)							
230	250 300	120	④	ECN4371BAU-A8/B62 ECN4371BAU-A8/B67	ECN4372BAU-A8/B62 ECN4372BAU-A8/B67	ECN4373BAU-A8/B62 ECN4373BAU-A8/B67	ECN4378BAU-A8/B62 ECN4378BAU-A8/B67
460	450 500 600			ECN4371CAU-A8/B78 ECN4371CAU-A8/B81 ECN4371CAU-A8/B84	ECN4372CAU-A8/B78 ECN4372CAU-A8/B81 ECN4372CAU-A8/B84	ECN4373CAU-A8/B78 ECN4373CAU-A8/B81 ECN4373CAU-A8/B84	ECN4378CAU-A8/B78 ECN4378CAU-A8/B81 ECN4378CAU-A8/B84
575	450 500 600			ECN4371DAU-A8/B79 ECN4371DAU-A8/B82 ECN4371DAU-A8/B85	ECN4372DAU-A8/B79 ECN4372DAU-A8/B82 ECN4372DAU-A8/B85	ECN4373DAU-A8/B79 ECN4373DAU-A8/B82 ECN4373DAU-A8/B85	ECN4378DAU-A8/B79 ECN4378DAU-A8/B82 ECN4378DAU-A8/B85
NEMA Size 8 (1215A)							
230	400 450	120	④	ECN4381BAU-A8/B72 ECN4381BAU-A8/B76	ECN4382BAU-A8/B72 ECN4382BAU-A8/B76	ECN4383BAU-A8/B72 ECN4383BAU-A8/B76	ECN4388BAU-A8/B72 ECN4388BAU-A8/B76
460	700 800 900			ECN4381CAU-A8/B87 ECN4381CAU-A8/B91 ECN4381CAU-A8/B94	ECN4382CAU-A8/B87 ECN4382CAU-A8/B91 ECN4382CAU-A8/B94	ECN4383CAU-A8/B87 ECN4383CAU-A8/B91 ECN4383CAU-A8/B94	ECN4388CAU-A8/B87 ECN4388CAU-A8/B91 ECN4388CAU-A8/B94
575	700 800 900			ECN4381DAU-A8/B88 ECN4381DAU-A8/B92 ECN4381DAU-A8/B95	ECN4382DAU-A8/B88 ECN4382DAU-A8/B92 ECN4382DAU-A8/B95	ECN4383DAU-A8/B88 ECN4383DAU-A8/B92 ECN4383DAU-A8/B95	ECN4388DAU-A8/B88 ECN4388DAU-A8/B92 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 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-20. Class ECN43 — Combination Autotransformer Starter — Non-fusible Disconnect

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Dis-connect Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②③
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 2 (45A)							
200	10	120	60A	ECN4321EAA-A8/B1	ECN4322EAA-A8/B1	ECN4323EAA-A8/B1	ECN4328EAA-A8/B1
230	10 15			ECN4321BAA-A8/B2 ECN4321BAA-A8/B7	ECN4322BAA-A8/B2 ECN4322BAA-A8/B7	ECN4323BAA-A8/B2 ECN4323BAA-A8/B7	ECN4328BAA-A8/B2 ECN4328BAA-A8/B7
460	10 15 20 25			ECN4321CAA-A8/B4 ECN4321CAA-A8/B9 ECN4321CAA-A8/B14 ECN4321CAA-A8/B19	ECN4322CAA-A8/B4 ECN4322CAA-A8/B9 ECN4322CAA-A8/B14 ECN4322CAA-A8/B19	ECN4323CAA-A8/B4 ECN4323CAA-A8/B9 ECN4323CAA-A8/B14 ECN4323CAA-A8/B19	ECN4328CAA-A8/B4 ECN4328CAA-A8/B9 ECN4328CAA-A8/B14 ECN4328CAA-A8/B19
575	10 15 20 25			ECN4321DAA-A8/B5 ECN4321DAA-A8/B10 ECN4321DAA-A8/B15 ECN4321DAA-A8/B20	ECN4322DAA-A8/B5 ECN4322DAA-A8/B10 ECN4322DAA-A8/B15 ECN4322DAA-A8/B20	ECN4323DAA-A8/B5 ECN4323DAA-A8/B10 ECN4323DAA-A8/B15 ECN4323DAA-A8/B20	ECN4328DAA-A8/B5 ECN4328DAA-A8/B10 ECN4328DAA-A8/B15 ECN4328DAA-A8/B20
NEMA Size 3 (90A)							
200	15 20 25	120	100A	ECN4331EAA-A8/B6 ECN4331EAA-A8/B11 ECN4331EAA-A8/B16	ECN4332EAA-A8/B6 ECN4332EAA-A8/B11 ECN4332EAA-A8/B16	ECN4333EAA-A8/B6 ECN4333EAA-A8/B11 ECN4333EAA-A8/B16	ECN4338EAA-A8/B6 ECN4338EAA-A8/B11 ECN4338EAA-A8/B16
230	20 25 30			ECN4331BAA-A8/B12 ECN4331BAA-A8/B17 ECN4331BAA-A8/B22	ECN4332BAA-A8/B12 ECN4332BAA-A8/B17 ECN4332BAA-A8/B22	ECN4333BAA-A8/B12 ECN4333BAA-A8/B17 ECN4333BAA-A8/B22	ECN4338BAA-A8/B12 ECN4338BAA-A8/B17 ECN4338BAA-A8/B22
460	30 40 50			ECN4331CAA-A8/B24 ECN4331CAA-A8/B29 ECN4331CAA-A8/B34	ECN4332CAA-A8/B24 ECN4332CAA-A8/B29 ECN4332CAA-A8/B34	ECN4333CAA-A8/B24 ECN4333CAA-A8/B29 ECN4333CAA-A8/B34	ECN4338CAA-A8/B24 ECN4338CAA-A8/B29 ECN4338CAA-A8/B34
575	30 40 50			ECN4331DAA-A8/B25 ECN4331DAA-A8/B30 ECN4331DAA-A8/B35	ECN4332DAA-A8/B25 ECN4332DAA-A8/B30 ECN4332DAA-A8/B35	ECN4333DAA-A8/B25 ECN4333DAA-A8/B30 ECN4333DAA-A8/B35	ECN4338DAA-A8/B25 ECN4338DAA-A8/B30 ECN4338DAA-A8/B35
NEMA Size 4 (135A)							
200	30 40	120	200A	ECN4341EAA-A8/B21 ECN4341EAA-A8/B26	ECN4342EAA-A8/B21 ECN4342EAA-A8/B26	ECN4343EAA-A8/B21 ECN4343EAA-A8/B26	ECN4348EAA-A8/B21 ECN4348EAA-A8/B26
230	40 50			ECN4341BAA-A8/B27 ECN4341BAA-A8/B32	ECN4342BAA-A8/B27 ECN4342BAA-A8/B32	ECN4343BAA-A8/B27 ECN4343BAA-A8/B32	ECN4348BAA-A8/B27 ECN4348BAA-A8/B32
460	75 100			ECN4341CAA-A8/B39 ECN4341CAA-A8/B44	ECN4342CAA-A8/B39 ECN4342CAA-A8/B44	ECN4343CAA-A8/B39 ECN4343CAA-A8/B44	ECN4348CAA-A8/B39 ECN4348CAA-A8/B44
575	75 100			ECN4341DAA-A8/B40 ECN4341DAA-A8/B45	ECN4342DAA-A8/B40 ECN4342DAA-A8/B45	ECN4343DAA-A8/B40 ECN4343DAA-A8/B45	ECN4348DAA-A8/B40 ECN4348DAA-A8/B45
NEMA Size 5 (270A)							
200	50 75	120	400A	ECN4351EAA-A8/B31 ECN4351EAA-A8/B36	ECN4352EAA-A8/B31 ECN4352EAA-A8/B36	ECN4353EAA-A8/B31 ECN4353EAA-A8/B36	ECN4358EAA-A8/B31 ECN4358EAA-A8/B36
230	75 100			ECN4351BAA-A8/B37 ECN4351BAA-A8/B42	ECN4352BAA-A8/B37 ECN4352BAA-A8/B42	ECN4353BAA-A8/B37 ECN4353BAA-A8/B42	ECN4358BAA-A8/B37 ECN4358BAA-A8/B42
460	125 150 200			ECN4351CAA-A8/B49 ECN4351CAA-A8/B54 ECN4351CAA-A8/B59	ECN4352CAA-A8/B49 ECN4352CAA-A8/B54 ECN4352CAA-A8/B59	ECN4353CAA-A8/B49 ECN4353CAA-A8/B54 ECN4353CAA-A8/B59	ECN4358CAA-A8/B49 ECN4358CAA-A8/B54 ECN4358CAA-A8/B59
575	125 150 200			ECN4351DAA-A8/B50 ECN4351DAA-A8/B55 ECN4351DAA-A8/B60	ECN4352DAA-A8/B50 ECN4352DAA-A8/B55 ECN4352DAA-A8/B60	ECN4353DAA-A8/B50 ECN4353DAA-A8/B55 ECN4353DAA-A8/B60	ECN4358DAA-A8/B50 ECN4358DAA-A8/B55 ECN4358DAA-A8/B60
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-20. Class ECN43 — Combination Autotransformer Starter — Non-fusible Disconnect (Continued)

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Dis-connect Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②③
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 6 (540A)							
200	100 125 150	120	600A	ECN4361EAA-A8/B41 ECN4361EAA-A8/B46 ECN4361EAA-A8/B51	ECN4362EAA-A8/B41 ECN4362EAA-A8/B46 ECN4362EAA-A8/B51	ECN4363EAA-A8/B41 ECN4363EAA-A8/B46 ECN4363EAA-A8/B51	ECN4368EAA-A8/B41 ECN4368EAA-A8/B46 ECN4368EAA-A8/B51
230	125 150 200			ECN4361BAA-A8/B47 ECN4361BAA-A8/B52 ECN4361BAA-A8/B57	ECN4362BAA-A8/B47 ECN4362BAA-A8/B52 ECN4362BAA-A8/B57	ECN4363BAA-A8/B47 ECN4363BAA-A8/B52 ECN4363BAA-A8/B57	ECN4368BAA-A8/B47 ECN4368BAA-A8/B52 ECN4368BAA-A8/B57
460	250 300 400			ECN4361CAA-A8/B64 ECN4361CAA-A8/B69 ECN4361CAA-A8/B74	ECN4362CAA-A8/B64 ECN4362CAA-A8/B69 ECN4362CAA-A8/B74	ECN4363CAA-A8/B64 ECN4363CAA-A8/B69 ECN4363CAA-A8/B74	ECN4368CAA-A8/B64 ECN4368CAA-A8/B69 ECN4368CAA-A8/B74
575	250 300 400			ECN4361DAA-A8/B65 ECN4361DAA-A8/B70 ECN4361DAA-A8/B75	ECN4362DAA-A8/B65 ECN4362DAA-A8/B70 ECN4362DAA-A8/B75	ECN4363DAA-A8/B65 ECN4363DAA-A8/B70 ECN4363DAA-A8/B75	ECN4368DAA-A8/B65 ECN4368DAA-A8/B70 ECN4368DAA-A8/B75
NEMA Size 7 (810A)							
230	250 300	120	④	ECN4371BAA-A8/B62 ECN4371BAA-A8/B67	ECN4372BAA-A8/B62 ECN4372BAA-A8/B67	ECN4373BAA-A8/B62 ECN4373BAA-A8/B67	ECN4378BAA-A8/B62 ECN4378BAA-A8/B67
460	450 500 600			ECN4371CAA-A8/B78 ECN4371CAA-A8/B81 ECN4371CAA-A8/B84	ECN4372CAA-A8/B78 ECN4372CAA-A8/B81 ECN4372CAA-A8/B84	ECN4373CAA-A8/B78 ECN4373CAA-A8/B81 ECN4373CAA-A8/B84	ECN4378CAA-A8/B78 ECN4378CAA-A8/B81 ECN4378CAA-A8/B84
575	450 500 600			ECN4371DAA-A8/B79 ECN4371DAA-A8/B82 ECN4371DAA-A8/B85	ECN4372DAA-A8/B79 ECN4372DAA-A8/B82 ECN4372DAA-A8/B85	ECN4373DAA-A8/B79 ECN4373DAA-A8/B82 ECN4373DAA-A8/B85	ECN4378DAA-A8/B79 ECN4378DAA-A8/B82 ECN4378DAA-A8/B85
NEMA Size 8 (1215A)							
230	400 450	120	④	ECN4381BAA-A8/B72 ECN4381BAA-A8/B76	ECN4382BAA-A8/B72 ECN4382BAA-A8/B76	ECN4383BAA-A8/B72 ECN4383BAA-A8/B76	ECN4388BAA-A8/B72 ECN4388BAA-A8/B76
460	700 800 900			ECN4381CAA-A8/B87 ECN4381CAA-A8/B91 ECN4381CAA-A8/B94	ECN4382CAA-A8/B87 ECN4382CAA-A8/B91 ECN4382CAA-A8/B94	ECN4383CAA-A8/B87 ECN4383CAA-A8/B91 ECN4383CAA-A8/B94	ECN4388CAA-A8/B87 ECN4388CAA-A8/B91 ECN4388CAA-A8/B94
575	700 800 900			ECN4381DAA-A8/B88 ECN4381DAA-A8/B92 ECN4381DAA-A8/B95	ECN4382DAA-A8/B88 ECN4382DAA-A8/B92 ECN4382DAA-A8/B95	ECN4383DAA-A8/B88 ECN4383DAA-A8/B92 ECN4383DAA-A8/B95	ECN4388DAA-A8/B88 ECN4388DAA-A8/B92 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 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-21. Class ECN44 — Combination Autotransformer Starter — Circuit Breaker

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②③
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 2 (45A)							
200	10	120	HMCPE 50A	ECN4421EAF-A8/B1	ECN4422EAF-A8/B1	ECN4423EAF-A8/B1	ECN4428EAF-A8/B1
230	10 15			ECN4421BAF-A8/B2 ECN4421BAF-A8/B7	ECN4422BAF-A8/B2 ECN4422BAF-A8/B7	ECN4423BAF-A8/B2 ECN4423BAF-A8/B7	ECN4428BAF-A8/B2 ECN4428BAF-A8/B7
460	10 15 20 25			ECN4421CAF-A8/B4 ECN4421CAF-A8/B9 ECN4421CAF-A8/B14 ECN4421CAF-A8/B19	ECN4422CAF-A8/B4 ECN4422CAF-A8/B9 ECN4422CAF-A8/B14 ECN4422CAF-A8/B19	ECN4423CAF-A8/B4 ECN4423CAF-A8/B9 ECN4423CAF-A8/B14 ECN4423CAF-A8/B19	ECN4428CAF-A8/B4 ECN4428CAF-A8/B9 ECN4428CAF-A8/B14 ECN4428CAF-A8/B19
575	10 15 20 25		HMCP 50A	ECN4421DA9-A8/B5 ECN4421DA9-A8/B10 ECN4421DA9-A8/B15 ECN4421DA9-A8/B20	ECN4422DA9-A8/B5 ECN4422DA9-A8/B10 ECN4422DA9-A8/B15 ECN4422DA9-A8/B20	ECN4423DA9-A8/B5 ECN4423DA9-A8/B10 ECN4423DA9-A8/B15 ECN4423DA9-A8/B20	ECN4428DA9-A8/B5 ECN4428DA9-A8/B10 ECN4428DA9-A8/B15 ECN4428DA9-A8/B20
NEMA Size 3 (90A)							
200	15 20 25	120	HMCPE 100A	ECN4431EAG-A8/B6 ECN4431EAG-A8/B11 ECN4431EAG-A8/B16	ECN4432EAG-A8/B6 ECN4432EAG-A8/B11 ECN4432EAG-A8/B16	ECN4433EAG-A8/B6 ECN4433EAG-A8/B11 ECN4433EAG-A8/B16	ECN4438EAG-A8/B6 ECN4438EAG-A8/B11 ECN4438EAG-A8/B16
230	20 25 30			ECN4431BAG-A8/B12 ECN4431BAG-A8/B17 ECN4431BAG-A8/B22	ECN4432BAG-A8/B12 ECN4432BAG-A8/B17 ECN4432BAG-A8/B22	ECN4433BAG-A8/B12 ECN4433BAG-A8/B17 ECN4433BAG-A8/B22	ECN4438BAG-A8/B12 ECN4438BAG-A8/B17 ECN4438BAG-A8/B22
460	30 40 50			ECN4431CAG-A8/B24 ECN4431CAG-A8/B29 ECN4431CAG-A8/B34	ECN4432CAG-A8/B24 ECN4432CAG-A8/B29 ECN4432CAG-A8/B34	ECN4433CAG-A8/B24 ECN4433CAG-A8/B29 ECN4433CAG-A8/B34	ECN4438CAG-A8/B24 ECN4438CAG-A8/B29 ECN4438CAG-A8/B34
575	30 40 50		HMCP 100A	ECN4431DAI-A8/B25 ECN4431DAI-A8/B30 ECN4431DAI-A8/B35	ECN4432DAI-A8/B25 ECN4432DAI-A8/B30 ECN4432DAI-A8/B35	ECN4433DAI-A8/B25 ECN4433DAI-A8/B30 ECN4433DAI-A8/B35	ECN4438DAI-A8/B25 ECN4438DAI-A8/B30 ECN4438DAI-A8/B35
NEMA Size 4 (135A)							
200	30 40	120	HMCP 150A	ECN4441EAH-A8/B21 ECN4441EAH-A8/B26	ECN4442EAH-A8/B21 ECN4442EAH-A8/B26	ECN4443EAH-A8/B21 ECN4443EAH-A8/B26	ECN4448EAH-A8/B21 ECN4448EAH-A8/B26
230	40 50			ECN4441BAH-A8/B27 ECN4441BAH-A8/B32	ECN4442BAH-A8/B27 ECN4442BAH-A8/B32	ECN4443BAH-A8/B27 ECN4443BAH-A8/B32	ECN4448BAH-A8/B27 ECN4448BAH-A8/B32
460	75 100			ECN4441CAH-A8/B39 ECN4441CAH-A8/B44	ECN4442CAH-A8/B39 ECN4442CAH-A8/B44	ECN4443CAH-A8/B39 ECN4443CAH-A8/B44	ECN4448CAH-A8/B39 ECN4448CAH-A8/B44
575	75 100			ECN4441DAH-A8/B40 ECN4441DAH-A8/B45	ECN4442DAH-A8/B40 ECN4442DAH-A8/B45	ECN4443DAH-A8/B40 ECN4443DAH-A8/B45	ECN4448DAH-A8/B40 ECN4448DAH-A8/B45
NEMA Size 5 (270A)							
200	50 75	120	HMCP 250A HMCP 400A	ECN4451EAJ-A8/B31 ECN4451EAK-A8/B36	ECN4452EAJ-A8/B31 ECN4452EAK-A8/B36	ECN4453EAJ-A8/B31 ECN4453EAK-A8/B36	ECN4458EAJ-A8/B31 ECN4458EAK-A8/B36
230	75 100		HMCP 250A HMCP 400A	ECN4451BAJ-A8/B37 ECN4451BAK-A8/B42	ECN4452BAJ-A8/B37 ECN4452BAK-A8/B42	ECN4453BAJ-A8/B37 ECN4453BAK-A8/B42	ECN4458BAJ-A8/B37 ECN4458BAK-A8/B42
460	125 150 200		HMCP 250A HMCP 250A HMCP 400A	ECN4451CAJ-A8/B49 ECN4451CAJ-A8/B54 ECN4451CAK-A8/B59	ECN4452CAJ-A8/B49 ECN4452CAJ-A8/B54 ECN4452CAK-A8/B59	ECN4453CAJ-A8/B49 ECN4453CAJ-A8/B54 ECN4453CAK-A8/B59	ECN4458CAJ-A8/B49 ECN4458CAJ-A8/B54 ECN4458CAK-A8/B59
575	125 150 200		HMCP 250A HMCP 250A HMCP 250A	ECN4451DAJ-A8/B50 ECN4451DAJ-A8/B55 ECN4451DAJ-A8/B60	ECN4452DAJ-A8/B50 ECN4452DAJ-A8/B55 ECN4452DAJ-A8/B60	ECN4453DAJ-A8/B50 ECN4453DAJ-A8/B55 ECN4453DAJ-A8/B60	ECN4458DAJ-A8/B50 ECN4458DAJ-A8/B55 ECN4458DAJ-A8/B60
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-21. Class ECN44 — Combination Autotransformer Starter — Circuit Breaker (Continued)

Motor Voltage	hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4 Water & Dust-Tight Painted Steel	Type 12 Dust-Tight Industrial External Reset ②③
				Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 6 (540A)							
200	100 125 150	120	HMCP 600A HMCP 600A HMCP 600A	**ECN4461EAL-A8/B41** **ECN4461EAL-A8/B46** **ECN4461EAL-A8/B51**	**ECN4462EAL-A8/B41** **ECN4462EAL-A8/B46** **ECN4462EAL-A8/B51**	**ECN4463EAL-A8/B41** **ECN4463EAL-A8/B46** **ECN4463EAL-A8/B51**	**ECN4468EAL-A8/B41** **ECN4468EAL-A8/B46** **ECN4468EAL-A8/B51**
230	125 150 200		HMCP 600A HMCP 600A MD 800A	**ECN4461BAL-A8/B47** **ECN4461BAL-A8/B52** **ECN4461BAM-A8/B57**	**ECN4462BAL-A8/B47** **ECN4462BAL-A8/B52** **ECN4462BAM-A8/B57**	**ECN4463BAL-A8/B47** **ECN4463BAL-A8/B52** **ECN4463BAM-A8/B57**	**ECN4468BAL-A8/B47** **ECN4468BAL-A8/B52** **ECN4468BAM-A8/B57**
460	250 300 400		HMCP 600A HMCP 600A MD 800A	**ECN4461CAL-A8/B64** **ECN4461CAL-A8/B69** **ECN4461CAM-A8/B74**	**ECN4462CAL-A8/B64** **ECN4462CAL-A8/B69** **ECN4462CAM-A8/B74**	**ECN4463CAL-A8/B64** **ECN4463CAL-A8/B69** **ECN4463CAM-A8/B74**	**ECN4468CAL-A8/B64** **ECN4468CAL-A8/B69** **ECN4468CAM-A8/B74**
575	250 300 400		HMCP 600A HMCP 600A MD 800A	**ECN4461DAL-A8/B65** **ECN4461DAL-A8/B70** **ECN4461DAM-A8/B75**	**ECN4462DAL-A8/B65** **ECN4462DAL-A8/B70** **ECN4462DAM-A8/B75**	**ECN4463DAL-A8/B65** **ECN4463DAL-A8/B70** **ECN4463DAM-A8/B75**	**ECN4468DAL-A8/B65** **ECN4468DAL-A8/B70** **ECN4468DAM-A8/B75**
NEMA Size 7 (810A)							
230	250 300	120	④	**ECN4471BAU-A8/B62** **ECN4471BAU-A8/B67**	**ECN4472BAU-A8/B62** **ECN4472BAU-A8/B67**	**ECN4473BAU-A8/B62** **ECN4473BAU-A8/B67**	**ECN4478BAU-A8/B62** **ECN4478BAU-A8/B67**
460	450 500 600			**ECN4471CAU-A8/B78** **ECN4471CAU-A8/B81** **ECN4471CAU-A8/B84**	**ECN4472CAU-A8/B78** **ECN4472CAU-A8/B81** **ECN4472CAU-A8/B84**	**ECN4473CAU-A8/B78** **ECN4473CAU-A8/B81** **ECN4473CAU-A8/B84**	**ECN4478CAU-A8/B78** **ECN4478CAU-A8/B81** **ECN4478CAU-A8/B84**
575	450 500 600			**ECN4471DAU-A8/B79** **ECN4471DAU-A8/B82** **ECN4471DAU-A8/B85**	**ECN4472DAU-A8/B79** **ECN4472DAU-A8/B82** **ECN4472DAU-A8/B85**	**ECN4473DAU-A8/B79** **ECN4473DAU-A8/B82** **ECN4473DAU-A8/B85**	**ECN4478DAU-A8/B79** **ECN4478DAU-A8/B82** **ECN4478DAU-A8/B85**
NEMA Size 8 (1215A)							
230	400 450	120	④	**ECN4481BAU-A8/B72** **ECN4481BAU-A8/B76**	**ECN4482BAU-A8/B72** **ECN4482BAU-A8/B76**	**ECN4483BAU-A8/B72** **ECN4483BAU-A8/B76**	**ECN4488BAU-A8/B72** **ECN4488BAU-A8/B76**
460	700 800 900			**ECN4481CAU-A8/B87** **ECN4481CAU-A8/B91** **ECN4481CAU-A8/B94**	**ECN4482CAU-A8/B87** **ECN4482CAU-A8/B91** **ECN4482CAU-A8/B94**	**ECN4483CAU-A8/B87** **ECN4483CAU-A8/B91** **ECN4483CAU-A8/B94**	**ECN4488CAU-A8/B87** **ECN4488CAU-A8/B91** **ECN4488CAU-A8/B94**
575	700 800 900			**ECN4481DAU-A8/B88** **ECN4481DAU-A8/B92** **ECN4481DAU-A8/B95**	**ECN4482DAU-A8/B88** **ECN4482DAU-A8/B92** **ECN4482DAU-A8/B95**	**ECN4483DAU-A8/B88** **ECN4483DAU-A8/B92** **ECN4483DAU-A8/B95**	**ECN4488DAU-A8/B88** **ECN4488DAU-A8/B92** **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 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Supply hp, voltage, FLA and whether motor is design E or not when ordering the starter.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Features

- Non-combination and Combination Designs
- 3-Phase Magnetic, 3-Pole
- Interchangeable Heater OLR
- 600V Maximum

Product Selection

Table 6-22. Class ECN45 — Non-combination Part Winding Starter

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②	Component Starter (Open)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	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** ③	**ECN4568BAA**	**AN16TN0AB**
460	600		**ECN4561CAA**	**ECN4562CAA**	**ECN4563CAA** ③	**ECN4568CAA**	
575	600		**ECN4561DAA**	**ECN4562DAA**	**ECN4563DAA** ③	**ECN4568DAA**	
NEMA Size 7PW							
230	450	120	**ECN4571BAA**	**ECN4572BAA**	**ECN4573BAA** ③	**ECN4578BAA**	**AN16UN0AB**
460	900		**ECN4571CAA**	**ECN4572CAA**	**ECN4573CAA** ③	**ECN4578CAA**	
575	900		**ECN4571DAA**	**ECN4572DAA**	**ECN4573DAA** ③	**ECN4578DAA**	
NEMA Size 8PW							
230	700	120	**ECN4581BAA**	**ECN4582BAA**	**ECN4583BAA** ③	**ECN4588BAA**	**AN16VN0AB**
460	1400		**ECN4581CAA**	**ECN4582CAA**	**ECN4583CAA** ③	**ECN4588CAA**	
575	1400		**ECN4581DAA**	**ECN4582DAA**	**ECN4583DAA** ③	**ECN4588DAA**	
Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each winding). Heater Pack Selection, **Page 16-6**.							

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 4 (Painted Steel) Sizes 6 – 8PW.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-23. Class ECN46 — Combination Part Winding Starter — Fusible Disconnect

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Fuse Clip Amperes	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ⑥ Water & Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) Catalog Number
NEMA Size 2PW								
200	20	120	100A	ECN4621EAF	ECN4622EAF	ECN4624EAF	ECN4628EAF	AN16GN0AB
230	15 25		60A 100A	ECN4621BAD ECN4621BAF	ECN4622BAD ECN4622BAF	ECN4624BAD ECN4624BAF	ECN4628BAD ECN4628BAF	AN16GN0AB
460	30 40		60A 100A	ECN4621CAE ECN4621CAG	ECN4622CAE ECN4622CAG	ECN4624CAE ECN4624CAG	ECN4628CAE ECN4628CAG	AN16GN0AB
575	20 40		30A 60A	ECN4621DAC ECN4621DAE	ECN4622DAC ECN4622DAE	ECN4624DAC ECN4624DAE	ECN4628DAC ECN4628DAE	AN16GN0AB
NEMA Size 3PW								
200	40	120	200A	ECN4631EAH	ECN4632EAH	ECN4634EAH	ECN4638EAH	AN16KN0AB
230	50		200A	ECN4631BAH	ECN4632BAH	ECN4634BAH	ECN4638BAH	AN16KN0AB
460	50 75		100A 200A	ECN4631CAG ECN4631CAJ	ECN4632CAG ECN4632CAJ	ECN4634CAG ECN4634CAJ	ECN4638CAG ECN4638CAJ	AN16KN0AB
575	60 75		100A 200A	ECN4631DAG ECN4631DAJ	ECN4632DAG ECN4632DAJ	ECN4634DAG ECN4634DAJ	ECN4638DAG ECN4638DAJ	AN16KN0AB
NEMA Size 4PW								
200	50 75	120	200A 400A	ECN4641EAH ECN4641EAK	ECN4642EAH ECN4642EAK	ECN4644EAH ECN4644EAK	ECN4648EAH ECN4648EAK	AN16NN0AB
230	75		400A	ECN4641BAK	ECN4642BAK	ECN4644BAK	ECN4648BAK	AN16NN0AB
460	100 150		200A 400A	ECN4641CAJ ECN4641CAL	ECN4642CAJ ECN4642CAL	ECN4644CAJ ECN4644CAL	ECN4648CAJ ECN4648CAL	AN16NN0AB
575	150		200A	ECN4641DAJ	ECN4642DAJ	ECN4644DAJ	ECN4648DAJ	AN16NN0AB
NEMA Size 5PW								
200	100 150	120	200	ECN4651EAK ECN4651EAM	ECN4652EAK ECN4652EAM	ECN4654EAK ECN4654EAM	ECN4658EAK ECN4658EAM	AN16SN0AB
230	100 150		230	ECN4651BAK ECN4651BAM	ECN4652BAK ECN4652BAM	ECN4654BAK ECN4654BAM	ECN4658BAK ECN4658BAM	AN16SN0AB
460	200 350		460	ECN4651CAL ECN4651CAN	ECN4652CAL ECN4652CAN	ECN4654CAL ECN4654CAN	ECN4658CAL ECN4658CAN	AN16SN0AB
575	300 350		575	ECN4651DAL ECN4651DAN	ECN4652DAL ECN4652DAN	ECN4654DAL ECN4654DAN	ECN4658DAL ECN4658DAN	AN16SN0AB
NEMA Size 6PW								
230 460 575	300 600 600	120	⑤	ECN4661BAU ECN4661CAU ECN4661DAU	ECN4662BAU ECN4662CAU ECN4662DAU	ECN4663BAU ④ ECN4663CAU ④ ECN4663DAU ④	ECN4668BAU ECN4668CAU ECN4668DAU	AN16TN0AB
NEMA Size 7PW								
230 460 575	450 900 900	120	⑤	ECN4671BAU ECN4671CAU ECN4671DAU	ECN4672BAU ECN4672CAU ECN4672DAU	ECN4673BAU ④ ECN4673CAU ④ ECN4673DAU ④	ECN4678BAU ECN4678CAU ECN4678DAU	AN16UN0AB
NEMA Size 8PW								
230 460 575	700 1400 1400	120	⑤	ECN4681BAU ECN4681CAU ECN4681DAU	ECN4682BAU ECN4682CAU ECN4682DAU	ECN4683BAU ④ ECN4683CAU ④ ECN4683DAU ④	ECN4688BAU ECN4688CAU ECN4688DAU	AN16VN0AB

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each winding). Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8PW.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-24. Class ECN46 — Combination Part Winding Starter — Non-fusible Disconnect

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Disconnect Amperes	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	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** ④	**ECN4668BAA**	**AN16TN0AB**
460	600			**ECN4661CAA**	**ECN4662CAA**	**ECN4663CAA** ④	**ECN4668CAA**	
575	600			**ECN4661DAA**	**ECN4662DAA**	**ECN4663DAA** ④	**ECN4668DAA**	
NEMA Size 7PW								
230	450	120	⑤	**ECN4671BAA**	**ECN4672BAA**	**ECN4673BAA** ④	**ECN4678BAA**	**AN16UN0AB**
460	900			**ECN4671CAA**	**ECN4672CAA**	**ECN4673CAA** ④	**ECN4678CAA**	
575	900			**ECN4671DAA**	**ECN4672DAA**	**ECN4673DAA** ④	**ECN4678DAA**	
NEMA Size 8PW								
230	700	120	⑤	**ECN4681BAA**	**ECN4682BAA**	**ECN4683BAA** ④	**ECN4688BAA**	**AN16VN0AB**
460	1400			**ECN4681CAA**	**ECN4682CAA**	**ECN4683CAA** ④	**ECN4688CAA**	
575	1400			**ECN4681DAA**	**ECN4682DAA**	**ECN4683DAA** ④	**ECN4688DAA**	
Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each winding). Heater Pack Selection, **Page 16-6**.								

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8PW.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN4624EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-25. Class ECN47 — Combination Part Winding Starter — Circuit Breaker

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 2PW								
200	15 20	120	70A 100A	**ECN4721EAH** **ECN4721EAK**	**ECN4722EAH** **ECN4722EAK**	**ECN4724EAH** **ECN4724EAK**	**ECN4728EAH** **ECN4728EAK**	**AN16GN0AB**
230	15 20 25		70A 90A 100A	**ECN4721BAH** **ECN4721BAJ** **ECN4721BAK**	**ECN4722BAH** **ECN4722BAJ** **ECN4722BAK**	**ECN4724BAH** **ECN4724BAJ** **ECN4724BAK**	**ECN4728BAH** **ECN4728BAJ** **ECN4728BAK**	**AN16GN0AB**
460	20 30 40		40A 60A 90A	**ECN4721CAE** **ECN4721CAG** **ECN4721CAJ**	**ECN4722CAE** **ECN4722CAG** **ECN4722CAJ**	**ECN4724CAE** **ECN4724CAG** **ECN4724CAJ**	**ECN4728CAE** **ECN4728CAG** **ECN4728CAJ**	**AN16GN0AB**
575	25 30 40		40A 50A 60A	**ECN4721DAE** **ECN4721DAF** **ECN4721DAG**	**ECN4722DAE** **ECN4722DAF** **ECN4722DAG**	**ECN4724DAE** **ECN4724DAF** **ECN4724DAG**	**ECN4728DAE** **ECN4728DAF** **ECN4728DAG**	**AN16GN0AB**
NEMA Size 3PW								
200	40	120	125A	**ECN4731EAL**	**ECN4732EAL**	**ECN4734EAL**	**ECN4738EAL**	**AN16KN0AB**
230	40 50		125A 150A	**ECN4731BAL** **ECN4731BAM**	**ECN4732BAL** **ECN4732BAM**	**ECN4734BAL** **ECN4734BAM**	**ECN4738BAL** **ECN4738BAM**	**AN16KN0AB**
460	50 75		100A 125A	**ECN4731CAK** **ECN4731CAL**	**ECN4732CAK** **ECN4732CAL**	**ECN4734CAK** **ECN4734CAL**	**ECN4738CAK** **ECN4738CAL**	**AN16KN0AB**
575	50 60 75		90A 100A 125A	**ECN4731DAJ** **ECN4731DAK** **ECN4731DAL**	**ECN4732DAJ** **ECN4732DAK** **ECN4732DAL**	**ECN4734DAJ** **ECN4734DAK** **ECN4734DAL**	**ECN4738DAJ** **ECN4738DAK** **ECN4738DAL**	**AN16KN0AB**
NEMA Size 4PW								
200	50 60 75	120	200A 225A 300A	**ECN4741EAP** **ECN4741EAQ** **ECN4741EAS**	**ECN4742EAP** **ECN4742EAQ** **ECN4742EAS**	**ECN4744EAP** **ECN4744EAQ** **ECN4744EAS**	**ECN4748EAP** **ECN4748EAQ** **ECN4748EAS**	**AN16NN0AB**
230	60 75		200A 250A	**ECN4741BAP** **ECN4741BAR**	**ECN4742BAP** **ECN4742BAR**	**ECN4744BAP** **ECN4744BAR**	**ECN4748BAP** **ECN4748BAR**	**AN16NN0AB**
460	100 125 150		150A 225A 250A	**ECN4741CAM** **ECN4741CAQ** **ECN4741CAR**	**ECN4742CAM** **ECN4742CAQ** **ECN4742CAR**	**ECN4744CAM** **ECN4744CAQ** **ECN4744CAR**	**ECN4748CAM** **ECN4748CAQ** **ECN4748CAR**	**AN16NN0AB**
575	100 125 150		125A 150A 200A	**ECN4741DAL** **ECN4741DAM** **ECN4741DAP**	**ECN4742DAL** **ECN4742DAM** **ECN4742DAP**	**ECN4744DAL** **ECN4744DAM** **ECN4744DAP**	**ECN4748DAL** **ECN4748DAM** **ECN4748DAP**	**AN16NN0AB**
NEMA Size 5PW								
200	100 125 150	120	350A 500A 600A	**ECN4751EAV** **ECN4751EAY** **ECN4751EAZ**	**ECN4752EAV** **ECN4752EAY** **ECN4752EAZ**	**ECN4754EAV** **ECN4754EAY** **ECN4754EAZ**	**ECN4758EAV** **ECN4758EAY** **ECN4758EAZ**	**AN16SN0AB**
230	100 125 150		350A 400A 500A	**ECN4751BAV** **ECN4751BAW** **ECN4751BAY**	**ECN4752BAV** **ECN4752BAW** **ECN4752BAY**	**ECN4754BAV** **ECN4754BAW** **ECN4754BAY**	**ECN4758BAV** **ECN4758BAW** **ECN4758BAY**	**AN16SN0AB**
460	200 250 300 350		350A 400A 500A 600A	**ECN4751CAV** **ECN4751CAW** **ECN4751CAY** **ECN4751CAZ**	**ECN4752CAV** **ECN4752CAW** **ECN4752CAY** **ECN4752CAZ**	**ECN4754CAV** **ECN4754CAW** **ECN4754CAY** **ECN4754CAZ**	**ECN4758CAV** **ECN4758CAW** **ECN4758CAY** **ECN4758CAZ**	**AN16SN0AB**
575	200 300 350		250A 350A 500A	**ECN4751DAR** **ECN4751DAV** **ECN4751DAY**	**ECN4752DAR** **ECN4752DAV** **ECN4752DAY**	**ECN4754DAR** **ECN4754DAV** **ECN4754DAY**	**ECN4758DAR** **ECN4758DAV** **ECN4758DAY**	**AN16SN0AB**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each winding). Heater Pack Selection, **Page 16-6**.

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 interlock.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN4724EAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-25. Class ECN47 — Combination Part Winding Starter — Circuit Breaker (Continued)

Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
NEMA Size 6PW								
230	300	120	⑤	**ECN4761BAU**	**ECN4762BAU**	**ECN4763BAU** ④	**ECN4768BAU**	**AN16TN0AB**
460	600			**ECN4761CAU**	**ECN4762CAU**	**ECN4763CAU** ④	**ECN4768CAU**	**AN16TN0AB**
575	600			**ECN4761DAU**	**ECN4762DAU**	**ECN4763DAU** ④	**ECN4768DAU**	**AN16TN0AB**
NEMA Size 7PW								
230	450	120	⑤	**ECN4771BAU**	**ECN4772BAU**	**ECN4773BAU** ④	**ECN4778BAU**	**AN16UN0AB**
460	900			**ECN4771CAU**	**ECN4772CAU**	**ECN4773CAU** ④	**ECN4778CAU**	**AN16UN0AB**
575	900			**ECN4771DAU**	**ECN4772DAU**	**ECN4773DAU** ④	**ECN4778DAU**	**AN16UN0AB**
NEMA Size 8PW								
230	700	120	⑤	**ECN4781BAU**	**ECN4782BAU**	**ECN4783BAU** ④	**ECN4788BAU**	**AN16VN0AB**
460	1400			**ECN4781CAU**	**ECN4782CAU**	**ECN4783CAU** ④	**ECN4788CAU**	**AN16VN0AB**
575	1400			**ECN4781DAU**	**ECN4782DAU**	**ECN4783DAU** ④	**ECN4788DAU**	**AN16VN0AB**
Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each winding). Heater Pack Selection, **Page 16-6**.								

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8PW.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN472**4**EAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Features

- Open or Closed Transition
- Non-combination and Combination Designs
- 3-Phase Magnetic, 3-Pole
- Interchangeable Heater OLR
- 600V Maximum

Product Selection

Table 6-26. Class ECN48 — Non-combination Open Transition Wye Delta Starter

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②	Component Starter (Open) ⑤
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	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 ③	ECN4868EAA	AN16TN0AB
7YD		500		ECN4871EAA	ECN4872EAA	ECN4873EAA ③	ECN4878EAA	AN16UN0AB
8YD		750		ECN4881EAA	ECN4882EAA	ECN4883EAA ③	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 ③	ECN4868BAA	AN16TN0AB
7YD		500		ECN4871BAA	ECN4872BAA	ECN4873BAA ③	ECN4878BAA	AN16UN0AB
8YD		800		ECN4881BAA	ECN4882BAA	ECN4883BAA ③	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 ③	ECN4868CAA	AN16TN0AB
7YD		1000		ECN4871CAA	ECN4872CAA	ECN4873CAA ③	ECN4878CAA	AN16UN0AB
8YD		1500		ECN4881CAA	ECN4882CAA	ECN4883CAA ③	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 ③	ECN4868DAA	AN16TN0AB
7YD		1000		ECN4871DAA	ECN4872DAA	ECN4873DAA ③	ECN4878DAA	AN16UN0AB
8YD		1500		ECN4881DAA	ECN4882DAA	ECN4883DAA ③	ECN4888DAA	AN16VN0AB

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 4 (Painted Steel) Sizes 6 – 8YD.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN482**4**EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-27. Class ECN49 — Combination Open Transition Wye Delta Starter — Fusible Disconnect

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①							
2YD	15 20	60A 100A	ECN4921EAD-W10/G1 ECN4921EAF-W10/G3	ECN4922EAD-W10/G1 ECN4922EAF-W10/G3	ECN4924EAD-W10/G1 ECN4924EAF-W10/G3	ECN4928EAD-W10/G1 ECN4928EAF-W10/G3	AN16GN0AB
3YD	25 30 40	100A 200A 200A	ECN4931EAF-W10/G8 ECN4931EAH-W10/G13 ECN4931EAH-W10/G18	ECN4932EAF-W10/G8 ECN4932EAH-W10/G13 ECN4932EAH-W10/G18	ECN4934EAF-W10/G8 ECN4934EAH-W10/G13 ECN4934EAH-W10/G18	ECN4938EAF-W10/G8 ECN4938EAH-W10/G13 ECN4938EAH-W10/G18	AN16KN0AB
4YD	50 60	200A 400A	ECN4941EAH-W10/G23 ECN4941EAK-W10/G28	ECN4942EAH-W10/G23 ECN4942EAK-W10/G28	ECN4944EAH-W10/G23 ECN4944EAK-W10/G28	ECN4948EAH-W10/G23 ECN4948EAK-W10/G28	AN16NN0AB
5YD	75 100 125 150	400A 400A 600A 600A	ECN4951EAK-W10/G33 ECN4951EAK-W10/G38 ECN4951EAM-W10/G43 ECN4951EAM-W10/G48	ECN4952EAK-W10/G33 ECN4952EAK-W10/G38 ECN4952EAM-W10/G43 ECN4952EAM-W10/G48	ECN4954EAK-W10/G33 ECN4954EAK-W10/G38 ECN4954EAM-W10/G43 ECN4954EAM-W10/G48	ECN4958EAK-W10/G33 ECN4958EAK-W10/G38 ECN4958EAM-W10/G43 ECN4958EAM-W10/G48	AN16SN0AB
6YD	200 250 300	⑤	ECN4961EAU-W10/G53 ECN4961EAU-W10/G58 ECN4961EAU-W10/G63	ECN4962EAU-W10/G53 ECN4962EAU-W10/G58 ECN4962EAU-W10/G63	ECN4963EAU-W10/G53 ④ ECN4963EAU-W10/G58 ④ ECN4963EAU-W10/G63 ④	ECN4968EAU-W10/G33 ECN4968EAU-W10/G58 ECN4968EAU-W10/G63	AN16TN0AB
7YD	350 400 450 500	⑤	ECN4971EAU-W10/G68 ECN4971EAU-W10/G73 ECN4971EAU-W10/G78 ECN4971EAU-W10/G83	ECN4972EAU-W10/G68 ECN4972EAU-W10/G73 ECN4972EAU-W10/G78 ECN4972EAU-W10/G83	ECN4973EAU-W10/G68 ④ ECN4973EAU-W10/G73 ④ ECN4973EAU-W10/G78 ④ ECN4973EAU-W10/G83 ④	ECN4978EAU-W10/G68 ECN4978EAU-W10/G73 ECN4978EAU-W10/G78 ECN4978EAU-W10/G83	AN16UN0AB
8YD	600 700 750	⑤	ECN4981EAU-W10/G88 ECN4981EAU-W10/G93 ECN4981EAU-W10/G98	ECN4982EAU-W10/G88 ECN4982EAU-W10/G93 ECN4982EAU-W10/G98	ECN4983EAU-W10/G88 ④ ECN4983EAU-W10/G93 ④ ECN4983EAU-W10/G98 ④	ECN4988EAU-W10/G88 ECN4988EAU-W10/G93 ECN4988EAU-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①							
2YD	15 20 25	60A 100A 100A	ECN4921BAD-W10/G2 ECN4921BAF-W10/G4 ECN4921BAF-W10/G9	ECN4922BAD-W10/G2 ECN4922BAF-W10/G4 ECN4922BAF-W10/G9	ECN4924BAD-W10/G2 ECN4924BAF-W10/G4 ECN4924BAF-W10/G9	ECN4928BAD-W10/G2 ECN4928BAF-W10/G4 ECN4928BAF-W10/G9	AN16GN0AB
3YD	30 40 50	100A 200A 200A	ECN4931BAF-W10/G14 ECN4931BAH-W10/G19 ECN4931BAH-W10/G24	ECN4932BAF-W10/G14 ECN4932BAH-W10/G19 ECN4932BAH-W10/G24	ECN4934BAF-W10/G14 ECN4934BAH-W10/G19 ECN4934BAH-W10/G24	ECN4938BAF-W10/G14 ECN4938BAH-W10/G19 ECN4938BAH-W10/G24	AN16KN0AB
4YD	60 75	200A 400A	ECN4941BAH-W10/G29 ECN4941BAK-W10/G34	ECN4942BAH-W10/G29 ECN4942BAK-W10/G34	ECN4944BAH-W10/G29 ECN4944BAK-W10/G34	ECN4948BAH-W10/G29 ECN4948BAK-W10/G34	AN16NN0AB
5YD	100 125 150	400A 400A 600A	ECN4951BAK-W10/G39 ECN4951BAK-W10/G44 ECN4951BAM-W10/G49	ECN4952BAK-W10/G39 ECN4952BAK-W10/G44 ECN4952BAM-W10/G49	ECN4954BAK-W10/G39 ECN4954BAK-W10/G44 ECN4954BAM-W10/G49	ECN4958BAK-W10/G39 ECN4958BAK-W10/G44 ECN4958BAM-W10/G49	AN16SN0AB
6YD	200 250 300 350	600A ⑤	ECN4961BAM-W10/G54 ECN4961BAU-W10/G59 ECN4961BAU-W10/G64 ECN4961BAU-W10/G69	ECN4962BAM-W10/G54 ECN4962BAU-W10/G59 ECN4962BAU-W10/G64 ECN4962BAU-W10/G69	ECN4963BAM-W10/G54 ④ ECN4963BAU-W10/G59 ④ ECN4963BAU-W10/G64 ④ ECN4963BAU-W10/G69 ④	ECN4968BAM-W10/G54 ECN4968BAU-W10/G59 ECN4968BAU-W10/G64 ECN4968BAU-W10/G69	AN16TN0AB
7YD	400 450 500	⑤	ECN4971BAU-W10/G74 ECN4971BAU-W10/G79 ECN4971BAU-W10/G84	ECN4972BAU-W10/G74 ECN4972BAU-W10/G79 ECN4972BAU-W10/G84	ECN4973BAU-W10/G74 ④ ECN4973BAU-W10/G79 ④ ECN4973BAU-W10/G84 ④	ECN4978BAU-W10/G74 ECN4978BAU-W10/G79 ECN4978BAU-W10/G84	AN16UN0AB
8YD	600 700 750 800	⑤	ECN4981BAU-W10/G89 ECN4981BAU-W10/G94 ECN4981BAU-W10/G99 ECN4981BAU-W10/G103	ECN4982BAU-W10/G89 ECN4982BAU-W10/G94 ECN4982BAU-W10/G99 ECN4982BAU-W10/G103	ECN4983BAU-W10/G89 ④ ECN4983BAU-W10/G94 ④ ECN4983BAU-W10/G99 ④ ECN4983BAU-W10/G103 ④	ECN4988BAU-W10/G89 ECN4988BAU-W10/G94 ECN4988BAU-W10/G99 ECN4988BAU-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN4924EAD. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-27. Class ECN49 — Combination Open Transition Wye Delta Starter — Fusible Disconnect (Continued)

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①							
2YD	20	60A	ECN4921CAE-W10/G6	ECN4922CAE-W10/G6	ECN4924CAE-W10/G6	ECN4928CAE-W10/G6	AN16GN0AB
	25	60A	ECN4921CAE-W10/G11	ECN4922CAE-W10/G11	ECN4924CAE-W10/G11	ECN4928CAE-W10/G11	
	30	60A	ECN4921CAE-W10/G16	ECN4922CAE-W10/G16	ECN4924CAE-W10/G16	ECN4928CAE-W10/G16	
	40	60A	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	100A	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	200A	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	400A	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 ④	ECN4968CAN-W10/G71	AN16TN0AB
	400	600A	ECN4961CAN-W10/G76	ECN4962CAN-W10/G76	ECN4963CAN-W10/G76 ④	ECN4968CAN-W10/G76	
	450	600A	ECN4961CAN-W10/G81	ECN4962CAN-W10/G81	ECN4963CAN-W10/G81 ④	ECN4968CAN-W10/G81	
	500	800A	ECN4961CAP-W10/G86	ECN4962CAP-W10/G86	ECN4963CAP-W10/G86 ④	ECN4968CAP-W10/G86	
	600	1200A	ECN4961CAQ-W10/G91	ECN4962CAQ-W10/G91	ECN4963CAQ-W10/G91 ④	ECN4968CAQ-W10/G91	
	700	1200A	ECN4961CAQ-W10/G96	ECN4962CAQ-W10/G96	ECN4963CAQ-W10/G96 ④	ECN4968CAQ-W10/G96	
7YD	750	1200A	ECN4971CAQ-W10/G101	ECN4972CAQ-W10/G101	ECN4973CAQ-W10/G101 ④	ECN4978CAQ-W10/G101	AN16UN0AB
	800	⑤	ECN4971CAU-W10/G105	ECN4972CAU-W10/G105	ECN4973CAU-W10/G105 ④	ECN4978CAU-W10/G105	
	900		ECN4971CAU-W10/G108	ECN4972CAU-W10/G108	ECN4973CAU-W10/G108 ④	ECN4978CAU-W10/G108	
	1000		ECN4971CAU-W10/G111	ECN4972CAU-W10/G111	ECN4973CAU-W10/G111 ④	ECN4978CAU-W10/G111	
8YD	1250	⑤	ECN4981CAU-W10/G114	ECN4982CAU-W10/G114	ECN4983CAU-W10/G114 ④	ECN4988CAU-W10/G114	AN16VN0AB
	1500		ECN4981CAU-W10/G117	ECN4982CAU-W10/G117	ECN4983CAU-W10/G117 ④	ECN4988CAU-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①							
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	60A	ECN4921DAE-W10/G17	ECN4922DAE-W10/G17	ECN4924DAE-W10/G17	ECN4928DAE-W10/G17	
	40	60A	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	100A	ECN4931DAG-W10/G32	ECN4932DAG-W10/G32	ECN4934DAG-W10/G32	ECN4938DAG-W10/G32	
	75	100A	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	200A	ECN4941DAJ-W10/G47	ECN4942DAJ-W10/G47	ECN4944DAJ-W10/G47	ECN4948DAJ-W10/G47	
	150	200A	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	400A	ECN4951DAL-W10/G62	ECN4952DAL-W10/G62	ECN4954DAL-W10/G62	ECN4958DAL-W10/G62	
	300	400A	ECN4951DAL-W10/G67	ECN4952DAL-W10/G67	ECN4954DAL-W10/G67	ECN4958DAL-W10/G67	
6YD	350	400A	ECN4961DAL-W10/G72	ECN4962DAL-W10/G72	ECN4963DAL-W10/G72 ④	ECN4968DAL-W10/G72	AN16TN0AB
	400	600A	ECN4961DAN-W10/G77	ECN4962DAN-W10/G77	ECN4963DAN-W10/G77 ④	ECN4968DAN-W10/G77	
	450	600A	ECN4961DAN-W10/G82	ECN4962DAN-W10/G82	ECN4963DAN-W10/G82 ④	ECN4968DAN-W10/G82	
	500	600A	ECN4961DAN-W10/G87	ECN4962DAN-W10/G87	ECN4963DAN-W10/G87 ④	ECN4968DAN-W10/G87	
	600	800A	ECN4961DAP-W10/G92	ECN4962DAP-W10/G92	ECN4963DAP-W10/G92 ④	ECN4968DAP-W10/G92	
	700	800A	ECN4961DAP-W10/G97	ECN4962DAP-W10/G97	ECN4963DAP-W10/G97 ④	ECN4968DAP-W10/G97	
7YD	750	⑤	ECN4971DAU-W10/G102	ECN4972DAU-W10/G102	ECN4973DAU-W10/G102 ④	ECN4978DAU-W10/G102	AN16UN0AB
	800		ECN4971DAU-W10/G106	ECN4972DAU-W10/G106	ECN4973DAU-W10/G106 ④	ECN4978DAU-W10/G106	
	900		ECN4971DAU-W10/G109	ECN4972DAU-W10/G109	ECN4973DAU-W10/G109 ④	ECN4978DAU-W10/G109	
	1000		ECN4971DAU-W10/G112	ECN4972DAU-W10/G112	ECN4973DAU-W10/G112 ④	ECN4978DAU-W10/G112	
8YD	1250	⑤	ECN4981DAU-W10/G115	ECN4982DAU-W10/G115	ECN4983DAU-W10/G115 ④	ECN4988DAU-W10/G115	AN16VN0AB
	1500		ECN4981DAU-W10/G118	ECN4982DAU-W10/G118	ECN4983DAU-W10/G118 ④	ECN4988DAU-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN492**4**CAE. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-28. Class ECN49 — Combination Open Transition Wye Delta Starter — Non-fusible Disconnect

NEMA Size	Max. hp Rating	Dis-connect Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①							
2YD	15 20	60A 100A	ECN4921EAA-W10/G1 ECN4921EAA-W10/G3	ECN4922EAA-W10/G1 ECN4922EAA-W10/G3	ECN4924EAA-W10/G1 ECN4924EAA-W10/G3	ECN4928EAA-W10/G1 ECN4928EAA-W10/G3	AN16GN0AB
3YD	25 30 40	100A 200A 200A	ECN4931EAA-W10/G8 ECN4931EAA-W10/G13 ECN4931EAA-W10/G18	ECN4932EAA-W10/G8 ECN4932EAA-W10/G13 ECN4932EAA-W10/G18	ECN4934EAA-W10/G8 ECN4934EAA-W10/G13 ECN4934EAA-W10/G18	ECN4938EAA-W10/G8 ECN4938EAA-W10/G13 ECN4938EAA-W10/G18	AN16KN0AB
4YD	50 60	200A 400A	ECN4941EAA-W10/G23 ECN4941EAA-W10/G28	ECN4942EAA-W10/G23 ECN4942EAA-W10/G28	ECN4944EAA-W10/G23 ECN4944EAA-W10/G28	ECN4948EAA-W10/G23 ECN4948EAA-W10/G28	AN16NN0AB
5YD	75 100 125 150	400A 400A 600A 600A	ECN4951EAA-W10/G33 ECN4951EAA-W10/G38 ECN4951EAA-W10/G43 ECN4951EAA-W10/G48	ECN4952EAA-W10/G33 ECN4952EAA-W10/G38 ECN4952EAA-W10/G43 ECN4952EAA-W10/G48	ECN4954EAA-W10/G33 ECN4954EAA-W10/G38 ECN4954EAA-W10/G43 ECN4954EAA-W10/G48	ECN4958EAA-W10/G33 ECN4958EAA-W10/G38 ECN4958EAA-W10/G43 ECN4958EAA-W10/G48	AN16SN0AB
6YD	200 250 300	⑤	ECN4961EAA-W10/G53 ECN4961EAA-W10/G58 ECN4961EAA-W10/G63	ECN4962EAA-W10/G53 ECN4962EAA-W10/G58 ECN4962EAA-W10/G63	ECN4963EAA-W10/G53 ④ ECN4963EAA-W10/G58 ④ ECN4963EAA-W10/G63 ④	ECN4968EAA-W10/G33 ECN4968EAA-W10/G58 ECN4968EAA-W10/G63	AN16TN0AB
7YD	350 400 450 500	⑤	ECN4971EAA-W10/G68 ECN4971EAA-W10/G73 ECN4971EAA-W10/G78 ECN4971EAA-W10/G83	ECN4972EAA-W10/G68 ECN4972EAA-W10/G73 ECN4972EAA-W10/G78 ECN4972EAA-W10/G83	ECN4973EAA-W10/G68 ④ ECN4973EAA-W10/G73 ④ ECN4973EAA-W10/G78 ④ ECN4973EAA-W10/G83 ④	ECN4978EAA-W10/G68 ECN4978EAA-W10/G73 ECN4978EAA-W10/G78 ECN4978EAA-W10/G83	AN16UN0AB
8YD	600 700 750	⑤	ECN4981EAA-W10/G88 ECN4981EAA-W10/G93 ECN4981EAA-W10/G98	ECN4982EAA-W10/G88 ECN4982EAA-W10/G93 ECN4982EAA-W10/G98	ECN4983EAA-W10/G88 ④ ECN4983EAA-W10/G93 ④ ECN4983EAA-W10/G98 ④	ECN4988EAA-W10/G88 ECN4988EAA-W10/G93 ECN4988EAA-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①							
2YD	15 20 25	60A 100A 100A	ECN4921BAA-W10/G2 ECN4921BAA-W10/G4 ECN4921BAA-W10/G9	ECN4922BAA-W10/G2 ECN4922BAA-W10/G4 ECN4922BAA-W10/G9	ECN4924BAA-W10/G2 ECN4924BAA-W10/G4 ECN4924BAA-W10/G9	ECN4928BAA-W10/G2 ECN4928BAA-W10/G4 ECN4928BAA-W10/G9	AN16GN0AB
3YD	30 40 50	100A 200A 200A	ECN4931BAA-W10/G14 ECN4931BAA-W10/G19 ECN4931BAA-W10/G24	ECN4932BAA-W10/G14 ECN4932BAA-W10/G19 ECN4932BAA-W10/G24	ECN4934BAA-W10/G14 ECN4934BAA-W10/G19 ECN4934BAA-W10/G24	ECN4938BAA-W10/G14 ECN4938BAA-W10/G19 ECN4938BAA-W10/G24	AN16KN0AB
4YD	60 75	200A 400A	ECN4941BAA-W10/G29 ECN4941BAA-W10/G34	ECN4942BAA-W10/G29 ECN4942BAA-W10/G34	ECN4944BAA-W10/G29 ECN4944BAA-W10/G34	ECN4948BAA-W10/G29 ECN4948BAA-W10/G34	AN16NN0AB
5YD	100 125 150	400A 400A 600A	ECN4951BAA-W10/G39 ECN4951BAA-W10/G44 ECN4951BAA-W10/G49	ECN4952BAA-W10/G39 ECN4952BAA-W10/G44 ECN4952BAA-W10/G49	ECN4954BAA-W10/G39 ECN4954BAA-W10/G44 ECN4954BAA-W10/G49	ECN4958BAA-W10/G39 ECN4958BAA-W10/G44 ECN4958BAA-W10/G49	AN16SN0AB
6YD	200 250 300 350	600A ⑤	ECN4961BAA-W10/G54 ECN4961BAA-W10/G59 ECN4961BAA-W10/G64 ECN4961BAA-W10/G69	ECN4962BAA-W10/G54 ECN4962BAA-W10/G59 ECN4962BAA-W10/G64 ECN4962BAA-W10/G69	ECN4963BAA-W10/G54 ④ ECN4963BAA-W10/G59 ④ ECN4963BAA-W10/G64 ④ ECN4963BAA-W10/G69 ④	ECN4968BAA-W10/G54 ECN4968BAA-W10/G59 ECN4968BAA-W10/G64 ECN4968BAA-W10/G69	AN16TN0AB
7YD	400 450 500	⑤	ECN4971BAA-W10/G74 ECN4971BAA-W10/G79 ECN4971BAA-W10/G84	ECN4972BAA-W10/G74 ECN4972BAA-W10/G79 ECN4972BAA-W10/G84	ECN4973BAA-W10/G74 ④ ECN4973BAA-W10/G79 ④ ECN4973BAA-W10/G84 ④	ECN4978BAA-W10/G74 ECN4978BAA-W10/G79 ECN4978BAA-W10/G84	AN16UN0AB
8YD	600 700 750 800	⑤	ECN4981BAA-W10/G89 ECN4981BAA-W10/G94 ECN4981BAA-W10/G99 ECN4981BAA-W10/G103	ECN4982BAA-W10/G89 ECN4982BAA-W10/G94 ECN4982BAA-W10/G99 ECN4982BAA-W10/G103	ECN4983BAA-W10/G89 ④ ECN4983BAA-W10/G94 ④ ECN4983BAA-W10/G99 ④ ECN4983BAA-W10/G103 ④	ECN4988BAA-W10/G89 ECN4988BAA-W10/G94 ECN4988BAA-W10/G99 ECN4988BAA-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN4924EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-28. Class ECN49 — Combination Open Transition Wye Delta Starter — Non-fusible Disconnect (Continued)

NEMA Size	Max. hp Rating	Dis-connect Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①							
2YD	20	60A	ECN4921CAA-W10/G6	ECN4922CAA-W10/G6	ECN4924CAA-W10/G6	ECN4928CAA-W10/G6	AN16GN0AB
	25	60A	ECN4921CAA-W10/G11	ECN4922CAA-W10/G11	ECN4924CAA-W10/G11	ECN4928CAA-W10/G11	
	30	60A	ECN4921CAA-W10/G16	ECN4922CAA-W10/G16	ECN4924CAA-W10/G16	ECN4928CAA-W10/G16	
	40	60A	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	100A	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	200A	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	400A	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 ④	ECN4968CAA-W10/G71	AN16TN0AB
	400	600A	ECN4961CAA-W10/G76	ECN4962CAA-W10/G76	ECN4963CAA-W10/G76 ④	ECN4968CAA-W10/G76	
	450	600A	ECN4961CAA-W10/G81	ECN4962CAA-W10/G81	ECN4963CAA-W10/G81 ④	ECN4968CAA-W10/G81	
	500	800A	ECN4961CAA-W10/G86	ECN4962CAA-W10/G86	ECN4963CAA-W10/G86 ④	ECN4968CAA-W10/G86	
	600	1200A	ECN4961CAA-W10/G91	ECN4962CAA-W10/G91	ECN4963CAA-W10/G91 ④	ECN4968CAA-W10/G91	
	700	1200A	ECN4961CAA-W10/G96	ECN4962CAA-W10/G96	ECN4963CAA-W10/G96 ④	ECN4968CAA-W10/G96	
7YD	750	1200A	ECN4971CAA-W10/G101	ECN4972CAA-W10/G101	ECN4973CAA-W10/G101 ④	ECN4978CAA-W10/G101	AN16UN0AB
	800	⑤	ECN4971CAA-W10/G105	ECN4972CAA-W10/G105	ECN4973CAA-W10/G105 ④	ECN4978CAA-W10/G105	
	900		ECN4971CAA-W10/G108	ECN4972CAA-W10/G108	ECN4973CAA-W10/G108 ④	ECN4978CAA-W10/G108	
	1000		ECN4971CAA-W10/G111	ECN4972CAA-W10/G111	ECN4973CAA-W10/G111 ④	ECN4978CAA-W10/G111	
8YD	1250	⑤	ECN4981CAA-W10/G114	ECN4982CAA-W10/G114	ECN4983CAA-W10/G114 ④	ECN4988CAA-W10/G114	AN16VN0AB
	1500		ECN4981CAA-W10/G117	ECN4982CAA-W10/G117	ECN4983CAA-W10/G117 ④	ECN4988CAA-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①							
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	60A	ECN4921DAA-W10/G17	ECN4922DAA-W10/G17	ECN4924DAA-W10/G17	ECN4928DAA-W10/G17	
	40	60A	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	100A	ECN4931DAA-W10/G32	ECN4932DAA-W10/G32	ECN4934DAA-W10/G32	ECN4938DAA-W10/G32	
	75	100A	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	200A	ECN4941DAA-W10/G47	ECN4942DAA-W10/G47	ECN4944DAA-W10/G47	ECN4948DAA-W10/G47	
	150	200A	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	400A	ECN4951DAA-W10/G62	ECN4952DAA-W10/G62	ECN4954DAA-W10/G62	ECN4958DAA-W10/G62	
	300	400A	ECN4951DAA-W10/G67	ECN4952DAA-W10/G67	ECN4954DAA-W10/G67	ECN4958DAA-W10/G67	
6YD	350	400A	ECN4961DAA-W10/G72	ECN4962DAA-W10/G72	ECN4963DAA-W10/G72 ④	ECN4968DAA-W10/G72	AN16TN0AB
	400	600A	ECN4961DAA-W10/G77	ECN4962DAA-W10/G77	ECN4963DAA-W10/G77 ④	ECN4968DAA-W10/G77	
	450	600A	ECN4961DAA-W10/G82	ECN4962DAA-W10/G82	ECN4963DAA-W10/G82 ④	ECN4968DAA-W10/G82	
	500	600A	ECN4961DAA-W10/G87	ECN4962DAA-W10/G87	ECN4963DAA-W10/G87 ④	ECN4968DAA-W10/G87	
	600	800A	ECN4961DAA-W10/G92	ECN4962DAA-W10/G92	ECN4963DAA-W10/G92 ④	ECN4968DAA-W10/G92	
	700	800A	ECN4961DAA-W10/G97	ECN4962DAA-W10/G97	ECN4963DAA-W10/G97 ④	ECN4968DAA-W10/G97	
7YD	750	⑤	ECN4971DAA-W10/G102	ECN4972DAA-W10/G102	ECN4973DAA-W10/G102 ④	ECN4978DAA-W10/G102	AN16UN0AB
	800		ECN4971DAA-W10/G106	ECN4972DAA-W10/G106	ECN4973DAA-W10/G106 ④	ECN4978DAA-W10/G106	
	900		ECN4971DAA-W10/G109	ECN4972DAA-W10/G109	ECN4973DAA-W10/G109 ④	ECN4978DAA-W10/G109	
	1000		ECN4971DAA-W10/G112	ECN4972DAA-W10/G112	ECN4973DAA-W10/G112 ④	ECN4978DAA-W10/G112	
8YD	1250	⑤	ECN4981DAA-W10/G115	ECN4982DAA-W10/G115	ECN4983DAA-W10/G115 ④	ECN4988DAA-W10/G115	AN16VN0AB
	1500		ECN4981DAA-W10/G118	ECN4982DAA-W10/G118	ECN4983DAA-W10/G118 ④	ECN4988DAA-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN492**4**CAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-29. Class ECN50 — Combination Open Transition Wye Delta Starter — Circuit Breaker

NEMA Size	Max. hp Rating	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①							
2YD	15 20	70A 90A	ECN5021EAH-W10/G1 ECN5021EAJ-W10/G3	ECN5022EAH-W10/G1 ECN5022EAJ-W10/G3	ECN5024EAH-W10/G1 ECN5024EAJ-W10/G3	ECN5028EAH-W10/G1 ECN5028EAJ-W10/G3	AN16GN0AB
3YD	25 30 40	100A 125A 175A	ECN5031EAK-W10/G8 ECN5031EAL-W10/G13 ECN5031EAN-W10/G18	ECN5032EAK-W10/G8 ECN5032EAL-W10/G13 ECN5032EAN-W10/G18	ECN5034EAK-W10/G8 ECN5034EAL-W10/G13 ECN5034EAN-W10/G18	ECN5038EAK-W10/G8 ECN5038EAL-W10/G13 ECN5038EAN-W10/G18	AN16KN0AB
4YD	50 60	200A 225A	ECN5041EAP-W10/G23 ECN5041EAQ-W10/G28	ECN5042EAP-W10/G23 ECN5042EAQ-W10/G28	ECN5044EAP-W10/G23 ECN5044EAQ-W10/G28	ECN5048EAP-W10/G23 ECN5048EAQ-W10/G28	AN16NN0AB
5YD	75 100 125 150	300A 350A 450A 500A	ECN5051EAS-W10/G33 ECN5051EAV-W10/G38 ECN5051EAX-W10/G43 ECN5051EAY-W10/G48	ECN5052EAS-W10/G33 ECN5052EAV-W10/G38 ECN5052EAX-W10/G43 ECN5052EAY-W10/G48	ECN5054EAS-W10/G33 ECN5054EAV-W10/G38 ECN5054EAX-W10/G43 ECN5054EAY-W10/G48	ECN5058EAS-W10/G33 ECN5058EAV-W10/G38 ECN5058EAX-W10/G43 ECN5058EAY-W10/G48	AN16SN0AB
6YD	200 250 300	800A 1000A 1200A	ECN5061EA2-W10/G53 ECN5061EA3-W10/G58 ECN5061EA4-W10/G63	ECN5062EA2-W10/G53 ECN5062EA3-W10/G58 ECN5062EA4-W10/G63	ECN5063EA2-W10/G53 ④ ECN5063EA3-W10/G58 ④ ECN5063EA4-W10/G63 ④	ECN5068EA2-W10/G33 ECN5068EA3-W10/G58 ECN5068EA4-W10/G63	AN16TN0AB
7YD	350 400 450 500	⑤	ECN5071EAU-W10/G68 ECN5071EAU-W10/G73 ECN5071EAU-W10/G78 ECN5071EAU-W10/G83	ECN5072EAU-W10/G68 ECN5072EAU-W10/G73 ECN5072EAU-W10/G78 ECN5072EAU-W10/G83	ECN5073EAU-W10/G68 ④ ECN5073EAU-W10/G73 ④ ECN5073EAU-W10/G78 ④ ECN5073EAU-W10/G83 ④	ECN5078EAU-W10/G68 ECN5078EAU-W10/G73 ECN5078EAU-W10/G78 ECN5078EAU-W10/G83	AN16UN0AB
8YD	600 700 750	⑤	ECN5081EAU-W10/G88 ECN5081EAU-W10/G93 ECN5081EAU-W10/G98	ECN5082EAU-W10/G88 ECN5082EAU-W10/G93 ECN5082EAU-W10/G98	ECN5083EAU-W10/G88 ④ ECN5083EAU-W10/G93 ④ ECN5083EAU-W10/G98 ④	ECN5088EAU-W10/G88 ECN5088EAU-W10/G93 ECN5088EAU-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①							
2YD	15 20 25	60A 70A 90A	ECN5021BAG-W10/G2 ECN5021BAH-W10/G4 ECN5021BAJ-W10/G9	ECN5022BAG-W10/G2 ECN5022BAH-W10/G4 ECN5022BAJ-W10/G9	ECN5024BAG-W10/G2 ECN5024BAH-W10/G4 ECN5024BAJ-W10/G9	ECN5028BAG-W10/G2 ECN5028BAH-W10/G4 ECN5028BAJ-W10/G9	AN16GN0AB
3YD	30 40 50	125A 150A 175A	ECN5031BAL-W10/G14 ECN5031BAM-W10/G19 ECN5031BAN-W10/G24	ECN5032BAL-W10/G14 ECN5032BAM-W10/G19 ECN5032BAN-W10/G24	ECN5034BAL-W10/G14 ECN5034BAM-W10/G19 ECN5034BAN-W10/G24	ECN5038BAL-W10/G14 ECN5038BAM-W10/G19 ECN5038BAN-W10/G24	AN16KN0AB
4YD	60 75	200A 250A	ECN5041BAP-W10/G29 ECN5041BAR-W10/G34	ECN5042BAP-W10/G29 ECN5042BAR-W10/G34	ECN5044BAP-W10/G29 ECN5044BAR-W10/G34	ECN5048BAP-W10/G29 ECN5048BAR-W10/G34	AN16NN0AB
5YD	100 125 150	350A 400A 500A	ECN5051BAV-W10/G39 ECN5051BAW-W10/G44 ECN5051BAY-W10/G49	ECN5052BAV-W10/G39 ECN5052BAW-W10/G44 ECN5052BAY-W10/G49	ECN5054BAV-W10/G39 ECN5054BAW-W10/G44 ECN5054BAY-W10/G49	ECN5058BAV-W10/G39 ECN5058BAW-W10/G44 ECN5058BAY-W10/G49	AN16SN0AB
6YD	200 250 300 350	600A 800A 1000A 1200A	ECN5061BAZ-W10/G54 ECN5061BA2-W10/G59 ECN5061BA3-W10/G64 ECN5061BA4-W10/G69	ECN5062BAZ-W10/G54 ECN5062BA2-W10/G59 ECN5062BA3-W10/G64 ECN5062BA4-W10/G69	ECN5063BAZ-W10/G54 ④ ECN5063BA2-W10/G59 ④ ECN5063BA3-W10/G64 ④ ECN5063BA4-W10/G69 ④	ECN5068BAZ-W10/G54 ECN5068BA2-W10/G59 ECN5068BA3-W10/G64 ECN5068BA4-W10/G69	AN16TN0AB
7YD	400 450 500	⑤	ECN5071BAU-W10/G74 ECN5071BAU-W10/G79 ECN5071BAU-W10/G84	ECN5072BAU-W10/G74 ECN5072BAU-W10/G79 ECN5072BAU-W10/G84	ECN5073BAU-W10/G74 ④ ECN5073BAU-W10/G79 ④ ECN5073BAU-W10/G84 ④	ECN5078BAU-W10/G74 ECN5078BAU-W10/G79 ECN5078BAU-W10/G84	AN16UN0AB
8YD	600 700 750 800	⑤	ECN5081BAU-W10/G89 ECN5081BAU-W10/G94 ECN5081BAU-W10/G99 ECN5081BAU-W10/G103	ECN5082BAU-W10/G89 ECN5082BAU-W10/G94 ECN5082BAU-W10/G99 ECN5082BAU-W10/G103	ECN5083BAU-W10/G89 ④ ECN5083BAU-W10/G94 ④ ECN5083BAU-W10/G99 ④ ECN5083BAU-W10/G103 ④	ECN5088BAU-W10/G89 ECN5088BAU-W10/G94 ECN5088BAU-W10/G99 ECN5088BAU-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5024EAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-29. Class ECN50 — Combination Open Transition Wye Delta Starter — Circuit Breaker (Continued)

NEMA Size	Max. hp Rating	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①							
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 ④	ECN5068CAZ-W10/G71	AN16TN0AB
	400	600A	ECN5061CAZ-W10/G76	ECN5062CAZ-W10/G76	ECN5063CAZ-W10/G76 ④	ECN5068CAZ-W10/G76	
	450	700A	ECN5061CA1-W10/G81	ECN5062CA1-W10/G81	ECN5063CA1-W10/G81 ④	ECN5068CA1-W10/G81	
	500	800A	ECN5061CA2-W10/G86	ECN5062CA2-W10/G86	ECN5063CA2-W10/G86 ④	ECN5068CA2-W10/G86	
	600	1000A	ECN5061CA3-W10/G91	ECN5062CA3-W10/G91	ECN5063CA3-W10/G91 ④	ECN5068CA3-W10/G91	
	700	1200A	ECN5061CA4-W10/G96	ECN5062CA4-W10/G96	ECN5063CA4-W10/G96 ④	ECN5068CA4-W10/G96	
7YD	750	⑤	ECN5071CAU-W10/G101	ECN5072CAU-W10/G101	ECN5073CAU-W10/G101 ④	ECN5078CAU-W10/G101	AN16UN0AB
	800		ECN5071CAU-W10/G105	ECN5072CAU-W10/G105	ECN5073CAU-W10/G105 ④	ECN5078CAU-W10/G105	
	900		ECN5071CAU-W10/G108	ECN5072CAU-W10/G108	ECN5073CAU-W10/G108 ④	ECN5078CAU-W10/G108	
	1000		ECN5071CAU-W10/G111	ECN5072CAU-W10/G111	ECN5073CAU-W10/G111 ④	ECN5078CAU-W10/G111	
8YD	1250	⑤	ECN5081CAU-W10/G114	ECN5082CAU-W10/G114	ECN5083CAU-W10/G114 ④	ECN5088CAU-W10/G114	AN16VN0AB
	1500		ECN5081CAU-W10/G117	ECN5082CAU-W10/G117	ECN5083CAU-W10/G117 ④	ECN5088CAU-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①							
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	350A	ECN5051DAV-W10/G67	ECN5052DAV-W10/G67	ECN5054DAV-W10/G67	ECN5058DAV-W10/G67	
6YD	350	500A	ECN5061DAY-W10/G72	ECN5062DAY-W10/G72	ECN5063DAY-W10/G72 ④	ECN5068DAY-W10/G72	AN16TN0AB
	400	500A	ECN5061DAY-W10/G77	ECN5062DAY-W10/G77	ECN5063DAY-W10/G77 ④	ECN5068DAY-W10/G77	
	450	600A	ECN5061DAZ-W10/G82	ECN5062DAZ-W10/G82	ECN5063DAZ-W10/G82 ④	ECN5068DAZ-W10/G82	
	500	600A	ECN5061DAZ-W10/G87	ECN5062DAZ-W10/G87	ECN5063DAZ-W10/G87 ④	ECN5068DAZ-W10/G87	
	600	800A	ECN5061DA2-W10/G92	ECN5062DA2-W10/G92	ECN5063DA2-W10/G92 ④	ECN5068DA2-W10/G92	
	700	1000A	ECN5061DA3-W10/G97	ECN5062DA3-W10/G97	ECN5063DA3-W10/G97 ④	ECN5068DA3-W10/G97	
7YD	750	⑤	ECN5071DAU-W10/G102	ECN5072DAU-W10/G102	ECN5073DAU-W10/G102 ④	ECN5078DAU-W10/G102	AN16UN0AB
	800		ECN5071DAU-W10/G106	ECN5072DAU-W10/G106	ECN5073DAU-W10/G106 ④	ECN5078DAU-W10/G106	
	900		ECN5071DAU-W10/G109	ECN5072DAU-W10/G109	ECN5073DAU-W10/G109 ④	ECN5078DAU-W10/G109	
	1000		ECN5071DAU-W10/G112	ECN5072DAU-W10/G112	ECN5073DAU-W10/G112 ④	ECN5078DAU-W10/G112	
8YD	1250	⑤	ECN5081DAU-W10/G115	ECN5082DAU-W10/G115	ECN5083DAU-W10/G115 ④	ECN5088DAU-W10/G115	AN16VN0AB
	1500		ECN5081DAU-W10/G118	ECN5082DAU-W10/G118	ECN5083DAU-W10/G118 ④	ECN5088DAU-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5024CAE. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires matching contactor with mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-30. Class ECN51 — Non-combination Closed Transition Wye Delta Starter

NEMA Size	Max. hp Rating	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②	Component Starter (Open) ⑤
		Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①						
2YD	15 20	ECN5121EAA-W10/G1 ECN5121EAA-W10/G3	ECN5122EAA-W10/G1 ECN5122EAA-W10/G3	ECN5124EAA-W10/G1 ECN5124EAA-W10/G3	ECN5128EAA-W10/G1 ECN5128EAA-W10/G3	AN16GN0AB
3YD	25 30 40	ECN5131EAA-W10/G8 ECN5131EAA-W10/G13 ECN5131EAA-W10/G18	ECN5132EAA-W10/G8 ECN5132EAA-W10/G13 ECN5132EAA-W10/G18	ECN5134EAA-W10/G8 ECN5134EAA-W10/G13 ECN5134EAA-W10/G18	ECN5138EAA-W10/G8 ECN5138EAA-W10/G13 ECN5138EAA-W10/G18	AN16KN0AB
4YD	50 60	ECN5141EAA-W10/G23 ECN5141EAA-W10/G28	ECN5142EAA-W10/G23 ECN5142EAA-W10/G28	ECN5144EAA-W10/G23 ECN5144EAA-W10/G28	ECN5148EAA-W10/G23 ECN5148EAA-W10/G28	AN16NN0AB
5YD	75 100 125 150	ECN5151EAA-W10/G33 ECN5151EAA-W10/G38 ECN5151EAA-W10/G43 ECN5151EAA-W10/G48	ECN5152EAA-W10/G33 ECN5152EAA-W10/G38 ECN5152EAA-W10/G43 ECN5152EAA-W10/G48	ECN5154EAA-W10/G33 ECN5154EAA-W10/G38 ECN5154EAA-W10/G43 ECN5154EAA-W10/G48	ECN5158EAA-W10/G33 ECN5158EAA-W10/G38 ECN5158EAA-W10/G43 ECN5158EAA-W10/G48	AN16SN0AB
6YD	200 250 300	ECN5161EAA-W10/G53 ECN5161EAA-W10/G58 ECN5161EAA-W10/G63	ECN5162EAA-W10/G53 ECN5162EAA-W10/G58 ECN5162EAA-W10/G63	ECN5163EAA-W10/G53 ③ ECN5163EAA-W10/G58 ③ ECN5163EAA-W10/G63 ③	ECN5168EAA-W10/G33 ECN5168EAA-W10/G58 ECN5168EAA-W10/G63	AN16TN0AB
7YD	350 400 450 500	ECN5171EAA-W10/G68 ECN5171EAA-W10/G73 ECN5171EAA-W10/G78 ECN5171EAA-W10/G83	ECN5172EAA-W10/G68 ECN5172EAA-W10/G73 ECN5172EAA-W10/G78 ECN5172EAA-W10/G83	ECN5173EAA-W10/G68 ③ ECN5173EAA-W10/G73 ③ ECN5173EAA-W10/G78 ③ ECN5173EAA-W10/G83 ③	ECN5178EAA-W10/G68 ECN5178EAA-W10/G73 ECN5178EAA-W10/G78 ECN5178EAA-W10/G83	AN16UN0AB
8YD	600 700 750	ECN5181EAA-W10/G88 ECN5181EAA-W10/G93 ECN5181EAA-W10/G98	ECN5182EAA-W10/G88 ECN5182EAA-W10/G93 ECN5182EAA-W10/G98	ECN5183EAA-W10/G88 ③ ECN5183EAA-W10/G93 ③ ECN5183EAA-W10/G98 ③	ECN5188EAA-W10/G88 ECN5188EAA-W10/G93 ECN5188EAA-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①						
2YD	15 20 25	ECN5121BAA-W10/G2 ECN5121BAA-W10/G4 ECN5121BAA-W10/G9	ECN5122BAA-W10/G2 ECN5122BAA-W10/G4 ECN5122BAA-W10/G9	ECN5124BAA-W10/G2 ECN5124BAA-W10/G4 ECN5124BAA-W10/G9	ECN5128BAA-W10/G2 ECN5128BAA-W10/G4 ECN5128BAA-W10/G9	AN16GN0AB
3YD	30 40 50	ECN5131BAA-W10/G14 ECN5131BAA-W10/G19 ECN5131BAA-W10/G24	ECN5132BAA-W10/G14 ECN5132BAA-W10/G19 ECN5132BAA-W10/G24	ECN5134BAA-W10/G14 ECN5134BAA-W10/G19 ECN5134BAA-W10/G24	ECN5138BAA-W10/G14 ECN5138BAA-W10/G19 ECN5138BAA-W10/G24	AN16KN0AB
4YD	60 75	ECN5141BAA-W10/G29 ECN5141BAA-W10/G34	ECN5142BAA-W10/G29 ECN5142BAA-W10/G34	ECN5144BAA-W10/G29 ECN5144BAA-W10/G34	ECN5148BAA-W10/G29 ECN5148BAA-W10/G34	AN16NN0AB
5YD	100 125 150	ECN5151BAA-W10/G39 ECN5151BAA-W10/G44 ECN5151BAA-W10/G49	ECN5152BAA-W10/G39 ECN5152BAA-W10/G44 ECN5152BAA-W10/G49	ECN5154BAA-W10/G39 ECN5154BAA-W10/G44 ECN5154BAA-W10/G49	ECN5158BAA-W10/G39 ECN5158BAA-W10/G44 ECN5158BAA-W10/G49	AN16SN0AB
6YD	200 250 300 350	ECN5161BAA-W10/G54 ECN5161BAA-W10/G59 ECN5161BAA-W10/G64 ECN5161BAA-W10/G69	ECN5162BAA-W10/G54 ECN5162BAA-W10/G59 ECN5162BAA-W10/G64 ECN5162BAA-W10/G69	ECN5163BAA-W10/G54 ③ ECN5163BAA-W10/G59 ③ ECN5163BAA-W10/G64 ③ ECN5163BAA-W10/G69 ③	ECN5168BAA-W10/G54 ECN5168BAA-W10/G59 ECN5168BAA-W10/G64 ECN5168BAA-W10/G69	AN16TN0AB
7YD	400 450 500	ECN5171BAA-W10/G74 ECN5171BAA-W10/G79 ECN5171BAA-W10/G84	ECN5172BAA-W10/G74 ECN5172BAA-W10/G79 ECN5172BAA-W10/G84	ECN5173BAA-W10/G74 ③ ECN5173BAA-W10/G79 ③ ECN5173BAA-W10/G84 ③	ECN5178BAA-W10/G74 ECN5178BAA-W10/G79 ECN5178BAA-W10/G84	AN16UN0AB
8YD	600 700 750 800	ECN5181BAA-W10/G89 ECN5181BAA-W10/G94 ECN5181BAA-W10/G99 ECN5181BAA-W10/G103	ECN5182BAA-W10/G89 ECN5182BAA-W10/G94 ECN5182BAA-W10/G99 ECN5182BAA-W10/G103	ECN5183BAA-W10/G89 ③ ECN5183BAA-W10/G94 ③ ECN5183BAA-W10/G99 ③ ECN5183BAA-W10/G103 ③	ECN5188BAA-W10/G89 ECN5188BAA-W10/G94 ECN5188BAA-W10/G99 ECN5188BAA-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.						

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 4 (Painted Steel) Sizes 6 – 8YD.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5124EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-30. Class ECN51 — Non-combination Closed Transition Wye Delta Starter (Continued)

NEMA Size	Max. hp Rating	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②	Component Starter (Open) ⑤
		Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①						
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 ③	ECN5168CAA-W10/G71	AN16TN0AB
	400	ECN5161CAA-W10/G76	ECN5162CAA-W10/G76	ECN5163CAA-W10/G76 ③	ECN5168CAA-W10/G76	
	450	ECN5161CAA-W10/G81	ECN5162CAA-W10/G81	ECN5163CAA-W10/G81 ③	ECN5168CAA-W10/G81	
	500	ECN5161CAA-W10/G86	ECN5162CAA-W10/G86	ECN5163CAA-W10/G86 ③	ECN5168CAA-W10/G86	
	600	ECN5161CAA-W10/G91	ECN5162CAA-W10/G91	ECN5163CAA-W10/G91 ③	ECN5168CAA-W10/G91	
	700	ECN5161CAA-W10/G96	ECN5162CAA-W10/G96	ECN5163CAA-W10/G96 ③	ECN5168CAA-W10/G96	
7YD	750	ECN5171CAA-W10/G101	ECN5172CAA-W10/G101	ECN5173CAA-W10/G101 ③	ECN5178CAA-W10/G101	AN16UN0AB
	800	ECN5171CAA-W10/G105	ECN5172CAA-W10/G105	ECN5173CAA-W10/G105 ③	ECN5178CAA-W10/G105	
	900	ECN5171CAA-W10/G108	ECN5172CAA-W10/G108	ECN5173CAA-W10/G108 ③	ECN5178CAA-W10/G108	
	1000	ECN5171CAA-W10/G111	ECN5172CAA-W10/G111	ECN5173CAA-W10/G111 ③	ECN5178CAA-W10/G111	
8YD	1250	ECN5181CAA-W10/G114	ECN5182CAA-W10/G114	ECN5183CAA-W10/G114 ③	ECN5188CAA-W10/G114	AN16VN0AB
	1500	ECN5181CAA-W10/G117	ECN5182CAA-W10/G117	ECN5183CAA-W10/G117 ③	ECN5188CAA-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①						
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 ③	ECN5168DAA-W10/G72	AN16TN0AB
	400	ECN5161DAA-W10/G77	ECN5162DAA-W10/G77	ECN5163DAA-W10/G77 ③	ECN5168DAA-W10/G77	
	450	ECN5161DAA-W10/G82	ECN5162DAA-W10/G82	ECN5163DAA-W10/G82 ③	ECN5168DAA-W10/G82	
	500	ECN5161DAA-W10/G87	ECN5162DAA-W10/G87	ECN5163DAA-W10/G87 ③	ECN5168DAA-W10/G87	
	600	ECN5161DAA-W10/G92	ECN5162DAA-W10/G92	ECN5163DAA-W10/G92 ③	ECN5168DAA-W10/G92	
	700	ECN5161DAA-W10/G97	ECN5162DAA-W10/G97	ECN5163DAA-W10/G97 ③	ECN5168DAA-W10/G97	
7YD	750	ECN5171DAA-W10/G102	ECN5172DAA-W10/G102	ECN5173DAA-W10/G102 ③	ECN5178DAA-W10/G102	AN16UN0AB
	800	ECN5171DAA-W10/G106	ECN5172DAA-W10/G106	ECN5173DAA-W10/G106 ③	ECN5178DAA-W10/G106	
	900	ECN5171DAA-W10/G109	ECN5172DAA-W10/G109	ECN5173DAA-W10/G109 ③	ECN5178DAA-W10/G109	
	1000	ECN5171DAA-W10/G112	ECN5172DAA-W10/G112	ECN5173DAA-W10/G112 ③	ECN5178DAA-W10/G112	
8YD	1250	ECN5181DAA-W10/G115	ECN5182DAA-W10/G115	ECN5183DAA-W10/G115 ③	ECN5188DAA-W10/G115	AN16VN0AB
	1500	ECN5181DAA-W10/G118	ECN5182DAA-W10/G118	ECN5183DAA-W10/G118 ③	ECN5188DAA-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 4 (Painted Steel) Sizes 6 – 8YD.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5124CAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-31. Class ECN52 — Combination Closed Transition Wye Delta Starter — Fusible Disconnect

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①							
2YD	15 20	60A 100A	ECN5221EAD-W10/G1 ECN5221EAF-W10/G3	ECN5222EAD-W10/G1 ECN5222EAF-W10/G3	ECN5224EAD-W10/G1 ECN5224EAF-W10/G3	ECN5228EAD-W10/G1 ECN5228EAF-W10/G3	AN16GN0AB
3YD	25 30 40	100A 200A 200A	ECN5231EAF-W10/G8 ECN5231EAH-W10/G13 ECN5231EAH-W10/G18	ECN5232EAF-W10/G8 ECN5232EAH-W10/G13 ECN5232EAH-W10/G18	ECN5234EAF-W10/G8 ECN5234EAH-W10/G13 ECN5234EAH-W10/G18	ECN5238EAF-W10/G8 ECN5238EAH-W10/G13 ECN5238EAH-W10/G18	AN16KN0AB
4YD	50 60	200A 400A	ECN5241EAH-W10/G23 ECN5241EAK-W10/G28	ECN5242EAH-W10/G23 ECN5242EAK-W10/G28	ECN5244EAH-W10/G23 ECN5244EAK-W10/G28	ECN5248EAH-W10/G23 ECN5248EAK-W10/G28	AN16NN0AB
5YD	75 100 125 150	400A 400A 600A 600A	ECN5251EAK-W10/G33 ECN5251EAK-W10/G38 ECN5251EAM-W10/G43 ECN5251EAM-W10/G48	ECN5252EAK-W10/G33 ECN5252EAK-W10/G38 ECN5252EAM-W10/G43 ECN5252EAM-W10/G48	ECN5254EAK-W10/G33 ECN5254EAK-W10/G38 ECN5254EAM-W10/G43 ECN5254EAM-W10/G48	ECN5258EAK-W10/G33 ECN5258EAK-W10/G38 ECN5258EAM-W10/G43 ECN5258EAM-W10/G48	AN16SN0AB
6YD	200 250 300	⑤	ECN5261EAU-W10/G53 ECN5261EAU-W10/G58 ECN5261EAU-W10/G63	ECN5262EAU-W10/G53 ECN5262EAU-W10/G58 ECN5262EAU-W10/G63	ECN5263EAU-W10/G53 ④ ECN5263EAU-W10/G58 ④ ECN5263EAU-W10/G63 ④	ECN5268EAU-W10/G33 ECN5268EAU-W10/G58 ECN5268EAU-W10/G63	AN16TN0AB
7YD	350 400 450 500	⑤	ECN5271EAU-W10/G68 ECN5271EAU-W10/G73 ECN5271EAU-W10/G78 ECN5271EAU-W10/G83	ECN5272EAU-W10/G68 ECN5272EAU-W10/G73 ECN5272EAU-W10/G78 ECN5272EAU-W10/G83	ECN5273EAU-W10/G68 ④ ECN5273EAU-W10/G73 ④ ECN5273EAU-W10/G78 ④ ECN5273EAU-W10/G83 ④	ECN5278EAU-W10/G68 ECN5278EAU-W10/G73 ECN5278EAU-W10/G78 ECN5278EAU-W10/G83	AN16UN0AB
8YD	600 700 750	⑤	ECN5281EAU-W10/G88 ECN5281EAU-W10/G93 ECN5281EAU-W10/G98	ECN5282EAU-W10/G88 ECN5282EAU-W10/G93 ECN5282EAU-W10/G98	ECN5283EAU-W10/G88 ④ ECN5283EAU-W10/G93 ④ ECN5283EAU-W10/G98 ④	ECN5288EAU-W10/G88 ECN5288EAU-W10/G93 ECN5288EAU-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①							
2YD	15 20 25	60A 100A 100A	ECN5221BAD-W10/G2 ECN5221BAF-W10/G4 ECN5221BAF-W10/G9	ECN5222BAD-W10/G2 ECN5222BAF-W10/G4 ECN5222BAF-W10/G9	ECN5224BAD-W10/G2 ECN5224BAF-W10/G4 ECN5224BAF-W10/G9	ECN5228BAD-W10/G2 ECN5228BAF-W10/G4 ECN5228BAF-W10/G9	AN16GN0AB
3YD	30 40 50	100A 200A 200A	ECN5231BAF-W10/G14 ECN5231BAH-W10/G19 ECN5231BAH-W10/G24	ECN5232BAF-W10/G14 ECN5232BAH-W10/G19 ECN5232BAH-W10/G24	ECN5234BAF-W10/G14 ECN5234BAH-W10/G19 ECN5234BAH-W10/G24	ECN5238BAF-W10/G14 ECN5238BAH-W10/G19 ECN5238BAH-W10/G24	AN16KN0AB
4YD	60 75	200A 400A	ECN5241BAH-W10/G29 ECN5241BAK-W10/G34	ECN5242BAH-W10/G29 ECN5242BAK-W10/G34	ECN5244BAH-W10/G29 ECN5244BAK-W10/G34	ECN5248BAH-W10/G29 ECN5248BAK-W10/G34	AN16NN0AB
5YD	100 125 150	400A 400A 600A	ECN5251BAK-W10/G39 ECN5251BAK-W10/G44 ECN5251BAM-W10/G49	ECN5252BAK-W10/G39 ECN5252BAK-W10/G44 ECN5252BAM-W10/G49	ECN5254BAK-W10/G39 ECN5254BAK-W10/G44 ECN5254BAM-W10/G49	ECN5258BAK-W10/G39 ECN5258BAK-W10/G44 ECN5258BAM-W10/G49	AN16SN0AB
6YD	200 250 300 350	600A ⑤	ECN5261BAM-W10/G54 ECN5261BAU-W10/G59 ECN5261BAU-W10/G64 ECN5261BAU-W10/G69	ECN5262BAM-W10/G54 ECN5262BAU-W10/G59 ECN5262BAU-W10/G64 ECN5262BAU-W10/G69	ECN5263BAM-W10/G54 ④ ECN5263BAU-W10/G59 ④ ECN5263BAU-W10/G64 ④ ECN5263BAU-W10/G69 ④	ECN5268BAM-W10/G54 ECN5268BAU-W10/G59 ECN5268BAU-W10/G64 ECN5268BAU-W10/G69	AN16TN0AB
7YD	400 450 500	⑤	ECN5271BAU-W10/G74 ECN5271BAU-W10/G79 ECN5271BAU-W10/G84	ECN5272BAU-W10/G74 ECN5272BAU-W10/G79 ECN5272BAU-W10/G84	ECN5273BAU-W10/G74 ④ ECN5273BAU-W10/G79 ④ ECN5273BAU-W10/G84 ④	ECN5278BAU-W10/G74 ECN5278BAU-W10/G79 ECN5278BAU-W10/G84	AN16UN0AB
8YD	600 700 750 800	⑤	ECN5281BAU-W10/G89 ECN5281BAU-W10/G94 ECN5281BAU-W10/G99 ECN5281BAU-W10/G103	ECN5282BAU-W10/G89 ECN5282BAU-W10/G94 ECN5282BAU-W10/G99 ECN5282BAU-W10/G103	ECN5283BAU-W10/G89 ④ ECN5283BAU-W10/G94 ④ ECN5283BAU-W10/G99 ④ ECN5283BAU-W10/G103 ④	ECN5288BAU-W10/G89 ECN5288BAU-W10/G94 ECN5288BAU-W10/G99 ECN5288BAU-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5224EAD. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-31. Class ECN52 — Combination Closed Transition Wye Delta Starter — Fusible Disconnect (Continued)

NEMA Size	Max. hp Rating	Fuse Clip Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①							
2YD	20	60A	ECN5221CAE-W10/G6	ECN5222CAE-W10/G6	ECN5224CAE-W10/G6	ECN5228CAE-W10/G6	AN16GN0AB
	25	60A	ECN5221CAE-W10/G11	ECN5222CAE-W10/G11	ECN5224CAE-W10/G11	ECN5228CAE-W10/G11	
	30	60A	ECN5221CAE-W10/G16	ECN5222CAE-W10/G16	ECN5224CAE-W10/G16	ECN5228CAE-W10/G16	
	40	60A	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	100A	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	200A	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	400A	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 ④	ECN5268CAN-W10/G71	AN16TN0AB
	400	600A	ECN5261CAN-W10/G76	ECN5262CAN-W10/G76	ECN5263CAN-W10/G76 ④	ECN5268CAN-W10/G76	
	450	600A	ECN5261CAN-W10/G81	ECN5262CAN-W10/G81	ECN5263CAN-W10/G81 ④	ECN5268CAN-W10/G81	
	500	800A	ECN5261CAP-W10/G86	ECN5262CAP-W10/G86	ECN5263CAP-W10/G86 ④	ECN5268CAP-W10/G86	
	600	1200A	ECN5261CAQ-W10/G91	ECN5262CAQ-W10/G91	ECN5263CAQ-W10/G91 ④	ECN5268CAQ-W10/G91	
	700	1200A	ECN5261CAQ-W10/G96	ECN5262CAQ-W10/G96	ECN5263CAQ-W10/G96 ④	ECN5268CAQ-W10/G96	
7YD	750	1200A	ECN5271CAQ-W10/G101	ECN5272CAQ-W10/G101	ECN5273CAQ-W10/G101 ④	ECN5278CAQ-W10/G101	AN16UN0AB
	800	⑤	ECN5271CAU-W10/G105	ECN5272CAU-W10/G105	ECN5273CAU-W10/G105 ④	ECN5278CAU-W10/G105	
	900		ECN5271CAU-W10/G108	ECN5272CAU-W10/G108	ECN5273CAU-W10/G108 ④	ECN5278CAU-W10/G108	
	1000		ECN5271CAU-W10/G111	ECN5272CAU-W10/G111	ECN5273CAU-W10/G111 ④	ECN5278CAU-W10/G111	
8YD	1250	⑤	ECN5281CAU-W10/G114	ECN5282CAU-W10/G114	ECN5283CAU-W10/G114 ④	ECN5288CAU-W10/G114	AN16VN0AB
	1500		ECN5281CAU-W10/G117	ECN5282CAU-W10/G117	ECN5283CAU-W10/G117 ④	ECN5288CAU-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①							
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	60A	ECN5221DAE-W10/G17	ECN5222DAE-W10/G17	ECN5224DAE-W10/G17	ECN5228DAE-W10/G17	
	40	60A	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	100A	ECN5231DAG-W10/G32	ECN5232DAG-W10/G32	ECN5234DAG-W10/G32	ECN5238DAG-W10/G32	
	75	100A	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	200A	ECN5241DAJ-W10/G47	ECN5242DAJ-W10/G47	ECN5244DAJ-W10/G47	ECN5248DAJ-W10/G47	
	150	200A	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	400A	ECN5251DAL-W10/G62	ECN5252DAL-W10/G62	ECN5254DAL-W10/G62	ECN5258DAL-W10/G62	
	300	400A	ECN5251DAL-W10/G67	ECN5252DAL-W10/G67	ECN5254DAL-W10/G67	ECN5258DAL-W10/G67	
6YD	350	400A	ECN5261DAL-W10/G72	ECN5262DAL-W10/G72	ECN5263DAL-W10/G72 ④	ECN5268DAL-W10/G72	AN16TN0AB
	400	600A	ECN5261DAN-W10/G77	ECN5262DAN-W10/G77	ECN5263DAN-W10/G77 ④	ECN5268DAN-W10/G77	
	450	600A	ECN5261DAN-W10/G82	ECN5262DAN-W10/G82	ECN5263DAN-W10/G82 ④	ECN5268DAN-W10/G82	
	500	600A	ECN5261DAN-W10/G87	ECN5262DAN-W10/G87	ECN5263DAN-W10/G87 ④	ECN5268DAN-W10/G87	
	600	800A	ECN5261DAP-W10/G92	ECN5262DAP-W10/G92	ECN5263DAP-W10/G92 ④	ECN5268DAP-W10/G92	
	700	800A	ECN5261DAP-W10/G97	ECN5262DAP-W10/G97	ECN5263DAP-W10/G97 ④	ECN5268DAP-W10/G97	
7YD	750	⑤	ECN5271DAU-W10/G102	ECN5272DAU-W10/G102	ECN5273DAU-W10/G102 ④	ECN5278DAU-W10/G102	AN16UN0AB
	800		ECN5271DAU-W10/G106	ECN5272DAU-W10/G106	ECN5273DAU-W10/G106 ④	ECN5278DAU-W10/G106	
	900		ECN5271DAU-W10/G109	ECN5272DAU-W10/G109	ECN5273DAU-W10/G109 ④	ECN5278DAU-W10/G109	
	1000		ECN5271DAU-W10/G112	ECN5272DAU-W10/G112	ECN5273DAU-W10/G112 ④	ECN5278DAU-W10/G112	
8YD	1250	⑤	ECN5281DAU-W10/G115	ECN5282DAU-W10/G115	ECN5283DAU-W10/G115 ④	ECN5288DAU-W10/G115	AN16VN0AB
	1500		ECN5281DAU-W10/G118	ECN5282DAU-W10/G118	ECN5283DAU-W10/G118 ④	ECN5288DAU-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN522**4**CAE. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-32. Class ECN52 — Combination Closed Transition Wye Delta Starter — Non-fusible Disconnect

NEMA Size	Max. hp Rating	Dis-connect Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①							
2YD	15 20	60A 100A	ECN5221EAA-W10/G1 ECN5221EAA-W10/G3	ECN5222EAA-W10/G1 ECN5222EAA-W10/G3	ECN5224EAA-W10/G1 ECN5224EAA-W10/G3	ECN5228EAA-W10/G1 ECN5228EAA-W10/G3	AN16GN0AB
3YD	25 30 40	100A 200A 200A	ECN5231EAA-W10/G8 ECN5231EAA-W10/G13 ECN5231EAA-W10/G18	ECN5232EAA-W10/G8 ECN5232EAA-W10/G13 ECN5232EAA-W10/G18	ECN5234EAA-W10/G8 ECN5234EAA-W10/G13 ECN5234EAA-W10/G18	ECN5238EAA-W10/G8 ECN5238EAA-W10/G13 ECN5238EAA-W10/G18	AN16KN0AB
4YD	50 60	200A 400A	ECN5241EAA-W10/G23 ECN5241EAA-W10/G28	ECN5242EAA-W10/G23 ECN5242EAA-W10/G28	ECN5244EAA-W10/G23 ECN5244EAA-W10/G28	ECN5248EAA-W10/G23 ECN5248EAA-W10/G28	AN16NN0AB
5YD	75 100 125 150	400A 400A 600A 600A	ECN5251EAA-W10/G33 ECN5251EAA-W10/G38 ECN5251EAA-W10/G43 ECN5251EAA-W10/G48	ECN5252EAA-W10/G33 ECN5252EAA-W10/G38 ECN5252EAA-W10/G43 ECN5252EAA-W10/G48	ECN5254EAA-W10/G33 ECN5254EAA-W10/G38 ECN5254EAA-W10/G43 ECN5254EAA-W10/G48	ECN5258EAA-W10/G33 ECN5258EAA-W10/G38 ECN5258EAA-W10/G43 ECN5258EAA-W10/G48	AN16SN0AB
6YD	200 250 300	⑤	ECN5261EAA-W10/G53 ECN5261EAA-W10/G58 ECN5261EAA-W10/G63	ECN5262EAA-W10/G53 ECN5262EAA-W10/G58 ECN5262EAA-W10/G63	ECN5263EAA-W10/G53 ④ ECN5263EAA-W10/G58 ④ ECN5263EAA-W10/G63 ④	ECN5268EAA-W10/G33 ECN5268EAA-W10/G58 ECN5268EAA-W10/G63	AN16TN0AB
7YD	350 400 450 500	⑤	ECN5271EAA-W10/G68 ECN5271EAA-W10/G73 ECN5271EAA-W10/G78 ECN5271EAA-W10/G83	ECN5272EAA-W10/G68 ECN5272EAA-W10/G73 ECN5272EAA-W10/G78 ECN5272EAA-W10/G83	ECN5273EAA-W10/G68 ④ ECN5273EAA-W10/G73 ④ ECN5273EAA-W10/G78 ④ ECN5273EAA-W10/G83 ④	ECN5278EAA-W10/G68 ECN5278EAA-W10/G73 ECN5278EAA-W10/G78 ECN5278EAA-W10/G83	AN16UN0AB
8YD	600 700 750	⑤	ECN5281EAA-W10/G88 ECN5281EAA-W10/G93 ECN5281EAA-W10/G98	ECN5282EAA-W10/G88 ECN5282EAA-W10/G93 ECN5282EAA-W10/G98	ECN5283EAA-W10/G88 ④ ECN5283EAA-W10/G93 ④ ECN5283EAA-W10/G98 ④	ECN5288EAA-W10/G88 ECN5288EAA-W10/G93 ECN5288EAA-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①							
2YD	15 20 25	60A 100A 100A	ECN5221BAA-W10/G2 ECN5221BAA-W10/G4 ECN5221BAA-W10/G9	ECN5222BAA-W10/G2 ECN5222BAA-W10/G4 ECN5222BAA-W10/G9	ECN5224BAA-W10/G2 ECN5224BAA-W10/G4 ECN5224BAA-W10/G9	ECN5228BAA-W10/G2 ECN5228BAA-W10/G4 ECN5228BAA-W10/G9	AN16GN0AB
3YD	30 40 50	100A 200A 200A	ECN5231BAA-W10/G14 ECN5231BAA-W10/G19 ECN5231BAA-W10/G24	ECN5232BAA-W10/G14 ECN5232BAA-W10/G19 ECN5232BAA-W10/G24	ECN5234BAA-W10/G14 ECN5234BAA-W10/G19 ECN5234BAA-W10/G24	ECN5238BAA-W10/G14 ECN5238BAA-W10/G19 ECN5238BAA-W10/G24	AN16KN0AB
4YD	60 75	200A 400A	ECN5241BAA-W10/G29 ECN5241BAA-W10/G34	ECN5242BAA-W10/G29 ECN5242BAA-W10/G34	ECN5244BAA-W10/G29 ECN5244BAA-W10/G34	ECN5248BAA-W10/G29 ECN5248BAA-W10/G34	AN16NN0AB
5YD	100 125 150	400A 400A 600A	ECN5251BAA-W10/G39 ECN5251BAA-W10/G44 ECN5251BAA-W10/G49	ECN5252BAA-W10/G39 ECN5252BAA-W10/G44 ECN5252BAA-W10/G49	ECN5254BAA-W10/G39 ECN5254BAA-W10/G44 ECN5254BAA-W10/G49	ECN5258BAA-W10/G39 ECN5258BAA-W10/G44 ECN5258BAA-W10/G49	AN16SN0AB
6YD	200 250 300 350	600A ⑤	ECN5261BAA-W10/G54 ECN5261BAA-W10/G59 ECN5261BAA-W10/G64 ECN5261BAA-W10/G69	ECN5262BAA-W10/G54 ECN5262BAA-W10/G59 ECN5262BAA-W10/G64 ECN5262BAA-W10/G69	ECN5263BAA-W10/G54 ④ ECN5263BAA-W10/G59 ④ ECN5263BAA-W10/G64 ④ ECN5263BAA-W10/G69 ④	ECN5268BAA-W10/G54 ECN5268BAA-W10/G59 ECN5268BAA-W10/G64 ECN5268BAA-W10/G69	AN16TN0AB
7YD	400 450 500	⑤	ECN5271BAA-W10/G74 ECN5271BAA-W10/G79 ECN5271BAA-W10/G84	ECN5272BAA-W10/G74 ECN5272BAA-W10/G79 ECN5272BAA-W10/G84	ECN5273BAA-W10/G74 ④ ECN5273BAA-W10/G79 ④ ECN5273BAA-W10/G84 ④	ECN5278BAA-W10/G74 ECN5278BAA-W10/G79 ECN5278BAA-W10/G84	AN16UN0AB
8YD	600 700 750 800	⑤	ECN5281BAA-W10/G89 ECN5281BAA-W10/G94 ECN5281BAA-W10/G99 ECN5281BAA-W10/G103	ECN5282BAA-W10/G89 ECN5282BAA-W10/G94 ECN5282BAA-W10/G99 ECN5282BAA-W10/G103	ECN5283BAA-W10/G89 ④ ECN5283BAA-W10/G94 ④ ECN5283BAA-W10/G99 ④ ECN5283BAA-W10/G103 ④	ECN5288BAA-W10/G89 ECN5288BAA-W10/G94 ECN5288BAA-W10/G99 ECN5288BAA-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5224EAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-32. Class ECN52 — Combination Closed Transition Wye Delta Starter — Non-fusible Disconnect (Continued)

NEMA Size	Max. hp Rating	Dis-connect Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①							
2YD	20	60A	ECN5221CAA-W10/G6	ECN5222CAA-W10/G6	ECN5224CAA-W10/G6	ECN5228CAA-W10/G6	AN16GN0AB
	25	60A	ECN5221CAA-W10/G11	ECN5222CAA-W10/G11	ECN5224CAA-W10/G11	ECN5228CAA-W10/G11	
	30	60A	ECN5221CAA-W10/G16	ECN5222CAA-W10/G16	ECN5224CAA-W10/G16	ECN5228CAA-W10/G16	
	40	60A	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	100A	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	200A	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	400A	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 ④	ECN5268CAA-W10/G71	AN16TN0AB
	400	600A	ECN5261CAA-W10/G76	ECN5262CAA-W10/G76	ECN5263CAA-W10/G76 ④	ECN5268CAA-W10/G76	
	450	600A	ECN5261CAA-W10/G81	ECN5262CAA-W10/G81	ECN5263CAA-W10/G81 ④	ECN5268CAA-W10/G81	
	500	800A	ECN5261CAA-W10/G86	ECN5262CAA-W10/G86	ECN5263CAA-W10/G86 ④	ECN5268CAA-W10/G86	
	600	1200A	ECN5261CAA-W10/G91	ECN5262CAA-W10/G91	ECN5263CAA-W10/G91 ④	ECN5268CAA-W10/G91	
	700	1200A	ECN5261CAA-W10/G96	ECN5262CAA-W10/G96	ECN5263CAA-W10/G96 ④	ECN5268CAA-W10/G96	
7YD	750	1200A	ECN5271CAA-W10/G101	ECN5272CAA-W10/G101	ECN5273CAA-W10/G101 ④	ECN5278CAA-W10/G101	AN16UN0AB
	800	⑤	ECN5271CAA-W10/G105	ECN5272CAA-W10/G105	ECN5273CAA-W10/G105 ④	ECN5278CAA-W10/G105	
	900		ECN5271CAA-W10/G108	ECN5272CAA-W10/G108	ECN5273CAA-W10/G108 ④	ECN5278CAA-W10/G108	
	1000		ECN5271CAA-W10/G111	ECN5272CAA-W10/G111	ECN5273CAA-W10/G111 ④	ECN5278CAA-W10/G111	
8YD	1250	⑤	ECN5281CAA-W10/G114	ECN5282CAA-W10/G114	ECN5283CAA-W10/G114 ④	ECN5288CAA-W10/G114	AN16VN0AB
	1500		ECN5281CAA-W10/G117	ECN5282CAA-W10/G117	ECN5283CAA-W10/G117 ④	ECN5288CAA-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①							
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	60A	ECN5221DAA-W10/G17	ECN5222DAA-W10/G17	ECN5224DAA-W10/G17	ECN5228DAA-W10/G17	
	40	60A	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	100A	ECN5231DAA-W10/G32	ECN5232DAA-W10/G32	ECN5234DAA-W10/G32	ECN5238DAA-W10/G32	
	75	100A	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	200A	ECN5241DAA-W10/G47	ECN5242DAA-W10/G47	ECN5244DAA-W10/G47	ECN5248DAA-W10/G47	
	150	200A	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	400A	ECN5251DAA-W10/G62	ECN5252DAA-W10/G62	ECN5254DAA-W10/G62	ECN5258DAA-W10/G62	
	300	400A	ECN5251DAA-W10/G67	ECN5252DAA-W10/G67	ECN5254DAA-W10/G67	ECN5258DAA-W10/G67	
6YD	350	400A	ECN5261DAA-W10/G72	ECN5262DAA-W10/G72	ECN5263DAA-W10/G72 ④	ECN5268DAA-W10/G72	AN16TN0AB
	400	600A	ECN5261DAA-W10/G77	ECN5262DAA-W10/G77	ECN5263DAA-W10/G77 ④	ECN5268DAA-W10/G77	
	450	600A	ECN5261DAA-W10/G82	ECN5262DAA-W10/G82	ECN5263DAA-W10/G82 ④	ECN5268DAA-W10/G82	
	500	600A	ECN5261DAA-W10/G87	ECN5262DAA-W10/G87	ECN5263DAA-W10/G87 ④	ECN5268DAA-W10/G87	
	600	800A	ECN5261DAA-W10/G92	ECN5262DAA-W10/G92	ECN5263DAA-W10/G92 ④	ECN5268DAA-W10/G92	
	700	800A	ECN5261DAA-W10/G97	ECN5262DAA-W10/G97	ECN5263DAA-W10/G97 ④	ECN5268DAA-W10/G97	
7YD	750	⑤	ECN5271DAA-W10/G102	ECN5272DAA-W10/G102	ECN5273DAA-W10/G102 ④	ECN5278DAA-W10/G102	AN16UN0AB
	800		ECN5271DAA-W10/G106	ECN5272DAA-W10/G106	ECN5273DAA-W10/G106 ④	ECN5278DAA-W10/G106	
	900		ECN5271DAA-W10/G109	ECN5272DAA-W10/G109	ECN5273DAA-W10/G109 ④	ECN5278DAA-W10/G109	
	1000		ECN5271DAA-W10/G112	ECN5272DAA-W10/G112	ECN5273DAA-W10/G112 ④	ECN5278DAA-W10/G112	
8YD	1250	⑤	ECN5281DAA-W10/G115	ECN5282DAA-W10/G115	ECN5283DAA-W10/G115 ④	ECN5288DAA-W10/G115	AN16VN0AB
	1500		ECN5281DAA-W10/G118	ECN5282DAA-W10/G118	ECN5283DAA-W10/G118 ④	ECN5288DAA-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN522**4**CAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-33. Class ECN53 — Combination Closed Transition Wye Delta Starter — Circuit Breaker

NEMA Size	Max. hp Rating	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 200/Magnet Coil Voltage 120 ①							
2YD	15 20	70A 90A	ECN5321EAH-W10/G1 ECN5321EAJ-W10/G3	ECN5322EAH-W10/G1 ECN5322EAJ-W10/G3	ECN5324EAH-W10/G1 ECN5324EAJ-W10/G3	ECN5328EAH-W10/G1 ECN5328EAJ-W10/G3	AN16GN0AB
3YD	25 30 40	100A 125A 175A	ECN5331EAK-W10/G8 ECN5331EAL-W10/G13 ECN5331EAN-W10/G18	ECN5332EAK-W10/G8 ECN5332EAL-W10/G13 ECN5332EAN-W10/G18	ECN5334EAK-W10/G8 ECN5334EAL-W10/G13 ECN5334EAN-W10/G18	ECN5338EAK-W10/G8 ECN5338EAL-W10/G13 ECN5338EAN-W10/G18	AN16KN0AB
4YD	50 60	200A 225A	ECN5341EAP-W10/G23 ECN5341EAQ-W10/G28	ECN5342EAP-W10/G23 ECN5342EAQ-W10/G28	ECN5344EAP-W10/G23 ECN5344EAQ-W10/G28	ECN5348EAP-W10/G23 ECN5348EAQ-W10/G28	AN16NN0AB
5YD	75 100 125 150	300A 350A 450A 500A	ECN5351EAS-W10/G33 ECN5351EAV-W10/G38 ECN5351EAX-W10/G43 ECN5351EAY-W10/G48	ECN5352EAS-W10/G33 ECN5352EAV-W10/G38 ECN5352EAX-W10/G43 ECN5352EAY-W10/G48	ECN5354EAS-W10/G33 ECN5354EAV-W10/G38 ECN5354EAX-W10/G43 ECN5354EAY-W10/G48	ECN5358EAS-W10/G33 ECN5358EAV-W10/G38 ECN5358EAX-W10/G43 ECN5358EAY-W10/G48	AN16SN0AB
6YD	200 250 300	800A 1000A 1200A	ECN5361EA2-W10/G53 ECN5361EA3-W10/G58 ECN5361EA4-W10/G63	ECN5362EA2-W10/G53 ECN5362EA3-W10/G58 ECN5362EA4-W10/G63	ECN5363EA2-W10/G53 ④ ECN5363EA3-W10/G58 ④ ECN5363EA4-W10/G63 ④	ECN5368EA2-W10/G33 ECN5368EA3-W10/G58 ECN5368EA4-W10/G63	AN16TN0AB
7YD	350 400 450 500	⑤	ECN5371EAU-W10/G68 ECN5371EAU-W10/G73 ECN5371EAU-W10/G78 ECN5371EAU-W10/G83	ECN5372EAU-W10/G68 ECN5372EAU-W10/G73 ECN5372EAU-W10/G78 ECN5372EAU-W10/G83	ECN5373EAU-W10/G68 ④ ECN5373EAU-W10/G73 ④ ECN5373EAU-W10/G78 ④ ECN5373EAU-W10/G83 ④	ECN5378EAU-W10/G68 ECN5378EAU-W10/G73 ECN5378EAU-W10/G78 ECN5378EAU-W10/G83	AN16UN0AB
8YD	600 700 750	⑤	ECN5381EAU-W10/G88 ECN5381EAU-W10/G93 ECN5381EAU-W10/G98	ECN5382EAU-W10/G88 ECN5382EAU-W10/G93 ECN5382EAU-W10/G98	ECN5383EAU-W10/G88 ④ ECN5383EAU-W10/G93 ④ ECN5383EAU-W10/G98 ④	ECN5388EAU-W10/G88 ECN5388EAU-W10/G93 ECN5388EAU-W10/G98	AN16VN0AB
Motor Volts 230/Magnet Coil Voltage 120 ①							
2YD	15 20 25	60A 70A 90A	ECN5321BAG-W10/G2 ECN5321BAH-W10/G4 ECN5321BAJ-W10/G9	ECN5322BAG-W10/G2 ECN5322BAH-W10/G4 ECN5322BAJ-W10/G9	ECN5324BAG-W10/G2 ECN5324BAH-W10/G4 ECN5324BAJ-W10/G9	ECN5328BAG-W10/G2 ECN5328BAH-W10/G4 ECN5328BAJ-W10/G9	AN16GN0AB
3YD	30 40 50	125A 150A 175A	ECN5331BAL-W10/G14 ECN5331BAM-W10/G19 ECN5331BAN-W10/G24	ECN5332BAL-W10/G14 ECN5332BAM-W10/G19 ECN5332BAN-W10/G24	ECN5334BAL-W10/G14 ECN5334BAM-W10/G19 ECN5334BAN-W10/G24	ECN5338BAL-W10/G14 ECN5338BAM-W10/G19 ECN5338BAN-W10/G24	AN16KN0AB
4YD	60 75	200A 250A	ECN5341BAP-W10/G29 ECN5341BAR-W10/G34	ECN5342BAP-W10/G29 ECN5342BAR-W10/G34	ECN5344BAP-W10/G29 ECN5344BAR-W10/G34	ECN5348BAP-W10/G29 ECN5348BAR-W10/G34	AN16NN0AB
5YD	100 125 150	350A 400A 500A	ECN5351BAV-W10/G39 ECN5351BAW-W10/G44 ECN5351BAY-W10/G49	ECN5352BAV-W10/G39 ECN5352BAW-W10/G44 ECN5352BAY-W10/G49	ECN5354BAV-W10/G39 ECN5354BAW-W10/G44 ECN5354BAY-W10/G49	ECN5358BAV-W10/G39 ECN5358BAW-W10/G44 ECN5358BAY-W10/G49	AN16SN0AB
6YD	200 250 300 350	600A 800A 1000A 1200A	ECN5361BAZ-W10/G54 ECN5361BA2-W10/G59 ECN5361BA3-W10/G64 ECN5361BA4-W10/G69	ECN5362BAZ-W10/G54 ECN5362BA2-W10/G59 ECN5362BA3-W10/G64 ECN5362BA4-W10/G69	ECN5363BAZ-W10/G54 ④ ECN5363BA2-W10/G59 ④ ECN5363BA3-W10/G64 ④ ECN5363BA4-W10/G69 ④	ECN5368BAZ-W10/G54 ECN5368BA2-W10/G59 ECN5368BA3-W10/G64 ECN5368BA4-W10/G69	AN16TN0AB
7YD	400 450 500	⑤	ECN5371BAU-W10/G74 ECN5371BAU-W10/G79 ECN5371BAU-W10/G84	ECN5372BAU-W10/G74 ECN5372BAU-W10/G79 ECN5372BAU-W10/G84	ECN5373BAU-W10/G74 ④ ECN5373BAU-W10/G79 ④ ECN5373BAU-W10/G84 ④	ECN5378BAU-W10/G74 ECN5378BAU-W10/G79 ECN5378BAU-W10/G84	AN16UN0AB
8YD	600 700 750 800	⑤	ECN5381BAU-W10/G89 ECN5381BAU-W10/G94 ECN5381BAU-W10/G99 ECN5381BAU-W10/G103	ECN5382BAU-W10/G89 ECN5382BAU-W10/G94 ECN5382BAU-W10/G99 ECN5382BAU-W10/G103	ECN5383BAU-W10/G89 ④ ECN5383BAU-W10/G94 ④ ECN5383BAU-W10/G99 ④ ECN5383BAU-W10/G103 ④	ECN5388BAU-W10/G89 ECN5388BAU-W10/G94 ECN5388BAU-W10/G99 ECN5388BAU-W10/G103	AN16VN0AB
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.							

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5324EAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 6-33. Class ECN53 — Combination Closed Transition Wye Delta Starter — Circuit Breaker (Continued)

NEMA Size	Max. hp Rating	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Water & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Motor Volts 460/Magnet Coil Voltage 120 ①							
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 ④	ECN5368CAZ-W10/G71	AN16TN0AB
	400	600A	ECN5361CAZ-W10/G76	ECN5362CAZ-W10/G76	ECN5363CAZ-W10/G76 ④	ECN5368CAZ-W10/G76	
	450	700A	ECN5361CA1-W10/G81	ECN5362CA1-W10/G81	ECN5363CA1-W10/G81 ④	ECN5368CA1-W10/G81	
	500	800A	ECN5361CA2-W10/G86	ECN5362CA2-W10/G86	ECN5363CA2-W10/G86 ④	ECN5368CA2-W10/G86	
	600	1000A	ECN5361CA3-W10/G91	ECN5362CA3-W10/G91	ECN5363CA3-W10/G91 ④	ECN5368CA3-W10/G91	
	700	1200A	ECN5361CA4-W10/G96	ECN5362CA4-W10/G96	ECN5363CA4-W10/G96 ④	ECN5368CA4-W10/G96	
7YD	750	④	ECN5371CAU-W10/G101	ECN5372CAU-W10/G101	ECN5373CAU-W10/G101 ④	ECN5378CAU-W10/G101	AN16UN0AB
	800		ECN5371CAU-W10/G105	ECN5372CAU-W10/G105	ECN5373CAU-W10/G105 ④	ECN5378CAU-W10/G105	
	900		ECN5371CAU-W10/G108	ECN5372CAU-W10/G108	ECN5373CAU-W10/G108 ④	ECN5378CAU-W10/G108	
	1000		ECN5371CAU-W10/G111	ECN5372CAU-W10/G111	ECN5373CAU-W10/G111 ④	ECN5378CAU-W10/G111	
8YD	1250	④	ECN5381CAU-W10/G114	ECN5382CAU-W10/G114	ECN5383CAU-W10/G114 ④	ECN5388CAU-W10/G114	AN16VN0AB
	1500		ECN5381CAU-W10/G117	ECN5382CAU-W10/G117	ECN5383CAU-W10/G117 ④	ECN5388CAU-W10/G117	
Motor Volts 575/Magnet Coil Voltage 120 ①							
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	350A	ECN5351DAV-W10/G67	ECN5352DAV-W10/G67	ECN5354DAV-W10/G67	ECN5358DAV-W10/G67	
6YD	350	500A	ECN5361DAY-W10/G72	ECN5362DAY-W10/G72	ECN5363DAY-W10/G72 ④	ECN5368DAY-W10/G72	AN16TN0AB
	400	500A	ECN5361DAY-W10/G77	ECN5362DAY-W10/G77	ECN5363DAY-W10/G77 ④	ECN5368DAY-W10/G77	
	450	600A	ECN5361DAZ-W10/G82	ECN5362DAZ-W10/G82	ECN5363DAZ-W10/G82 ④	ECN5368DAZ-W10/G82	
	500	600A	ECN5361DAZ-W10/G87	ECN5362DAZ-W10/G87	ECN5363DAZ-W10/G87 ④	ECN5368DAZ-W10/G87	
	600	800A	ECN5361DA2-W10/G92	ECN5362DA2-W10/G92	ECN5363DA2-W10/G92 ④	ECN5368DA2-W10/G92	
	700	1000A	ECN5361DA3-W10/G97	ECN5362DA3-W10/G97	ECN5363DA3-W10/G97 ④	ECN5368DA3-W10/G97	
7YD	750	④	ECN5371DAU-W10/G102	ECN5372DAU-W10/G102	ECN5373DAU-W10/G102 ④	ECN5378DAU-W10/G102	AN16UN0AB
	800		ECN5371DAU-W10/G106	ECN5372DAU-W10/G106	ECN5373DAU-W10/G106 ④	ECN5378DAU-W10/G106	
	900		ECN5371DAU-W10/G109	ECN5372DAU-W10/G109	ECN5373DAU-W10/G109 ④	ECN5378DAU-W10/G109	
	1000		ECN5371DAU-W10/G112	ECN5372DAU-W10/G112	ECN5373DAU-W10/G112 ④	ECN5378DAU-W10/G112	
8YD	1250	④	ECN5381DAU-W10/G115	ECN5382DAU-W10/G115	ECN5383DAU-W10/G115 ④	ECN5388DAU-W10/G115	AN16VN0AB
	1500		ECN5381DAU-W10/G118	ECN5382DAU-W10/G118	ECN5383DAU-W10/G118 ④	ECN5388DAU-W10/G118	

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater Pack Selection, **Page 16-6**.

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 interlock.

④ Type 4 (Painted Steel) Sizes 6 – 8YD.

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

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN5324CAE. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Also requires 2 matching contactors and mechanical interlock.

Cover Control ..... **Page 6-20**
Other Magnet Coils ..... **Page 6-19**
Dimensions ..... **Page 15-8**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Product Description

- 3-Phase Magnetic
- Interchangeable Heater OLR

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 in **Figure 6-10**.

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.

Product Selection

Table 6-34. Class ECN64 — Combination Part Winding Pump Control Starter — Fusible

Motor Voltage	Max. hp 50/60 Hz ①	NEMA Size	Fuse Clip Rating		Catalog Number
			Amperes	Volts	
230	50	3PW	200	250	**ECN6432BAH**
460	50		100	600	**ECN6432CAG**
460	75		200	600	**ECN6432CAJ**
230	75	4PW	400	250	**ECN6442BAK**
460	125		200	600	**ECN6442CAJ**
460	150		400	600	**ECN6442CAL**
230	100	5PW	400	250	**ECN6452BAK**
230	150		600	250	**ECN6452BAM**
460	200		400	600	**ECN6452CAL**
460	350		600	600	**ECN6452CAN**
230	300	6PW	1200 ②	250	**ECN6462BAQ**
460	600		1200 ②	600	**ECN6462CAQ**

① Horsepower ratings based on dual element fuses.
② Class L fuse mounting.

Table 6-35. Class ECN65 — Combination Part Winding Pump Control Starter — Circuit Breaker

Motor Voltage	Max. hp 50/60 Hz ③	NEMA Size	Circuit Breaker Type	Catalog Number
230	40	3PW	HFD 125	**ECN6532BAL**
230	50		HFD 150	**ECN6532BAM**
460	50		HFD 100	**ECN6532CAK**
460	75		HFD 125	**ECN6532CAL**
230	60	4PW	JD 200	**ECN6542BAP**
230	75		JD 250	**ECN6542BAR**
460	100		HFD 150	**ECN6542CAM**
460	125		JD 225	**ECN6542BAQ**
460	150		JD 250	**ECN6542CAR**
230	100	5PW	KD 350	**ECN6552BAV**
230	125		KD 400	**ECN6552BAW**
230	150		LD 500	**ECN6552BAY**
460	200		KD 350	**ECN6552CAV**
460	250		KD 400	**ECN6552CAW**
460	300		LD 500	**ECN6552CAY**
460	350		LD 600	**ECN6552CAZ**
230	350	6PW	ND 1200	**ECN6562BA4**
460	600		ND 1200	**ECN6562CA4**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6.** Starters with Electronic Overload — See **Page 16-45** of Modification Codes.				

③ Horsepower ratings based on dual element fuses.

Kits ..... **Page 8-4**
Modifications ..... **Page 16-40**

Wiring Diagrams

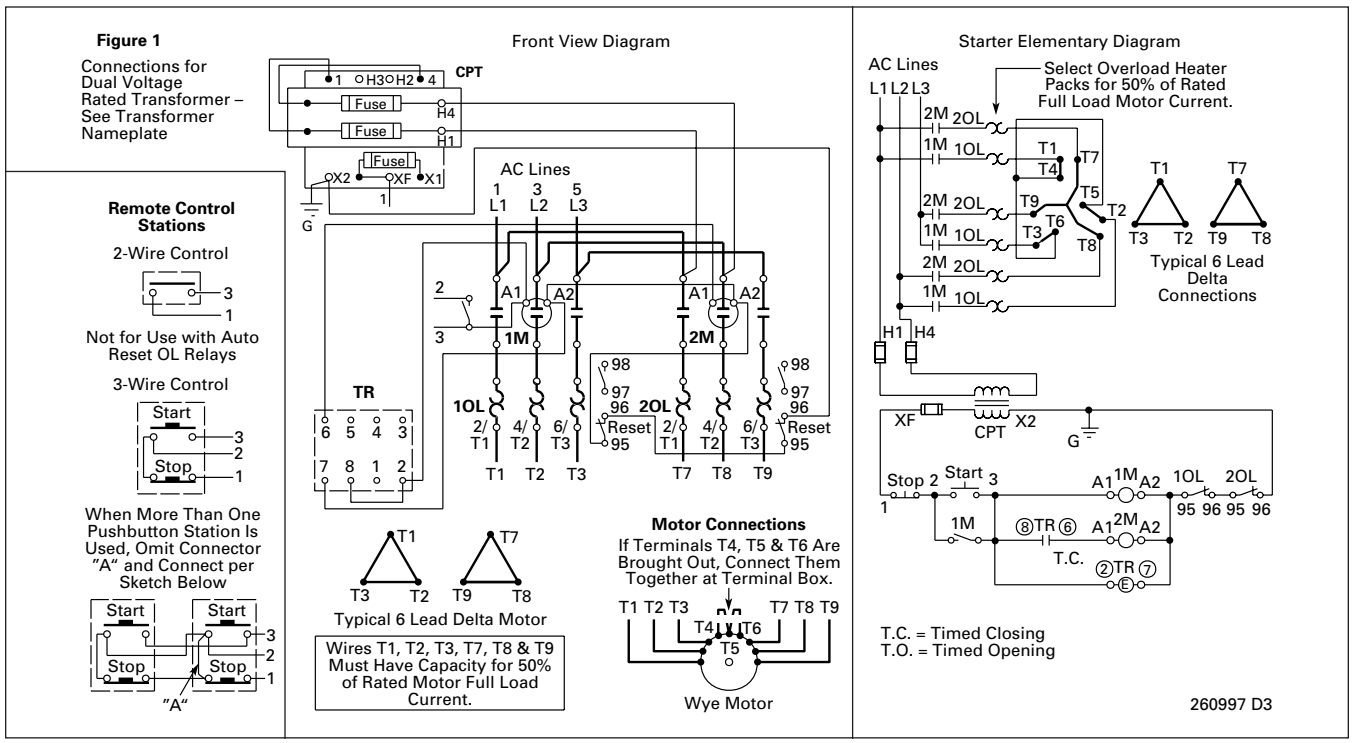


Figure 6-6. Part Winding — Non-combination

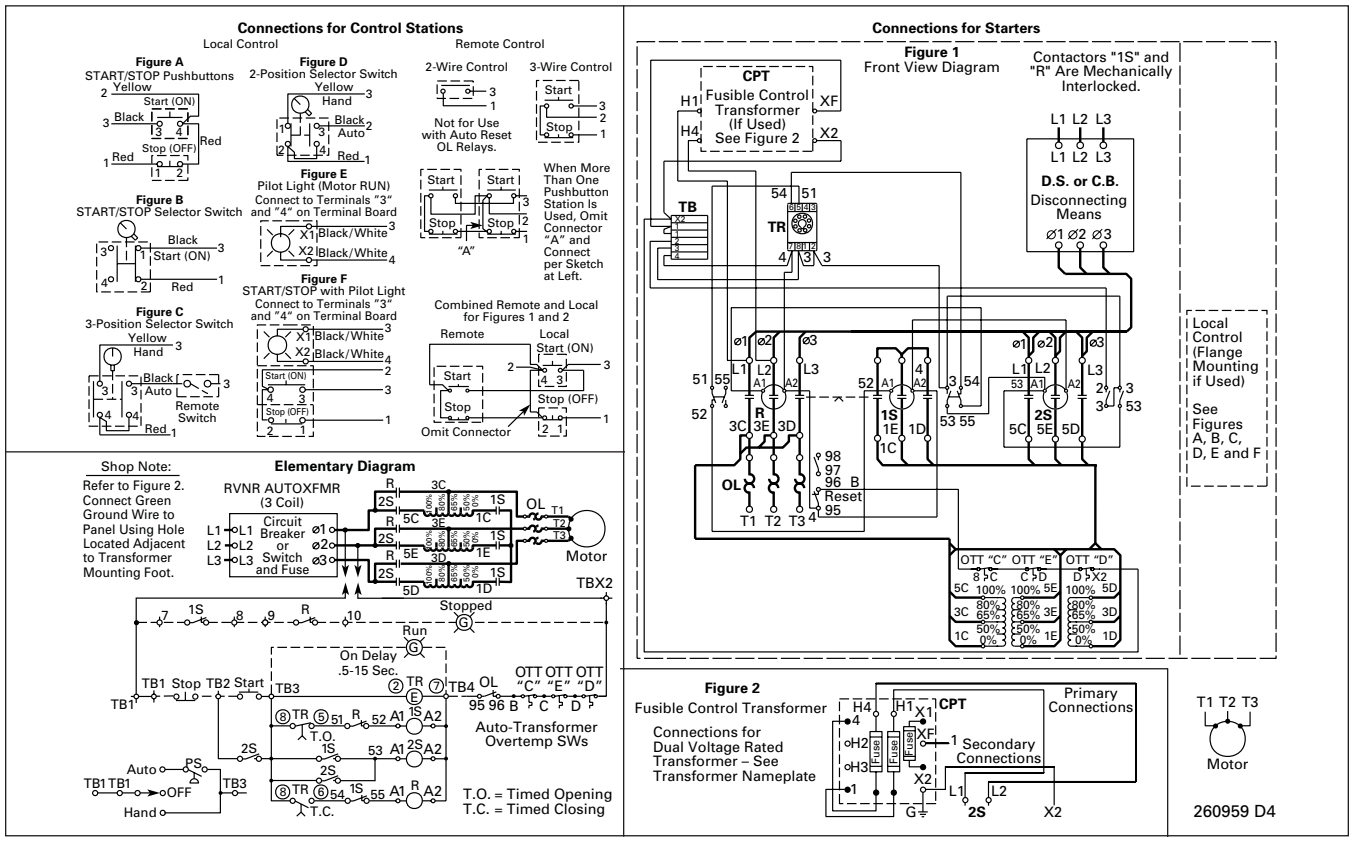


Figure 6-7. Autotransformer — Combination

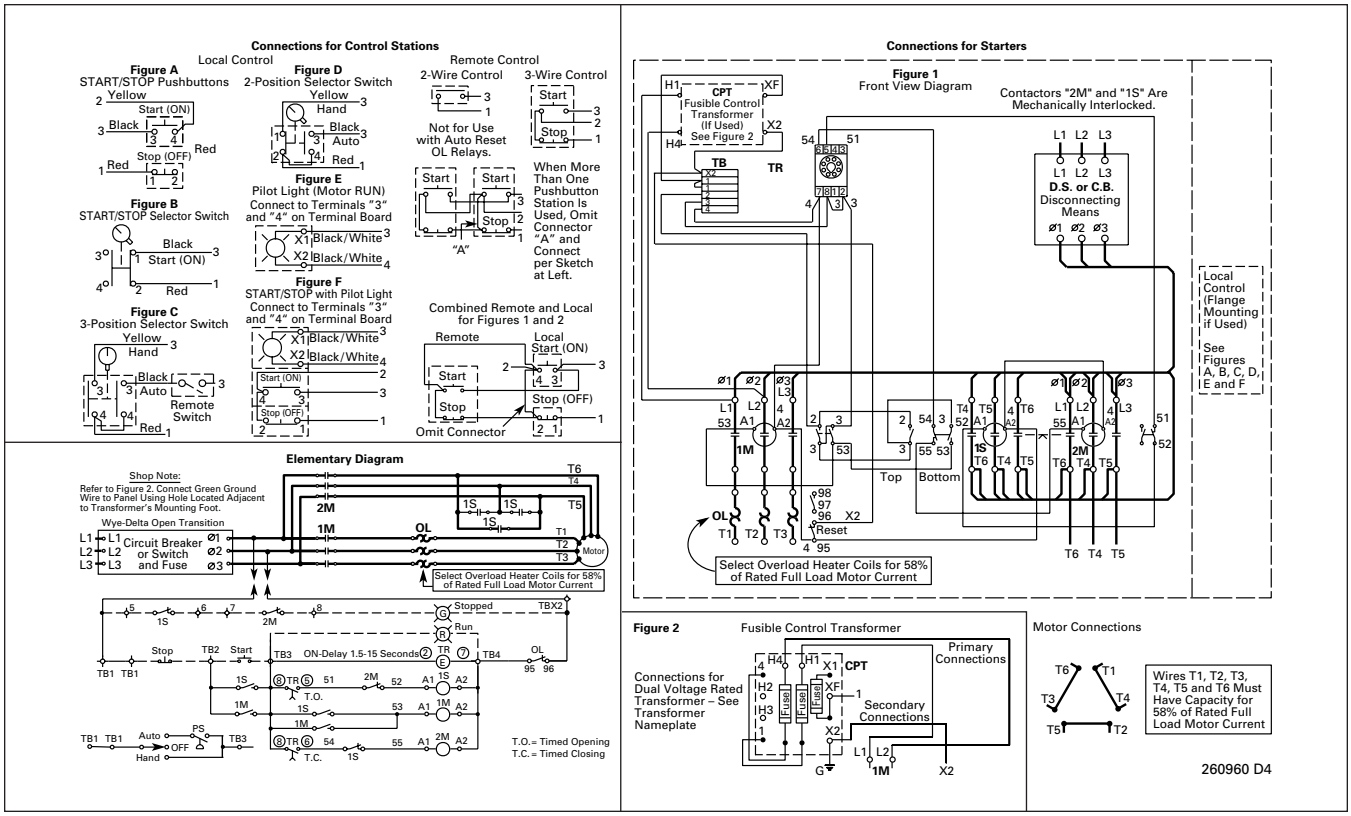


Figure 6-8. Wye Delta — Open Transition Combination

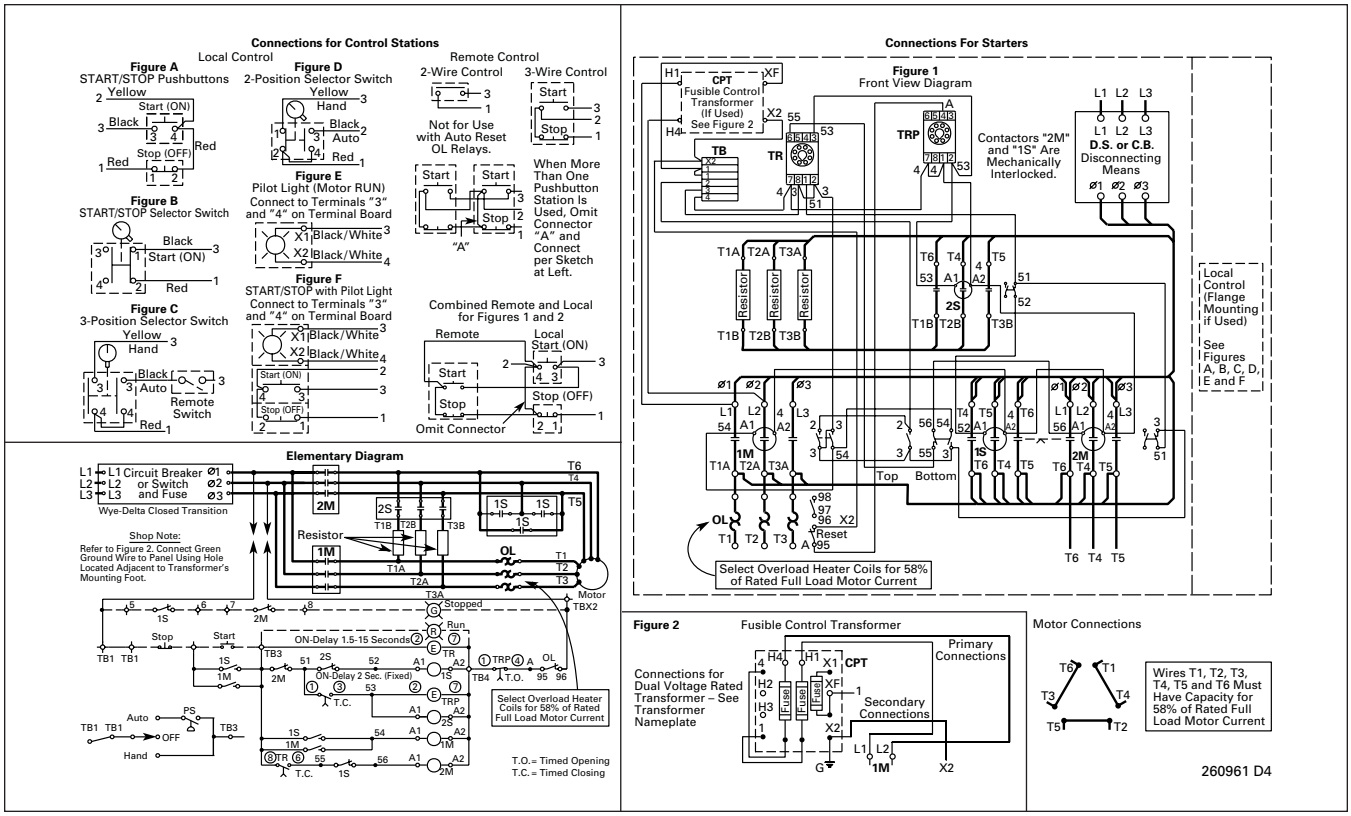


Figure 6-9. Wye Delta — Closed Transition Combination

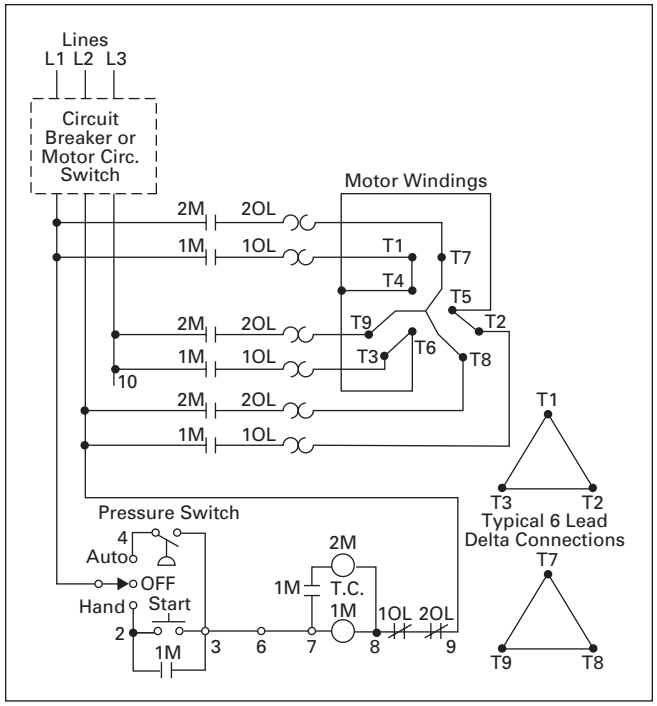


Figure 6-10. Typical Part Winding Pump Control Wiring Diagram

April 2008

Adjustable Frequency Drives

Contents

MVX9000 Microdrives

MVX Drive with 3-Contactor Bypass

Product Description

Eaton's Cutler-Hammer® MVX9000 is offered in a variety of enclosure options to provide protection for operator and equipment. Enclosure ratings include Type 1, 12, 3R and 4X. (Enclosure ratings are defined in **Tab 1**.)

Model MVX9000 sensorless vector adjustable frequency AC drives are designed to provide adjustable speed control of three-phase motors. These microprocessor-based, sensorless vector drives have standard features that can be programmed to tailor the drive's performance to suit a wide variety of application requirements.

The MVX9000 sensorless vector product line utilizes a 32-bit microprocessor and insulated gate bipolar transistors (IGBTs) which provide quiet motor operation, high motor efficiency and smooth low speed performance. The size and simplicity of the MVX9000 make it ideal for hassle free installations where size is a primary concern.

Models rated at 575 and 480 volts, 3-phase, 50/60 Hz are available in sizes ranging from 1 to 10 hp. Models rated at 240 volts, single- or 3-phase, 50/60 Hz are available in sizes ranging from 1/2 to7-1/2 hp.

The standard drive includes a digital display, operating and programming keys on a removable keypad. The display provides drive monitoring as well as adjustment and diagnostic information. The keys are utilized for digital adjustment and programming of the drive as well as for operator control. Separate terminal blocks for control and power wiring are provided for customer connections. Other features provided as standard include built-in DC braking, RS-485 serial communications and PID control.

The enclosed microdrives can be configured with standard modification codes including options for various cover controls, two- and three-contactor bypass, communications and traditional disconnect switch offerings.

Type 1/3R with Keypad Cover

Type 1 Enclosure

The Type 1 version of the MVX9000 sensorless vector product line utilizes a door-mountable (option) keypad. The keypad, with digital display, can be used for operating and programming the MVX9000 drive. Type 1 enclosed MVX9000s offer a standard gasketed cover in a ventilated enclosure.

Type 12 Enclosure

The Type 12 design uses a seam welded, dust-tight enclosure. These enclosures use the latest advances in cooling technology to offer space saving designs as well as providing ample space for modifications.

Type 12 Design

Type 3R Enclosure

The Type 3R design incorporates the MVX9000 technology into a compact, rainproof enclosure. Type 3R enclosures are available with a door mount keypad option utilizing a steel flange door to protect the keypad.

Type 4X Enclosure

The Type 4X enclosed MVX utilizes a seam-welded stainless steel enclosure. These enclosures use the latest advances in cooling technology to offer space saving designs as well as providing ample space for modifications.

Features

- **Drive Keypad Access** — Through-the-door access to STOP/START, speed potentiometer drive keys and programming available as an option on Type 1, 3R and 12
- Available as non-combination or combination with fusible or circuit breaker disconnect
- **Fusible Disconnect** — 30A or 60A with Class CC / J fuses or R fuses
- **Circuit Breaker** — Thermal magnetic circuit breaker with trip rating based on maximum drive FLA
- **Operating Mechanism** — Rotary or flange type with provisions for padlocking in the OFF position. An interlock defeater is built into the operating mechanism to permit the cover to be opened with the disconnect on
- **Cover Control** — Control devices available installed or in field assembly kits
- **Options** — Bus Choke, Bypass/Isolation Contactors, EMI Filter, Line Reactors, DeviceNet Interface and more

The compact design allows the controller to be located adjacent to the motor.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approval
- CE Mark available (Requires EMI filter)

Catalog Number Selection

Table 7-1. Enclosed Microdrive Catalog Numbering System

E C S 8 0 B 1 B A A

Design
S = Solid-State

Class	Page
80 = Non-combination	**7-9**
81 = Disconnect Switch Combination	**7-10**
82 = Motor Circuit Protector Combination	**7-11**

Frame (hp)	
B = 1/2 ①	**F** = 5
C = 1	**G** = 7-1/2
D = 2	**H** = 10 ②
E = 3	

Enclosure Type
1 = 1 — General Purpose
2 = 3R — Rainproof
3 = 4 — Painted Steel
4 = 4X — 304-Grade Stainless Steel
8 = 12 — Dust-Tight
9 = 4X — 316-Grade Stainless Steel

Voltage
B = 208 – 240V
C = 380 – 480V
D = 575V

Cover Control
See **Page 7-5**

Disconnect Rating Fuse Clips	
A = None	**E** = 60 Amp
C = 30 Amp	

Circuit Breaker Rating	
A = 15 Amp	**E** = 40 Amp
B = 20 Amp	**F** = 50 Amp
D = 30 Amp	

① Frame (hp) only available at 208 – 240V.
② Frame (hp) only available at 380 – 480V.

Cover Control

Table 7-2. MVX Non-reversing Pilot Devices

Description	Factory Installed	Type 1, 3R Kits for Field Installation	Type 12, 4X Kits for Field Installation
	Position 9 Alpha	Catalog Number	Catalog Number
None	**A**	**—**	**—**
START/STOP Pushbuttons	**B**	**C400T21**	**C400T1**
with Red RUN Pilot Light	**C**	**C400T22** ①	**—**
with Red RUN/Green OFF Lights	**D**	**C400T23** ①	**—**
ON/OFF Pushbuttons	**E**	**—**	**C400T2**
with Red RUN Pilot Light	**F**	**—**	**—**
with Red RUN/Green OFF Lights	**G**	**—**	**—**
HAND/OFF/AUTO Selector Switch	**H**	**C400T24**	**C400T12**
with Red RUN Pilot Light	**J**	**C400T25** ①	**—**
with Red RUN/Green OFF Lights	**K**	**C400T26** ①	**—**
Red RUN Pilot Light	**L**	**C400T10** ①	**C400T9** ①
Green OFF Pilot Light	**M**	**C400T11** ①	**C400T10** ①
Red RUN/Green OFF Pilot Lights	**N**	**C400T12** ①	**C400T11** ①
START/STOP Selector Switch	**P**	**—**	**C400T13**
with Red RUN Pilot Light	**Q**	**—**	**—**
with Red RUN/Green OFF Lights	**R**	**—**	**—**
Speed Potentiometer	**S**	**—**	**—**

① Add Code Letter from table below to Catalog Number for voltage — kits only. Example: C400T10**A**.

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**

Table 7-3. MVX Reversing Pilot Devices

Description	Factory Installed	Type 1, 3R Kits for Field Installation	Type 12, 4X Kits for Field Installation
	Position 9 Alpha	Catalog Number	Catalog Number
None	**A**	**—**	**—**
FORWARD/REVERSE/STOP Pushbuttons	**T**	**C400T50**	**C400T6**
with 2 Red Pilot Lights	**U**	**C400T51** ②	**—**
with 2 Red/1 Green Lights	**V**	**C400T52** ②	**—**
UP/STOP/DOWN Pushbuttons	**W**	**—**	**—**
with 2 Red Pilot Lights	**X**	**—**	**—**
with 2 Red/1 Green Lights	**Y**	**—**	**—**
FORWARD/OFF/REVERSE Selector Switch	**Z**	**C400T53**	**C400T15**
with 2 Red Pilot Lights	**1**	**C400T54** ②	**—**
with 2 Red/1 Green Lights	**2**	**C400T55** ②	**—**
2 Red Pilot Lights	**3**	**—**	③
Green OFF Pilot Light	**4**	**C400T11** ②	**C400T10** ②
2 Red/1 Green Pilot Lights	**5**	**—**	**—**
Speed Potentiometer	**S**	**—**	**—**

② Add Code Letter from table below to Catalog Number for voltage — kits only. Example: C400T10**A**.

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**

③ Order 2 C400T9 ②.

Modification Codes

Table 7-4. A — Auxiliary Contacts (when bypass contactor chosen)

Modification	Catalog Number Suffix	Description
Top Mounted Auxiliary Contacts (Unwired) ①	**A13**	1NO
	A14	1NC
	A15	1NO-1NC
	A16	2NO
	A17	2NC
	A18	2NO-1NC
	A19	1NO-2NC
	A20	3NO
	A21	3NC
	A22	3NO-1NC
	A23	2NO-2NC
	A24	1NO-3NC
	A25	4NO
	A26	4NC

① For drive only run contacts, see Mods C12 and C14.

Table 7-5. B — Breaker Modifications, Bell Alarm, DC Bus Choke

Modification	Catalog Number Suffix	Description
Breaker	**B1**	1NO-1NC Auxiliary Contacts
	B2	2NO-2NC Auxiliary Contacts
	B3	Shunt Trip on Circuit Breaker — 48 – 127V AC or DC
Bell Alarm	**B16**	Bell Alarm for GHC
Bus Choke	**B20**	240V or 480V DC Bus Choke, Open Core and Coil ②

② A DC bus choke may be used in place of an AC line reactor for line harmonic current reduction and for power source exceeding 500 kVA. The DC bus choke will not provide any protection for line voltage unbalance or transients.

Table 7-6. C — Control Power Transformers, Control Relays, Control Sources, Bypass Contactors

Modification	Catalog Number Suffix	Description
Control Power Transformer	**C1**	Standard Size CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C42	50 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C3	100 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C5 ③	200 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C7 ③	300 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C8 ③	400 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
Control Relay ④	**C13**	RUN Relay, 24V DC
Separate Control	**C35**	Wired for Separate Control
	C45	Separate Source Disc (Type 1/12 fusible only)
Customer Supplied	**C36**	Customer Supplied Components to Be Installed
	C37	Customer Supplied Wiring Diagram to Use
Bypass Contactors ③	**C46/J1**	Isolation Contactor
	C46/J2	Output Contactor
	C46/J3	Bypass Contactor ⑤
	C46/J4	Isolation/Output/Bypass Contactors ⑤
	C46/J5	3 Contactor Bypass Package — Includes CPT, Pilot Lights, Selector Switch, Auxiliary Contacts and Control Relay ⑤

③ Requires oversize enclosure.
④ Provides additional contacts for drive run indication.
⑤ Includes bimetallic overload.

Table 7-7. D — Device Labels, DIN Rail

Modification	Catalog Number Suffix	Description
Device Labels	**D1**	Device Labels — Specify
DIN Rail	**D8**	DIN Rail Installed

Table 7-8. E — Enclosure Modifications, Elapsed Time Meter

Modification	Catalog Number Suffix	Description
Enclosure	**E3**	Oversized Enclosure
Elapsed Time Meter	**E9**	Type 1, 3R, 12, 4X

Table 7-9. F — Fuse Clips, Fuse Blocks, EMI Filter

Modification	Catalog Number Suffix	Description
Fuse Blocks	**F4**	Power Fuses Included — Order by Description
	F5	30A Control Circuit Fuseholder (KTK) Mounted on Panel (unwired) Fuse Not Supplied
	F6	30A Control Circuit Fuseholder Mounted on Panel (unwired), 5A KTK Fuse Supplied
EMI Filter ②	**F22**	240V or 480V 3-Phase ①
	F23	240V 1-Phase ①

① The EMI filter is not necessary to meet the CE mark requirements for EMC when installing the MVX in an EC country.
② Requires oversized enclosure.

Table 7-10. H — Space Heater, Heater Packs Installed

Modification	Catalog Number Suffix	Description			
Space Heater	**H1**	Space Heater and Thermostat			
	H2	Space Heater and NC Interlock (100 Watt)			
Install Heater Packs (Freedom Series) ③	**H5**	**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

③ Use only when C46 or R7 modifications are required.

Table 7-11. K — Keypad

Modification	Catalog Number Suffix	Description
Keypad	**K1**	Door-Mounted AFD Keypad (Type 1 and 12)
	K2	Door-Mounted AFD Keypad (Type 3R)
	K3	AFD Copy Keypad (mounted on drive)
	K4	Door-Mounted AFD Copy Keypad (Type 1 and 12)
	K5	Door-Mounted AFD Copy Keypad (Type 3R)

Table 7-12. L — Lightning Arrestor, Carton Label, Line Reactor, Load Reactor

Modification	Catalog Number Suffix	Description
Lightning Arrestor ④	**L1**	Lightning Arrestor
Label	**L10**	Carton Label — Customer Marking — Specify
Line Reactor (Type 1/12 design limited to either line or load reactor, not both)	**L12**	240V or 480V 3% Input Line Reactor, 3-Phase, Open Core and Coil ⑤
	L13	240V 3% Input Line Reactor, 1-Phase, Open Core and Coil ⑤
	L14	240V or 480V 5% Input Line Reactor, 3-Phase, Open Core and Coil ⑤
	L15	240V 5% Input Line Reactor, 1-Phase, Open Core and Coil ⑤
	L16	Line Reactor by Description
Output Line Filter (Type 1/12 design limited to either line or load reactor, not both)	**L17**	480V Output Line dv/dt Filter, Open Core and Coil ⑥
	L18	Load Reactor by Description

④ Requires oversized enclosure.
⑤ If the power source exceeds 500 kVA, 3% line unbalance, or if transient voltages from power factor capacitor switching events are present, an input line reactor must be used. The input line reactor will also reduce line current harmonics.
⑥ The output line dv/dt filter is required when the distance from the drive to the motor exceeds 33 feet (10.1m). The total cable run should not exceed 165 feet (50.3m).

Table 7-13. N — Nameplates

Modification	Catalog Number Suffix	Description
Nameplates	**N1**	Nameplate on Enclosure — Order Wording to Be Inscribed

7

Table 7-14. P — Pilot Lights, Pushbuttons, Phase Loss Relay, Phase Reversal Relay

Modification	Catalog Number Suffix	Description
Push-to-Test Pilot Lights	**P1**	Push-to-Test Pilot Light (Red RUN)
	P2	Push-to-Test Pilot Light (Green OFF)
	P3	Combination of **P1** and **P2** Above
	P4	Push-to-Test Pilot Light (Amber RUN)
	P54	Push-to-Test Pilot Light — Red BYPASS
	P55	Push-to-Test Pilot Light — Amber INVERTER ENABLE
	P56	Push-to-Test Pilot Light — Red INVERTER RUNNING
	P57	Push-to-Test Pilot Light — Green STOPPED
Pushbuttons	**P5**	EMERGENCY STOP — Mushroom Head
	P7	START/STOP
	P8	ON/OFF
	P9	START
	P10	ON
	P11	OFF
	P12	FORWARD/REVERSE/STOP
	P52	UP/STOP/DOWN
	P18	Pushbutton with Legend Plate (Order by Description)
Pilot Lights	**P19**	Amber Light "POWER AVAILABLE" Wired to Load Side of 2 Fuses or Circuit Breaker
	P20	Pilot Light (Amber) Wired to Coil
	P23	Pilot Light — Red RUN
	P24	Pilot Light — Red ON
	P25	Pilot Light — Green OFF
	P58	Pilot Light — Red BYPASS
	P59	Pilot Light — Amber INVERTER ENABLE
	P60	Pilot Light — Red INVERTER RUNNING
	P61	Pilot Light — Green STOP
	P26	Pilot Light (Order by Description)
Illuminated Pushbutton	**P27**	Illuminated Pushbutton (Order by Description)
Phase Loss Relay	**P28**	Phase Loss Relay
Phase Reversal Relay	**P30**	Phase Reversal Relay
Phase Unbalance Relay	**P32**	Phase Unbalance Relay
Phase Monitoring Relay	**P34**	Phase Monitoring Relay

Table 7-15. R — Relays, Overload Relay Modifications, DeviceNet™ Interface Mode

Modification	Catalog Number Suffix	Description
Relay	**R2**	Overvoltage Relay
	R7	Overload Relay (Order by Description)
Relay Modifications	**R45**	Auto Reset Only on Overload Relay
DeviceNet Interface Module	**R69**	DeviceNet Communication Interface

Table 7-16. S — Selector Switches, Suppressor, Surge Capacitor, Speed Pot

Modification	Catalog Number Suffix	Description
Selector Switches	**S3**	HAND-OFF-AUTO Selector Switch
	S10	OFF-AUTO Selector Switch
	S11	START-STOP Selector Switch
	S12	ON-OFF Selector Switch
	S16	FORWARD-REVERSE Selector Switch
	S38	INVERTER-OFF-BYPASS Selector Switch
	S40	Selector Switch (Order by Description)
Surge Capacitor	**S37**	Surge Capacitor Wired to Disconnect Line Side
Speed Pot	**S39**	Speed Potentiometer

Table 7-17. T — Timers, Terminal Blocks, Terminal Points, Ring Lug

Modification	Catalog Number Suffix	Description
Timers	**T3**	Pneumatic Timer Mounted in Enclosure, Unwired, 180 Seconds Maximum
	T4	Pneumatic Timer (Order by Description)
	T5	Solid-State Timer (Order by Description)
Terminal Blocks	**T9**	With 1 Single-Circuit Terminal Block, Unwired
	T10	With 2 Single-Circuit Terminal Blocks, Unwired
Terminal Points	**T11**	With 6 Terminal Points, Unwired
	T12	With 12 Terminal Points, Unwired
	T13	With 16 Terminal Points, Unwired
	T14	Terminal Point per Customer Specification, Unwired
	T15	Terminal Point per Customer Specification, Wired
Ring Lug	**T16**	Ring Lug Connections on Power Wires
	T17	Ring Lug Connections on Control Wires

Table 7-18. U — Undervoltage Relay

Modification	Catalog Number Suffix	Description
Undervoltage Relay	**U2**	Undervoltage Relay, Non-adjustable
Under and Over Relay	**U7**	Under and Overvoltage Relay

Table 7-19. W — Wiremarkers

Modification	Catalog Number Suffix	Description
Wiremarkers	**W7**	Wiremarkers

Product Selection

Table 7-20. Class ECS80 — Non-combination MVX9000 Drives

Volts	Input Amp. Single-/ 3-Phase Rating	Continuous Output Amp. Rating	Type 1 General Purpose	Type 3R Rainproof	Type 4X ① Watertight Stainless Steel	Type 12 Industrial Dust-Tight	Component Microdrive (Open)
			Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1/2 hp							
208 – 240	5.8/3.4	2.5	**ECS80B1BAA**	**ECS80B2BAA**	**ECS80B4BAA**	**ECS80B8BAA**	**MVXF50A0-2**
1 hp							
208 – 240	9/5.2	5	**ECS80C1BAA**	**ECS80C2BAA**	**ECS80C4BAA**	**ECS80C8BAA**	**MVX001A0-2**
380 – 480	—/3.3	3	**ECS80C1CAA**	**ECS80C2CAA**	**ECS80C4CAA**	**ECS80C8CAA**	**MVX001A0-4**
500 – 600	—/2.4	1.7	**ECS80C1DAA**	**ECS80C2DAA**	**ECS80C4DAA**	**ECS80C8DAA**	**MVX001A0-5**
2 hp							
208 – 240	16/9.3	7	**ECS80D1BAA**	**ECS80D2BAA**	**ECS80D4BAA**	**ECS80D8BAA**	**MVX002A0-2**
380 – 480	—/5	4	**ECS80D1CAA**	**ECS80D2CAA**	**ECS80D4CAA**	**ECS80D8CAA**	**MVX002A0-4**
500 – 600	—/4.2	3	**ECS80D1DAA**	**ECS80D2DAA**	**ECS80D4DAA**	**ECS80D8DAA**	**MVX002A0-5**
3 hp							
208 – 240	22.5/13	10	**ECS80E1BAA**	**ECS80E2BAA**	**ECS80E4BAA**	**ECS80E8BAA**	**MVX003A0-2**
380 – 480	—/7	5	**ECS80E1CAA**	**ECS80E2CAA**	**ECS80E4CAA**	**ECS80E8CAA**	**MVX003A0-4**
500 – 600	—/5.9	4.2	**ECS80E1DAA**	**ECS80E2DAA**	**ECS80E4DAA**	**ECS80E8DAA**	**MVX003A0-5**
5 hp							
208 – 240	—/20	17	**ECS80F1BAA**	**ECS80F2BAA**	**ECS80F4BAA**	**ECS80F8BAA**	**MVX005A0-2**
380 – 480	—/11	8.2	**ECS80F1CAA**	**ECS80F2CAA**	**ECS80F4CAA**	**ECS80F8CAA**	**MVX005A0-4**
500 – 600	—/7.0	6.6	**ECS80F1DAA**	**ECS80F2DAA**	**ECS80F4DAA**	**ECS80F8DAA**	**MVX005A0-5**
7-1/2 hp							
208 – 240	—/31	25	**ECS80G1BAA**	**ECS80G2BAA**	**ECS80G4BAA**	**ECS80G8BAA**	**MVX007A0-2**
380 – 480	—/17	13	**ECS80G1CAA**	**ECS80G2CAA**	**ECS80G4CAA**	**ECS80G8CAA**	**MVX007A0-4**
500 – 600	—/10.5	9.9	**ECS80G1DAA**	**ECS80G2DAA**	**ECS80G4DAA**	**ECS80G8DAA**	**MVX007A0-5**
10 hp							
380 – 480	—/21	18	**ECS80H1CAA**	**ECS80H2CAA**	**ECS80H4CAA**	**ECS80H8CAA**	**MVX010A0-4**
500 – 600	—/12.9	12.2	**ECS80H1DAA**	**ECS80H2DAA**	**ECS80H4DAA**	**ECS80H8DAA**	**MVX010A0-5**

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS80B**4**BAA-C1. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Cover Controls . . . . . **Page 7-5**
Modifications . . . . . **Pages 7-6 – 7-8**
Dimensions . . . . . **Page 15-8**

Table 7-21. Class ECS81 — Combination Disconnect Switch MVX9000 Drives

Volts	Input Amp. Single-/ 3-Phase Rating	Continuous Output Amp. Rating	Fuse Clips	Type 1 General Purpose	Type 3R Rainproof	Type 4X ① Watertight Stainless Steel	Type 12 Industrial Dust-Tight	Component Microdrive (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1/2 hp								
208 – 240	5.8/3.4	2.6	**30A**	**ECS81B1BAC**	**ECS81B2BAC**	**ECS81B4BAC**	**ECS81B8BAC**	**MVXF50A0-2**
1 hp								
208 – 240	9/5.2	4	**30A**	**ECS81C1BAC**	**ECS81C2BAC**	**ECS81C4BAC**	**ECS81C8BAC**	**MVX001A0-2**
380 – 480	—/3.3	2.5	**30A**	**ECS81C1CAC**	**ECS81C2CAC**	**ECS81C4CAC**	**ECS81C8CAC**	**MVX001A0-4**
500 – 600	—/2.4	1.7	**30A**	**ECS81C1DAC**	**ECS81C2DAC**	**ECS81C4DAC**	**ECS81C8DAC**	**MVX001A0-5**
2 hp								
208 – 240	16/9.3	7.1	**30A**	**ECS81D1BAC**	**ECS81D2BAC**	**ECS81D4BAC**	**ECS81D8BAC**	**MVX002A0-2**
380 – 480	—/5	3.8	**30A**	**ECS81D1CAC**	**ECS81D2CAC**	**ECS81D4CAC**	**ECS81D8CAC**	**MVX002A0-4**
500 – 600	—/4.2	3	**30A**	**ECS81D1DAC**	**ECS81D2DAC**	**ECS81D4DAC**	**ECS81D8DAC**	**MVX002A0-5**
3 hp								
208 – 240	22.5/13	10	**30A**	**ECS81E1BAC**	**ECS81E2BAC**	**ECS81E4BAC**	**ECS81E8BAC**	**MVX003A0-2**
380 – 480	—/7	5.5	**30A**	**ECS81E1CAC**	**ECS81E2CAC**	**ECS81E4CAC**	**ECS81E8CAC**	**MVX003A0-4**
500 – 600	—/5.9	4.2	**30A**	**ECS81E1DAC**	**ECS81E2DAC**	**ECS81E4DAC**	**ECS81E8DAC**	**MVX003A0-5**
5 hp								
208 – 240	—/20	15.9	**30A**	**ECS81F1BAC**	**ECS81F2BAC**	**ECS81F4BAC**	**ECS81F8BAC**	**MVX005A0-2**
380 – 480	—/11	8.6	**30A**	**ECS81F1CAC**	**ECS81F2CAC**	**ECS81F4CAC**	**ECS81F8CAC**	**MVX005A0-4**
500 – 600	—/7.0	6.6	**30A**	**ECS81F1DAC**	**ECS81F2DAC**	**ECS81F4DAC**	**ECS81F8DAC**	**MVX005A0-5**
7-1/2 hp								
208 – 240	—/31	24	**60A**	**ECS81G1BAE**	**ECS81G2BAE**	**ECS81G4BAE**	**ECS81G8BAE**	**MVX007A0-2**
380 – 480	—/17	13	**30A**	**ECS81G1CAC**	**ECS81G2CAC**	**ECS81G4CAC**	**ECS81G8CAC**	**MVX007A0-4**
500 – 600	—/10.5	9.9	**30A**	**ECS81G1DAC**	**ECS81G2DAC**	**ECS81G4DAC**	**ECS81G8DAC**	**MVX007A0-5**
10 hp								
380 – 480	—/21	16	**30A**	**ECS81H1CAC**	**ECS81H2CAC**	**ECS81H4CAC**	**ECS81H8CAC**	**MVX010A0-4**
500 – 600	—/12.9	12.2	**30A**	**ECS81H1DAC**	**ECS81H2DAC**	**ECS81H4DAC**	**ECS81H8DAC**	**MVX010A0-5**

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS81B4BAC-C1. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Type 3R Combination HMCPE MVX Drive

Type 1 MXV Drive with Disconnect Switch and Bypass

Cover Controls ..... **Page 7-5**
Modifications ..... **Pages 7-6 – 7-8**
Dimensions ..... **Page 15-8**

Table 7-22. Class ECS82 — Combination HMCPE Circuit Breaker MVX9000 Drives

Volts	Input Amp. Single-/ 3-Phase Rating	Continuous Output Amp. Rating	HMCP Rating Amps.	Type 1 General Purpose	Type 3R Rainproof	Type 4X ① Watertight Stainless Steel	Type 12 Industrial Dust-Tight	Component Microdrive (Open)
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
1/2 hp								
208 – 240	5.8/3.4	2.6	15	**ECS82B1BAA**	**ECS82B2BAA**	**ECS82B4BAA**	**ECS82B8BAA**	**MVXF50A0-2**
1 hp								
208 – 240	9/5.2	4	15	**ECS82C1BAA**	**ECS82C2BAA**	**ECS82C4BAA**	**ECS82C8BAA**	**MVX001A0-2**
380 – 480	—/3.3	2.5	15	**ECS82C1CAA**	**ECS82C2CAA**	**ECS82C4CAA**	**ECS82C8CAA**	**MVX001A0-4**
500 – 600	—/2.4	1.7	15	**ECS82C1DAA**	**ECS82C2DAA**	**ECS82C4DAA**	**ECS82C8DAA**	**MVX001A0-5**
2 hp								
208 – 240	16/9.3	7.1	15	**ECS82D1BAA**	**ECS82D2BAA**	**ECS82D4BAA**	**ECS82D8BAA**	**MVX002A0-2**
380 – 480	—/5	3.8	15	**ECS82D1CAA**	**ECS82D2CAA**	**ECS82D4CAA**	**ECS82D8CAA**	**MVX002A0-4**
500 – 600	—/4.2	3	15	**ECS82D1DAA**	**ECS82D2DAA**	**ECS82D4DAA**	**ECS82D8DAA**	**MVX002A0-5**
3 hp								
208 – 240	22.5/13	10	30	**ECS82E1BAD**	**ECS82E2BAD**	**ECS82E4BAD**	**ECS82E8BAD**	**MVX003A0-2**
380 – 480	—/7	5.5	15	**ECS82E1CAA**	**ECS82E2CAA**	**ECS82E4CAA**	**ECS82E8CAA**	**MVX003A0-4**
500 – 600	—/5.9	4.2	15	**ECS82E1DAA**	**ECS82E2DAA**	**ECS82E4DAA**	**ECS82E8DAA**	**MVX003A0-5**
5 hp								
208 – 240	—/20	15.9	30	**ECS82F1BAD**	**ECS82F2BAD**	**ECS82F4BAD**	**ECS82F8BAD**	**MVX005A0-2**
380 – 480	—/11	8.6	15	**ECS82F1CAA**	**ECS82F2CAA**	**ECS82F4CAA**	**ECS82F8CAA**	**MVX005A0-4**
500 – 600	—/7.0	6.6	15	**ECS82F1DAA**	**ECS82F2DAA**	**ECS82F4DAA**	**ECS82F8DAA**	**MVX005A0-5**
7-1/2 hp								
208 – 240	—/31	24	50	**ECS82G1BAF**	**ECS82G2BAF**	**ECS82G4BAF**	**ECS82G8BAF**	**MVX007A0-2**
380 – 480	—/17	13	30	**ECS82G1CAD**	**ECS82G2CAD**	**ECS82G4CAD**	**ECS82G8CAD**	**MVX007A0-4**
500 – 600	—/10.5	9.9	15	**ECS82G1DAA**	**ECS82G2DAA**	**ECS82G4DAA**	**ECS82G8DAA**	**MVX007A0-5**
10 hp								
380 – 480	—/21	16	30	**ECS82H1CAD**	**ECS82H2CAD**	**ECS82H4CAD**	**ECS82H8CAD**	**MVX010A0-4**
500 – 600	—/12.9	12.2	30	**ECS82H1DAD**	**ECS82H2DAD**	**ECS82H4DAD**	**ECS82H8DAD**	**MVX010A0-5**

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS82B**4**BAA-C1. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

Type 3R Combination HMCPE MVX Drive

Type 1 MXV Drive with Disconnect Switch and Bypass

Cover Controls . . . . . **Page 7-5**
Modifications . . . . . **Pages 7-6 – 7-8**
Dimensions . . . . . **Page 15-8**

Wiring Diagrams

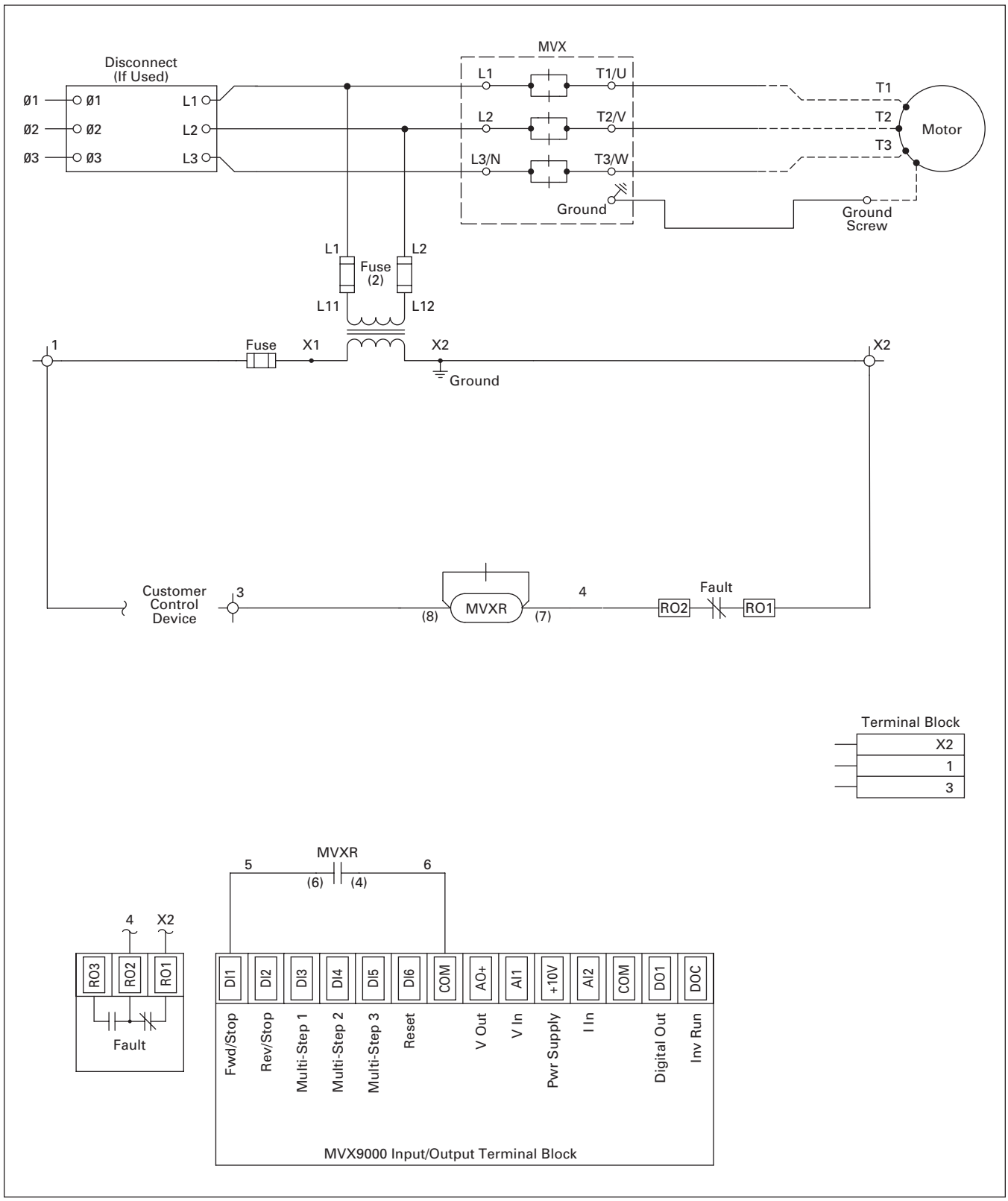


Figure 7-1. MVX9000 Wiring Diagram

Pump Panels

Contents

8

Product Description

Eaton's Cutler-Hammer® 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 and ***IT.*** 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 S752, S801 and S811 soft starter products which are members of the Cutler-Hammer® 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 24V DC 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.

Type 3R Standard Enclosure with Size 4 IT. Starter

Type 3R Standard Enclosure with Size 1 – 3 Starter

Type 3R Narrow Enclosure with Size 1, 2 Starter

Type 3R Narrow Enclosure with Size 1 Starter and Electronic Overload

Type 3R Standard Enclosure with a Size 3 Part Winding Starter

Features

The *IT.* and 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.
  - The *IT.* electronic overload relay offers motor protection and can be adjusted over a range of 3.2:1 in Class 10, 20 or 30 with a choice of manual or automatic reset. Settings such as Trip Class, phase loss/phase current unbalance enabled or disabled can be programmed without the use of any software. Fault indication is provided for thermal memory, overload trip, phase loss/phase current unbalance, ready for reset and other parameters.
- **HAND/OFF/AUTO Selector Switch and START Pushbutton** — 10250T heavy-duty units mounted on the flange of the enclosure for outside accessibility. START pushbutton not used as standard on NEMA *IT.* pumps, but available as an option.
- **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 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 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** — .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 2 primary and 1 secondary fuses.
- **Electrical Interlocks** — Side mounted in NO, NC and NO-NC. Maximum of 2 contacts on either side of starter through Size 2, maximum of 3 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", 1-1/4", 1-1/2", 2", 2-1/2" and 3" 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 **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approval

Accessories

Kits

Table 8-1. Kits for Field Mounting

Description	Catalog Number Suffix	Catalog Number
Backspin Timer — .2 sec. to 3 min. (60 Hz)	**B12**	**—**
Control Transformers 240/480V Pri., 120V Sec.		
Size 1	**C1**	**—**
Size 2	**C1**	**—**
Size 3	**C1**	**—**
Size 4	**C1**	**—**
Size 5	**C1**	**—**
Lightning Arrestor	**L3**	**—**
Control Circuit Fuse Kit (600V)	**C31**	**—**
Electrical Interlocks — Freedom Line/Vacuum		
NO	**A27**	**—**
NC	**A28**	**C320KGS2**
NO & 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" Conduit Size	**—**	**DS075H1**
1-1/4" Conduit Size	**—**	**DS125H1**
1-1/2" Conduit Size	**—**	**DS150H1**
2" Conduit Size	**—**	**DS200H1**
2-1/2" Conduit Size	**—**	**DS250H2**
3" Conduit Size	**—**	**DS300H2**
Power Supply	**C34**	**—**

① Does not apply to reduced voltage controllers.

Overload Relays

Table 8-2. Freedom SSOL Overload Relays

NEMA Size	Full Load Current Adjustment Range (A)	3-Phase Manual Reset Overload		3-Phase Automatic/ Manual Reset
		Class 10	Class 20	Class 20
Catalog Number Suffix ➡		**R52**	**R50**	**R51**
00	0.1 – 1.3	G101	G81	G121
	0.3 – 1.0	G102	G82	G122
	1.0 – 2.9	G103	G83	G123
	1.6 – 5.0	G104	G84	G124
	3.7 – 12	G105	G85	G125
0 & 1	0.1 – 1.3	G101	G81	G121
	0.3 – 1.0	G102	G82	G122
	1.0 – 2.9	G103	G83	G123
	1.6 – 5.0	G104	G84	G124
	3.7 – 12	G105	G85	G125
	12 – 32	G106	G86	G126
2	12 – 37	G107	G87	G127
	14 – 45	G108	G88	G128
3	26 – 85	G109	G89	G129
4	57 – 180	G112	G92	G132
5	96 – 300	G104	G84	G124
6	192 – 600	G104	G84	G124

Example: **R50/G87** = Class 20, 12 – 37 ampere overload for Size 2 starters.

Catalog Number Selection

Table 8-3. Pump Panel Catalog Number Selection

E C N 5 4 1 2 B A A - ____

Design
N = Freedom
T = ***IT.***
2 = A200
V = Vacuum

Class
54 = Type 3R Pump Panel with Disconnect
55 = Type 3R Pump Panel with HMCP
64 = Part Winding with Motor Circuit
65 = Part Winding with Circuit Breaker
68 = Duplex, Non-combination ③
69 = Duplex, with Disconnect Switch ③
70 = Duplex, with HMCP/E ③

NEMA Size
1 = Size 1
2 = Size 2
3 = Size 3
4 = Size 4
5 = Size 5
6 = Size 6
7 = Size 7

Enclosure
2 = 3R Painted Steel
A = 3R Stainless Steel

Voltage ①
A = 120V/60 or 110/50
B = 240V/60 or 220/50
C = 460V/60 or 440/50

Cover Control ④
A = None

Disconnect Fuse Clip Ratings

A = None	**H** = 200A/250V R
B = 30A/250V R	**J** = 200A/600V R
C = 30A/600V R	**K** = 400A/250V R
D = 60A/250V R	**L** = 400A/600V R
E = 60A/600V R	**M** = 600A/250V R
F = 100A/250V R	**N** = 600A/600V R
G = 100A/600V R	**Q** = 1200A/600V L

HMCP or Breaker Ratings

B = 3 Amp	**M** = 800 Amp
C = 7 Amp	**N** = 1000 Amp
D = 15 Amp	**P** = 1200 Amp
E = 30 Amp	**Q** = 2000 Amp
F = 50 Amp	**R** = 3000 Amp
G = 100 Amp	**U** = ②
H = 150 Amp	**W** = 70 Amp
J = 250 Amp	**X** = 100 Amp
K = 400 Amp	**Y** = 150 Amp
L = 600 Amp	

Modification Code

① For other voltages and single-phase applications, consult your Eaton salesperson.
② Engineering determination depending on size, horsepower FLA, NEC or other considerations.
③ More information on Type 1, 3R, 4X and 12 Duplex Pump Panels is on **Page 8-17**. Product Selection is on **Page 8-19**.
④ HOA selector switch and START pushbutton provided as standard, except for ***IT.*** where HOA selector switch is provided as standard.

Product Description

- Solid-State OL Relay
- Suitable for Franklin Motors

Standard ECT54 controllers have a HAND/OFF/AUTO selector switch on the enclosure and are wired as illustrated in **Figure 8-1**. All controllers come with DC power supply.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

Wiring Diagram

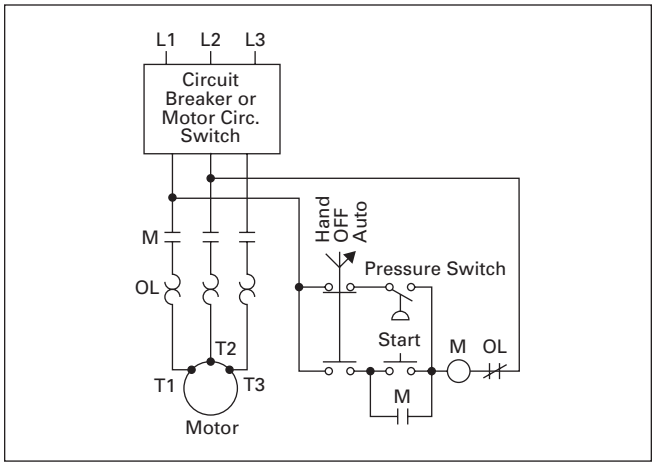


Figure 8-1. Typical Wiring Diagram

Product Selection

Table 8-4. Class ECT54 — Combination Pump Panel — Fusible Disconnect

Motor Voltage ①	Max. hp 50/60 Hz	NEMA Size	Fuse Clip Rating		Narrow Width ②	Standard Width ②
			Amperes	Volts	Catalog Number	Catalog Number
230 460 —	7-1/2 10 —	1	30 30 Not Installed	250 600 Not Installed	**ECT5412BAB-E14** **ECT5412CAC-E14** **ECT5412CAA-E14**	**ECT5412BAB** **ECT5412CAC** **ECT5412CAA**
230 460 —	15 25 —	2	60 60 Not Installed	250 600 Not Installed	**ECT5422BAD-E14** **ECT5422CAE-E14** **ECT5422CAA-E14**	**ECT5422BAD** **ECT5422CAE** **ECT5422CAA**
230 460 —	30 50 —	3	100 100 Not Installed	250 600 Not Installed	— — —	**ECT5432BAF** **ECT5432CAG** **ECT5432CAA**
230 460 —	50 100 —	4	200 200 Not Installed	250 600 Not Installed	— — —	**ECT5442BAH** **ECT5442CAJ** **ECT5442CAA**
230 460	100 200	5	400 400	250 600	— —	**ECT5452BAK** **ECT5452CAL**
230 460	200 400	6	600 600	250 600	— —	**ECT5462BAM** **ECT5462CAN**

① Dual element fuse ratings.
② Add modification code **C34** for Control Power Transformer.

Table 8-5. Solid-State Overload Range Codes

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80 .59 – 1.9 1.4 – 4.4 2.8 – 9.0	**A** **B** **C** **D**	**A** **B** **C** **D**	**A** **B** **C** **D**	— — — —	— — — —	— — — —	— — — —
5.0 – 16 6.3 – 20 8.4 – 27 10 – 32 14 – 45 16 – 50	— — — — — —	— **G** — **J** — —	**F** — **H** — — **L**	— — — — **K** —	— — — — — —	— — — — — —	— — — — — —
28 – 90 31 – 100 42 – 135 63 – 200 84 – 270 131 – 420	— — — — — —	— — — — — —	— — — — — —	— **N** — — — —	**M** — — — — —	— — **P** **R** — —	— — — — **S** **T**

Kits ..... **Page 8-4**
Panel Space ..... **Page 8-7**
Dimensions ..... **Page 15-9**
Modifications ..... **Page 16-40**

Product Description

- Solid-State OL Relay
- Suitable for Franklin Motors

Standard ECT55 controllers have a HAND/OFF/AUTO selector switch on the enclosure and are wired as illustrated in **Figure 8-3**. Controllers provided with 24V DC as standard.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

Dimensions

Table 8-6. Panel Space

Panel Size	NEMA Size	Position (see Figure 8-2)	Approximate Dimensions in Inches (mm)	
			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)

① Space is between disconnect switch or circuit breaker and starter.

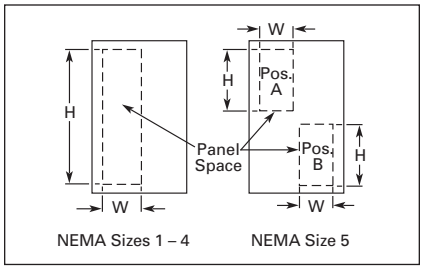


Figure 8-2. Panel Space

Wiring Diagram

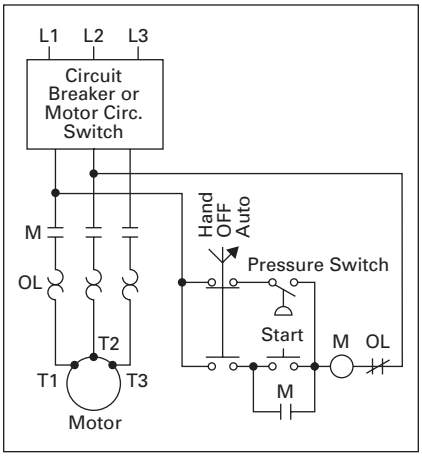


Figure 8-3. Typical Wiring Diagram

Product Selection

Table 8-7. Class ECT55 — Combination Pump Panel — Circuit Breaker

Motor Voltage	Max. hp 50/60 Hz	NEMA Size	Circuit Breaker Type	Narrow Width ①	Standard Width ①
				Catalog Number	Catalog Number
230	1	1	HMCPE 7A	**ECT5512BAC-E14**	**ECT5512BAC**
	2		HMCPE 15A	**ECT5512BAD-E14**	**ECT5512BAD**
	7-1/2		HMCPE 30A	**ECT5512BAE-E14**	**ECT5512BAE**
460	3/4		HMCPE 3A	**ECT5512CAB-E14**	**ECT5512CAB**
	2		HMCPE 7A	**ECT5512CAC-E14**	**ECT5512CAC**
	5		HMCPE 15A	**ECT5512CAD-E14**	**ECT5512CAD**
	10		HMCPE 30A	**ECT5512CAE-E14**	**ECT5512CAE**
230	15	2	HMCPE 50A	**ECT5522BAF-E14**	**ECT5522BAF**
460	25		HMCPE 50A	**ECT5522CAF-E14**	**ECT5522CAF**
230	30	3	HMCPE 100A	—	**ECT5532BAG**
460	50		HMCPE 100A	—	**ECT5532CAG**
230	50	4	HMCP 150A	—	**ECT5542BAH**
460	100		HMCP 150A	—	**ECT5542CAH**
230	75	5	HMCP 250A	—	**ECT5552BAJ**
230	100		HMCP 400A	—	**ECT5552BAK**
460	150		HMCP 250A	—	**ECT5552CAJ**
460	200		HMCP 400A	—	**ECT5552CAK**
230	125	6	HMCP 600A	—	**ECT5562BAL**
230	200		MD 800A	—	**ECT5562BAM**
460	300		HMCP 600A	—	**ECT5562CAL**
460	400		MD 800A	—	**ECT5562CAM**

① Add modification code **C34** for Control Power Transformer.
Note: For Solid-State Overload Range Codes, See **Table 8-5** on **Page 8-6**.

Kits ..... **Page 8-4**
Dimensions..... **Page 15-9**
Modifications..... **Page 16-40**

Narrow Width
Size 2 Type 3R

Product Description

- 3-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 in **Figure 8-4**.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

Accessories

Table 8-8. C351 — Fuse Clip Selection — 3-Pole (3 Fuses)

NEMA Size	Motor Voltage	Fuse Clip Rating		Fuse Clip Kit for Field Installation in Non-fusible Starter	
		Amperes	Volts	For Non-rejection Type Fuses	For use with "R" Rejection Type Fuses
				Catalog Number	Catalog Number
1	200/230 460 – 575	30 30	250 600	**C351KC21** **C351KD22-61**	**C351KC21R** **C351KD22-61R**
2	200 230 460 – 575	60 60 60	250 250 600	**C351KD22-61** **C351KD22-61** **C351KD62**	**C351KD22-61R** **C351KD22-61R** **C351KD62R**
3	200 230 460 – 575	100 100 100	250 250 600	**C351KE23-63** **C351KE23-63** **C351KE23-63**	**C351KE23-63** ① **C351KE23-63** ① **C351KE23-63** ①
4	200 230 460 – 575	200 200 200	250 250 600	**C351KF24-64** **C351KF24-64** **C351KF24-64**	**C351KF24-64** ① **C351KF24-64** ① **C351KF24-64** ①

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

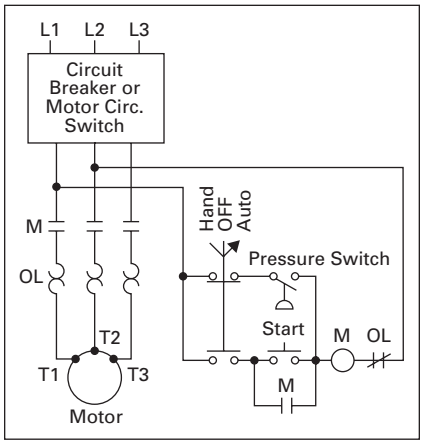


Figure 8-4. Typical Wiring Diagram

Product Selection

Table 8-9. Class ECN54 — Combination Pump Panel — Fusible Disconnect

Motor Voltage ①	Max. hp 50/60 Hz	NEMA Size	Fuse Clip Rating ②		Narrow Width ③	Standard Width ③
			Amperes	Volts	Catalog Number	Catalog Number
230 460 —	7-1/2 10 —	1	30 30 Not Installed	250 600 Not Installed	**ECN5412BAB-E14** **ECN5412CAC-E14** **ECN5412AAA-E14**	**ECN5412BAB** **ECN5412CAC** **ECN5412AAA**
230 460 —	15 25 —	2	60 60 Not Installed	250 600 Not Installed	**ECN5422BAD-E14** **ECN5422CAE-E14** **ECN5422AAA-E14**	**ECN5422BAD** **ECN5422CAE** **ECN5422AAA**
230 460 —	30 50 —	3	100 100 Not Installed	250 600 Not Installed	— — —	**ECN5432BAF** **ECN5432CAG** **ECN5432AAA**
230 460 —	50 100 —	4	200 200 Not Installed	250 600 Not Installed	— — —	**ECN5442BAH** **ECN5442CAJ** **ECN5442AAA**
230 460	100 200	5	400 400	250 600	— —	**ECN5452BAK** **ECN5452CAL**
230 460	200 400	6	600 600	250 600	— —	**ECN5462BAM** **ECN5462CAN**
460	600	7	1200	600	—	**ECN5472CAQ**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6.** Starters with Electronic Overload — See **Page 16-45** of Modification Codes.						

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 from **Table 8-8**.
③ To order without the START pushbutton, add Modification Code **P6**.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

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, 8th digit in Catalog Number with proper Code Suffix from **Table 8-10**.

Example: For 600V 60 Hz coil, change ECN5412**B**AC to ECN5412**D**AC

Table 8-10. 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**

Kits . . . . . **Page 8-4**
Dimensions. . . . . **Page 15-9**
Modifications. . . . . **Page 16-40**

Product Description

- 3-Phase Magnetic
- Interchangeable Heater OLR

These ECN55 Pump Controllers feature the Cutler-Hammer 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 8-8**.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

8

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

Dimensions

Table 8-11. Panel Space

Panel Size	NEMA Size	Position (see Figure 8-5)	Approximate Dimensions in Inches (mm)	
			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)

① Space is between disconnect switch or circuit breaker and starter.

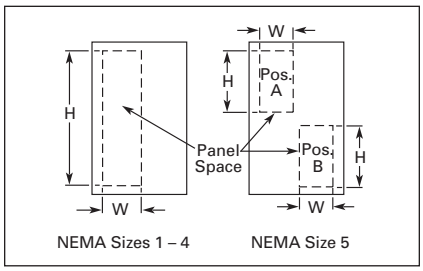


Figure 8-5. Panel Space

Product Selection

Table 8-12. Class ECN55 — Combination Pump Panel — Circuit Breaker

Motor Voltage	Max. hp 50/60 Hz	NEMA Size	Circuit Breaker Type	Narrow Width ②	Standard Width ②
				Catalog Number	Catalog Number
230	1	1	HMCPE 7A	**ECN5512BAC-E14**	**ECN5512BAC**
	3		HMCPE 15A	**ECN5512BAD-E14**	**ECN5512BAD**
	7-1/2		HMCPE 30A	**ECN5512BAE-E14**	**ECN5512BAE**
460	1		HMCPE 3A	**ECN5512CAB-E14**	**ECN5512CAB**
	3		HMCPE 7A	**ECN5512CAC-E14**	**ECN5512CAC**
	5		HMCPE 15A	**ECN5512CAD-E14**	**ECN5512CAD**
	10		HMCPE 30A	**ECN5512CAE-E14**	**ECN5512CAE**
230	10	2	HMCPE 50A	**ECN5522BAF-E14**	**ECN5522BAF**
460	25		HMCPE 50A	**ECN5522CAF-E14**	**ECN5522CAF**
230	30	3	HMCPE 100A	—	**ECN5532BAG**
460	50		HMCPE 100A	—	**ECN5532CAG**
230	50	4	HMCP 150A	—	**ECN5542BAH**
460	100		HMCP 150A	—	**ECN5542CAH**
230	60	5	HMCP 250A	—	**ECN5552BAJ**
230	100		HMCP 400A	—	**ECN5552BAK**
460	150		HMCP 250A	—	**ECN5552CAJ**
460	200		HMCP 400A	—	**ECN5552CAK**
230	125	6	HMCP 600A	—	**ECN5562BAL**
230	200		MD 800A	—	**ECN5562BAM**
460	300		HMCP 600A	—	**ECN5562CAL**
460	400		MD 800A	—	**ECN5562CAM**
230	250	7 ③	④	—	**ECN5572BAU**
230	300		④	—	**ECN5572BAU**
460	500		④	—	**ECN5572CAU**
460	600		④	—	**ECN5572CAU**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6.**					

② To order without the START pushbutton, add Mod Code **P6**.

③ Consult factory in the event ground fault protection is required.

④ 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, 8th digit in Catalog Number with proper Code Suffix from **Table 8-13**. Example: For 600V 60 Hz coil, change ECN5512**C**AC to ECN5512**D**AC.

Table 8-13. 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**

Kits ..... **Page 8-4**
Dimensions ..... **Page 15-9**
Modifications ..... **Page 16-40**

Narrow Width
Size 2 Type 3R

Product Description

- 3-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 in **Figure 8-6**.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

Wiring Diagram

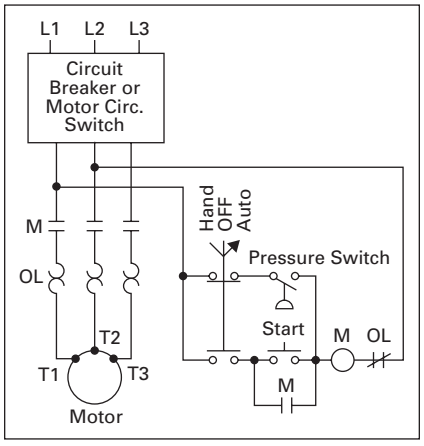


Figure 8-6. Typical Wiring Diagram

Product Selection

Table 8-14. Class EC254 — Combination Vacuum Pump Panel — Fusible Disconnect

Motor Voltage ①	Max. hp 50/60 Hz	NEMA Size	Fuse Clip Rating ②		Narrow Width ③	Standard Width ③
			Amperes	Volts	Catalog Number	Catalog Number
230 460 —	7-1/2 10 —	1	30 30 Not Installed	250 600 Not Installed	**EC25412BAB-E14** **EC25412CAC-E14** **EC25412AAA-E14**	**EC25412BAB** **EC25412CAC** **EC25412AAA**
230 460 —	15 25 —	2	60 60 Not Installed	250 600 Not Installed	**EC25422BAD-E14** **EC25422CAE-E14** **EC25422AAA-E14**	**EC25422BAD** **EC25422CAE** **EC25422AAA**
230 460 —	30 50 —	3	100 100 Not Installed	250 600 Not Installed	**—** **—** **—**	**EC25432BAF** **EC25432CAG** **EC25432AAA**
230 460 —	50 100 —	4	200 200 Not Installed	250 600 Not Installed	**—** **—** **—**	**EC25442BAH** **EC25442CAJ** **EC25442AAA**
230 460	100 200	5	400 400	250 600	**—** **—**	**EC25452BAK** **EC25452CAL**
230 460	200 400	6	600 600	250 600	**—** **—**	**EC25462BAM** **EC25462CAN**
460	600	7	1200	600	**—**	**EC25472CAQ**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6.**						

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 from **Table 8-8**.
③ To order without the START pushbutton, add Modification Code **P6**.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

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, 8th digit in Catalog Number with proper Code Suffix from **Table 8-15**.

Example: For 600V 60 Hz coil, change EC25412**B**AC to EC25412**D**AC

Table 8-15. 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**

Product Description

- 3-Phase Magnetic
- Interchangeable Heater OLR

These ECN55 Pump Controllers feature the Cutler-Hammer 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 8-11**.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

Note: Stainless Steel enclosure may be ordered by changing the seventh digit to **A**. Type 3R Rating will still apply.

Product Selection

Table 8-16. Class EC255 — Combination Vacuum Pump Panel — Circuit Breaker

Motor Voltage	Max. hp 50/60 Hz	NEMA Size	Circuit Breaker Type	Narrow Width ① Catalog Number	Standard Width ② Catalog Number
230	1 3 7-1/2	1	HMCPE 7A HMCPE 15A HMCPE 30A	**EC25512BAC-E14** **EC25512BAD-E14** **EC25512BAE-E14**	**EC25512BAC** **EC25512BAD** **EC25512BAE**
460	1 3 5 10		HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**EC25512CAB-E14** **EC25512CAC-E14** **EC25512CAD-E14** **EC25512CAE-E14**	**EC25512CAB** **EC25512CAC** **EC25512CAD** **EC25512CAE**
230 460	10 25	2	HMCPE 50A HMCPE 50A	**EC25522BAF-E14** **EC25522CAF-E14**	**EC25522BAF** **EC25522CAF**
230 460	30 50	3	HMCPE 100A HMCPE 100A	— —	**EC25532BAG** **EC25532CAG**
230 460	50 100	4	HMCP 150A HMCP 150A	— —	**EC25542BAH** **EC25542CAH**
230 230 460 460	60 100 150 200	5	HMCP 250A HMCP 400A HMCP 250A HMCP 400A	— — — —	**EC25552BAJ** **EC25552BAK** **EC25552CAJ** **EC25552CAK**
230 230 460 460	125 200 300 400	6	HMCP 600A MD 800A HMCP 600A MD 800A	— — — —	**EC25562BAL** **EC25562BAM** **EC25562CAL** **EC25562CAM**
230 230 460 460	250 300 500 600	7 ②	③ ③ ③ ③	— — — —	**EC25572BAU** **EC25572BAU** **EC25572CAU** **EC25572CAU**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.					

① To order without the START pushbutton, add Mod 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.

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, 8th digit in Catalog Number with proper Code Suffix from **Table 8-17**. Example: For 600V 60 Hz coil, change EC25512**C**AC to EC25512**D**AC.

Table 8-17. 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**

Dimensions

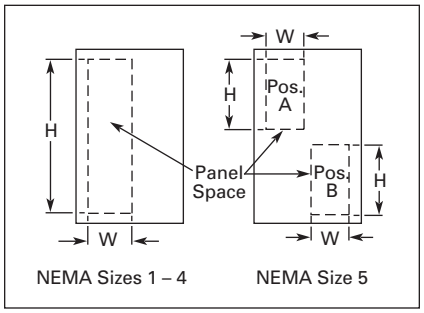


Figure 8-7. Panel Space

Table 9. Panel Space

NEMA Size	Position (see Figure 8-7)	Approximate Dimensions in Inches (mm) Width W	Height H
Panel Size — Narrow ①			
1 – 2	—	5.5 (140)	6.0 (152)
Panel Size — 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)
Panel Size — Oversize			
1 – 2	—	12.0 (318)	39.0 (991)
3	—	11.0 (279)	39.0 (991)

① Space is between disconnect switch or circuit breaker and starter.

Kits ..... **Page 8-4**
Modifications Codes..... **Page 16-40**

Product Description

- 3-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 in **Figure 8-8**.

Note: Type 3R enclosure does not include top conduit hubs. Hubs are available in kit form — see **Page 8-4**.

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.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL (indicates appropriate CSA Standard investigation)
- ABS Type Approval

Wiring Diagram

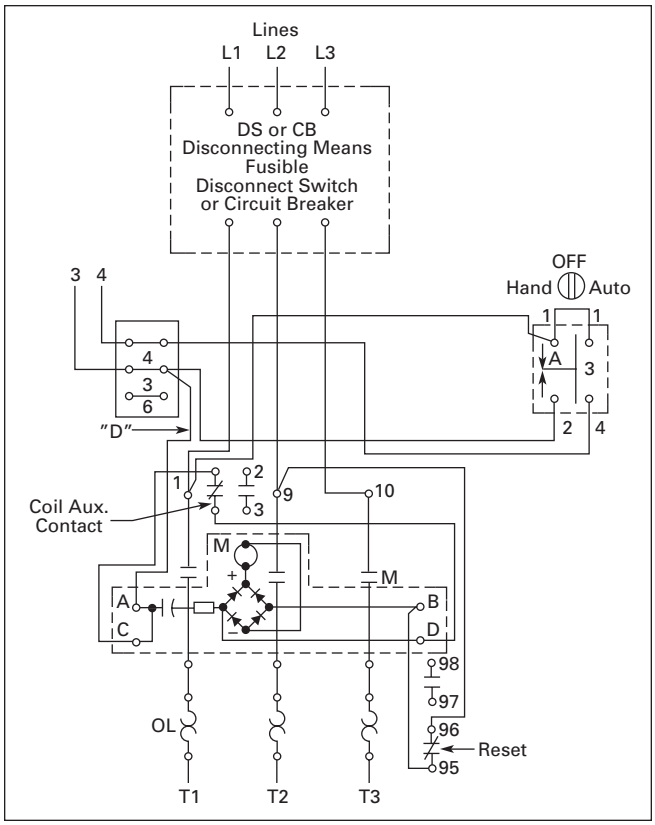


Figure 8-8. Typical Wiring Diagram

Product Selection

Table 8-1. Class ECV54 — Combination Vacuum Pump Panel — Fusible Disconnect

Motor Voltage	Max. hp 50/60 Hz	NEMA Size	Fuse Clip Rating		With START Pushbutton
			Amperes	Volts	Catalog Number
230 460	50 100	4	200 200	250 600	**ECV5442BAH** **ECV5442CAJ**
230 460	100 200	5	400 400	250 600	**ECV5452BAK** **ECV5452CAL**
230 460	200 400	6	600 600	250 600	**ECV5462BAM** **ECV5462CAN**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.					

Table 8-2. Class ECV55 — Combination Vacuum Pump Panel — Circuit Breaker

Motor Voltage	Max. hp 50/60 Hz	NEMA Size	Circuit Breaker Type	With START Pushbutton
				Catalog Number
230 460	50 100	4	HMCP 150A HMCP 150A	**ECV5542BAH** **ECV5542CAH**
230 230 460 460	75 100 150 200	5	HMCP 250A HMCP 400A HMCP 250A HMCP 400A	**ECV5552BAJ** **ECV5552BAK** **ECV5552CAJ** **ECV5552CAK**
230 460	200 400	6	HMCP 600A HMCP 600A	**ECV5562BAL** **ECV5562CAL**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.				

Kits . . . . . **Page 8-4**
Dimensions . . . . . **Page 15-9**
Modifications . . . . . **Page 16-40**

Irrigation Pump Panel

Product Description

Eaton's Cutler-Hammer® 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 @ 460V. These controllers have two styles of overload protection available, interchangeable heater and solid-state overload (SSOL).

- The interchangeable heater overload (C306) utilizes individual heater packs to allow customers the ability to use various heater styles.
- The solid-state overload relay provides enhanced protection and adjustment ranges as compared to bimetallic overload relays. Trip Class 10 and 20 are available, along with a very wide trip current range to make setup very easy.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approval

Catalog Number Selection

Table 8-3. Irrigation Pump Panel Catalog Number Selection

EC P 54 12 B A B - ____

Design
P = Irrigation

Class
54 = Type 3R Pump Panel with Disconnect
55 = Type 3R Pump Panel with HMCP

NEMA Size / Enclosure

12 = Size 1/3R	**42** = Size 4/3R
22 = Size 2/3R	**52** = Size 5/3R
32 = Size 3/3R	**62** = Size 6/3R

Voltage
A = 120V/60 or 110/50
B = 240V/60 or 220/50
C = 460V/60 or 440/50

Cover Control
A = None

Modification Code/ Relay Code

Disconnect Fuse Clip Ratings

A = None	**H** = 200A/250V R
B = 30A/250V R	**J** = 200A/600V R
C = 30A/600V R	**K** = 400A/250V R
D = 60A/250V R	**L** = 400A/600V R
E = 60A/600V R	**M** = 600A/250V R
F = 100A/250V R	**N** = 600A/600V R
G = 100A/600V R	

Breaker Ratings

B = 3 Amp	**G** = 100 Amp
C = 7 Amp	**H** = 150 Amp
D = 15 Amp	**N** = 175 Amp ①
E = 30 Amp	**Q** = 225 Amp ①
F = 50 Amp	

① Thermal magnetic breakers.

Product Selection

Standard ECP54 controllers have a HAND/OFF/AUTO selector switch and START pushbutton mounted on the enclosure and are wired as illustrated in **Figure 8-9**.

Table 8-4. Class ECP54 — Combination Irrigation Pump Panel — Fusible Disconnect

Motor Voltage ①	Max. hp 50/60 Hz	NEMA Size	Fuse Clip Rating ②		Standard Width
			Amperes	Volts	Catalog Number
230	7-1/2	1	30	250	**ECP5412BAB**
460	10		30	600	**ECP5412CAC**
—	—		Not Installed	Not Installed	**ECP5412AAA**
230	15	2	60	250	**ECP5422BAD**
460	25		60	600	**ECP5422CAE**
—	—		Not Installed	Not Installed	**ECP5422AAA**
230	30	3	100	250	**ECP5432BAF**
460	50		100	600	**ECP5432CAG**
—	—		Not Installed	Not Installed	**ECP5432AAA**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6.**					

① Dual element fuse ratings.
② Class R fuse clips.

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, 8th digit in Catalog Number with proper Code Suffix from **Table 8-5**.

Example: For 600V 60 Hz coil, change ECP5412**B**AB to ECP5412**D**AB

Table 8-5. 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

Table 8-6. C351 — Fuse Clip Selection — 3-Pole (3 Fuses)

NEMA Size	Motor Voltage	Fuse Clip Rating		Fuse Clip Kit for Field Installation in Non-fusible Starter	
		Amperes	Volts	For Non-rejection Type Fuses	For use with "R" Rejection Type Fuses
				Catalog Number	Catalog Number
1	200/230	30	250	**C351KC21**	**C351KC21R**
	460 – 575	30	600	**C351KD22-61**	**C351KD22-61R**
2	200	60	250	**C351KD22-61**	**C351KD22-61R**
	230	60	250	**C351KD22-61**	**C351KD22-61R**
	460 – 575	60	600	**C351KD62**	**C351KD62R**
3	200	100	250	**C351KE23-63**	**C351KE23-63** ①
	230	100	250	**C351KE23-63**	**C351KE23-63** ①
	460 – 575	100	600	**C351KE23-63**	**C351KE23-63** ①

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.

Kits . . . . . **Page 8-4**
Dimensions. . . . . **Page 15-9**
Modifications. . . . . **Page 16-40**

Product Selection

Table 8-7. Class ECP54 — Combination Irrigation Pump Panel with Solid-State Overload — Fusible Disconnect ①

Motor Voltage	Max. hp	NEMA Size	Fuse Clip Amperes	Trip Range	Catalog Number
240V	1	1	30	1.0 – 5.0	**ECP5412BAB-R60/C**
	3	1	30	1.6 – 8.0	**ECP5412BAB-R60/D**
	7-1/2	1	30	6.4 – 32	**ECP5412BAB-R60/E**
	10	2	60	9 – 45	**ECP5422BAD-R60/F**
	15	2	60	9 – 45	**ECP5422BAD-R60/F**
	25	3	100	15 – 75	**ECP5432BAF-R60/G**
480V	1	1	30	1.0 – 5.0	**ECP5412CAC-R60/C**
	2	1	30	1.6 – 8.0	**ECP5412CAC-R60/D**
	5	1	30	6.4 – 32	**ECP5412CAC-R60/E**
	10	1	30	6.4 – 32	**ECP5412CAC-R60/E**
	20	2	60	9 – 45	**ECP5422CAE-R60/F**
	25	2	60	9 – 45	**ECP5422CAE-R60/F**
	50	3	100	15 – 75	**ECP5432CAG-R60/G**

① Motor FLA based on NEC Table. Overload has selectable trip class 5, 10, 20 and 30 and Auto or Manual settings.

Table 8-8. Class ECP55 — Combination Irrigation Pump Panel with Solid-State Overload — Circuit Breaker ②

Motor Voltage	Max. hp	NEMA Size	Breaker Rating	Trip Range	Catalog Number
240V	1	1	7	1.0 – 5.0	**ECP5512BAC-R60/C**
	3	1	15	1.6 – 8.0	**ECP5512BAD-R60/D**
	7-1/2	1	30	6.4 – 32	**ECP5512BAE-R60/E**
	10	2	50	6.4 – 32	**ECP5522BAF-R60/E**
	15	2	50	9 – 45	**ECP5522BAF-R60/F**
	25	3	100	15 – 75	**ECP5532BAG-R60/G**
	50	4	100	30 – 150	**ECP5532BAH-R60/J**
480V	1	1	30	1.0 – 5.0	**ECP5512CAB-R60/C**
	2	1	30	1.6 – 8.0	**ECP5512CAC-R60/D**
	5	1	30	6.4 – 32	**ECP5512CAD-R60/E**
	10	1	30	6.4 – 32	**ECP5512CAE-R60/E**
	20	2	60	9 – 45	**ECP5522CAE-R60/E**
	25	2	60	9 – 45	**ECP5522CAF-R60/F**
	50	3	100	15 – 75	**ECP5532CAG-R60/G**
	100	4	150	30 – 150	**ECP5532CAG-R60/J**

② Motor FLA based on NEC Table. Overload has selectable trip class 5, 10, 20 and 30 and Auto or Manual settings.

Table 8-9. Class ECP55 — Combination Irrigation Pump Panel — Circuit Breaker

Motor Voltage	Max. hp	NEMA Size	Breaker Rating	Catalog Number
240V	1	1	7	**ECP5512BAC**
	3	1	15	**ECP5512BAD**
	7-1/2	1	30	**ECP5512BAE**
	10	2	50	**ECP5522BAF**
	15	2	70	**ECP5522BAW**
	25	3	100	**ECP5532BAG**
	50	4	150	**ECP5542BAH**
480V	1	1	3	**ECP5512CAB**
	3	1	7	**ECP5512CAC**
	5	1	15	**ECP5512CAD**
	10	1	30	**ECP5512CAE**
	10	2	30	**ECP5522CAE**
	25	2	50	**ECP5522CAF**
	50	3	100	**ECP5532CAG**
	100	4	175	**ECP5542CAN**

Relays

Table 8-10. Freedom Solid-State Overload Relays

C396 Overload Relay ③	NEMA Size	Full Load Current Adjustment Range (A)	3-Phase Automatic/Manual Reset
			Class 5/10/20/30
Catalog Number Suffix ➡ ④			R61_
	00	0.1 – 0.5	**A**
		0.4 – 2.0	**B**
		1.0 – 5.0	**C**
		1.6 – 8.0	**D**
	0, 1	0.1 – 0.5	**A**
		0.4 – 2.0	**B**
		1.0 – 5.0	**C**
		1.6 – 8.0	**D**
		6.4 – 32	**E**
	2	9 – 45	**F**
	3	15 – 75	**G**
		22 – 110	**H**
	4	30 – 150	**J**
	5	96 – 300	**C**
	6	192 – 600	**C**

③ Features:
- Self Powered
- Phase Loss Protection
- Current Adjustment Knob
- ±1% Repeat Accuracy
- 1NO and 1NC Isolated Contacts

④ Complete Modification Code includes overload range. Example **R61/C**.

Wiring Diagram

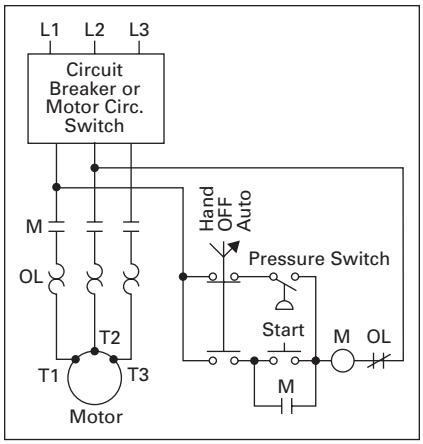


Figure 8-9. Typical Wiring Diagram

Dimensions ..... **Page 15-9**
Modifications ..... **Page 16-40**

Catalog Number Selection

Table 8-11. Freedom Duplex Pump Panels Catalog Numbering System

E C N 6 8 2 1 A A F - __

Design
N = Freedom NEMA

Class

	Page
68 = Duplex, Non-combination	**8-19**
69 = Duplex, with Disconnect Switch	**8-20**
70 = Duplex, with HMCP/E	**8-22**

NEMA Size
2 = Size 2
3 = Size 3
4 = Size 4
5 = Size 5
6 = Size 6
7 = Size 7
8 = Size 8
9 = Size 9

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 (Nonmetallic)
6 = Type 7/9 — Bolted Hazardous Location
7 = Type 7/9 — Threaded Hazardous Location
8 = Type 12 — Dust-Tight
9 = Type 4X — 316-Grade

Cover Control
See **Table 8-14**

Coil Voltage and/or Control Transformers
See **Tables 8-12** and **8-13**

Modification Codes
See **Page 16-40**

Disconnect Fuse Clip Ratings

A = None	**G** = 100A/600V R	**N** = 600A/600V R
B = 30A/250V R	**H** = 200A/250V R	**P** = 800A/600V L
C = 30A/600V R	**J** = 200A/600V R	**Q** = 1200A/600V L
D = 60A/250V R	**K** = 400A/250V R	**R** = 1600A/600V L
E = 60A/600V R	**L** = 400A/600V R	**S** = 2000A/600V L
F = 100A/250V R	**M** = 600A/250V R	**T** = by Description

HMCP/E or Breaker Ratings

A = None	**H** = 150A	**R** = 3000A
B = 3A	**J** = 250A	**T** = by Description
C = 7A	**K** = 400A	**5** = 3A ①
D = 15A	**L** = 600A	**6** = 7A ①
E = 30A	**M** = 800A	**7** = 15A ①
F = 50A	**N** = 1000A	**8** = 30A ①
G = 100A	**P** = 1200A	**9** = 50A ①
	Q = 2000A	**I** = 100A ①
		2 = 70A

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

Table 8-12. 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**	12V DC	**X**	104 – 120/60
E	208/60	**Q**	24V DC	**Y**	48/50
G	550/50	**R**	48V DC	**Z**	By Description
H	277/60	**S**	125V DC		
J	208 – 240/60	**T**	24/60		

② When control power transformer modification codes (**C1** – **C11**) are used or when starter class includes CPT (i.e. ECN07, 18) see table to the right for system voltage code.

Table 8-13. 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	

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approval

Cover Control

Non-reversing

8

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 to the right. Example: to order an **ECN0514CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, i.e. ECN0514C**C**A.

Figure 8-10.

Figure 8-11.

Table 8-14. Non-reversing Cover Control

Description	Factory Installed Flange Control			Field Installation Kits	
	Position 9 Alpha	Type 1 Non-combination ① See Figure 8-10	All Others ② See Figure 8-11	Type 1 Non-combination ① See Figure 8-10	All Others ② See Figure 8-11
				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	—	■	—	—

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

Features

- Full Voltage Non-reversing Non-combination
- 3-Phase Magnetic, 3-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

Table 8-15. Class ECN68 — Non-combination Duplex Pump Panels with Automatic Alternator ②③

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Type 1 General Purpose	Type 3R Rainproof	Type 4X ④ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ①	Component Starter (Open) ⑤
				Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	—	—	120	ECN6801AAA	ECN6802AAA	ECN6804AAA	ECN6808AAA	AN16BN0AC
	200	3	208	ECN6801EAA	ECN6802EAA	ECN6804EAA	ECN6808EAA	AN16BN0EC
	230	3	240	ECN6801BAA	ECN6802BAA	ECN6804BAA	ECN6808BAA	AN16BN0BC
	460	5	480	ECN6801CAA	ECN6802CAA	ECN6804CAA	ECN6808CAA	AN16BN0CC
	575	5	600	ECN6801DAA	ECN6802DAA	ECN6804DAA	ECN6808DAA	AN16BN0DC
1	—	—	120	ECN6811AAA	ECN6812AAA	ECN6814AAA	ECN6818AAA	AN16DN0AB
	200	7-1/2	208	ECN6811EAA	ECN6812EAA	ECN6814EAA	ECN6818EAA	AN16DN0EB
	230	7-1/2	240	ECN6811BAA	ECN6812BAA	ECN6814BAA	ECN6818BAA	AN16DN0BB
	460	10	480	ECN6811CAA	ECN6812CAA	ECN6814CAA	ECN6818CAA	AN16DN0CB
	575	10	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	25	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	50	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	100	600	ECN6841DAA	ECN6842DAA	ECN6844DAA	ECN6848DAA	AN16NN0D

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each motor). Heater Pack Selection, **Page 16-6**.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Modification Code **R5**.

② Circuitry arranged for double-pole pilot devices.

③ All duplexes come standard with alternator. To remove, add Modification Code **D12**.

④ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑤ Requires 2 starters.

Cover Control ..... **Page 8-18**
Other Magnet Coils ..... **Page 8-17**
Dimensions ..... **Page 15-9**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Features

- Full Voltage Non-reversing Combination
- 3-Phase Magnetic, 3-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

Table 8-16. Class ECN69 — Combination Duplex Pump Panels with Automatic Alternator — Fusible Disconnect ④⑤

NEMA Size	Motor Voltage	Max. hp Rating Dual Element Fuses	Magnet Coil Voltage ①	Fuse Clip Amps.	Type 1 General Purpose Catalog Number	Type 3R Rainproof Catalog Number	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ②③ Catalog Number	Component Starter (Open) ⑦ Catalog Number
0	230	3	120	30A	**ECN6901AAB**	**ECN6902AAB**	**ECN6904AAB**	**ECN6908AAB**	**AN16BN0AC**
	460	5	120		**ECN6901AAC**	**ECN6902AAC**	**ECN6904AAC**	**ECN6908AAC**	**AN16BN0AC**
	200	3	208		**ECN6901EAB**	**ECN6902EAB**	**ECN6904EAB**	**ECN6908EAB**	**AN16BN0EC**
	230	3	240		**ECN6901BAB**	**ECN6902BAB**	**ECN6904BAB**	**ECN6908BAB**	**AN16BN0BC**
	460	5	480		**ECN6901CAC**	**ECN6902CAC**	**ECN6904CAC**	**ECN6908CAC**	**AN16BN0CC**
	575	5	600		**ECN6901DAC**	**ECN6902DAC**	**ECN6904DAC**	**ECN6908DAC**	**AN16BN0DC**
1	230	7-1/2	120	30A	**ECN6911AAB**	**ECN6912AAB**	**ECN6914AAB**	**ECN6918AAB**	**AN16DN0AB**
	460	10	120		**ECN6911AAC**	**ECN6912AAC**	**ECN6914AAC**	**ECN6918AAC**	**AN16DN0AB**
	200	7-1/2	208		**ECN6911EAB**	**ECN6912EAB**	**ECN6914EAB**	**ECN6918EAB**	**AN16DN0EB**
	230	7-1/2	240		**ECN6911BAB**	**ECN6912BAB**	**ECN6914BAB**	**ECN6918BAB**	**AN16DN0BB**
	460	10	480		**ECN6911CAC**	**ECN6912CAC**	**ECN6914CAC**	**ECN6918CAC**	**AN16DN0CB**
	575	10	600		**ECN6911DAC**	**ECN6912DAC**	**ECN6914DAC**	**ECN6918DAC**	**AN16DN0DB**
2	230	15	120	60A	**ECN6921AAD**	**ECN6922AAD**	**ECN6924AAD**	**ECN6928AAD**	**AN16GN0AB**
	460	25	120		**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	25	600		**ECN6921DAE**	**ECN6922DAE**	**ECN6924DAE**	**ECN6928DAE**	**AN16GN0DB**
3	230	30	120	100A	**ECN6931AAF**	**ECN6932AAF**	**ECN6934AAF**	**ECN6938AAF**	**AN16KN0A**
	460	50	120		**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	50	600		**ECN6931DAG**	**ECN6932DAG**	**ECN6934DAG**	**ECN6938DAG**	**AN16KN0D**
4	230	50	120	200A	**ECN6941AAH**	**ECN6942AAH**	**ECN6944AAH**	**ECN6948AAH**	**AN16NN0A**
	460	100	120		**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	100	600		**ECN6941DAJ**	**ECN6942DAJ**	**ECN6944DAJ**	**ECN6948DAJ**	**AN16NN0D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each motor). Heater Pack Selection, **Page 16-6**.

① 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.

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 Circuitry arranged for double-pole pilot devices.

⑤ All duplexes come standard with alternator. To remove, add Modification Code **D12**.

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECN690**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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Requires 2 starters.

Cover Control ..... **Page 8-18**
Other Magnet Coils ..... **Page 8-17**
Dimensions ..... **Page 15-9**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 8-17. Class ECN69 — Combination Duplex Pump Panels with Automatic Alternator — Non-fusible Disconnect ③④

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 ⑤ Watertight & Dust-Tight Stainless Steel Catalog Number	Type 12 Dust-Tight Industrial External Reset ①② 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	3	240		**ECN6901BAA**	**ECN6902BAA**	**ECN6904BAA**	**ECN6908BAA**	**AN16BN0BC**
	460	5	480		**ECN6901CAA**	**ECN6902CAA**	**ECN6904CAA**	**ECN6908CAA**	**AN16BN0CC**
	575	5	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	7-1/2	240		**ECN6911BAA**	**ECN6912BAA**	**ECN6914BAA**	**ECN6918BAA**	**AN16DN0BB**
	460	10	480		**ECN6911CAA**	**ECN6912CAA**	**ECN6914CAA**	**ECN6918CAA**	**AN16DN0CB**
	575	10	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	25	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	50	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	100	600		**ECN6941DAA**	**ECN6942DAA**	**ECN6944DAA**	**ECN6948DAA**	**AN16NN0D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each motor). Heater Pack Selection, **Page 16-6**.

① All Type 12 enclosures are standardized with external reset. For internal reset, order Modification Code **R5**.

② Type 12 enclosure is without safety door interlock.

③ Circuitry arranged for double-pole pilot devices.

④ All duplexes come standard with alternator. To remove, add Modification Code **D12**.

⑤ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑥ Requires 2 starters.

Cover Control ..... **Page 8-18**
Other Magnet Coils ..... **Page 8-17**
Dimensions ..... **Page 15-9**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

Table 8-18. Class ECN70 — Combination Duplex Pump Panels with Automatic Alternator — Circuit Breaker ④⑤

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X ⑥ Watertight & Dust-Tight Stainless Steel	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open) ⑦
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
0	200	1 3	208	HMCPE 7A HMCPE 15A	**ECN7001EAC** **ECN7001EAD**	**ECN7002EAC** **ECN7002EAD**	**ECN7004EAC** **ECN7004EAD**	**ECN7008EAC** **ECN7008EAD**	**AN16BN0EC**
	230	1 3	240	HMCPE 7A HMCPE 15A	**ECN7001BAC** **ECN7001BAD**	**ECN7002BAC** **ECN7002BAD**	**ECN7004BAC** **ECN7004BAD**	**ECN7008BAC** **ECN7008BAD**	**AN16BN0BC**
	460	3/4 2 5	480	HMCPE 3A HMCPE 7A HMCPE 15A	**ECN7001CAB** **ECN7001CAC** **ECN7001CAD**	**ECN7002CAB** **ECN7002CAC** **ECN7002CAD**	**ECN7004CAB** **ECN7004CAC** **ECN7004CAD**	**ECN7008CAB** **ECN7008CAC** **ECN7008CAD**	**AN16BN0CC**
	575	1 3 3	600	HMCP 3A HMCP 7A HMCP 15A	**ECN7001DAB** **ECN7001DAC** **ECN7001DAD**	**ECN7002DAB** **ECN7002DAC** **ECN7002DAD**	**ECN7004DAB** **ECN7004DAC** **ECN7004DAD**	**ECN7008DAB** **ECN7008DAC** **ECN7008DAD**	**AN16BN0DC**
1	200	1 2 7-1/2	208	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN7011EAC** **ECN7011EAD** **ECN7011EAE**	**ECN7012EAC** **ECN7012EAD** **ECN7012EAE**	**ECN7014EAC** **ECN7014EAD** **ECN7014EAE**	**ECN7018EAC** **ECN7018EAD** **ECN7018EAE**	**AN16DN0EB**
	230	1 2 7-1/2	240	HMCPE 7A HMCPE 15A HMCPE 30A	**ECN7011BAC** **ECN7011BAD** **ECN7011BAE**	**ECN7012BAC** **ECN7012BAD** **ECN7012BAE**	**ECN7014BAC** **ECN7014BAD** **ECN7014BAE**	**ECN7018BAC** **ECN7018BAD** **ECN7018BAE**	**AN16DN0BB**
	460	3/4 2 5 10	480	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECN7011CAB** **ECN7011CAC** **ECN7011CAD** **ECN7011CAE**	**ECN7012CAB** **ECN7012CAC** **ECN7012CAD** **ECN7012CAE**	**ECN7014CAB** **ECN7014CAC** **ECN7014CAD** **ECN7014CAE**	**ECN7018CAB** **ECN7018CAC** **ECN7018CAD** **ECN7018CAE**	**AN16DN0CB**
	575	1 3 7-1/2 10	600	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN7011DAB** **ECN7011DAC** **ECN7011DAD** **ECN7011DAE**	**ECN7012DAB** **ECN7012DAC** **ECN7012DAD** **ECN7012DAE**	**ECN7014DAB** **ECN7014DAC** **ECN7014DAD** **ECN7014DAE**	**ECN7018DAB** **ECN7018DAC** **ECN7018DAD** **ECN7018DAE**	**AN16DN0DB**
2	200 230 460	10 15 25	208 240 480	HMCPE 50A	**ECN7021EAF** **ECN7021BAF** **ECN7021CAF**	**ECN7022EAF** **ECN7022BAF** **ECN7022CAF**	**ECN7024EAF** **ECN7024BAF** **ECN7024CAF**	**ECN7028EAF** **ECN7028BAF** **ECN7028CAF**	**AN16GN0EB** **AN16GN0BB** **AN16GN0CB**
	575	25	600	HMCP 50A	**ECN7021DAF**	**ECN7022DAF**	**ECN7024DAF**	**ECN7028DAF**	**AN16GN0DB**
3	200 230 460	25 30 50	208 240 480	HMCPE 100A	**ECN7031EAG** **ECN7031BAG** **ECN7031CAG**	**ECN7032EAG** **ECN7032BAG** **ECN7032CAG**	**ECN7034EAG** **ECN7034BAG** **ECN7034CAG**	**ECN7038EAG** **ECN7038BAG** **ECN7038CAG**	**AN16KN0E** **AN16KN0B** **AN16KN0C**
	575	50	600	HMCP 100A	**ECN7031DAI**	**ECN7032DAI**	**ECN7034DAI**	**ECN7038DAI**	**AN16KN0D**
4	200 230 460 575	40 50 100 100	208 240 480 600	HMCP 150A	**ECN7041EAH** **ECN7041BAH** **ECN7041CAH** **ECN7041DAH**	**ECN7042EAH** **ECN7042BAH** **ECN7042CAH** **ECN7042DAH**	**ECN7044EAH** **ECN7044BAH** **ECN7044CAH** **ECN7044DAH**	**ECN7048EAH** **ECN7048BAH** **ECN7048CAH** **ECN7048DAH**	**AN16NN0E** **AN16NN0B** **AN16NN0C** **AN16NN0D**

Starters do not include heater packs. Select 2 cartons of 3 heater packs (2 overload relays — 1 for each motor). Heater Pack Selection, **Page 16-6**.

① 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.

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 Circuitry arranged for double-pole pilot devices.

⑤ All duplexes come standard with alternator. To remove, add Modification Code **D12**.

⑥ The Catalog Numbers listed in the Type 4X column are for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ Requires 2 starters.

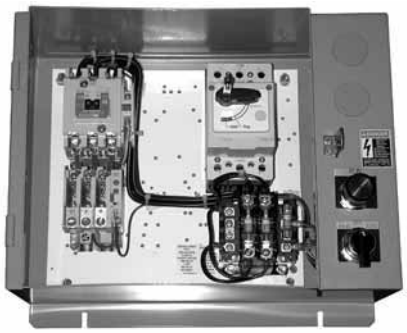
Cover Control ..... **Page 8-18**
Other Magnet Coils ..... **Page 8-17**
Dimensions ..... **Page 15-9**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-7**

HVAC Control

Contents

9

HVAC Starter



HVAC Panel with Bimetallic Overload and HMCPE

9

Product Description

Eaton's Cutler-Hammer® 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 ±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.
- Bimetallic, ambient compensated operated. Trip free mechanism.
- Electrically isolated NO-NC contacts (pull RESET button to test). (Electrical Ratings see **Table 18-15** on **Page 18-12**).
- 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

Eaton's Cutler-Hammer Motor Control Center and Enclosed Control Product Lines now offer the latest in motor protection through the use of the solid-state overload relay. It provides higher accuracy, less heat dissipation and enhanced protection through the use of state-of-the-art microelectronic packaging technology. Solid-state overload relays are standard with Trip Class 5, 10, 20 and 30 Manual/Automatic Reset. Key features of the solid-state overload relays include:

- Standard Version: Selectable trip class (5, 10, 20, 30) with Selectable Manual or Auto Reset
- Broad 5:1 FLA range
- Self-Powered Design, will accept AC voltages from 12 – 690V 50/60 Hz
- Ambient Temperature Compensation
- Low Heat Generation
- Phase Loss Protection
- Phase Unbalance Protection
- Electrically Isolated 1NO-1NC Contacts (Push-to-Test)
- Trip Status Indicator
- FLA Range of 0.1 – 1500 Amps

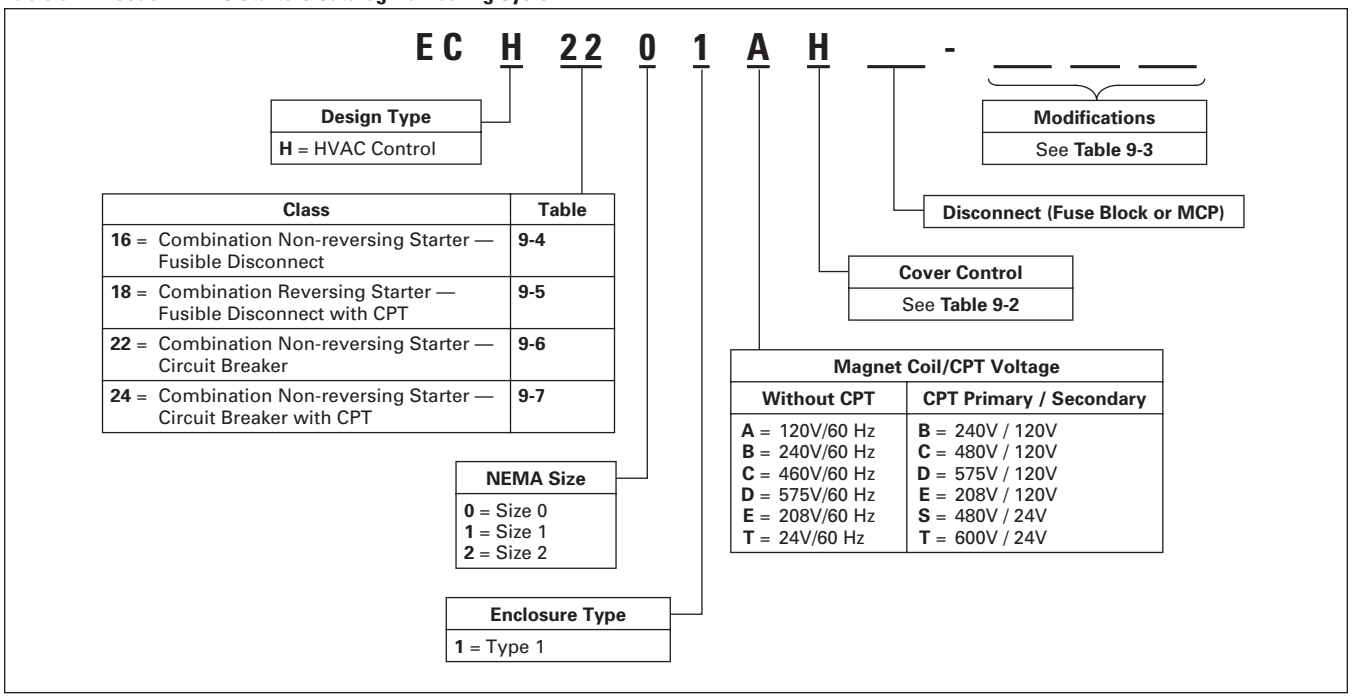
Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- ABS Type Approval

Catalog Number Selection

Table 9-1. Freedom HVAC Starters Catalog Numbering System



Cover Control

Table 9-2. Pilot Device Factory Installation

Description	Position 9 Alpha
None	**A**
HAND/OFF/AUTO	**H**
HAND/OFF/AUTO with Red RUN Pilot	**J**

Modification Codes

Table 9-3. HVAC Modification Codes

Modification	Catalog Number Suffix	Description
Auxiliary Contacts	**A27**	1NO — Wired
	A28	1NC — Wired
	A29	1NO 1NC — Wired
Solid-State Overloads	**R61/A**	Size 0 — 0.1 – 0.5A
	R61/B	Size 0 — 0.2 – 2.0A
	R61/C	Size 0 — 1.0 – 5.0A
	R61/D	Size 1 — 1.6 – 8.0A
	R61/E	Size 1 — 6.4 – 32A
	R61/F	Size 2 — 9.0 – 45A
Heaters	**H5/D1**	.254 – .411A
	H5/D2	.375 – .607A
	H5/D3	.560 – .907A
	H5/D4	.814 – 1.32A
Heaters, continued	**H5/D5**	1.20 – 1.96A
	H5/D6	1.79 – 2.90A
	H5/D7	2.15 – 3.49A
	H5/D8	3.23 – 5.23A
	H5/D9	4.55 – 7.40A
	H5/D10	6.75 – 11.0A
	H5/D11	9.14 – 14.0A
	H5/D12	14.0 – 22.8A
	H5/D13	18.7 – 30.7A
	H5/D14	23.5 – 38.5A
Labels and Timers	**L10**	Carton Label
	T1	Pneumatic Timer (.1 – 30 sec. max.)
	T2	Pneumatic Timer (10 – 180 sec. max.)
	T4	Solid-State ON Delay Timer (1 – 30 secs.)
	T5	Solid-State ON Delay Timer (30 – 300 secs.)

Product Selection

Table 9-4. Class ECH16 — Combination Non-reversing Starter — Fusible Disconnect

NEMA Size	Motor Voltage	Max. hp	Coil Voltage	Type 1	Type 1 with HOA	Type 1 with HOA & Red RUN Pilot	Component Starter (Open)
				Catalog Number ①	Catalog Number ①	Catalog Number ①	Catalog Number ②
0	230	3	120 240 460	ECH1601AA_ ECH1601BA_ ECH1601CA_	ECH1601AH_ ECH1601BH_ ECH1601CH_	ECH1601AJ_ ECH1601BJ_ ECH1601CJ_	AN16BN0AC AN16BN0BC AN16BN0CC
	480	5	575 208 24	ECH1601DA_ ECH1601EA_ ECH1601TA_	ECH1601DH_ ECH1601EH_ ECH1601TH_	ECH1601DJ_ ECH1601EJ_ ECH1601TJ_	AN16BN0DC AN16BN0EC AN16BN0TC
1	230	7-1/2	120 240 460	ECH1611AA_ ECH1611BA_ ECH1611CA_	ECH1611AH_ ECH1611BH_ ECH1611CH_	ECH1611AJ_ ECH1611BJ_ ECH1611CJ_	AN16DN0AB AN16DN0BB AN16DN0CB
	480	10	575 208 24	ECH1611DA_ ECH1611EA_ ECH1611TA_	ECH1611DH_ ECH1611EH_ ECH1611TH_	ECH1611DJ_ ECH1611EJ_ ECH1611TJ_	AN16DN0DB AN16DN0EB AN16DN0TB
2	230	15	120 240 460	ECH1621AA_ ECH1621BA_ ECH1621CA_	ECH1621AH_ ECH1621BH_ ECH1621CH_	ECH1621AJ_ ECH1621BJ_ ECH1621CJ_	AN16GN0AB AN16GN0BB AN16GN0CB
	480	25	575 208 24	ECH1621DA_ ECH1621EA_ ECH1621TA_	ECH1621DH_ ECH1621EH_ ECH1621TH_	ECH1621DJ_ ECH1621EJ_ ECH1621TJ_	AN16GN0DB AN16GN0EB AN16GN0TB

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)

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.

Table 9-5. Class ECH18 — Combination Reversing Starter — Fusible Disconnect with CPT

NEMA Size	Motor Voltage	Max. hp	Coil Voltage	Type 1	Type 1 with HOA	Type 1 with HOA & Red RUN Pilot	Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ④
0	230	3	120 240 460	ECH1801BA_ ECH1801CA_ ECH1801DA_	ECH1801BH_ ECH1801CH_ ECH1801DH_	ECH1801BJ_ ECH1801CJ_ ECH1801DJ_	AN16BN0AC AN16BN0BC AN16BN0CC
	480	5	575 208 24	ECH1801EA_ ECH1801SA_ ECH1801TA_	ECH1801EH_ ECH1801SH_ ECH1801TH_	ECH1801EJ_ ECH1801SJ_ ECH1801TJ_	AN16BN0DC AN16BN0EC AN16BN0TC
1	230	7-1/2	120 240 460	ECH1811BA_ ECH1811CA_ ECH1811DA_	ECH1811BH_ ECH1811CH_ ECH1811DH_	ECH1811BJ_ ECH1811CJ_ ECH1811DJ_	AN16DN0AB AN16DN0BB AN16DN0CB
	480	10	575 208 24	ECH1811EA_ ECH1811SA_ ECH1811TA_	ECH1811EH_ ECH1811SH_ ECH1811TH_	ECH1811EJ_ ECH1811SJ_ ECH1811TJ_	AN16DN0DB AN16DN0EB AN16DN0TB
2	230	15	120 240 460	ECH1821BA_ ECH1821CA_ ECH1821DA_	ECH1821BH_ ECH1821CH_ ECH1821DH_	ECH1821BJ_ ECH1821CJ_ ECH1821DJ_	AN16GN0AB AN16GN0BB AN16GN0CB
	480	25	575 208 24	ECH1821EA_ ECH1821SA_ ECH1821TA_	ECH1821EH_ ECH1821SH_ ECH1821TH_	ECH1821EJ_ ECH1821SJ_ ECH1821TJ_	AN16GN0DB AN16GN0EB AN16GN0TB

③ 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)

④ If the solid-state overload option is selected, refer to Publication Number TD03408001E, Relay for MCCs and Enclosed Control Technical Data, for component selection.

Product Selection

Table 9-6. Class ECH22 — Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp	Coil Voltage	Type 1	Type 1 with HOA	Type 1 with HOA & Red RUN Pilot	Component Starter (Open)
				Catalog Number ①	Catalog Number ①	Catalog Number ①	Catalog Number ②
0	230	3	120 240 460	ECH2201AA_ ECH2201BA_ ECH2201CA_	ECH2201AH_ ECH2201BH_ ECH2201CH_	ECH2201AJ_ ECH2201BJ_ ECH2201CJ_	AN16BN0AC AN16BN0BC AN16BN0CC
	480	5	575 208 24	ECH2201DA_ ECH2201EA_ ECH2201TA_	ECH2201DH_ ECH2201EH_ ECH2201TH_	ECH2201DJ_ ECH2201EJ_ ECH2201TJ_	AN16BN0DC AN16BN0EC AN16BN0TC
1	230	7-1/2	120 240 460	ECH2211AA_ ECH2211BA_ ECH2211CA_	ECH2211AH_ ECH2211BH_ ECH2211CH_	ECH2211AJ_ ECH2211BJ_ ECH2211CJ_	AN16DN0AB AN16DN0BB AN16DN0CB
	480	10	575 208 24	ECH2211DA_ ECH2211EA_ ECH2211TA_	ECH2211DH_ ECH2211EH_ ECH2211TH_	ECH2211DJ_ ECH2211EJ_ ECH2211TJ_	AN16DN0DB AN16DN0EB AN16DN0TB
2	230	15	120 240 460	ECH2221AA_ ECH2221BA_ ECH2221CA_	ECH2221AH_ ECH2221BH_ ECH2221CH_	ECH2221AJ_ ECH2221BJ_ ECH2221CJ_	AN16GN0AB AN16GN0BB AN16GN0CB
	480	25	575 208 24	ECH2221DA_ ECH2221EA_ ECH2221TA_	ECH2221DH_ ECH2221EH_ ECH2221TH_	ECH2221DJ_ ECH2221EJ_ ECH2221TJ_	AN16GN0DB AN16GN0EB AN16GN0TB

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	15 Amp	D
3 Amp	B	30 Amp	E
7 Amp	C	50 Amp	F

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.

Table 9-7. Class ECH24 — Combination Non-reversing Starter — Circuit Breaker with CPT

NEMA Size	Motor Voltage	Max. hp	Coil Voltage	Type 1	Type 1 with HOA	Type 1 with HOA & Red RUN Pilot	Component Starter (Open)
				Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ④
0	230	3	120 240 460	ECH2401BA_ ECH2401CA_ ECH2401DA_	ECH2401BH_ ECH2401CH_ ECH2401DH_	ECH2401BJ_ ECH2401CJ_ ECH2401DJ_	AN16BN0AC AN16BN0BC AN16BN0CC
	480	5	575 208 24	ECH2401EA_ ECH2401SA_ ECH2401TA_	ECH2401EH_ ECH2401SH_ ECH2401TH_	ECH2401EJ_ ECH2401SJ_ ECH2401TJ_	AN16BN0DC AN16BN0EC AN16BN0TC
1	230	7-1/2	120 240 460	ECH2411BA_ ECH2411CA_ ECH2411DA_	ECH2411BH_ ECH2411CH_ ECH2411DH_	ECH2411BJ_ ECH2411CJ_ ECH2411DJ_	AN16DN0AB AN16DN0BB AN16DN0CB
	480	10	575 208 24	ECH2411EA_ ECH2411SA_ ECH2411TA_	ECH2411EH_ ECH2411SH_ ECH2411TH_	ECH2411EJ_ ECH2411SJ_ ECH2411TJ_	AN16DN0DB AN16DN0EB AN16DN0TB
2	230	15	120 240 460	ECH2421BA_ ECH2421CA_ ECH2421DA_	ECH2421BH_ ECH2421CH_ ECH2421DH_	ECH2421BJ_ ECH2421CJ_ ECH2421DJ_	AN16GN0AB AN16GN0BB AN16GN0CB
	480	25	575 208 24	ECH2421EA_ ECH2421SA_ ECH2421TA_	ECH2421EH_ ECH2421SH_ ECH2421TH_	ECH2421EJ_ ECH2421SJ_ ECH2421TJ_	AN16GN0DB AN16GN0EB AN16GN0TB

③ 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	15 Amp	D
3 Amp	B	30 Amp	E
7 Amp	C	50 Amp	F

④ If the solid-state overload option is selected, refer to Publication Number TD03408001E, Relay for MCCs and Enclosed Control Technical Data, for component selection.

Wiring Diagrams

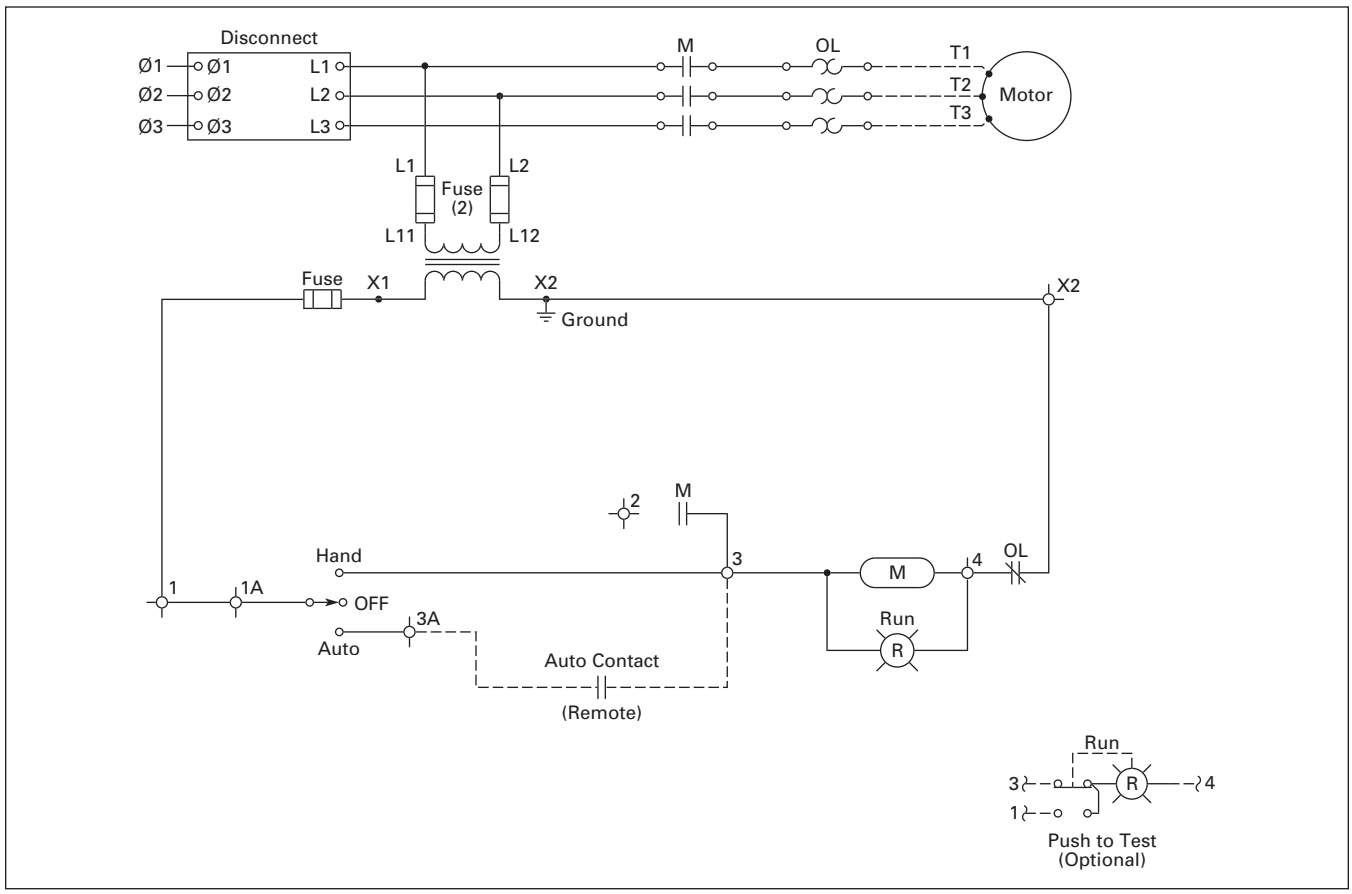


Figure 9-1. HVAC Combination Starter with CPT, HOA and Indicating Light

Dimensions

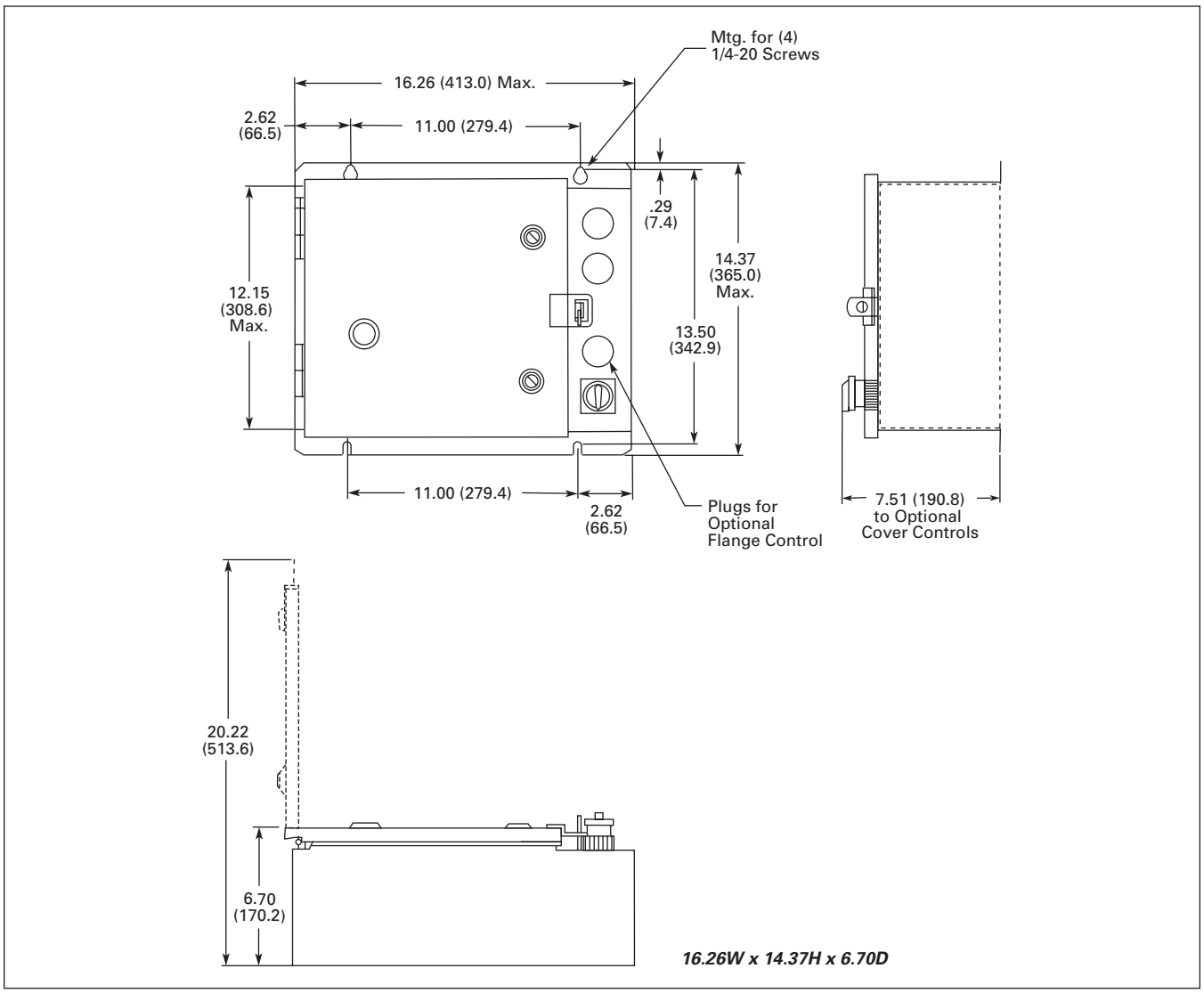
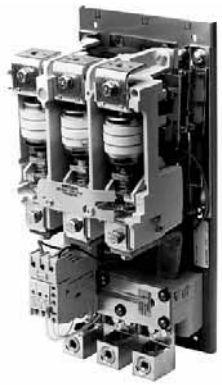


Figure 10. Box 7, Type 1 — Approximate Dimensions in Inches (mm)

NEMA Vacuum Break Contactors & Starters

Contents

NEMA Vacuum Break Starter



Cat. No. AV10GNOA or V200M5CJC Vacuum Break Starter

Product Description

- 3-Phase Magnetic
- 3-Pole Full Voltage
- Non-reversing and Reversing
- 600 and 1500V AC Maximum
- Starters with Interchangeable Heater OLR

Application Description

Eaton's Cutler-Hammer 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.

Features/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

Operation

The contact structures of these vacuum break contactors are located inside sealed ceramic tubes which 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 feet, the contactor is designed to tolerate normal variations in barometric pressure. If the contactor is to be operated above 6600 feet above sea level, consult Eaton.

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL listed
- cUL Listed (indicates appropriate CSA Standand investigation)
- CE Mark available
- ABS Type Approved

Catalog Number Selection

Table 10-1. NEMA Vacuum Break Catalog Numbering System

E C V 0 5 5 1 A A A -

Design
V = Vacuum

Class	Table
01 = Non-reversing Contactor — 3-Pole	**10-5**
02 = Reversing Contactor — 3-Pole	**10-6**
05 = Non-combination Non-reversing Starters	**10-9**
06 = Non-combination Reversing Starters	**10-10**
07 = Non-combination Non-reversing Starters with CPT	**10-11**
16 = Combination Non-reversing Starters — Fusible and Non-fusible Disconnect	**10-12**
17 = Combination Reversing Starters — Fusible and Non-fusible Disconnect	**10-13**
18 = Combination Non-reversing Starters — Fusible and Non-fusible Disconnect with CPT	**10-14**
22 = Combination Non-reversing Starters — Circuit Breaker	**10-15**
23 = Combination Reversing Starters — Circuit Breaker	**10-16**
24 = Combination Non-reversing Starters — Circuit Breaker with CPT	**10-17**

NEMA Size
4
5
6

Enclosure Type
1 = 1 — General Purpose
2 = 3R — Rainproof
3 = 4 — Painted Steel
4 = 4X — 304-Grade Stainless Steel
8 = 12 — Dust-Tight
9 = 4X — 316-Grade Stainless Steel

Coil Voltage or Motor Voltage	
A = 120V	**D** = 575V
B = 230V	**E** = 200V
C = 460V	**V** = 380V

Cover Control
Non-rev. Starters see **Table 10-3** Rev. Starters see **Table 10-4**
Contactors
3 = 3 Poles

Disconnect Fuse Clip Ratings	
A = None	**L** = 400A/600V R
H = 200A/250V R	**M** = 600A/250V R
J = 200A/600V R	**N** = 600A/600V R
K = 400A/250V R	
Breaker Ratings	
A = None	**K** = 400A
H = 150A	**L** = 600A
J = 250A	**M** = 800A

Modification Codes
(See **Page 16-40**)

Table 10-2. Alternate "Open" Catalog Numbers

Listed "Open" Catalog Number	Alternate "Open" Catalog Number
AV10FNOA **AV10GNOAB** **AV10JNOAB**	**V200M4CJC** **V200M5CJC** **V200M6CJC**
CV10FN3A **CV10GN3A** **CV10JN3A**	**V201K4CJ** **V201K5CJZ1** **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 9th character of the Catalog Number to the alpha shown in the table to the right. Example: to order an **ECV0548AAA** with START/STOP push-buttons and a red pilot light, change the **A** to a **C**, i.e. ECV0548A**C**A.

Table 10-3. Non-reversing Cover Control Field Kits and Factory Installation

Description	Factory Installed Flange Control	Field Installation Kits	
	Position 9 Alpha	Type 1 Non-combination ②	All Others ③
		Catalog Number	Catalog Number
No Cover Mounted Pilot Devices	**A**	**C400GK0**	—
START/STOP Pushbuttons	**B**	**C400GK1**	**C400T1**
with Red RUN Pilot Light	**C**	**C400GK12** ①	—
with Red RUN/Green OFF Lights	**D**	**C400GK16** ①	—
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** ①	—
with Red RUN/Green OFF Lights	**K**	**C400GK36** ①	—
START Pushbutton	**L**	—	**C400T3**
ON Pushbutton	**M**	—	**C400T4**
OFF Pushbutton	**N**	—	**C400T5**
Red RUN Pilot Light	**P**	**C400GK42** ①	**C400T9** ①
Green OFF	**Q**	**C400GK41** ①	**C400T10** ①
Red RUN/Green OFF Pilot Lights	**R**	**C400GK46** ①	**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**	—	—

① 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**

② Type 1 Non-combination, Size 4.

③ Type 1 Non-combination, Sizes 5 & 6; Type 3R, 4X, 12 Non-combination, all Sizes; All Combination Control.

Reversing

Flange Control Kits

For on-the-job conversion of Type1, 3R, 4X and 12 enclosed starters. Knockouts are provided on the Type1 flange. Type 3R, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed

To order factory installed pilot devices, change the 9th character of the Catalog Number to the alpha shown in the table to the right. Example: to order an **ECV1748AAH** with FOR/REV/STOP pushbuttons and 2 red pilot lights, change the **A** to a **C**, i.e. ECV1748A**C**H.

Table 10-4. Reversing Cover Control Field Kits and Factory Installation

Description	Factory Installed Flange Control	Field Installation Kits	
	Position 9 Alpha	Type 1 Non-combination ⑤	All Others ⑥
		Catalog Number	Catalog Number
No Cover Mounted Pilot Devices	**A**	**C400GK0**	—
FOR/REV/STOP Pushbuttons	**B**	**C400GR1**	**C400T6**
with 2 Red Pilot Lights	**C**	**C400GR14** ④	—
with 2 Red/1 Green Pilot Lights	**D**	—	—
UP/STOP/DOWN Pushbuttons	**E**	**C400GR2**	—
with 2 Red Pilot Lights	**F**	**C400GR24** ④	—
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** ④	⑦
One Green Pilot Light	**Q**	**C400GK41** ④	**C400T10** ④
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**	—	—

④ 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**

⑤ Type 1 Non-combination, Size 4.

⑥ Type 1 Non-combination, Sizes 5 & 6; Type 3R, 4X, 12 Non-combination, all Sizes; All Combination Control.

⑦ Order quantity 2 of **C400T9**④.

Product Selection

Table 10-5. Class ECV01 — Non-reversing Contactor — 3-Pole

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ①	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial	Component Contactor (Open) ③
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	135	— 200 230 380 460 575	— 40 50 75 100 100	110/120	**ECV0141A3A**	**ECV0142A3A**	**ECV0144A3A**	**ECV0148A3A**	**CV10FN3A**
5	270	— 200 230 380 460 575	— 75 100 150 200 200	110/120	**ECV0151A3A**	**ECV0152A3A**	**ECV0154A3A**	**ECV0158A3A**	**CV10GN3A**
6	540	— 200 230 380 460 575	— 150 200 300 400 400	110/120	**ECV0161A3A**	**ECV0162A3A**	**ECV0164A3A**	**ECV0168A3A**	**CV10JN3A**

① Wired for separate control.

② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.

Table 10-6. Class ECV02 — Reversing Contactor — 3-Pole

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ④	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ⑤	Type 12 Dust-Tight Industrial	Component Contactor (Open) ⑥
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	135	— 200 230 380 460 575	— 40 50 75 100 100	110/120	**ECV0241A3A**	**ECV0242A3A**	**ECV0244A3A**	**ECV0248A3A**	**V211K4CJ**
5	270	— 200 230 380 460 575	— 75 100 150 200 200	110/120	**ECV0251A3A**	**ECV0252A3A**	**ECV0254A3A**	**ECV0258A3A**	**V211K5CJZ1**
6	540	— 200 230 380 460 575	— 150 200 300 400 400	110/120	**ECV0261A3A**	**ECV0262A3A**	**ECV0264A3A**	**ECV0268A3A**	**V211K6CJZ1**

④ Wired for separate control.

⑤ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECV0244A31. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑥ Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.

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.

Table 10-7. Auxiliary Contacts

Contact Arrangement	Catalog Number
1NO-1NC	**J11**
2NO	**J20**
2NC	**J02**

Table 10-8. Horizontal Mechanical Interlock

Size	Catalog Number
4	**180C113G04**
5	**180C113G12**
6	**180C113G13**

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Product Selection

Table 10-9. 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	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ④	Component Starter (Open) ③
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	135	— 200 230 380 460 575	— 40 50 75 100 100	110/120	**ECV0541AAA**	**ECV0542AAA**	**ECV0544AAA**	**ECV0548AAA**	**AV10FNOA**
5	270	— 200 230 380 460 575	— 75 100 150 200 200	110/120	**ECV0551AAA**	**ECV0552AAA**	**ECV0554AAA**	**ECV0558AAA**	**AV10GNOAB**
6	540	— 200 230 380 460 575	— 150 200 300 400 400	110/120	**ECV0561AAA**	**ECV0562AAA**	**ECV0564AAA**	**ECV0568AAA**	**AV10JNOAB**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**. **Starters with Electronic Overload**, see **Page 16-45** of Modification Codes.									

① Wired for separate control.

② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECV0544AAA. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

③ Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.

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

Table 10-10. Class ECV06 — Non-combination Reversing Starter

NEMA Size	Enclosed Ampere Rating	Motor Voltage	Maximum hp Rating	Magnet Coil Voltage ⑤	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ⑥	Type 12 Dust-Tight Industrial External Reset ⑦	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	135	— 200 230 380 460 575	— 40 50 75 100 100	110/120	**ECV0641AAA**	**ECV0642AAA**	**ECV0644AAA**	**ECV0648AAA**	**V210M4CJC**
5	270	— 200 230 380 460 575	— 75 100 150 200 200	110/120	**ECV0651AAA**	**ECV0652AAA**	**ECV0654AAA**	**ECV0658AAA**	**V210M5CJC**
6	540	— 200 230 380 460 575	— 150 200 300 400 400	110/120	**ECV0661AAA**	**ECV0662AAA**	**ECV0664AAA**	**ECV0668AAA**	**V210M6CJC**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**. **Starters with Electronic Overload**, see **Page 16-45** of Modification Codes.									

⑤ Wired for separate control.

⑥ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

⑦ All Type 12 enclosures are standardized with external reset. For internal reset, order Modification Code **R5**.

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Table 10-11. 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	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ①	Type 12 Dust-Tight Industrial External Reset ③	Component Starter (Open) ②
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	135	200 230 380 460 575	40 50 75 100 100	110/120	**ECV0741EAA** **ECV0741BAA** **ECV0741VAA** **ECV0741CAA** **ECV0741DAA**	**ECV0742EAA** **ECV0742BAA** **ECV0742VAA** **ECV0742CAA** **ECV0742DAA**	**ECV0744EAA** **ECV0744BAA** **ECV0744VAA** **ECV0744CAA** **ECV0744DAA**	**ECV0748EAA** **ECV0748BAA** **ECV0748VAA** **ECV0748CAA** **ECV0748DAA**	**AV10FNOA**
5	270	200 230 380 460 575	75 100 150 200 200	110/120	**ECV0751EAA** **ECV0751BAA** **ECV0751VAA** **ECV0751CAA** **ECV0751DAA**	**ECV0752EAA** **ECV0752BAA** **ECV0752VAA** **ECV0752CAA** **ECV0752DAA**	**ECV0754EAA** **ECV0754BAA** **ECV0754VAA** **ECV0754CAA** **ECV0754DAA**	**ECV0758EAA** **ECV0758BAA** **ECV0758VAA** **ECV0758CAA** **ECV0758DAA**	**AV10GNOAB**
6	540	200 230 380 460 575	150 200 300 400 400	110/120	**ECV0761EAA** **ECV0761BAA** **ECV0761VAA** **ECV0761CAA** **ECV0761DAA**	**ECV0762EAA** **ECV0762BAA** **ECV0762VAA** **ECV0762CAA** **ECV0762DAA**	**ECV0764EAA** **ECV0764BAA** **ECV0764VAA** **ECV0764CAA** **ECV0764DAA**	**ECV0768EAA** **ECV0768BAA** **ECV0768VAA** **ECV0768CAA** **ECV0768DAA**	**AV10JNOAB**

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

② Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.

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

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Product Selection

Table 10-12. 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	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ④⑤	Component Starter (Open) ③
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Fusible									
4	200 230 380 460 575	40 50 75 100 100	110/120	200A	**ECV1641AAH** **ECV1641AAH** **ECV1641AAJ** **ECV1641AAJ** **ECV1641AAJ**	**ECV1642AAH** **ECV1642AAH** **ECV1642AAJ** **ECV1642AAJ** **ECV1642AAJ**	**ECV1644AAH** **ECV1644AAH** **ECV1644AAJ** **ECV1644AAJ** **ECV1644AAJ**	**ECV1648AAH** **ECV1648AAH** **ECV1648AAJ** **ECV1648AAJ** **ECV1648AAJ**	**AV10FNOA**
5	200 230 380 460 575	75 100 150 200 200	110/120	400A	**ECV1651AAK** **ECV1651AAK** **ECV1651AAL** **ECV1651AAL** **ECV1651AAL**	**ECV1652AAK** **ECV1652AAK** **ECV1652AAL** **ECV1652AAL** **ECV1652AAL**	**ECV1654AAK** **ECV1654AAK** **ECV1654AAL** **ECV1654AAL** **ECV1654AAL**	**ECV1658AAK** **ECV1658AAK** **ECV1658AAL** **ECV1658AAL** **ECV1658AAL**	**AV10GNOA**
6	200 230 380 460 575	150 200 300 400 400	110/120	600A	**ECV1661AAM** **ECV1661AAM** **ECV1661AAN** **ECV1661AAN** **ECV1661AAN**	**ECV1662AAM** **ECV1662AAM** **ECV1662AAN** **ECV1662AAN** **ECV1662AAN**	**ECV1664AAM** **ECV1664AAM** **ECV1664AAN** **ECV1664AAN** **ECV1664AAN**	**ECV1668AAM** **ECV1668AAM** **ECV1668AAN** **ECV1668AAN** **ECV1668AAN**	**AV10JNOA**
Non-fusible									
4	— 200 230 380 460 575	— 40 50 75 100 100	110/120	200A	**ECV1641AAA**	**ECV1642AAA**	**ECV1644AAA**	**ECV1648AAA**	**AV10FNOA**
5	— 200 230 380 460 575	— 75 100 150 200 200	110/120	400A	**ECV1651AAA**	**ECV1652AAA**	**ECV1654AAA**	**ECV1658AAA**	**AV10GNOA**
6	— 200 230 380 460 575	— 150 200 300 400 400	110/120	600A	**ECV1661AAA**	**ECV1662AAA**	**ECV1664AAA**	**ECV1668AAA**	**AV10JNOA**

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Wired for separate control.
② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECV164**4**AAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
③ Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.
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 Code **E11**.

Type 12 Non-reversing Vacuum Starter with Fused Disconnect

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Table 10-13. 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	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ①	Type 12 Dust-Tight Industrial External Reset ②③	Component Starter (Open)
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Fusible									
4	200 230 380 460 575	40 50 75 100 100	110/120	200A	**ECV1741AAH** **ECV1741AAH** **ECV1741AAJ** **ECV1741AAJ** **ECV1741AAJ**	**ECV1742AAH** **ECV1742AAH** **ECV1742AAJ** **ECV1742AAJ** **ECV1742AAJ**	**ECV1744AAH** **ECV1744AAH** **ECV1744AAJ** **ECV1744AAJ** **ECV1744AAJ**	**ECV1748AAH** **ECV1748AAH** **ECV1748AAJ** **ECV1748AAJ** **ECV1748AAJ**	**V210M4CJC**
5	200 230 380 460 575	75 100 150 200 200	110/120	400A	**ECV1751AAK** **ECV1751AAK** **ECV1751AAL** **ECV1751AAL** **ECV1751AAL**	**ECV1752AAK** **ECV1752AAK** **ECV1752AAL** **ECV1752AAL** **ECV1752AAL**	**ECV1754AAK** **ECV1754AAK** **ECV1754AAL** **ECV1754AAL** **ECV1754AAL**	**ECV1758AAK** **ECV1758AAK** **ECV1758AAL** **ECV1758AAL** **ECV1758AAL**	**V210M5CJC**
6	200 230 380 460 575	150 200 300 400 400	110/120	600A	**ECV1761AAM** **ECV1761AAM** **ECV1761AAN** **ECV1761AAN** **ECV1761AAN**	**ECV1762AAM** **ECV1762AAM** **ECV1762AAN** **ECV1762AAN** **ECV1762AAN**	**ECV1764AAM** **ECV1764AAM** **ECV1764AAN** **ECV1764AAN** **ECV1764AAN**	**ECV1768AAM** **ECV1768AAM** **ECV1768AAN** **ECV1768AAN** **ECV1768AAN**	**V210M6CJC**
Non-fusible									
4	— 200 230 380 460 575	— 40 50 75 100 100	110/120	200A	**ECV1741AAA**	**ECV1742AAA**	**ECV1744AAA**	**ECV1748AAA**	**V210M4CJC**
5	— 200 230 380 460 575	— 75 100 150 200 200	110/120	400A	**ECV1751AAA**	**ECV1752AAA**	**ECV1754AAA**	**ECV1758AAA**	**V210M5CJC**
6	— 200 230 380 460 575	— 150 200 300 400 400	110/120	600A	**ECV1761AAA**	**ECV1762AAA**	**ECV1764AAA**	**ECV1768AAA**	**V210M6CJC**

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECV174**4**AAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

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**.

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Table 10-14. 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	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ①	Type 12 Dust-Tight Industrial External Reset ③④	Component Starter (Open) ②
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
Fusible									
4	200 230 380 460 575	40 50 75 100 100	110/120	200A	**ECV1841EAH** **ECV1841BAH** **ECV1841VAJ** **ECV1841CAJ** **ECV1841DAJ**	**ECV1842EAH** **ECV1842BAH** **ECV1842VAJ** **ECV1842CAJ** **ECV1842DAJ**	**ECV1844EAH** **ECV1844BAH** **ECV1844VAJ** **ECV1844CAJ** **ECV1844DAJ**	**ECV1848EAH** **ECV1848BAH** **ECV1848VAJ** **ECV1848CAJ** **ECV1848DAJ**	**AV10FNOA**
5	200 230 380 460 575	75 100 150 200 200	110/120	400A	**ECV1851EAK** **ECV1851BAK** **ECV1851VAL** **ECV1851CAL** **ECV1851DAL**	**ECV1852EAK** **ECV1852BAK** **ECV1852VAL** **ECV1852CAL** **ECV1852DAL**	**ECV1854EAK** **ECV1854BAK** **ECV1854VAL** **ECV1854CAL** **ECV1854DAL**	**ECV1858EAK** **ECV1858BAK** **ECV1858VAL** **ECV1858CAL** **ECV1858DAL**	**AV10GNOA**
6	200 230 380 460 575	150 200 300 400 400	110/120	600A	**ECV1861EAM** **ECV1861BAM** **ECV1861VAN** **ECV1861CAN** **ECV1861DAN**	**ECV1862EAM** **ECV1862BAM** **ECV1862VAN** **ECV1862CAN** **ECV1862DAN**	**ECV1864EAM** **ECV1864BAM** **ECV1864VAN** **ECV1864CAN** **ECV1864DAN**	**ECV1868EAM** **ECV1868BAM** **ECV1868VAN** **ECV1868CAN** **ECV1868DAN**	**AV10JNOA**
Non-fusible									
4	200 230 380 460 575	40 50 75 100 100	110/120	200A	**ECV1841EAA** **ECV1841BAA** **ECV1841VAA** **ECV1841CAA** **ECV1841DAA**	**ECV1842EAA** **ECV1842BAA** **ECV1842VAA** **ECV1842CAA** **ECV1842DAA**	**ECV1844EAA** **ECV1844BAA** **ECV1844VAA** **ECV1844CAA** **ECV1844DAA**	**ECV1848EAA** **ECV1848BAA** **ECV1848VAA** **ECV1848CAA** **ECV1848DAA**	**AV10FNOA**
5	200 230 380 460 575	75 100 150 200 200	110/120	400A	**ECV1851EAA** **ECV1851BAA** **ECV1851VAA** **ECV1851CAA** **ECV1851DAA**	**ECV1852EAA** **ECV1852BAA** **ECV1852VAA** **ECV1852CAA** **ECV1852DAA**	**ECV1854EAA** **ECV1854BAA** **ECV1854VAA** **ECV1854CAA** **ECV1854DAA**	**ECV1858EAA** **ECV1858BAA** **ECV1858VAA** **ECV1858CAA** **ECV1858DAA**	**AV10GNOA**
6	200 230 380 460 575	150 200 300 400 400	110/120	600A	**ECV1861EAA** **ECV1861BAA** **ECV1861VAA** **ECV1861CAA** **ECV1861DAA**	**ECV1862EAA** **ECV1862BAA** **ECV1862VAA** **ECV1862CAA** **ECV1862DAA**	**ECV1864EAA** **ECV1864BAA** **ECV1864VAA** **ECV1864CAA** **ECV1864DAA**	**ECV1868EAA** **ECV1868BAA** **ECV1868VAA** **ECV1868CAA** **ECV1868DAA**	**AV10JNOA**

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECV1844EAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

② Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.

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**.

Type 12 Non-reversing Vacuum Starter with HMCP

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Table 10-15. Class ECV22 — Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ②	Type 12 Dust-Tight Industrial External Reset ④⑤	Component Starter (Open) ③
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	200 230 380 460 575	40 50 75 100 100	110/120	HMCP 150A	**ECV2241AAH**	**ECV2242AAH**	**ECV2244AAH**	**ECV2248AAH**	**AV10FNOA**
5	200 230 460 575	60 75 150 200	110/120	HMCP 250A	**ECV2251AAJ**	**ECV2252AAJ**	**ECV2254AAJ**	**ECV2258AAJ**	**AV10GNOA**
	200 230 380 460	75 100 150 200	110/120	HMCP 400A	**ECV2251AAK**	**ECV2252AAK**	**ECV2254AAK**	**ECV2258AAK**	**AV10GNOA**
6	200 230 460 575	100 150 300 300	110/120	HMCP 600A	**ECV2261AAL**	**ECV2262AAL**	**ECV2264AAL**	**ECV2268AAL**	**AV10JNOA**
	230 460 575	200 400 400	110/120	MD 800A	**ECV2261AAM**	**ECV2262AAM**	**ECV2264AAM**	**ECV2268AAM**	**AV10JNOA**

Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Wired for separate control.
② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.
③ Alternate Catalog Numbers for those listed can be found in **Table 10-2** on **Page 10-4**.
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 Code **E11**.

10

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Table 10-16. Class ECV23 — Combination Reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & 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
4	200 230 380 460 575	40 50 75 100 100	110/120	HMCP 150A	**ECV2341AAH**	**ECV2342AAH**	**ECV2344AAH**	**ECV2348AAH**	**V210M4CJC**
5	200 230 460 575	60 75 150 200	110/120	HMCP 250A	**ECV2351AAJ**	**ECV2352AAJ**	**ECV2354AAJ**	**ECV2358AAJ**	**V210M5CJC**
	200 230 380 460	75 100 150 200	110/120	HMCP 400A	**ECV2351AAK**	**ECV2352AAK**	**ECV2354AAK**	**ECV2358AAK**	**V210M5CJC**
6	200 230 460 575	100 150 300 300	110/120	HMCP 600A	**ECV2361AAL**	**ECV2362AAL**	**ECV2364AAL**	**ECV2368AAL**	**V210M6CJC**
	230 460 575	200 400 400	110/120	MD 800A	**ECV2361AAM**	**ECV2362AAM**	**ECV2364AAM**	**ECV2368AAM**	**V210M6CJC**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**. **Starters with Electronic Overload**, see **Page 16-45** of Modification Codes.									

① Wired for separate control.

② These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECV234**4**AAH. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

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**.

10

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Table 10-17. Class ECV24 — Combination Non-reversing Starter — Circuit Breaker with CPT

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage	Circuit Breaker Type	Type 1 General Purpose	Type 3R Rainproof	Type 4X Watertight & Dust-Tight Stainless Steel ①	Type 12 Dust-Tight Industrial External Reset ②④	Component Starter (Open) ③
					Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
4	200 230 380 460 575	40 50 75 100 100	110/120	HMCP 150A	**ECV2441EAH** **ECV2441BAH** **ECV2441VAH** **ECV2441CAH** **ECV2441DAH**	**ECV2442EAH** **ECV2442BAH** **ECV2442VAH** **ECV2442CAH** **ECV2442DAH**	**ECV2444EAH** **ECV2444BAH** **ECV2444VAH** **ECV2444CAH** **ECV2444DAH**	**ECV2448EAH** **ECV2448BAH** **ECV2448VAH** **ECV2448CAH** **ECV2448DAH**	**AV10FNOA**
5	200 230 460 575	60 75 150 200	110/120	HMCP 250A	**ECV2451EAJ** **ECV2451BAJ** **ECV2451CAJ** **ECV2451DAJ**	**ECV2452EAJ** **ECV2452BAJ** **ECV2452CAJ** **ECV2452DAJ**	**ECV2454EAJ** **ECV2454BAJ** **ECV2454CAJ** **ECV2454DAJ**	**ECV2458EAJ** **ECV2458BAJ** **ECV2458CAJ** **ECV2458DAJ**	**AV10GNOA**
	200 230 380 460	75 100 150 200	110/120	HMCP 400A	**ECV2451EAK** **ECV2451BAK** **ECV2451VAK** **ECV2451CAK**	**ECV2452EAK** **ECV2452BAK** **ECV2452VAK** **ECV2452CAK**	**ECV2454EAK** **ECV2454BAK** **ECV2454VAK** **ECV2454CAK**	**ECV2458EAK** **ECV2458BAK** **ECV2458VAK** **ECV2458CAK**	**AV10GNOA**
6	200 230 460 575	100 150 300 300	110/120	HMCP 600A	**ECV2461EAL** **ECV2461BAL** **ECV2461CAL** **ECV2461DAL**	**ECV2462EAL** **ECV2462BAL** **ECV2462CAL** **ECV2462DAL**	**ECV2464EAL** **ECV2464BAL** **ECV2464CAL** **ECV2464DAL**	**ECV2468EAL** **ECV2468BAL** **ECV2468CAL** **ECV2468DAL**	**AV10JNOA**
	230 460 575	200 400 400	110/120	MD 800A	**ECV2461BAM** **ECV2461CAM** **ECV2461DAM**	**ECV2462BAM** **ECV2462CAM** **ECV2462DAM**	**ECV2464BAM** **ECV2464CAM** **ECV2464DAM**	**ECV2468BAM** **ECV2468CAM** **ECV2468DAM**	**AV10JNOA**
Starters do not include heater packs. Select 1 carton of 3 heater packs. Heater pack selection, **Page 16-6**. **Starters with Electronic Overload**, see **Page 16-45** of Modification Codes.									

① These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. 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 Nonmetallic, change that digit to **5**. For details on these Alternate Enclosures, see **Tab 14**.

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 **Table 10-2** on **Page 10-4**.

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

Cover Control ..... **Page 10-5**
Wiring Diagrams ..... **Page 10-15**
Dimensions ..... **Page 15-10**
Accessories, Kits ..... **Page 16-39**
Modifications ..... **Page 16-40**
Technical Data ..... **Page 18-47**

Wiring Diagrams

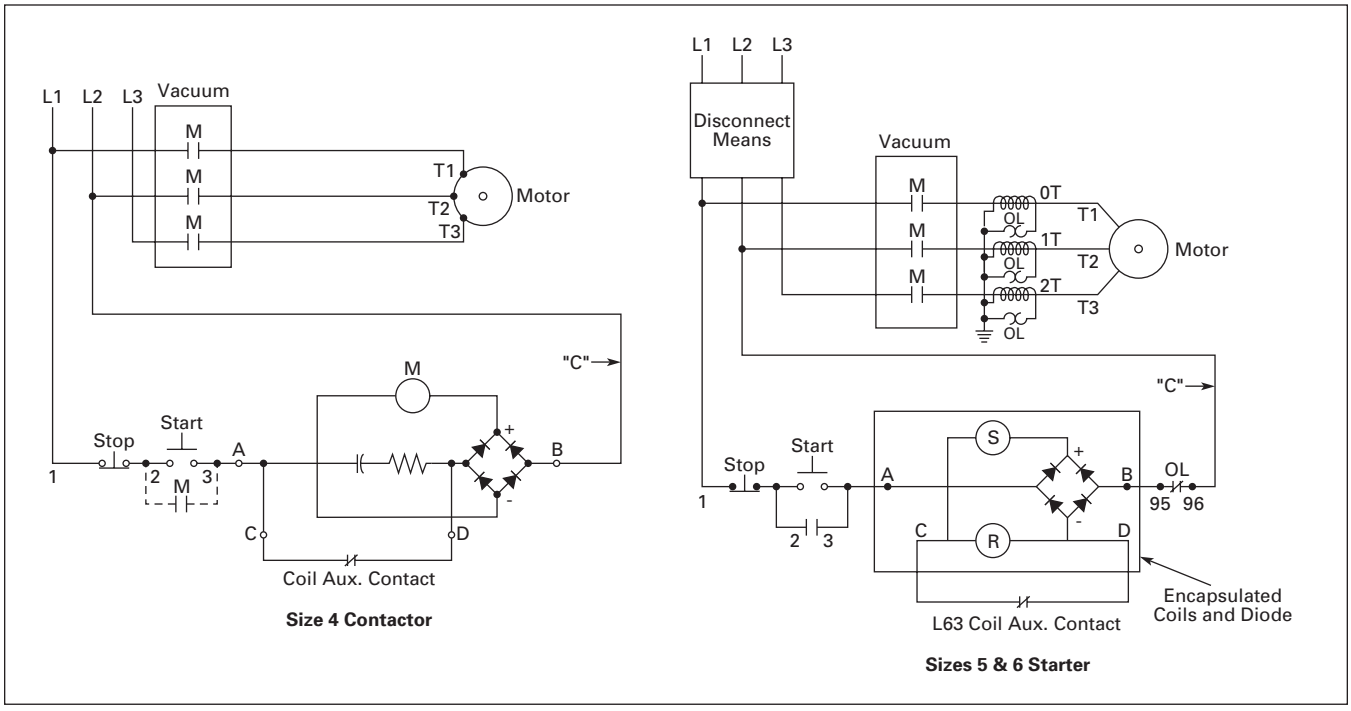


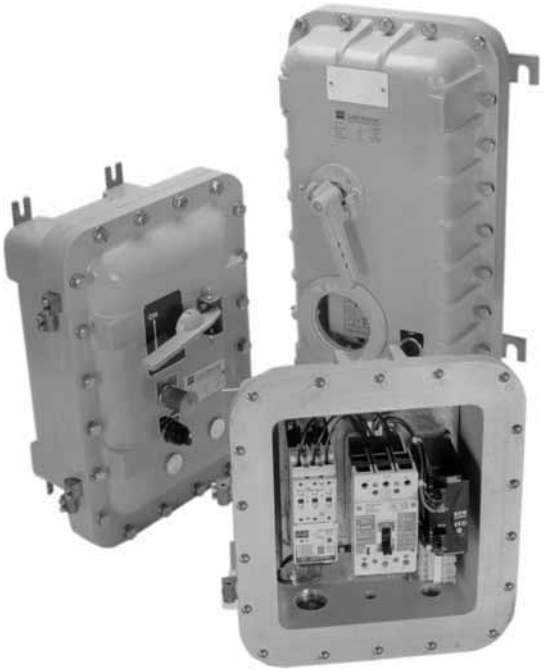
Figure 10-1. Typical Wiring Diagrams

10

April 2008

Type 7/9 Hazardous Location Starters

Contents



Type 7/9 Explosion Proof Enclosed Control

Hazardous Location Enclosure

Application Description

Eaton's Cutler-Hammer 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 AIC-UL 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" NPSM outlets drilled and tapped for control devices
- Standard outlets top and bottom
- Plugged 1/2" 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

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Classified — Standard 886 File #104565
  - Class I, Groups B, C & D
  - Class II, Groups E, F & G
  - Class III
  - Type 4, 4X, 7 & 9
  - Zone 1, IIB + H2
- CSA Certified — Standard C22.2 File #28361
  - Class I, Groups B, C & D
  - Class II, Groups E, F & G
  - Class III
  - Type 4, 4X, 7 & 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, benzine, 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.

Catalog Number Selection

Table 11-1. Type 7/9 Hazardous Location Catalog Numbering System

E C T 2 2 1 6 B A C - A

Design

T = ***IT.*** NEMA
N = Freedom NEMA
S = Soft Starter ⑥

Class	Table
05 = Type 7/9 Non-combination Non-reversing Starter	**11-5** & **11-11**
06 = Type 7/9 Non-combination Reversing Starter	**11-6** & **11-12**
07 = Type 7/9 Non-combination Starter with CPT	**11-7** & **11-13**
22 = Type 7/9 Combination Non-reversing Starter — Circuit Breaker	**11-8** & **11-14**
23 = Type 7/9 Combination Reversing Starter — Circuit Breaker	**11-9** & **11-15**
24 = Type 7/9 Combination Starter with CPT — Circuit Breaker	**11-10** & **11-16**

NEMA Size

A = Size 00	**3** = Size 3
0 = Size 0	**4** = Size 4
1 = Size 1	**5** = Size 5
2 = Size 2	

Enclosure Type

6 = Type 7/9 — Bolted

Motor Voltage/Power Supply ①②

A = 120/60 110/50
B = 240/60 220/50 Freedom; 230/60 ***IT.***
C = 480/60 440/50 Freedom; 460/60 ***IT.***
D = 600/60 550/50
E = 208/60 Freedom; 200/60 ***IT.***
Q = 24V DC ③
L = 380V/50 Hz

Cover Control

Non-rev. Starters see **Table 11-3**
Rev. Starters see **Table 11-4**

HMCP/E or 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

Solid-State ④ Overload Range — *IT.* Only

Refer to **Table 11-2.**

Modification Codes

(See **Page 16-40**)

① ***IT.***: If CPT is selected, Power Supply to be 120V – 24V DC.

② Freedom: When control power transformer modification codes (**C1** – **C11**) are used or when starter class includes CPT (i.e. 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

③ Power supply omitted.

④ See **Table 11-2**, Solid-State Overload Range Codes.

⑤ Use for Sizes 0 – 3, HMCP 600V applications only.

⑥ For Soft Starter information see **Tab 6**.

Table 11-2. *IT.* Solid-State Overload Range Codes

FLA Range	Size						
	00	**0**	**1**	**2**	**3**	**4**	**5**
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Cover Control

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 **ECN0516CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, i.e. ECN0516C**C**A.

Table 11-3. Non-reversing Cover Control

Description	Factory Installed Flange Control Position 9 Alpha
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**

Table 11-4. Reversing Cover Control

Description	Factory Installed Flange Control Position 9 Alpha
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/One Green Pilot Lights	**R**
OPEN/OFF/CLOSE Selector Switch	**V**
with 2 Red Pilot Lights	**W**
with 2 Red/1 Green Pilot Lights	**X**

Features

- Full Voltage
- 3-Phase Electromechanical
- Solid-State Overload Relay

Product Selection

Table 11-5. Class ECT05 — Type 7/9 Non-combination Non-reversing Starter

NEMA Size	Motor Voltage	Max. hp	Coil ① Voltage	3-Pole Type 7/9 Bolted	Component Starter (Open)
				Catalog Number ②	Catalog Number ②
00	—	—	24V DC	ECT05A6QAA-_	N101BSA_3A
	200	1-1/2		ECT05A6EAA-_	
	230	1-1/2		ECT05A6BAA-_	
	460	2		ECT05A6CAA-_	
	575	2		ECT05A6DAA-_	
	380/50 Hz	1-1/2		ECT05A6LAA-_	
0	—	—	24V DC	ECT0506QAA-_	N101BS0_3A
	200	3		ECT0506EAA-_	
	230	3		ECT0506BAA-_	
	460	5		ECT0506CAA-_	
	575	5		ECT0506DAA-_	
	380/50 Hz	5		ECT0506LAA-_	
1	—	—	24V DC	ECT0516QAA-_	N101CS1_3A
	200	7-1/2		ECT0516EAA-_	
	230	7-1/2		ECT0516BAA-_	
	460	10		ECT0516CAA-_	
	575	10		ECT0516DAA-_	
	380/50 Hz	10		ECT0516LAA-_	
2	—	—	24V DC	ECT0526QAA-K	N101DS2_3A
	200	10		ECT0526EAA-K	
	230	15		ECT0526BAA-K	
	460	25		ECT0526CAA-K	
	575	25		ECT0526DAA-K	
	380/50 Hz	25		ECT0526LAA-K	
3	—	—	24V DC	ECT0536QAA-M	N101ES3_3A
	200	25		ECT0536EAA-M	
	230	30		ECT0536BAA-M	
	460	50		ECT0536CAA-M	
	575	50		ECT0536DAA-M	
	380/50 Hz	50		ECT0536LAA-M	
4	—	—	24V DC	ECT0546QAA-P	N101ES4_3A
	200	40		ECT0546EAA-P	
	230	50		ECT0546BAA-P	
	460	100		ECT0546CAA-P	
	575	100		ECT0546DAA-P	
	380/50 Hz	75		ECT0546LAA-P	
5	—	—	24V DC	ECT0556QAA-S	N101FS5_3A
	200	75		ECT0556EAA-S	
	230	100		ECT0556BAA-S	
	460	200		ECT0556CAA-S	
	575	200		ECT0556DAA-S	
	380/50 Hz	150		ECT0556LAA-S	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	A	A	A	—	—	—	—
.59 – 1.9	B	B	B	—	—	—	—
1.4 – 4.4	C	C	C	—	—	—	—
2.8 – 9.0	D	D	D	—	—	—	—
5.0 – 16	—	—	F	—	—	—	—
6.3 – 20	—	G	—	—	—	—	—
8.4 – 27	—	—	H	—	—	—	—
10 – 32	—	J	—	—	—	—	—
14 – 45	—	—	—	K	—	—	—
16 – 50	—	—	L	—	—	—	—
28 – 90	—	—	—	—	M	—	—
31 – 100	—	—	—	N	—	—	—
42 – 135	—	—	—	—	—	P	—
63 – 200	—	—	—	—	—	R	—
84 – 270	—	—	—	—	—	—	S
131 – 420	—	—	—	—	—	—	T

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-2**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-3**

Table 11-6. Class ECT06 — Type 7/9 Non-combination Reversing Starter

NEMA Size	Motor Voltage	Max. hp	Coil ① Voltage	3-Pole Type 7/9 Bolted Catalog Number ②	Component Starter (Open) Catalog Number ②
00	—	—	24V DC	**ECT06A6QAA-_**	**N501BSA_3A**
	200	1-1/2		**ECT06A6EAA-_**	
	230	1-1/2		**ECT06A6BAA-_**	
	460	2		**ECT06A6CAA-_**	
	575	2		**ECT06A6DAA-_**	
	380/50 Hz	1-1/2		**ECT06A6LAA-_**	
0	—	—	24V DC	**ECT0606QAA-_**	**N501BS0_3A**
	200	3		**ECT0606EAA-_**	
	230	3		**ECT0606BAA-_**	
	460	5		**ECT0606CAA-_**	
	575	5		**ECT0606DAA-_**	
	380/50 Hz	5		**ECT0606LAA-_**	
1	—	—	24V DC	**ECT0616QAA-_**	**N501CS1_3A**
	200	7-1/2		**ECT0616EAA-_**	
	230	7-1/2		**ECT0616BAA-_**	
	460	10		**ECT0616CAA-_**	
	575	10		**ECT0616DAA-_**	
	380/50 Hz	10		**ECT0616LAA-_**	
2	—	—	24V DC	**ECT0626QAA-K**	**N501DS2_3A**
	200	10		**ECT0626EAA-K**	
	230	15		**ECT0626BAA-K**	
	460	25		**ECT0626CAA-K**	
	575	25		**ECT0626DAA-K**	
	380/50 Hz	25		**ECT0626LAA-K**	
3	—	—	24V DC	**ECT0636QAA-M**	**N501ES3_3A**
	200	25		**ECT0636EAA-M**	
	230	30		**ECT0636BAA-M**	
	460	50		**ECT0636CAA-M**	
	575	50		**ECT0636DAA-M**	
	380/50 Hz	50		**ECT0636LAA-M**	
4	—	—	24V DC	**ECT0646QAA-P**	**N501ES4_3A**
	200	40		**ECT0646EAA-P**	
	230	50		**ECT0646BAA-P**	
	460	100		**ECT0646CAA-P**	
	575	100		**ECT0646DAA-P**	
	380/50 Hz	75		**ECT0646LAA-P**	
5	—	—	24V DC	**ECT0656QAA-S**	**N501FS5_3A**
	200	75		**ECT0656EAA-S**	
	230	100		**ECT0656BAA-S**	
	460	200		**ECT0656CAA-S**	
	575	200		**ECT0656DAA-S**	
	380/50 Hz	75		**ECT0656LAA-S**	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	**A**	**A**	**A**	—	—	—	—
.59 – 1.9	**B**	**B**	**B**	—	—	—	—
1.4 – 4.4	**C**	**C**	**C**	—	—	—	—
2.8 – 9.0	**D**	**D**	**D**	—	—	—	—
5.0 – 16	—	—	**F**	—	—	—	—
6.3 – 20	—	**G**	—	—	—	—	—
8.4 – 27	—	—	**H**	—	—	—	—
10 – 32	—	**J**	—	—	—	—	—
14 – 45	—	—	—	**K**	—	—	—
16 – 50	—	—	**L**	—	—	—	—
28 – 90	—	—	—	—	**M**	—	—
31 – 100	—	—	—	**N**	—	—	—
42 – 135	—	—	—	—	—	**P**	—
63 – 200	—	—	—	—	—	**R**	—
84 – 270	—	—	—	—	—	—	**S**
131 – 420	—	—	—	—	—	—	**T**

Table 11-7. Class ECT07/ECT06 — Type 7/9 Non-combination Starter with CPT

Motor Voltage	Max. hp	Coil ① Voltage	Non-reversing		Reversing	
			3-Pole Type 7/9 Bolted	Component Starter (Open)	3-Pole Type 7/9 Bolted	Component Starter (Open)
			Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②
NEMA Size — 00						
—	—	24V DC	ECT07A6QAA-_	N101BSA_3A	ECT06A6QAA-_-C1	N501BSA_3A
200	1-1/2		ECT07A6EAA-_		ECT06A6EAA-_-C1	
230	1-1/2		ECT07A6BAA-_		ECT06A6BAA-_-C1	
460	2		ECT07A6CAA-_		ECT06A6CAA-_-C1	
575	2		ECT07A6DAA-_		ECT06A6DAA-_-C1	
380/50 Hz	1-1/2		ECT07A6LAA-_		ECT06A6LAA-_-C1	
NEMA Size — 0						
—	—	24V DC	ECT0706QAA-_	N101BS0_3A	ECT0606QAA-_-C1	N501BS0_3A
200	3		ECT0706EAA-_		ECT0606EAA-_-C1	
230	3		ECT0706BAA-_		ECT0606BAA-_-C1	
460	5		ECT0706CAA-_		ECT0606CAA-_-C1	
575	5		ECT0706DAA-_		ECT0606DAA-_-C1	
380/50 Hz	5		ECT0706LAA-_		ECT0606LAA-_-C1	
NEMA Size — 1						
—	—	24V DC	ECT0716QAA-_	N101CS1_3A	ECT0616QAA-_-C1	N501CS1_3A
200	7-1/2		ECT0716EAA-_		ECT0616EAA-_-C1	
230	7-1/2		ECT0716BAA-_		ECT0616BAA-_-C1	
460	10		ECT0716CAA-_		ECT0616CAA-_-C1	
575	10		ECT0716DAA-_		ECT0616DAA-_-C1	
380/50 Hz	10		ECT0716LAA-_		ECT0616LAA-_-C1	
NEMA Size — 2						
—	—	24V DC	ECT0726QAA-K	N101DS2_3A	ECT0626QAA-K-C1	N501DS2_3A
200	10		ECT0726EAA-K		ECT0626EAA-K-C1	
230	15		ECT0726BAA-K		ECT0626BAA-K-C1	
460	25		ECT0726CAA-K		ECT0626CAA-K-C1	
575	25		ECT0726DAA-K		ECT0626DAA-K-C1	
380/50 Hz	25		ECT0726LAA-K		ECT0626LAA-K-C1	
NEMA Size — 3						
—	—	24V DC	ECT0736QAA-M	N101ES3_3A	ECT0636QAA-M-C1	N501ES3_3A
200	25		ECT0736EAA-M		ECT0636EAA-M-C1	
230	30		ECT0736BAA-M		ECT0636BAA-M-C1	
460	50		ECT0736CAA-M		ECT0636CAA-M-C1	
575	50		ECT0736DAA-M		ECT0636DAA-M-C1	
380/50 Hz	50		ECT0736LAA-M		ECT0636LAA-M-C1	
NEMA Size — 4						
—	—	24V DC	ECT0746QAA-P	N101ES4_3A	ECT0646QAA-P-C1	N501ES4_3A
200	40		ECT0746EAA-P		ECT0646EAA-P-C1	
230	50		ECT0746BAA-P		ECT0646BAA-P-C1	
460	100		ECT0746CAA-P		ECT0646CAA-P-C1	
575	100		ECT0746DAA-P		ECT0646DAA-P-C1	
380/50 Hz	75		ECT0746LAA-P		ECT0646LAA-P-C1	
NEMA Size — 5						
—	—	24V DC	ECT0756QAA-S	N101FS5_3A	ECT0656QAA-S-C1	N501FS5_3A
200	75		ECT0756EAA-S		ECT0656EAA-S-C1	
230	100		ECT0756BAA-S		ECT0656BAA-S-C1	
460	200		ECT0756CAA-S		ECT0656CAA-S-C1	
575	200		ECT0756DAA-S		ECT0656DAA-S-C1	
380/50 Hz	150		ECT0756LAA-S		ECT0656LAA-S-C1	

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from the following table:

FLA Range	Size						
	00	0	1	2	3	4	5
.25 – .80	A	A	A	—	—	—	—
.59 – 1.9	B	B	B	—	—	—	—
1.4 – 4.4	C	C	C	—	—	—	—
2.8 – 9.0	D	D	D	—	—	—	—
5.0 – 16	—	—	F	—	—	—	—
6.3 – 20	—	G	—	—	—	—	—
8.4 – 27	—	—	H	—	—	—	—
10 – 32	—	J	—	—	—	—	—
14 – 45	—	—	—	K	—	—	—
16 – 50	—	—	L	—	—	—	—
28 – 90	—	—	—	—	M	—	—
31 – 100	—	—	—	N	—	—	—
42 – 135	—	—	—	—	—	P	—
63 – 200	—	—	—	—	—	R	—
84 – 270	—	—	—	—	—	—	S
131 – 420	—	—	—	—	—	—	T

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-2**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-3**

Features

- Full Voltage
- 3-Phase Electromechanical
- Solid-State Overload Relay

Product Selection

Table 11-8. Class ECT22 — Type 7/9 Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 7/9 Bolted	Component Starter (Open)
					Catalog Number ②	Catalog Number ②
0	200	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2206EAC-_** **ECT2206EAD-_**	**N101BS0_3A**
	230	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2206BAC-_** **ECT2206BAD-_**	**N101BS0_3A**
	460	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2206CAB-_** **ECT2206CAC-_** **ECT2206CAD-_**	**N101BS0_3A**
	575	1 3 5	24V DC	HMCP 3A HMCP 7A HMCP 15A	**ECT2206DAB-_** **ECT2206DAC-_** **ECT2206DAD-_**	**N101BS0_3A**
1	200	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2216EAC-_** **ECT2216EAD-_** **ECT2216EAE-_** **ECT2216EAF-_**	**N101CS1_3A**
	230	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2216BAC-_** **ECT2216BAD-_** **ECT2216BAE-_** **ECT2216BAF-_**	**N101CS1_3A**
	460	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2216CAB-_** **ECT2216CAC-_** **ECT2216CAD-_** **ECT2216CAE-_**	**N101CS1_3A**
	575	1 3 5 10	24V DC	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECT2216DAB-_** **ECT2216DAC-_** **ECT2216DAD-_** **ECT2216DAE-_**	**N101CS1_3A**
2	200	10	24V DC	HMCPE 50A	**ECT2226EAF-K**	**N101DS2_3A**
	230	10 15	24V DC	HMCPE 50A HMCPE 70A	**ECT2226BAF-K** **ECT2226BAW-K**	**N101DS2_3A**
	460	25	24V DC	HMCPE 50A	**ECT2226CAF-K**	**N101DS2_3A**
	575	15 25	24V DC	HMCP 30A HMCP 50A	**ECT2226DAE-K** **ECT2226DAF-K**	**N101DS2_3A**
3	200	20 25	24V DC	HMCPE 100A HMCPE 100A	**ECT2236EAG-M** **ECT2236EAG-M**	**N101ES3_3A**
	230	25 30	24V DC	HMCPE 100A HMCPE 100A	**ECT2236BAG-M** **ECT2236BAG-M**	**N101ES3_3A**
	460	50	24V DC	HMCPE 100A	**ECT2236CAG-M**	**N101ES3_3A**
	575	30 50	24V DC	HMCP 50A HMCP 100A	**ECT2236DAF-M** **ECT2236DAG-M**	**N101ES3_3A**
4	200	40	24V DC	HMCP 150A	**ECT2246EAH-P**	**N101ES4_3A**
	230	50	24V DC	HMCP 150A	**ECT2246BAH-P**	**N101ES4_3A**
	460	100	24V DC	HMCP 150A	**ECT2246CAH-P**	**N101ES4_3A**
	575	100	24V DC	HMCP 150A	**ECT2246DAH-P**	**N101ES4_3A**
5	200	50 75	24V DC	HMCP 250A HMCP 400A	**ECT2256EAJ-S** **ECT2256EAK-S**	**N101FS5_3A**
	230	60 100	24V DC	HMCP 250A HMCP 400A	**ECT2256BAJ-S** **ECT2256BAK-S**	**N101FS5_3A**
	460	125 200	24V DC	HMCP 250A HMCP 400A	**ECT2256CAJ-S** **ECT2256CAK-S**	**N101FS5_3A**
	575	150 200	24V DC	HMCP 250A HMCP 400A	**ECT2256DAJ-S** **ECT2256DAK-S**	**N101FS5_3A**

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from **Table 11-2**.

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-2**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-3**

Table 11-9. Class ECT23 — Type 7/9 Combination Reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 7/9 Bolted	Component Starter (Open)
					Catalog Number ②	Catalog Number ②
0	200	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2306EAC-_** **ECT2306EAD-_**	**N501BS0_3A**
	230	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2306BAC-_** **ECT2306BAD-_**	**N501BS0_3A**
	460	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2306CAB-_** **ECT2306CAC-_** **ECT2306CAD-_**	**N501BS0_3A**
	575	1 3 5	24V DC	HMCP 3A HMCP 7A HMCP 15A	**ECT2306DAB-_** **ECT2306DAC-_** **ECT2306DAD-_**	**N501BS0_3A**
1	200	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2316EAC-_** **ECT2316EAD-_** **ECT2316EAE-_** **ECT2316EAF-_**	**N501CS1_3A**
	230	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2316BAC-_** **ECT2316BAD-_** **ECT2316BAE-_** **ECT2316BAF-_**	**N501CS1_3A**
	460	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2316CAB-_** **ECT2316CAC-_** **ECT2316CAD-_** **ECT2316CAE-_**	**N501CS1_3A**
	575	1 3 5 10	24V DC	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECT2316DAB-_** **ECT2316DAC-_** **ECT2316DAD-_** **ECT2316DAE-_**	**N501CS1_3A**
2	200	10	24V DC	HMCPE 50A	**ECT2326EAF-K**	**N501DS2_3A**
	230	10 15	24V DC	HMCPE 50A HMCPE 70A	**ECT2326BAF-K** **ECT2326BAW-K**	**N501DS2_3A**
	460	25	24V DC	HMCPE 50A	**ECT2326CAF-K**	**N501DS2_3A**
	575	15 25	24V DC	HMCP 30A HMCP 50A	**ECT2326DAE-K** **ECT2326DAF-K**	**N501DS2_3A**
3	200	20 25	24V DC	HMCPE 100A HMCPE 100A	**ECT2336EAG-M** **ECT2336EAG-M**	**N501ES3_3A**
	230	25 30	24V DC	HMCPE 100A HMCPE 100A	**ECT2336BAG-M** **ECT2336BAG-M**	**N501ES3_3A**
	460	50	24V DC	HMCPE 100A	**ECT2336CAG-M**	**N501ES3_3A**
	575	30 50	24V DC	HMCP 50A HMCP 100A	**ECT2336DAF-M** **ECT2336DAG-M**	**N501ES3_3A**
4	200	40	24V DC	HMCP 150A	**ECT2346EAH-P**	**N501ES4_3A**
	230	50	24V DC	HMCP 150A	**ECT2346BAH-P**	**N501ES4_3A**
	460	100	24V DC	HMCP 150A	**ECT2346CAH-P**	**N501ES4_3A**
	575	100	24V DC	HMCP 150A	**ECT2346DAH-P**	**N501ES4_3A**
5	200	50 75	24V DC	HMCP 250A HMCP 400A	**ECT2356EAJ-S** **ECT2356EAK-S**	**N501FS5_3A**
	230	60 100	24V DC	HMCP 250A HMCP 400A	**ECT2356BAJ-S** **ECT2356BAK-S**	**N501FS5_3A**
	460	125 200	24V DC	HMCP 250A HMCP 400A	**ECT2356CAJ-S** **ECT2356CAK-S**	**N501FS5_3A**
	575	150 200	24V DC	HMCP 250A HMCP 400A	**ECT2356DAJ-S** **ECT2356DAK-S**	**N501FS5_3A**

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Q** denotes separate 24V DC control source.

② A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from **Table 11-2**.

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-2**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-2**
Technical Data ..... **Page 18-3**

Table 11-10. Class ECT24/ECT23 — Type 7/9 Combination Starter with CPT — Circuit Breaker

Motor Voltage	Max. hp	Magnet Coil Voltage ①	Circuit Breaker Type	Non-reversing		Reversing	
				3-Pole Type 7/9 Bolted	Component Starter (Open)	3-Pole Type 7/9 Bolted	Component Starter (Open)
				Catalog Number ②	Catalog Number ②	Catalog Number ②	Catalog Number ②
NEMA Size — 0							
200	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2406EAC-_** **ECT2406EAD-_**	**N101BS0_3A**	**ECT2306EAC-_-C** **ECT2306EAD-_-C**	**N501BS0_3A**
230	1 3	24V DC	HMCPE 7A HMCPE 15A	**ECT2406BAC-_** **ECT2406BAD-_**	**N101BS0_3A**	**ECT2306BAC-_-C** **ECT2306BAD-_-C**	**N501BS0_3A**
460	1 3 5	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A	**ECT2406CAB-_** **ECT2406CAC-_** **ECT2406CAD-_**	**N101BS0_3A**	**ECT2306CAB-_-C** **ECT2306CAC-_-C** **ECT2306CAD-_-C**	**N501BS0_3A**
575	1 3 5	24V DC	HMCP 3A HMCP 7A HMCP 15A	**ECT2406DAB-_** **ECT2406DAC-_** **ECT2406DAD-_**	**N101BS0_3A**	**ECT2306DAB-_-C** **ECT2306DAC-_-C** **ECT2306DAD-_-C**	**N501BS0_3A**
NEMA Size — 1							
200	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2416EAC-_** **ECT2416EAD-_** **ECT2416EAE-_** **ECT2416EAF-_**	**N101CS1_3A**	**ECT2316EAC-_-C** **ECT2316EAD-_-C** **ECT2316EAE-_-C** **ECT2316EAF-_-C**	**N501CS1_3A**
230	1 3 5 7-1/2	24V DC	HMCPE 7A HMCPE 15A HMCPE 30A HMCPE 50A	**ECT2416BAC-_** **ECT2416BAD-_** **ECT2416BAE-_** **ECT2416BAF-_**	**N101CS1_3A**	**ECT2316BAC-_-C** **ECT2316BAD-_-C** **ECT2316BAE-_-C** **ECT2316BAF-_-C**	**N501CS1_3A**
460	1 3 5 10	24V DC	HMCPE 3A HMCPE 7A HMCPE 15A HMCPE 30A	**ECT2416CAB-_** **ECT2416CAC-_** **ECT2416CAD-_** **ECT2416CAE-_**	**N101CS1_3A**	**ECT2316CAB-_-C** **ECT2316CAC-_-C** **ECT2316CAD-_-C** **ECT2316CAE-_-C**	**N501CS1_3A**
575	1 3 5 10	24V DC	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECT2416DAB-_** **ECT2416DAC-_** **ECT2416DAD-_** **ECT2416DAE-_**	**N101CS1_3A**	**ECT2316DAB-_-C** **ECT2316DAC-_-C** **ECT2316DAD-_-C** **ECT2316DAE-_-C**	**N501CS1_3A**
NEMA Size — 2							
200	10	24V DC	HMCPE 50A	**ECT2426EAF-K**	**N101DS2_3A**	**ECT2326EAF-K-C**	**N501DS2_3A**
230	10 15	24V DC	HMCPE 50A HMCPE 70A	**ECT2426BAF-K** **ECT2426BAW-K**	**N101DS2_3A**	**ECT2326BAF-K-C** **ECT2326BAW-K-C**	**N501DS2_3A**
460	25	24V DC	HMCPE 50A	**ECT2426CAF-K**	**N101DS2_3A**	**ECT2326CAF-K-C**	**N501DS2_3A**
575	15 25	24V DC	HMCP 30A HMCP 50A	**ECT2426DAE-K** **ECT2426DAF-K**	**N101DS2_3A**	**ECT2326DAE-K-C** **ECT2326DAF-K-C**	**N501DS2_3A**
NEMA Size — 3							
200	20 25	24V DC	HMCPE 100A HMCPE 100A	**ECT2436EAG-M** **ECT2436EAG-M**	**N101ES3_3A**	**ECT2336EAG-M-C** **ECT2336EAG-M-C**	**N501ES3_3A**
230	25 30	24V DC	HMCPE 100A HMCPE 100A	**ECT2436BAG-M** **ECT2436BAG-M**	**N101ES3_3A**	**ECT2336BAG-M-C** **ECT2336BAG-M-C**	**N501ES3_3A**
460	50	24V DC	HMCPE 100A	**ECT2436CAG-M**	**N101ES3_3A**	**ECT2336CAG-M-C**	**N501ES3_3A**
575	30 50	24V DC	HMCP 50A HMCP 100A	**ECT2436DAF-M** **ECT2436DAG-M**	**N101ES3_3A**	**ECT2336DAF-M-C** **ECT2336DAG-M-C**	**N501ES3_3A**
NEMA Size — 4							
200	40	24V DC	HMCP 150A	**ECT2446EAH-P**	**N101ES4_3A**	**ECT2346EAH-P-C**	**N501ES4_3A**
230	50	24V DC	HMCP 150A	**ECT2446BAH-P**	**N101ES4_3A**	**ECT2346BAH-P-C**	**N501ES4_3A**
460	100	24V DC	HMCP 150A	**ECT2446CAH-P**	**N101ES4_3A**	**ECT2346CAH-P-C**	**N501ES4_3A**
575	100	24V DC	HMCP 150A	**ECT2446DAH-P**	**N101ES4_3A**	**ECT2346DAH-P-C**	**N501ES4_3A**
NEMA Size — 5							
200	50 75	24V DC	HMCP 250A HMCP 400A	**ECT2456EAJ-S** **ECT2456EAK-S**	**N101FS5_3A**	**ECT2356EAJ-S-C** **ECT2356EAK-S-C**	**N501FS5_3A**
230	60 100	24V DC	HMCP 250A HMCP 400A	**ECT2456BAJ-S** **ECT2456BAK-S**	**N101FS5_3A**	**ECT2356BAJ-S-C** **ECT2356BAK-S-C**	**N501FS5_3A**
460	125 200	24V DC	HMCP 250A HMCP 400A	**ECT2456CAJ-S** **ECT2456CAK-S**	**N101FS5_3A**	**ECT2356CAJ-S-C** **ECT2356CAK-S-C**	**N501FS5_3A**
575	150 200	24V DC	HMCP 250A HMCP 400A	**ECT2456DAJ-S** **ECT2456DAK-S**	**N101FS5_3A**	**ECT2356DAJ-S-C** **ECT2356DAK-S-C**	**N501FS5_3A**

① All *IT.* Contactors and Starters are furnished with 24V DC coil and control power supply. The eighth digit **Ω** denotes separate 24V DC control source.

② A "_" denotes Catalog Numbers are incomplete without the Solid-State Overload Range Code. To complete the Catalog Number, select the appropriate Code from **Table 11-2**.

Features

- Full Voltage
- Standard Interchangeable Heater OLR
- Optional Electronic Overload
- 600V Maximum

Product Selection

Table 11-11. Class ECN05 — Type 7/9 Non-combination Non-reversing Starter

NEMA Size	Motor Volt.	Max. hp Rating ①	Mag. Coil Volt.	3-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	**ECN0506AAA**	**AN16BN0AC**
	200	3	208	**ECN0506EAA**	**AN16BN0EC**
	230	3	240	**ECN0506BAA**	**AN16BN0BC**
	460	5	480	**ECN0506CAA**	**AN16BN0CC**
	575	5	600	**ECN0506DAA**	**AN16BN0DC**
1	—	—	120	**ECN0516AAA**	**AN16DN0AB**
	200	7-1/2	208	**ECN0516EAA**	**AN16DN0EB**
	230	7-1/2	240	**ECN0516BAA**	**AN16DN0BB**
	460	10	480	**ECN0516CAA**	**AN16DN0CB**
	575	10	600	**ECN0516DAA**	**AN16DN0DB**
2	—	—	120	**ECN0526AAA**	**AN16GN0AB**
	200	10	208	**ECN0526EAA**	**AN16GN0EB**
	230	15	240	**ECN0526BAA**	**AN16GN0BB**
	460	25	480	**ECN0526CAA**	**AN16GN0CB**
	575	25	600	**ECN0526DAA**	**AN16GN0DB**
3	—	—	120	**ECN0536AAA**	**AN16KN0A**
	200	25	208	**ECN0536EAA**	**AN16KN0E**
	230	30	240	**ECN0536BAA**	**AN16KN0B**
	460	50	480	**ECN0536CAA**	**AN16KN0C**
	575	50	600	**ECN0536DAA**	**AN16KN0D**
4	—	—	120	**ECN0546AAA**	**AN16NN0A**
	200	40	208	**ECN0546EAA**	**AN16NN0E**
	230	50	240	**ECN0546BAA**	**AN16NN0B**
	460	100	480	**ECN0546CAA**	**AN16NN0C**
	575	100	600	**ECN0546DAA**	**AN16NN0D**
5	—	—	120	**ECN0556AAA**	**AN16SN0AB**
	200	75	208	**ECN0556EAA**	**AN16SN0EB**
	230	100	240	**ECN0556BAA**	**AN16SN0BB**
	460	200	480	**ECN0556CAA**	**AN16SN0CB**
	575	200	600	**ECN0556DAA**	**AN16SN0DB**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

11

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-4**
Technical Data ..... **Page 18-7**

Table 11-12. Class ECN06 — Type 7/9 Non-combination Reversing Starter

NEMA Size	Motor Volt.	Max. hp Rating ①	Mag. Coil Volt.	3-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	—	—	120	**ECN0606AAA**	**AN56BN0AC**
	200	3	208	**ECN0606EAA**	**AN56BN0EC**
	230	3	240	**ECN0606BAA**	**AN56BN0BC**
	460	5	480	**ECN0606CAA**	**AN56BN0CC**
	575	5	600	**ECN0606DAA**	**AN56BN0DC**
1	—	—	120	**ECN0616AAA**	**AN56DN0AB**
	200	7-1/2	208	**ECN0616EAA**	**AN56DN0EB**
	230	7-1/2	240	**ECN0616BAA**	**AN56DN0BB**
	460	10	480	**ECN0616CAA**	**AN56DN0CB**
	575	10	600	**ECN0616DAA**	**AN56DN0DB**
2	—	—	120	**ECN0626AAA**	**AN56GN0AB**
	200	10	208	**ECN0626EAA**	**AN56GN0EB**
	230	15	240	**ECN0626BAA**	**AN56GN0BB**
	460	25	480	**ECN0626CAA**	**AN56GN0CB**
	575	25	600	**ECN0626DAA**	**AN56GN0DB**
3	—	—	120	**ECN0636AAA**	**AN56KN0A**
	200	25	208	**ECN0636EAA**	**AN56KN0E**
	230	30	240	**ECN0636BAA**	**AN56KN0B**
	460	50	480	**ECN0636CAA**	**AN56KN0C**
	575	50	600	**ECN0636DAA**	**AN56KN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

Table 11-13. Class ECN07 — Type 7/9 Non-combination Non-reversing Starter with CPT

NEMA Size	Primary Voltage ②	Max. hp Rating ①	Magnetic Coil Voltage	3-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	208 240 480 600	3 3 5 5	120	**ECN0706EAA** **ECN0706BAA** **ECN0706CAA** **ECN0706DAA**	**AN16BN0AC**
1	208 240 480 600	7-1/2 7-1/2 10 10	120	**ECN0716EAA** **ECN0716BAA** **ECN0716CAA** **ECN0716DAA**	**AN16DN0AB**
2	208 240 480 600	10 15 25 25	120	**ECN0726EAA** **ECN0726BAA** **ECN0726CAA** **ECN0726DAA**	**AN16GN0AB**
3	208 240 480 600	25 30 50 50	120	**ECN0736EAA** **ECN0736BAA** **ECN0736CAA** **ECN0736DAA**	**AN16KN0A**
4	208 240 480 600	40 50 100 100	120	**ECN0746EAA** **ECN0746BAA** **ECN0746CAA** **ECN0746DAA**	**AN16NN0A**
5	208 240 480 600	75 100 200 200	120	**ECN0756EAA** **ECN0756BAA** **ECN0756CAA** **ECN0756DAA**	**AN16SN0AB**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

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

② For other control power transformer primary and/or secondary voltage options, see **Page 3-20**.

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-4**
Technical Data ..... **Page 18-7**

Features

- Full Voltage
- Standard Interchangeable Heater OLR
- Optional Electronic Overload
- 600V Maximum

Product Selection

Table 11-14. ECN22 — Type 7/9 Combination Non-reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	200	1 3	208	HMCP 7A HMCP 15A	**ECN2206EAC** **ECN2206EAD**	**AN16BN0EC**
	230	1 3	240	HMCP 7A HMCP 15A	**ECN2206BAC** **ECN2206BAD**	**AN16BN0BC**
	460	1 3 5	480	HMCP 3A HMCP 7A HMCP 15A	**ECN2206CAB** **ECN2206CAC** **ECN2206CAD**	**AN16BN0CC**
	575	1 3 5	600	HMCP 3A HMCP 7A HMCP 15A	**ECN2206DA5** **ECN2206DA6** **ECN2206DA7**	**AN16BN0DC**
1	200	1 3 5 7-1/2	208	HMCP 7A HMCP 15A HMCP 30A HMCP 50A	**ECN2216EAC** **ECN2216EAD** **ECN2216EAE** **ECN2216EAF**	**AN16DN0EB**
	230	1 3 5 7-1/2	240	HMCP 7A HMCP 15A HMCP 30A HMCP 50A	**ECN2216BAC** **ECN2216BAD** **ECN2216BAE** **ECN2216BAF**	**AN16DN0BB**
	460	1 3 5 10	480	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2216CZB** **ECN2216CAC** **ECN2216CAD** **ECN2216CAE**	**AN16DN0CB**
	575	1 3 5 10	600	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2216DA5** **ECN2216DA6** **ECN2216DA7** **ECN2216DA8**	**AN16DN0DB**
2	200	10	208	HMCP 50A	**ECN2226EAF**	**AN16GN0EB**
	230	10 15	240	HMCP 50A HMCP 70A	**ECN2226BAF** **ECN2226BAW**	**AN16GN0BB**
	460	25	480	HMCP 50A	**ECN2226CAF**	**AN16GN0CB**
	575	15 25	600	HMCP 30A HMCP 50A	**ECN2226DA8** **ECN2226DA9**	**AN16GN0DB**
3	200	20 25	208	HMCP 100A HMCP 100A	**ECN2236EAG** **ECN2236EAG**	**AN16KN0E**
	230	25 30	240	HMCP 100A HMCP 100A	**ECN2236BAG** **ECN2236BAG**	**AN16KN0B**
	460	50	480	HMCP 100A	**ECN2236CAG**	**AN16KN0C**
	575	30 50	600	HMCP 50A HMCP 100A	**ECN2236DA9** **ECN2236DAI**	**AN16KN0D**
4	200 230 460 575	40 50 100 100	208 240 480 600	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**ECN2246EAH** **ECN2246BAH** **ECN2246CAH** **ECN2246DAH**	**AN16NN0E** **AN16NN0B** **AN16NN0C** **AN16NN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the 8th character of the listed Catalog Number.

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-4**
Technical Data ..... **Page 18-7**

Table 11-15. ECN23 — Type 7/9 Combination Reversing Starter — Circuit Breaker

NEMA Size	Motor Voltage	Max. hp Rating	Magnet Coil Voltage ①	Circuit Breaker Type	3-Pole Type 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	200	1 3	208	HMCP 7A HMCP 15A	**ECN2306EAC** **ECN2306EAD**	**AN56BN0EC**
	230	1 3	240	HMCP 7A HMCP 15A	**ECN2306BAC** **ECN2306BAD**	**AN56BN0BC**
	460	1 3 5	480	HMCP 3A HMCP 7A HMCP 15A	**ECN2306CAB** **ECN2306CAC** **ECN2306CAD**	**AN56BN0CC**
	575	1 3 5	600	HMCP 3A HMCP 7A HMCP 15A	**ECN2306DA5** **ECN2306DA6** **ECN2306DA7**	**AN56BN0DC**
1	200	1 3 5 7-1/2	208	HMCP 7A HMCP 15A HMCP 30A HMCP 50A	**ECN2316EAC** **ECN2316EAD** **ECN2316EAE** **ECN2316EAF**	**AN56DN0EB**
	230	1 3 5 7-1/2	240	HMCP 7A HMCP 15A HMCP 30A HMCP 50A	**ECN2316BAC** **ECN2316BAD** **ECN2316BAE** **ECN2316BAF**	**AN56DN0BB**
	460	1 3 5 10	480	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2316CAB** **ECN2316CAC** **ECN2316CAD** **ECN2316CAE**	**AN56DN0CB**
	575	1 3 5 10	600	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2316DA5** **ECN2316DA6** **ECN2316DA7** **ECN2316DA8**	**AN56DN0DB**
2	200	10	208	HMCP 50A	**ECN2326EAF**	**AN56GN0EB**
	230	10 15	240	HMCP 50A HMCP 70A	**ECN2326BAF** **ECN2326BAW**	**AN56GN0BB**
	460	25	480	HMCP 50A	**ECN2326CAF**	**AN56GN0CB**
	575	15 25	600	HMCP 30A HMCP 50A	**ECN2326DA8** **ECN2326DA9**	**AN56GN0DB**
3	200	20 25	208	HMCP 100A HMCP 100A	**ECN2336EAG** **ECN2336EAG**	**AN56KN0E**
	230	25 30	240	HMCP 100A HMCP 100A	**ECN2336BAG** **ECN2336BAG**	**AN56KN0B**
	460	50	480	HMCP 100A	**ECN2336CAG**	**AN56KN0C**
	575	30 50	600	HMCP 50A HMCP 100A	**ECN2336DA9** **ECN2336DAI**	**AN56KN0D**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① Starters with 120V coil (for separate control) are available. To order, substitute the letter **A** for the 8th character of the listed Catalog Number.

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-4**
Technical Data ..... **Page 18-7**

Table 11-16. ECN24 — Type 7/9 Combination Non-reversing Starter with CPT — Circuit Breaker

NEMA Size	Primary Voltage ①	Max. hp Rating	Magnetic Coil Voltage	Circuit Breaker Type	3-Pole NEMA 7/9 Bolted Catalog Number	Component Starter (Open) Catalog Number
0	200	1 3	120	HMCP 7A HMCP 15A	**ECN2406EAC** **ECN2406EAD**	**AN16BN0AC**
	230	1 3	120	HMCP 7A HMCP 15A	**ECN2406BAC** **ECN2406BAD**	**AN16BN0AC**
	460	1 3 5	120	HMCP 3A HMCP 7A HMCP 15A	**ECN2406CAB** **ECN2406CAC** **ECN2406CAD**	**AN16BN0AC**
	575	1 3 5	120	HMCP 3A HMCP 7A HMCP 15A	**ECN2406DA5** **ECN2406DA6** **ECN2406DA7**	**AN16BN0AC**
1	200	1 3 5 7-1/2	120	HMCP 7A HMCP 15A HMCP 30A HMCP 50A	**ECN2416EAC** **ECN2416EAD** **ECN2416EAE** **ECN2416EAF**	**AN16DN0AB**
	230	1 3 5 7-1/2	120	HMCP 7A HMCP 15A HMCP 30A HMCP 50A	**ECN2416BAC** **ECN2416BAD** **ECN2416BAE** **ECN2416BAF**	**AN16DN0AB**
	460	1 3 5 10	120	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2416CAB** **ECN2416CAC** **ECN2416CAD** **ECN2416CAE**	**AN16DN0AB**
	575	1 3 5 10	120	HMCP 3A HMCP 7A HMCP 15A HMCP 30A	**ECN2416DA5** **ECN2416DA6** **ECN2416DA7** **ECN2416DA8**	**AN16DN0AB**
2	200	10	120	HMCP 50A	**ECN2426EAF**	**AN16GN0AB**
	230	10 15	120	HMCP 50A HMCP 70A	**ECN2426BAF** **ECN2426BAW**	**AN16GN0AB**
	460	25	120	HMCP 50A	**ECN2426CAF**	**AN16GN0AB**
	575	15 25	120	HMCP 30A HMCP 50A	**ECN2426DA8** **ECN2426DA9**	**AN16GN0AB**
3	200	20 25	120	HMCP 100A HMCP 100A	**ECN2436EAG** **ECN2436EAG**	**AN16KN0A**
	230	25 30	120	HMCP 100A HMCP 100A	**ECN2436BAG** **ECN2436BAG**	**AN16KN0A**
	460	50	120	HMCP 100A	**ECN2436CAG**	**AN16KN0A**
	575	30 50	120	HMCP 50A HMCP 100A	**ECN2436DA9** **ECN2436DAI**	**AN16KN0A**
4	200 230 460 575	40 50 100 100	120	HMCP 150A HMCP 150A HMCP 150A HMCP 150A	**ECN2446EAH** **ECN2446BAH** **ECN2446CAH** **ECN2446DAH**	**AN16NN0A**

Starters do not include heater packs. Select 1 carton of 3 heater packs. For Heater Pack Selection, see **Page 16-6**.
Starters with Electronic Overload, see **Page 16-45** of Modification Codes.

① For other control power transformer primary and/or secondary voltage options, see **Page 3-20**.

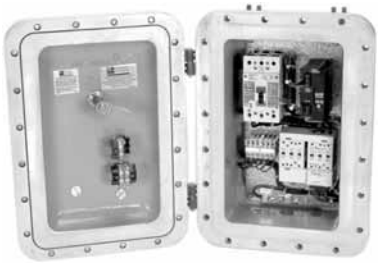
11

Cover Control ..... **Page 11-5**
Dimensions ..... **Page 11-19**
Wiring Diagrams ..... **Page 11-22**
Accessories ..... **Page 16-4**
Modifications ..... **Page 16-40**
Renewal Parts ..... **Page 17-4**
Technical Data ..... **Page 18-7**

Combination 27A Soft Starter

Product Description

Besides Cutler-Hammer® NEMA Size ***IT.*** and Freedom Starters, Eaton offers Type 7/9 Cast Aluminum Enclosures for solid-state reduced voltage starters and lighting contactors.



Combination Reversing Size 1

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 6**.

The ***IT.*** Soft Starters are designed to be the smallest, most compact soft starters on the market today. The built-in overload (ranges from .25 to 1000 amps) 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 can not. 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 5**.

Dimensions

NEMA Size *IT.*

Table 11-17. Intelligent Technologies Full Voltage Non-reversing Starters

Rough Outside Dimensions	Non-combination Sizes	Standard Conduit	Combination Sizes	Standard Conduit
17 x 14	0, 1	1-1/2"	—	—
18 x 15	0, 1, 2	1-1/2"	—	—
28 x 14	3, 4	2"	0, 1, 2, 3	2"
32 x 18	—	—	4	2-1/2"
46 x 16	5	3"	5	3"

NEMA Size Freedom

Table 11-18. 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

Table 11-19. S801/S811 Intelligent Technologies Solid-State Soft Starters

Rough Outside Dimensions	Non-combination	Standard Conduit	Combination	Standard Conduit
17 x 14	66 Amps	1-1/2"	—	—
28 x 14	135 Amps	2"	66 Amps	2"
32 x 18	—	—	135 Amps	2-1/2"
46 x 16	304 Amps	3"	304 Amps	3"

Table 11-20. S752 Intelligent Technologies Solid-State Soft Starters

Rough Outside Dimensions	Non-combination	Standard Conduit	Combination	Standard Conduit
18 x 15	50 Amps	1-1/2"	—	—
28 x 14	—	—	50 Amps	1-1/2"

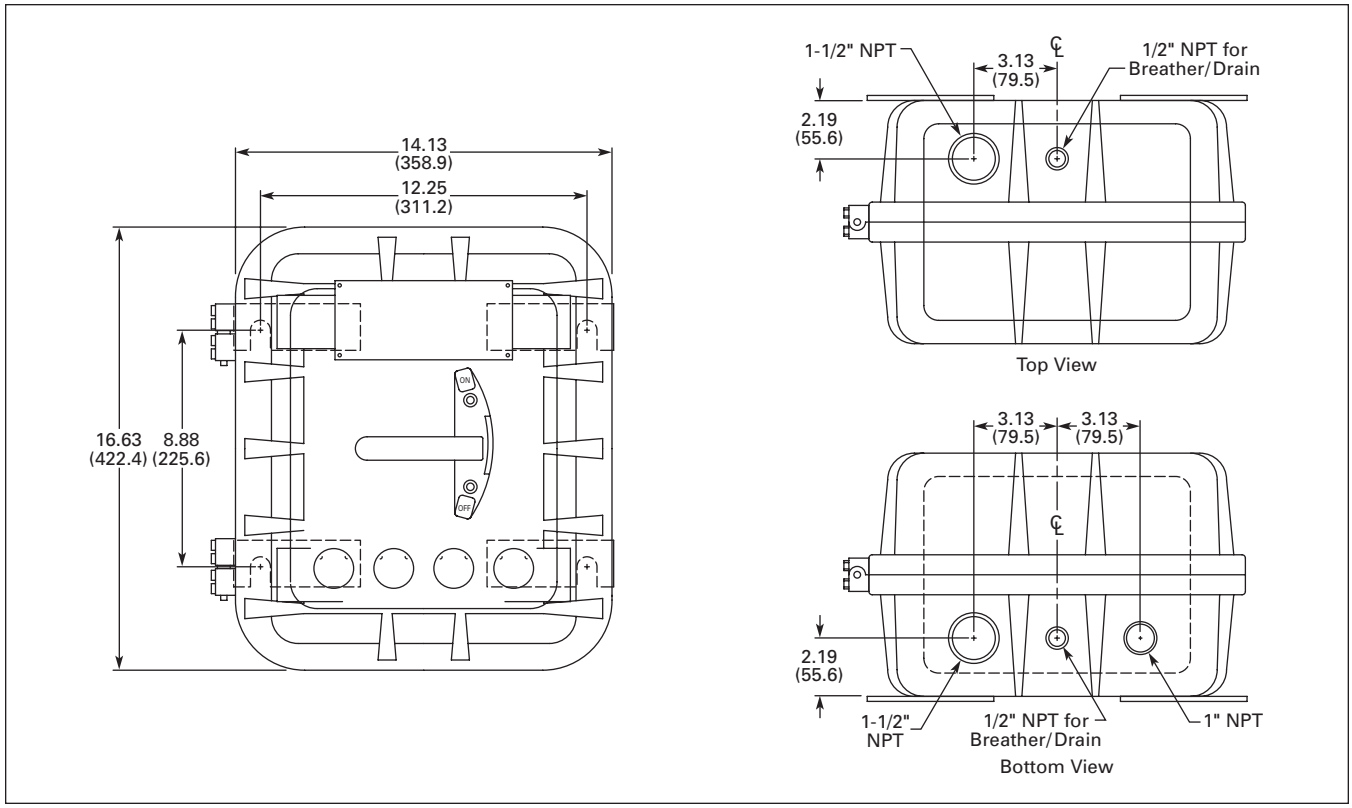


Figure 11-1. Example of Type 7/9 *IT.* Starters — Approximate Dimensions in Inches (mm)

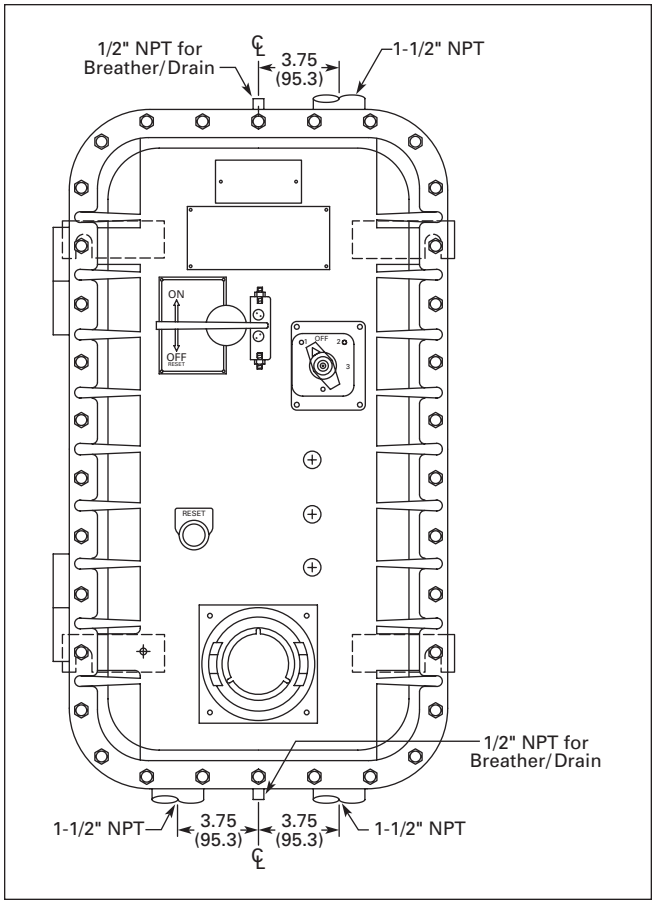


Figure 11-2. Type 7/9 Freedom Starters

Table 11-21. Type 7/9 Approximate Dimensions in Inches (mm)

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

Wiring Diagrams

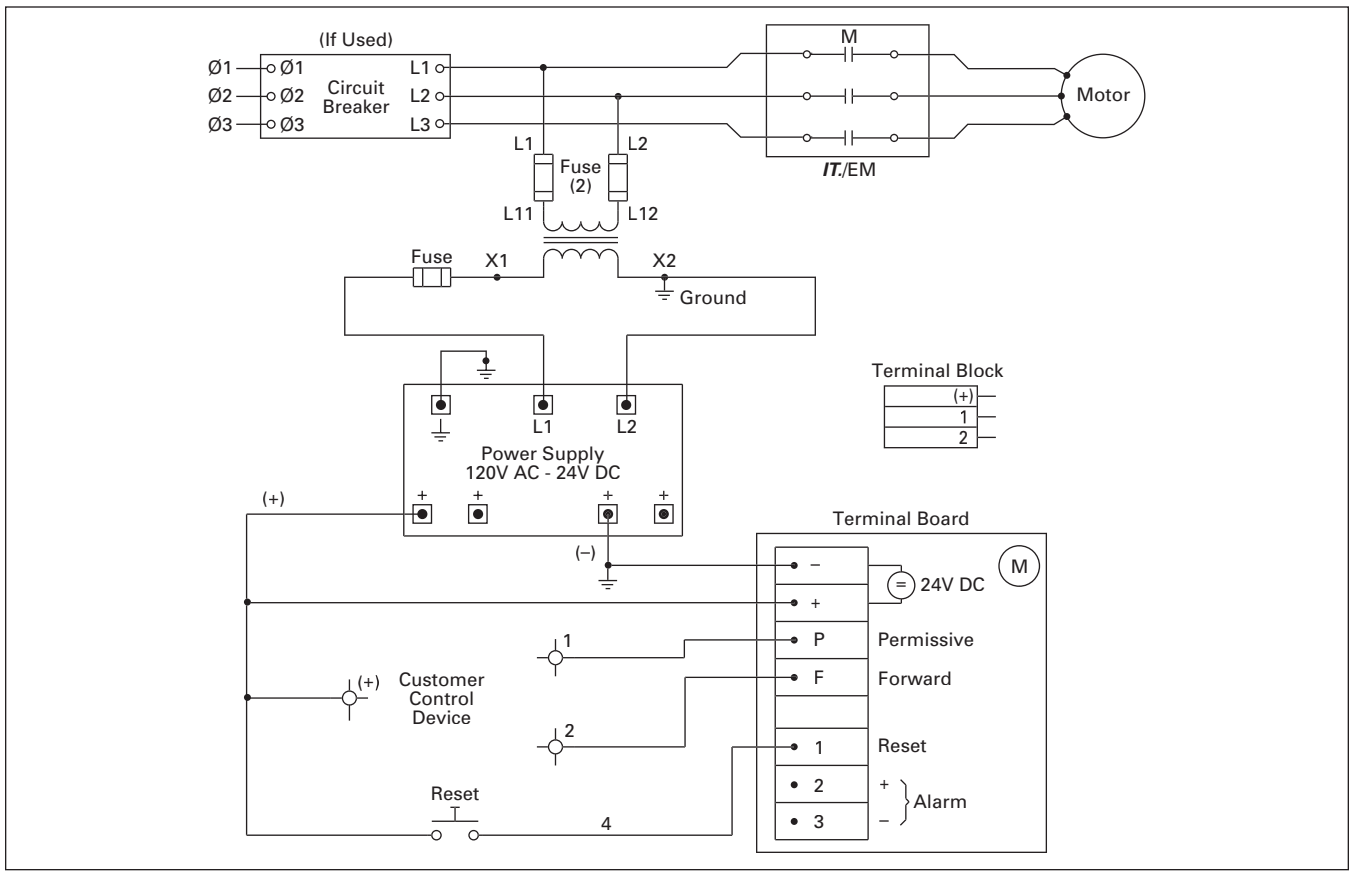


Figure 11-3. *IT.* Combination Starter with CPT and Power Supply

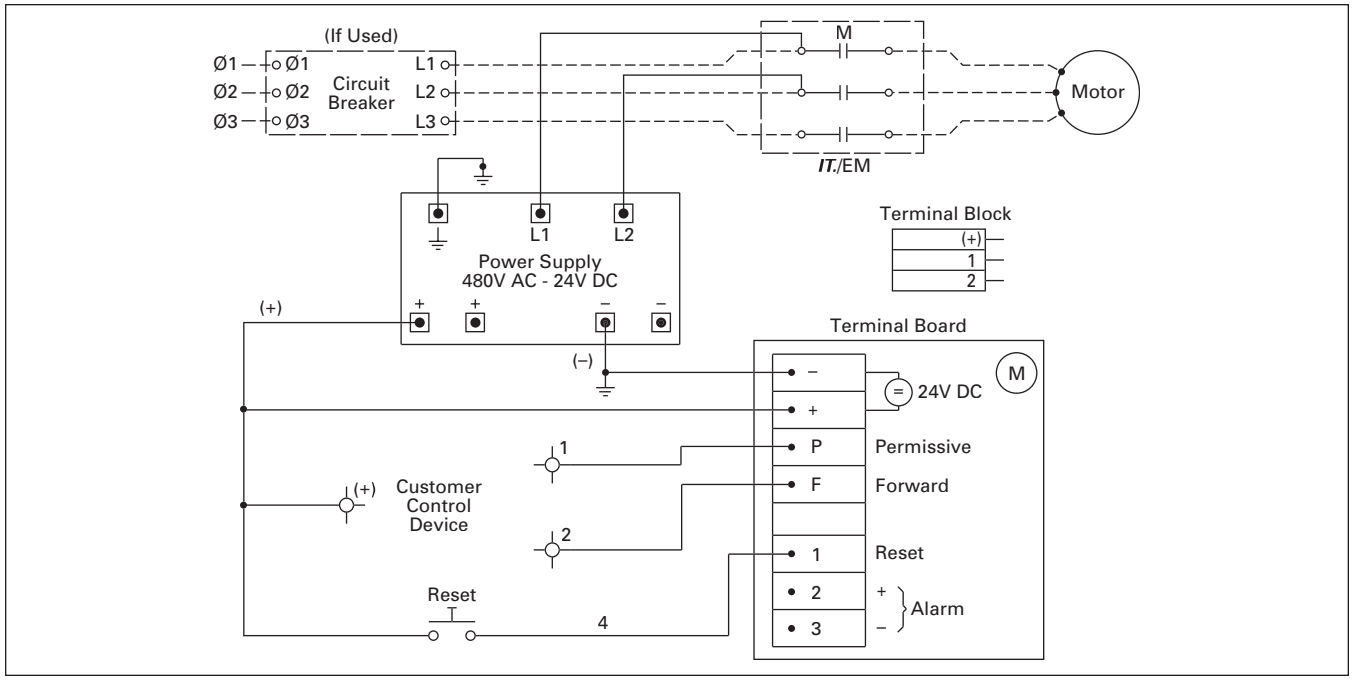


Figure 11-4. *IT.* Combination Starter with Power Supply

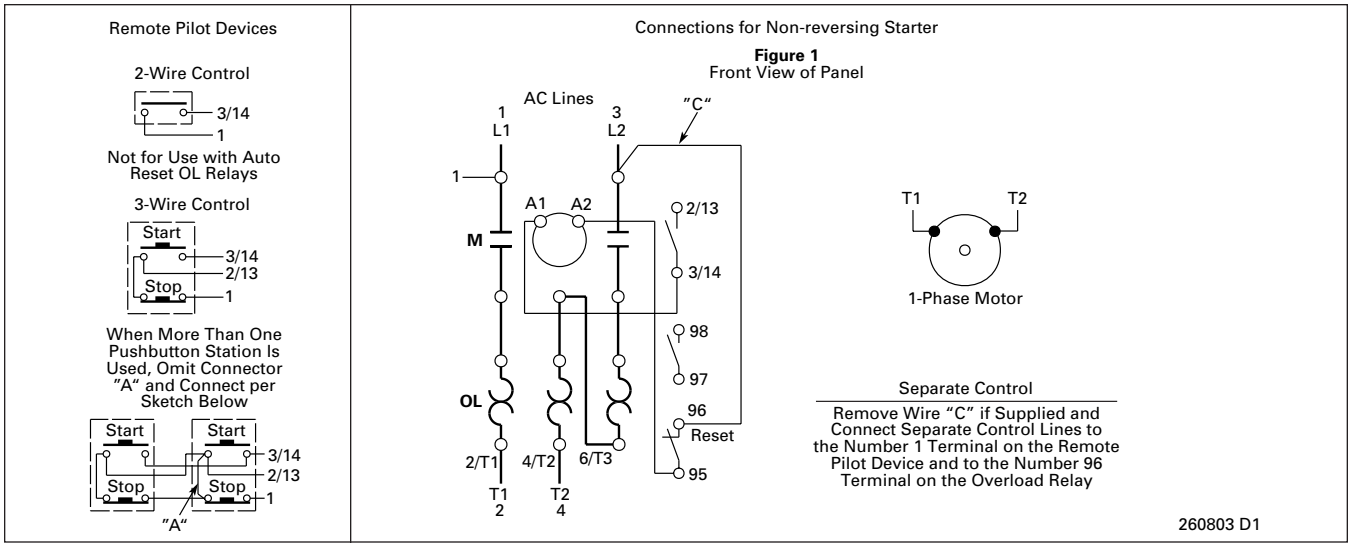


Figure 11-5. Freedom Non-reversing Starter — Single-Phase Non-combination

11

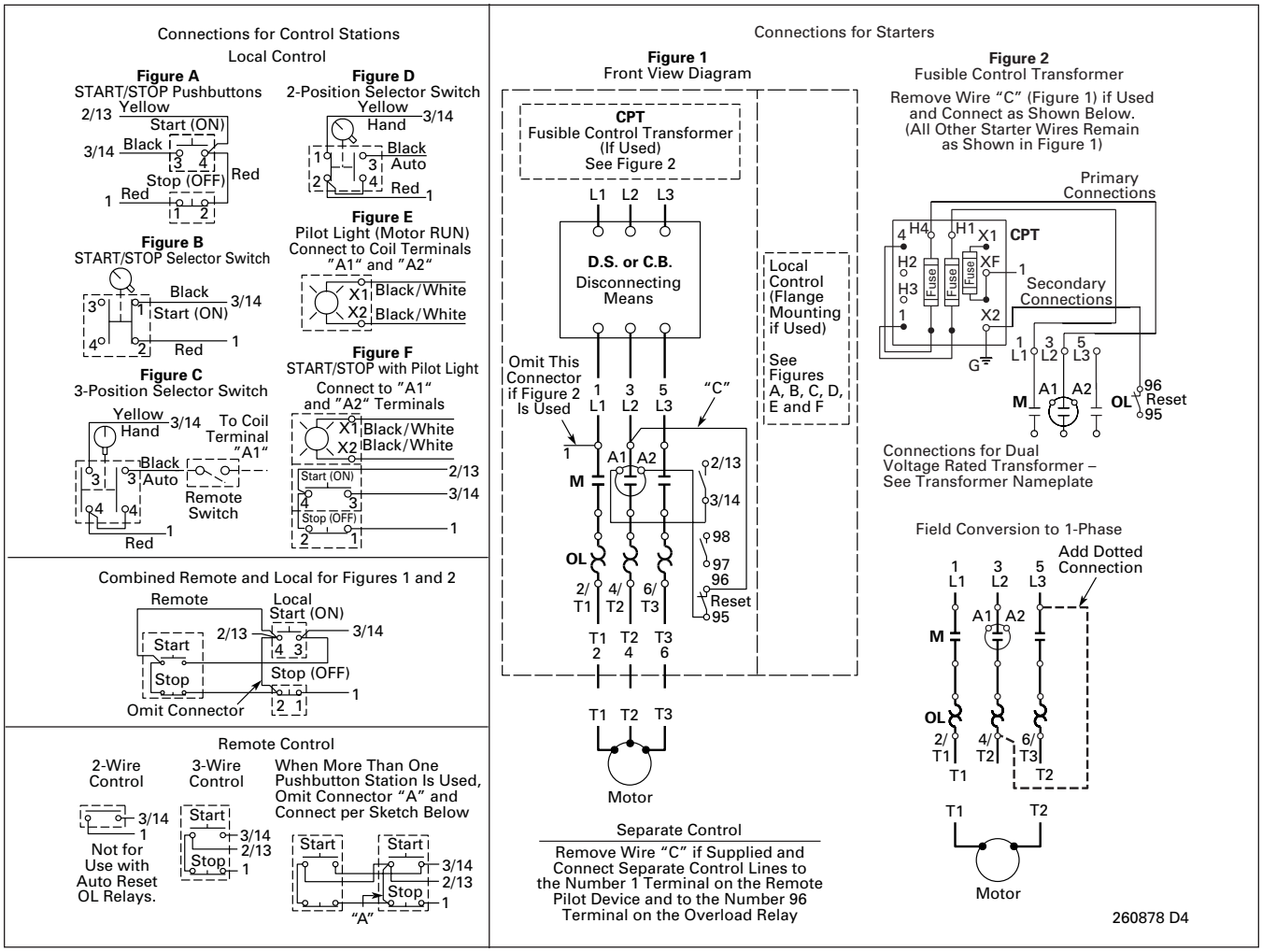


Figure 11-6. Freedom Non-reversing Starter — Combination

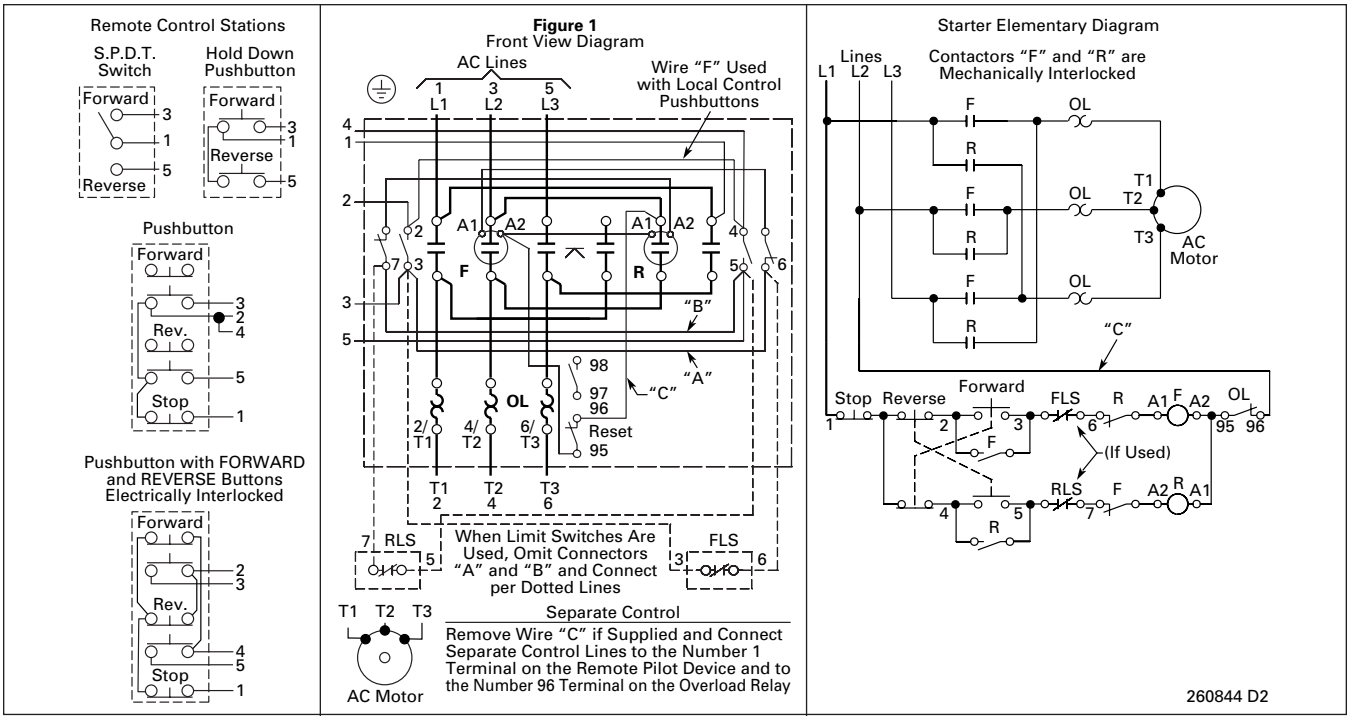


Figure 11-7. Freedom Reversing Starter — Non-combination

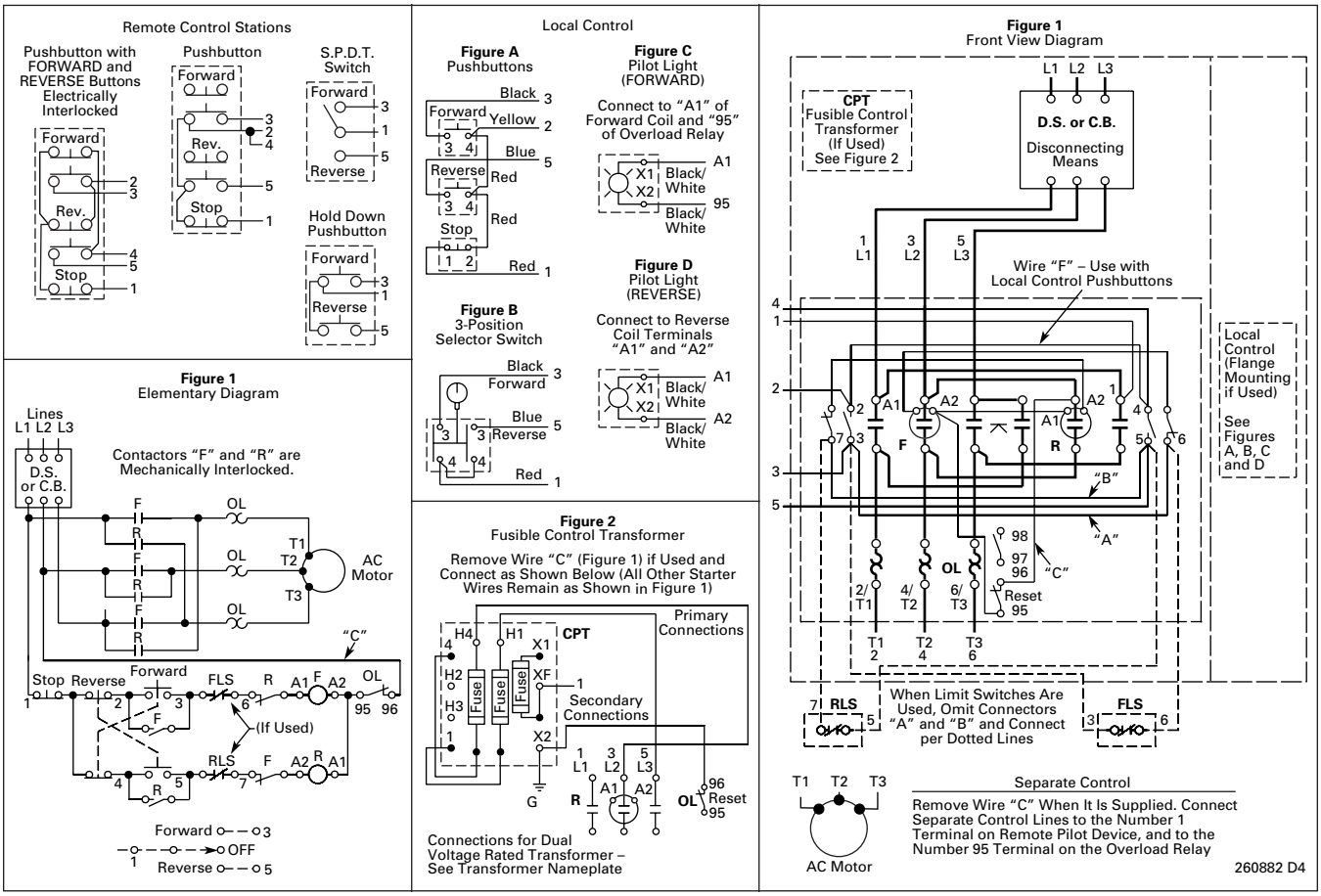


Figure 11-8. Freedom Reversing Starter — Combination

Non-reversing Cover Control

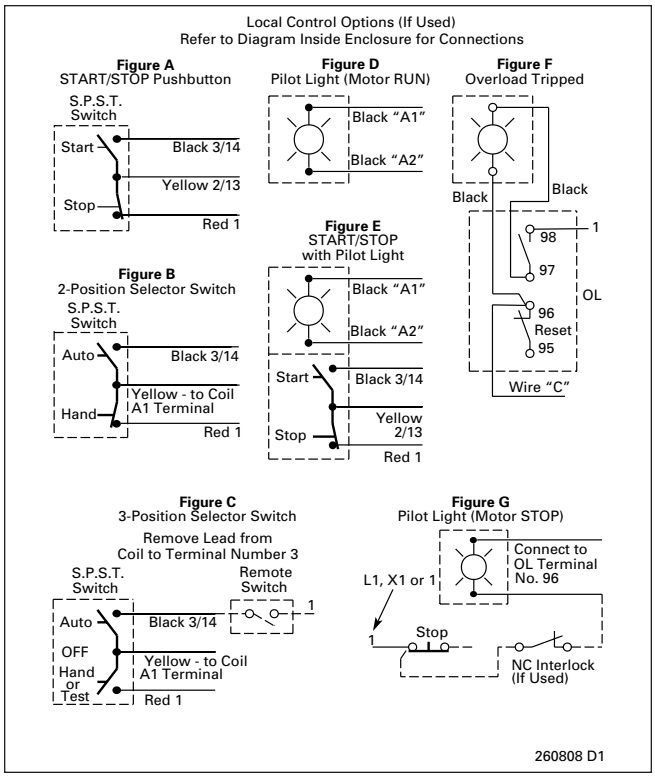


Figure 11-9. Type 1 C400GK Control Options

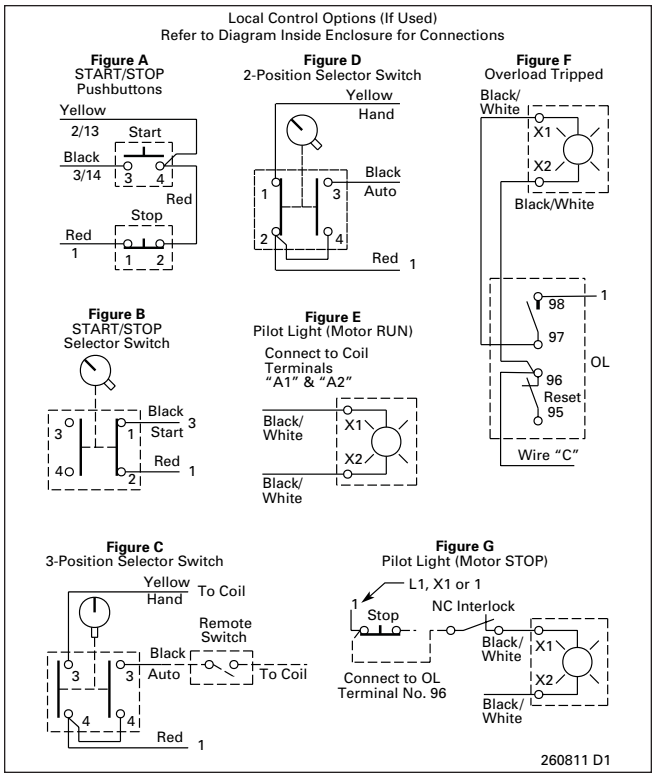


Figure 11-10. C400T Control Options

Reversing Cover Control

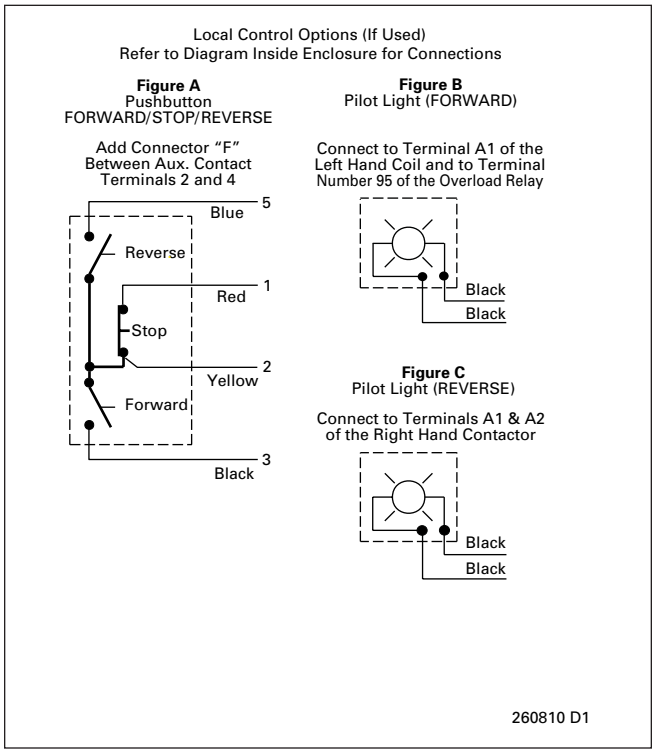


Figure 11-11. Type 1 C400GR Control Options

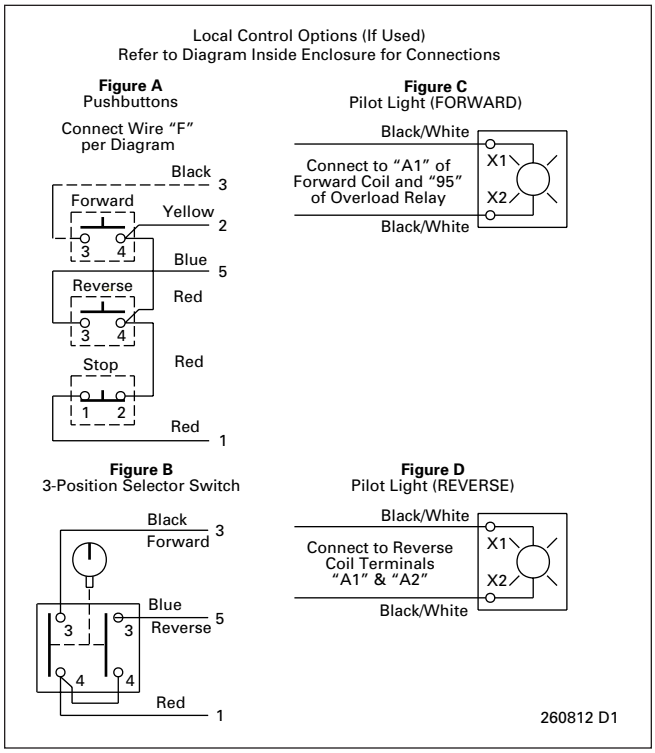


Figure 11-12. C400T Control Options

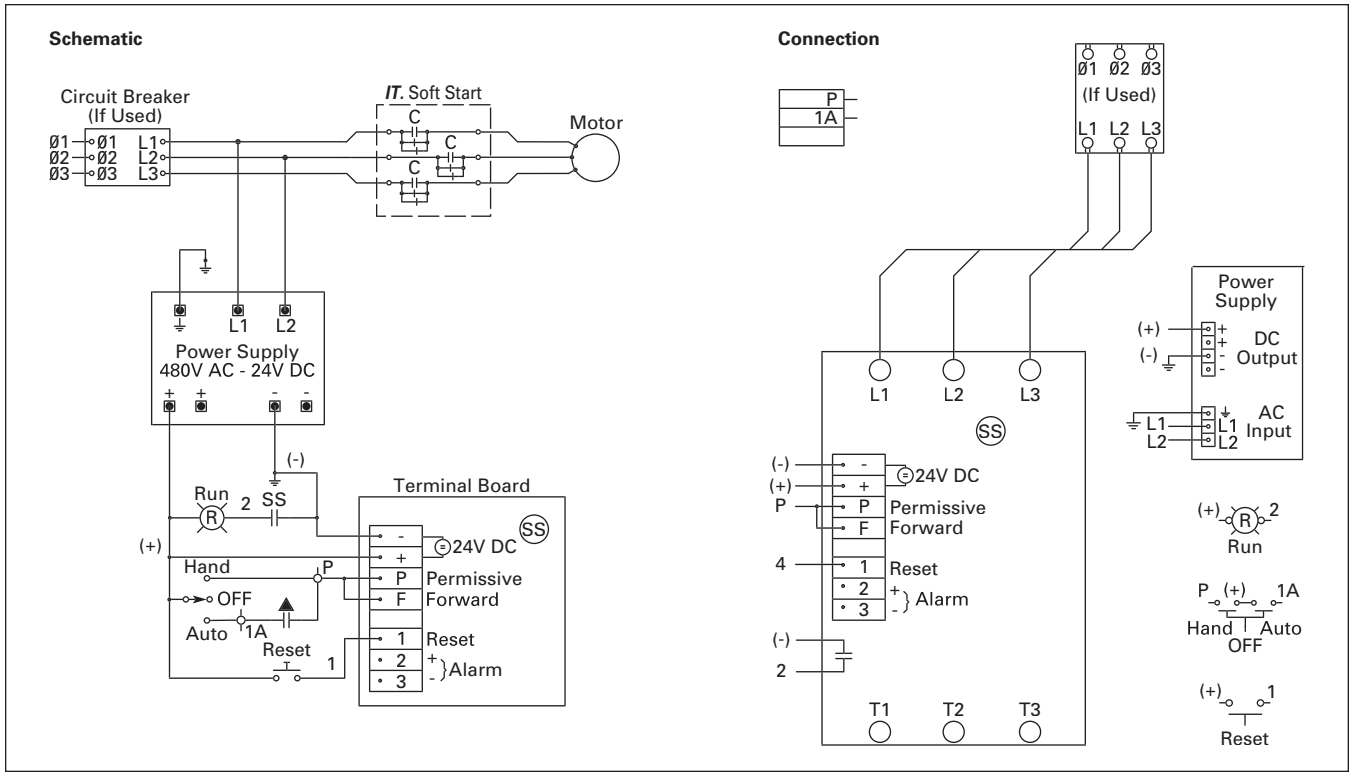


Figure 11-13. S752 Wiring Diagram

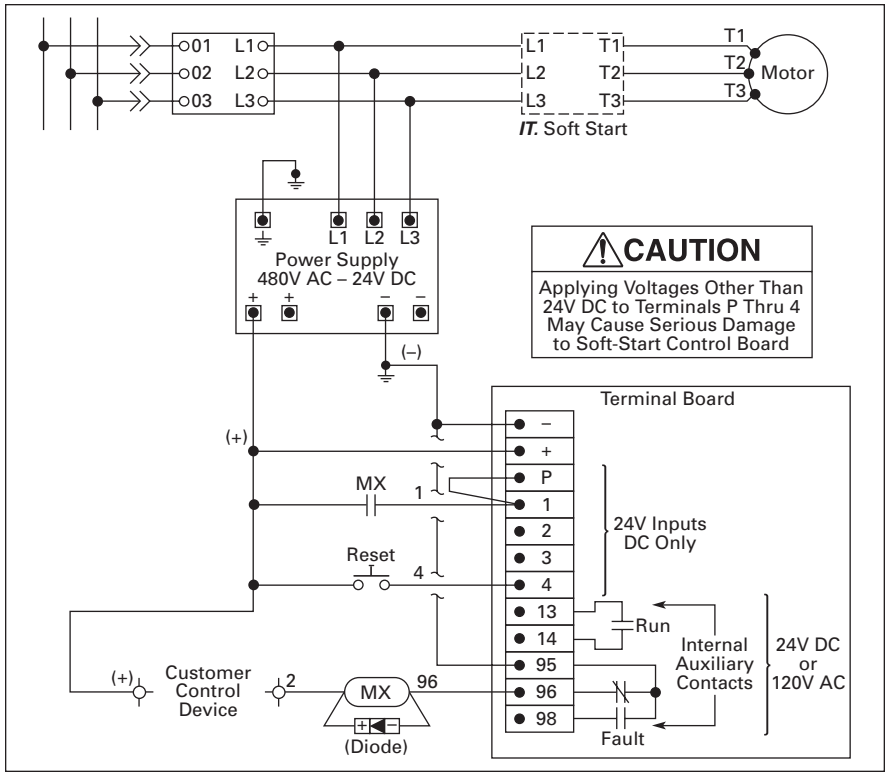


Figure 11-14. S801/S811 Wiring Diagram

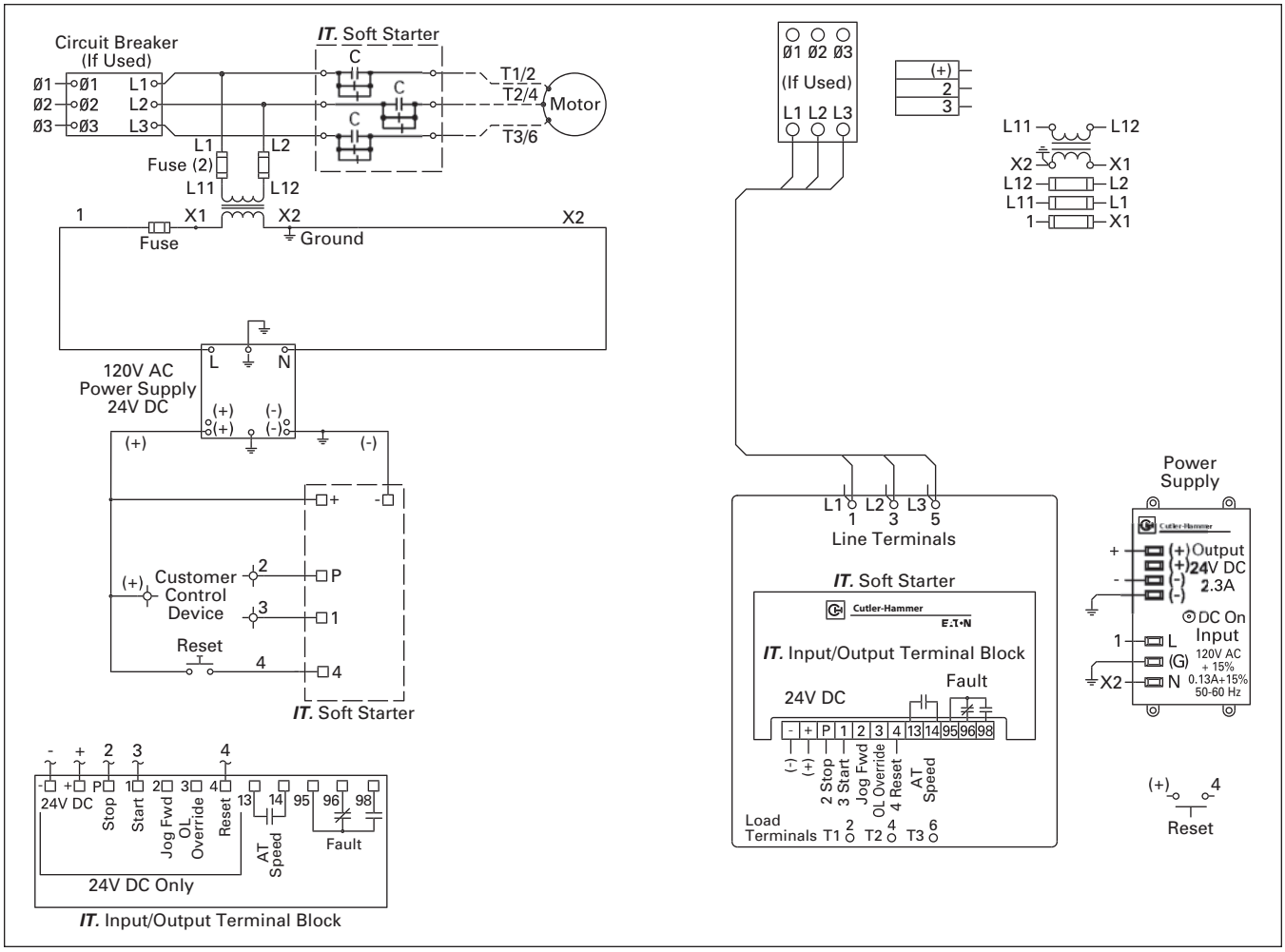


Figure 11-15. S801/S811 with External 120V AC Control

April 2008

Multi-Pak Group Control

Contents

Multi-Pak Group

Multi-Pak Grouping

Product Description

Eaton's Cutler-Hammer 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"L x 26"H space for four compartments or 48"L x 26"H for six compartments. Combinations of 4, 6, 8, 10, 12, 14, etc. 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.

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 MCM. 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 line-starter 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

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 **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL Listed
- cUL Listed
- ABS Type Approved

Accessories

Transformer Kits

Includes transformer, fuse clip mounting and fuse clip.

Table 12-1. Transformer Sizes ①

Size	VA Capacity	
	Freedom	Vacuum
0	50	—
1, 2	100	—
3	150	—
4	200	100
5	200	150
6	250	350

① Non-reversing, single contactor only.

Table 12-2. 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	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

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.

Table 12-3. Breaker/Switch Kits

Description	Catalog Number
Modification kit for 2nd fusible switch	6263A18G01
Modification kit for 2nd circuit breaker	6263A18G02

Terminal Kits

Table 12-4. Terminal Kits

Description	Catalog Number
Neutral or replacement kit	6263A18G08

Modification Codes

Table 12-5. Factory Installed Modifications

Description	Modification Number
Pushbutton ②	
2 Unit	1
3 Unit	1
2 or 3 Unit Selector Switch ②	2
Indicating Light (specify color) ②	3
Push-to-Test Indicating Light ②	4
Extra Auxiliary Contact (per contact)	5
Control Relay (D15) ③	
2 Pole	6
4 Pole	6
Timing Relay ③	7
Substitute Mark 75 Breaker for standard or feeder unit	8
Control Transformer ④	
Size 1	9
Size 2	9
Size 3	9
Size 4	9

② Three devices per module maximum.
③ Refer to factory for spacing.
④ Primary and secondary fusing supplied.

Note: For more Modification Codes, see **Page 16-40**.

Product Selection

When Ordering Specify

- Orders for modules, kits, etc. 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, etc. 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

Table 12-6. Starter Modules with Fusible Disconnect Product Selection ③

NEMA Size	Maximum Horsepower				NEC Fuse Clip Rating		Compart. Required	Catalog Number			
	208/230 Volts		460 – 575 Volts					Coil Voltage			
	NEC Fuses	Dual Element	NEC Fuses	Dual Element	Volts	Amps		120	240	480	550
Class 204 — Three-Phase Non-reversing Combination Starters											
1	3	7-1/2	5	10	600 ②	30	1	6263A08G05	6263A08G01 ①	6263A08G01 ①	6263A08G09
1	7-1/2	—	10	—	600 ②	60	1	6263A08G06	6263A08G02 ①	6263A08G02 ①	6263A08G10
2	7-1/2	15	15	25	600 ②	60	1	6263A08G07	6263A08G03 ①	6263A08G03 ①	6263A08G11
2	15	—	—	—	250	100	1	6263A08G08	6263A08G04 ①	6263A08G04 ①	—
3	15	30	—	—	250	100	2	6263A09G01	6263A09G02	—	—
3	30	—	—	—	250	200	2	6263A09G03	6263A09G04	—	—
3	—	—	30	50	600	100	2	6263A09G05	—	6263A09G06	6263A09G07
3	—	—	50	—	600	200	2	6263A09G08	—	6263A09G09	6263A09G10
Class 214 — Three-Phase Reversing Combination Starters											
1	3	7-1/2	—	—	250	30	2	6263A10G01	6263A10G02	—	—
1	—	—	5	10	600	30	2	6263A10G03	—	6263A10G04	6263A10G05
1	7-1/2	—	—	—	250	60	2	6263A10G06	6263A10G07	—	—
1	—	—	10	—	600	60	2	6263A10G08	—	6263A10G09	6263A10G10
2	7-1/2	15	—	—	250	60	2	6263A10G11	6263A10G12	—	—
2	—	—	15	25	600	60	2	6263A10G13	—	6263A10G14	6263A10G15
2	15	—	—	—	250	100	2	6263A10G16	6263A10G17	—	—

① Dual voltage coil wired for 480 volts; can be field converted to 240 volts.
② 600 volt clips are factory installed. A conversion kit for 250 volt fuses is included with starter modules.
③ Does not include heaters. See **Pages 12-7** and **12-8**.

Starter Modules with HMCP Circuit Breaker

Table 12-7. Starter Modules with HMCP Circuit Breaker Product Selection ⑥

NEMA Size	Maximum Horsepower		HMCP Trip Rating in Amperes	Compartments Required	Catalog Number			
	208/230 Volts	460 – 575 Volts			Coil Voltage			
					120	240	480	550
Class 206 — Three-Phase Non-reversing Combination Starters								
1	—	1	.69 – 2.5	1	6263A01G08	6263A01G07	6263A01G07	6263A01G09
1	1	2	1.5 – 5.7	1	6263A01G11	6263A01G10	6263A01G10	6263A01G12
1	3	5	3.4 – 12.6	1	6263A01G14	6263A01G13	6263A01G13	6263A01G15
1	7-1/2	10	6.9 – 25.2	1	6263A01G03	6263A01G01 ④	6263A01G01 ④	6263A01G05
2	15	25	11.5 – 42.1	1	6263A01G04	6263A01G02 ④	6263A01G02 ④	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 ⑤	5 – 10 ⑤	3.4 – 25.2	2	6263A04G01	6263A04G02	6263A04G03	6263A04G04
2	10 – 15	15 – 25	6.9 – 42.1	2	6263A04G05	6263A04G06	6263A04G07	6263A04G08

④ Dual voltage coil wired for 480 volts; can be field converted to 240 volts.
⑤ For smaller hp, order by description for proper selection of MCP.
⑥ Does not include heaters. See **Pages 12-7** and **12-8**.

Heater Selection ..... **Pages 12-7, 12-8**
Modifications ..... **Page 12-3**
Dimensions ..... **Page 12-9**

Product Selection

When Ordering Specify

- Orders for modules, kits, etc. 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, etc. 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)

Table 12-8. Fusible Main and Feeder Switch Modules Product Selection (Three-Pole) ①

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**

① Includes door.

Note: 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 on **Page 12-3**. Doors for fusible switch modules have cutout for second operating handle.

Main and Feeder Air Circuit Breaker Modules

Table 12-9. Main and Feeder Air Circuit Breaker Modules Product Selection ②

Amperes	Poles	Compartments Required	Module with One 600 Volt Therm./Mag. 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**
Type HJD			
125	3	2	**6263A17G01**
150	3	2	**6263A17G02**
175	3	2	**6263A17G03**
200	3	2	**6263A17G04**
225	3	2	**6263A17G05**

② Includes door.

Note: 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**, from **Page 12-3**. Doors for breaker modules have cutout for second operating handle.

12

Modifications ..... **Page 12-3**
Dimensions ..... **Page 12-9**

Product Selection

When Ordering Specify

- Total number of compartments required.
- Quantity of four compartment and/or six compartment enclosures required. (Include future space requirements.)

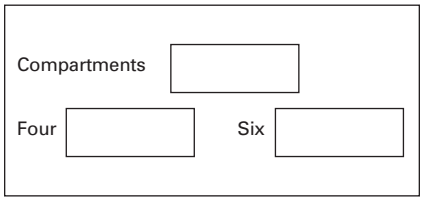


Figure 12-1. Compartments

Table 12-10. Enclosures and Blank Doors Product Selection

Description	Catalog Number
Type 1 Enclosure ① with four compartments with six compartments	 **6262A70G01** **6262A70G02**
Dust and Weather Resistant Enclosure to House Type 1 Enclosure with four compartments with six compartments	 **6262A70G05** **6262A70G06**
Blank Door for One Compartment Blank Door for Two Compartments and Blank Back Pan for Two Compartments	**6262A70G03** **6262A70G04**

① Incoming line and extension terminals included are suitable for either copper or aluminum conductors from 6 – 350 kcmil.

12

Modifications ..... **Page 12-3**
Dimensions ..... **Page 12-9**

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

1. The Heater Application Tables provide 115 to 125% protection for motors rated 40°C having a service factor of 1.15 and 1.25.
2. Use one smaller heater when:
   a. The motor is rated 50° or 55°C.
   b. The motor has a service factor of 1.00.
   c. A maximum of 115 protection is desired.
3. 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, 3-Pole Protection

Table 12-11. Heater Selection — Starter Size 1 ①

Motor Full Load Current in Amperes ②	Style Number	Max. 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**

① Use in fusible starters only. Do not use with circuit breakers.
② Ambient compensated.

Table 12-12. Heater Selection — Starter Size 1 & 2

Motor Full Load Current in Amperes ④	Style Number	Max. Breaker or Fuse	Catalog Number
2.16 – 2.35 ③	117C524G25	8	**FH25**
2.36 – 2.58 ③	117C524G26	8	**FH26**
2.59 – 2.83 ③	117C524G27	10	**FH27**
2.84 – 3.11 ③	117C524G28	10	**FH28**
3.12 – 3.42 ③	117C524G29	12	**FH29**
3.43 – 3.73 ③	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**

③ Use in fusible starters only. Do not use with circuit breakers.
④ Ambient compensated.

Table 12-13. Heater Selection — Starter Size 2

Motor Full Load Current in Amperes ⑤	Style Number	Max. 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**

⑤ Ambient compensated.

Table 12-14. Heater Selection — Starter Size 3 & 4

Motor Full Load Current in Amperes ①	Style Number	Max. 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**

① Ambient compensated.

Table 12-15. Heater Selection — Starter Size 4

Motor Full Load Current in Amperes ②	Style Number	Max. 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**

② Ambient compensated.

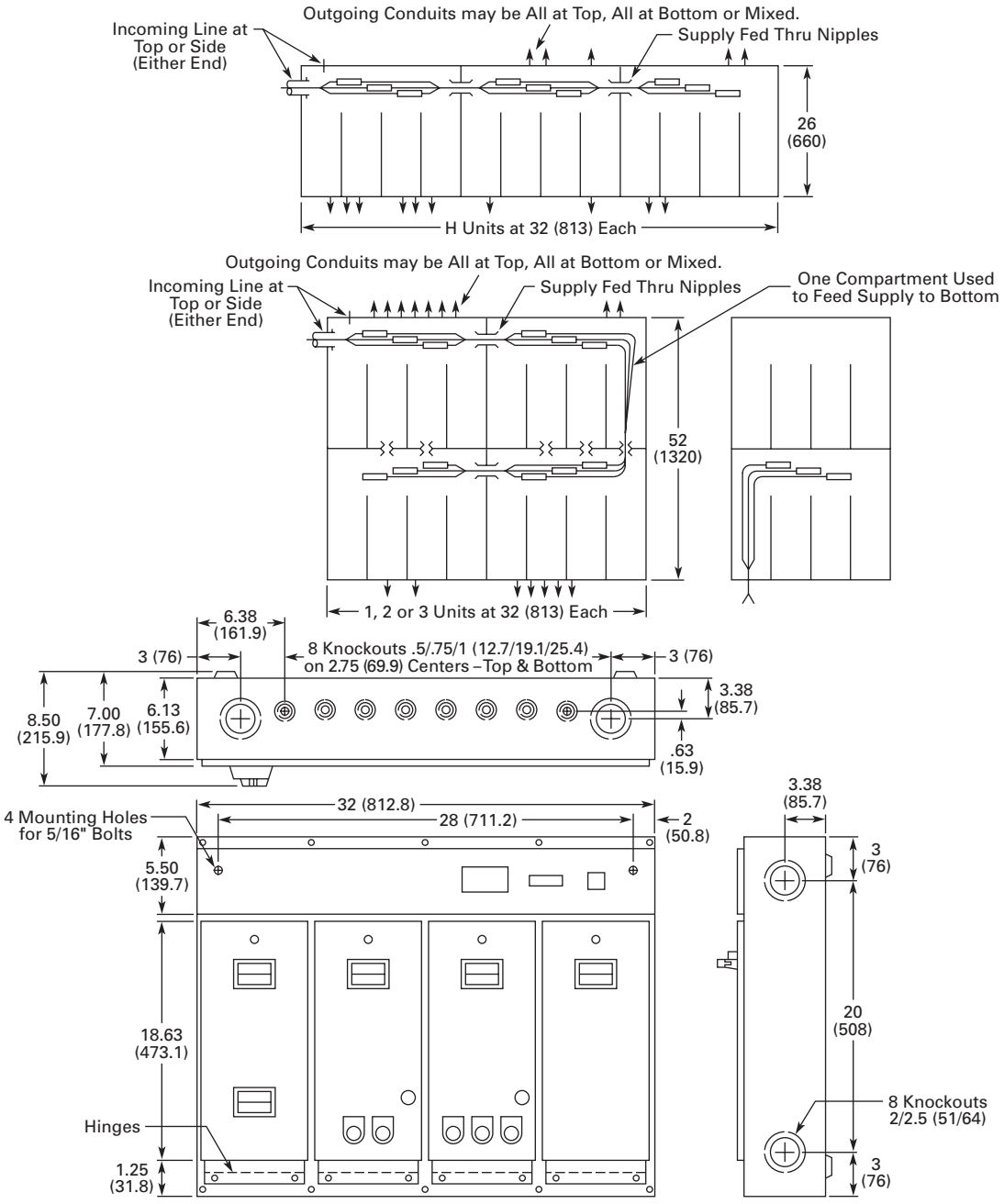
Dimensions

Dimension and Wiring Arrangements

Type 1 enclosures are 32 or 48 inches (813 or 1219 mm) wide, 26 inches (660 mm) high and 7 inches (178 mm) deep, with provisions for four-bolt wall mounting. Enclosures may be grouped together by nippling 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 4 or 6 module units are available. These enclosures are 34 or 50 inches (864 or 1270 mm) wide, 31 inches (787 mm) high and 11.75 inches (298 mm) deep.



Note: Six module units are 48 inches wide.

Figure 12-2. Approximate Dimensions and Wiring Arrangements, Four Module Unit

Table 12-16. Enclosures and Blank Doors

Description	Approximate Dimensions in Inches (mm)			Shipping Weight Lbs. (kg)
	Width	Height	Depth	
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)

① Incoming line and extension terminals included are suitable for either copper or aluminum conductors from 6 to 350 kcmil.

Shipping Weights

Table 12-17. Module Weights

Description	Weight Lbs. (kg)
Fusible Switches	
30 – 60 Amperes	10 (4.5)
100 Amperes	15 (6.8)
Circuit Breakers	
15 – 100 Amperes	10 (4.5)
125 – 225 Amperes	20 (9.1)

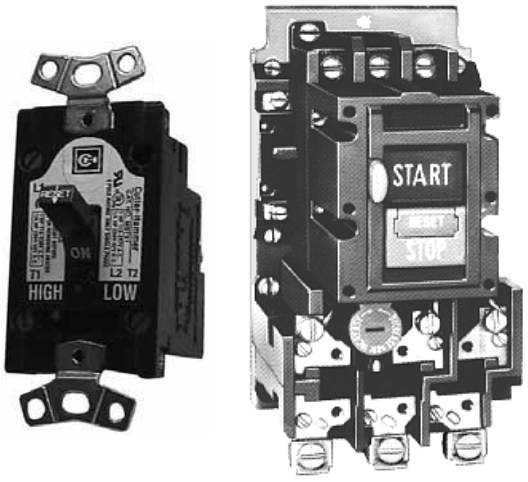
Description	Weight Lbs. (kg)
Starters — A204, A206	
Sizes 1, 2	15 (6.8)
Sizes 3, 4	25 (11.4)
Starters — A214	
Sizes 1, 2	15 (6.8)
Starters — A216	
Sizes 1, 2	20 (9.1)

April 2008

Manual Motor Control

Contents

13



Manual Motor Control

Modular Toggle Operated Starter

Product Description

- Eaton's Cutler-Hammer® 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 .40 amps up to 16.0 amps. 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 an G (dust).

Instructional Leaflet

IL12987G

Standards and Certifications

Note: See **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer Enclosed Control products.

- UL File No. E1922, Category NLRV (for motor controller)
- CSA File No. LR39402-6, Class 3211-05
- ABS Type Approved

Accessories

Table 13-1. MS 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**

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

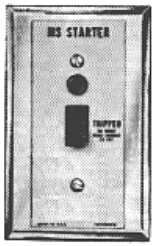
Table 13-2. Product Selection — MS Series Starters

Number of Poles	Horsepower	Voltage	Catalog Number ①
Open Type			
1	1 1/4 1/4	120/240V, 277V AC 120/240V DC 32V DC	**MST01**
2	1 1 1/4	120/240V, 277V AC 120/240V DC 32V DC	**MST02**
Flush Plate (No Enclosure Included)			
1	**Flush Plate Type**	Switch Only Switch with Pilot Light	**MST01FN** **MST01FN1P**
2	General Purpose	Switch Only Switch with Pilot Light	**MST02FN** **MST02FN1P**
1	Stainless Steel	Switch Only Switch with Pilot Light	**MST01DN** **MST01DN1P**
2		Switch Only Switch with Pilot Light	**MST02DN** **MST02DN1P**
Enclosed Types			
1	**Enclosure Type**	Switch Only Switch with Pilot Light	**MST01SN** **MST01SN1P**
2	General Purpose Type 1	Switch Only Switch with Pilot Light	**MST02SN** **MST02SN1P**
1	Waterproof Type 3, 4 & 5	Through Hub	**MST01AH**
2		Through Hub	**MST02AH**
1	Hazardous Location ② Types 7D, 9E, 9F & 9G	Through Hub	**MST01EH**
2		Through Hub	**MST02EH**

① Does not include heater. Select heater from **Table 13-3**.
② Type 7D = Type 7, Class I, Group D; Type 9E, 9F and 9G = Type 9, Class II, Groups E, F and G.

Table 13-3. Heater Selection for MS Starters

Motor Full Load Current	Catalog Number	Motor Full Load Current	Catalog Number	Motor Full Load Current	Catalog Number	Motor Full Load Current	Catalog Number
.4 – .43	**MSH-5A**	1.04 – 1.15	**MSH1-3A**	2.72 – 2.95	**MSH3-4A**	7.04 – 7.74	**MSH8-8A**
.44 – .48	**MSH-55A**	1.16 – 1.27	**MSH1-45A**	2.96 – 3.27	**MSH3-7A**	7.75 – 8.46	**MSH9-7A**
.49 – .53	**MSH-61A**	1.28 – 1.35	**MSH1-6A**	3.28 – 3.59	**MSH4-1A**	8.47 – 9.35	**MSH10-6A**
.54 – .58	**MSH-67A**	1.36 – 1.51	**MSH1-7A**	3.60 – 3.99	**MSH4-5A**	9.36 – 10.30	**MSH11-7A**
.59 – .64	**MSH-74A**	1.52 – 1.67	**MSH1-9A**	4.00 – 4.39	**MSH5-0A**	10.31 – 11.35	**MSH12-9A**
.65 – .71	**MSH-81A**	1.68 – 1.83	**MSH2-1A**	4.40 – 4.79	**MSH5-5A**	11.36 – 12.47	**MSH14-2A**
.72 – .78	**MSH-89A**	1.84 – 1.99	**MSH2-3A**	4.80 – 5.26	**MSH6-0A**	12.48 – 13.67	**MSH15-6A**
.79 – .87	**MSH-98A**	2.00 – 2.23	**MSH2-5A**	5.27 – 5.83	**MSH6-6A**	13.68 – 15.12	**MSH17-1A**
.88 – .95	**MSH1-1A**	2.24 – 2.47	**MSH2-8A**	5.84 – 6.39	**MSH7-3A**	15.13 – 16.00	**MSH18-6A**
.96 – 1.03	**MSH1-2A**	2.48 – 2.71	**MSH3-1A**	6.40 – 7.03	**MSH8-0A**		



Switch and Pilot Light Mounted on Flush Plate

Switch and Pilot Light Mounted in Type 1 Enclosure


Waterproof Type 3, 4 & 5


Hazardous Location Type 7D, 9E, 9F & 9G


Typical Heater


Heater Element Installation

13

Dimensions. . . . . **Page 13-4**

Dimensions

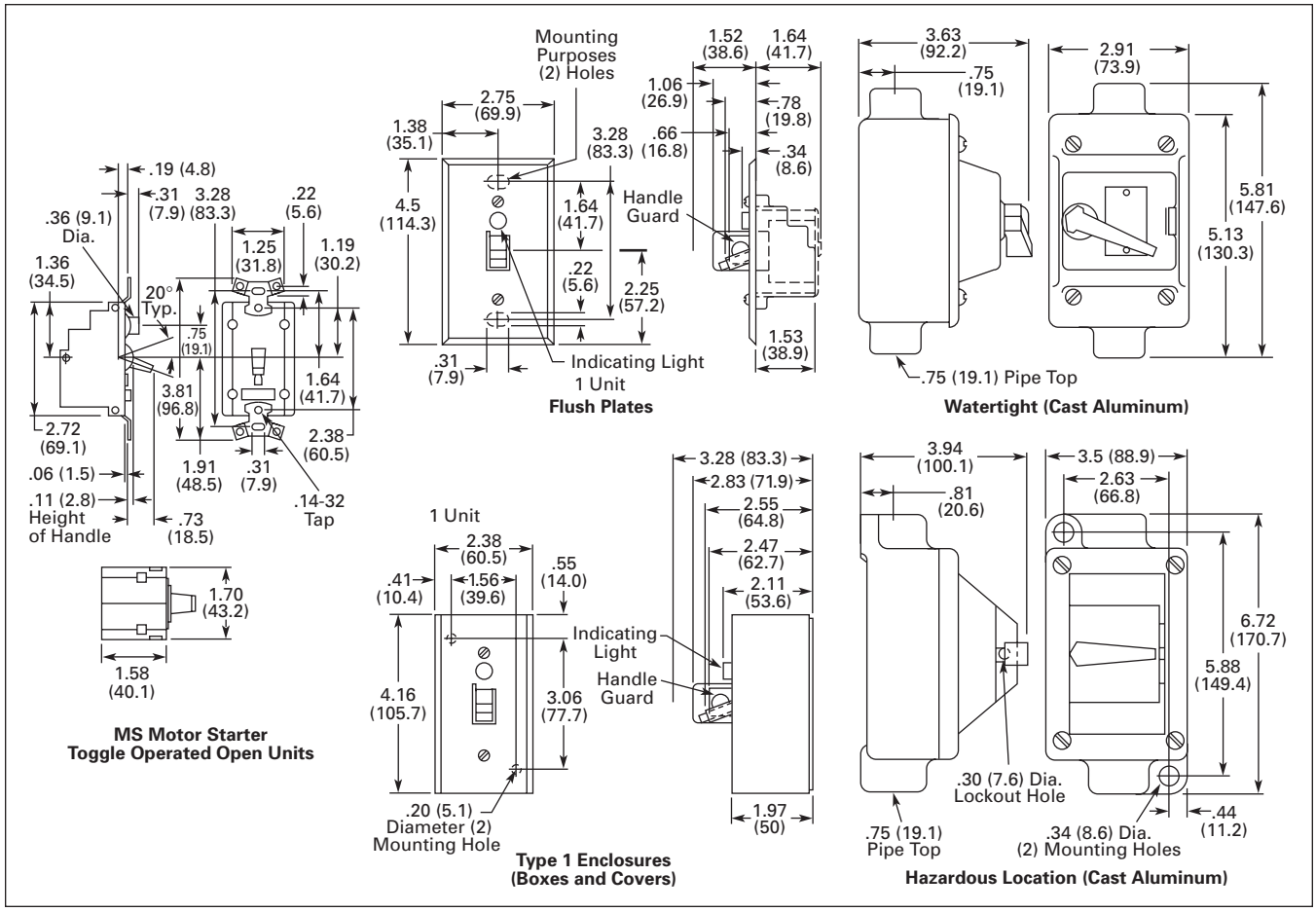
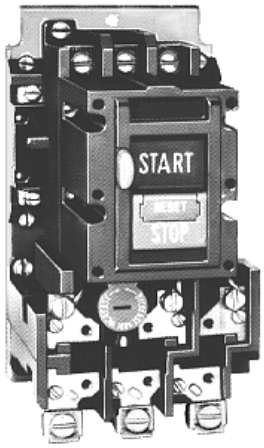


Figure 13-1. Approximate Dimensions in Inches (mm)



Pushbutton Operated

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 **Page 18-2** for additional information on Standards and Certifications that apply to all Cutler-Hammer 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

Product Description

Eaton's Cutler-Hammer® B100 Manual Motor Starters can be used in single-phase applications rated 3 hp at 240V AC or 2 hp at 230V DC. The starter can also be rated for three-phase applications up to 10 hp at 600V AC.

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 38.9 amp single-phase and 26.8 amp three-phase with the appropriate heater selection.

Technical Data

Table 13-4. Specifications

NEMA Size	Maximum hp for AC Ratings ①			Maximum hp for DC Ratings	
	120V AC	208 – 240V AC	480 – 600V AC	115V DC	230V DC
2-Pole, Single-Phase					
M-0	1	2	—	1	1-1/2
M-1	2	3	—	1-1/2	2
3-Pole, Three-Phase					
M-0	2	3	5	—	—
M-1	3	7-1/2	10	—	—

① Ratings up to 3 hp, 3-phase are suitable for group fusing.

Options

Table 13-5. Factory Modifications

Description	Catalog Number ② Suffix
Pushbutton operator (open and Type 1 only)	**A**
Without lockoff (open only)	**X**

② Add Suffix letter to starter Catalog Number Ex: B100MOC**A**.

Accessories

Table 13-6. Accessories

Description	Catalog Number
Field Mounting Kits	
Auxiliary Contact —	
1NO	**B1A**
1NC	**B1B**
Red Pilot Light —	
120/60 (Type 1 Enc. Only)	**LK-21**
208-240/6 (Type 1 Enc. Only)	**LK-22**
480-600/60 (Type 1 Enc. Only)	**LK-26**
For Type 4 and 12 Enclosures Only	
Red Pilot Light —	
120V	**LK-41**
240V	**LK-42**

13

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

Table 13-7. Product Selection — Toggle and Pushbutton Operated Starters

NEMA Size	Open Type Toggle Handle	Enclosed			
		Type 1 General Purpose	Type 4 Watertight, Stainless Steel ①	Type 7D, 9E, 9F & 9G for Hazardous Locations ②④	Type 12 Dust-Tight
	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③	Catalog Number ③
Type B100 Non-reversing 2-Pole (For Single-Phase Motors and DC)					
M-0 M-1	**B100M0B** **B100M1B**	**B100S0B** **B100S1B**	**B100W0B** **B100W1B**	**B100U0B** **B100U1B**	**B100J0B** **B100J1B**
Type B100 Non-reversing 3-Pole (For Polyphase Motors) ④					
M-0 M-1	**B100M0C** **B100M1C**	**B100S0C** **B100S1C**	**B100W0C** **B100W1C**	**B100U0C** **B100U1C**	**B100J0C** **B100J1C**

① One 1-inch chrome hub supplied on each end.
② Type 7D = Type 7, Class I, Group D. Type 9E, 9F and 9G = Type 9, Class II, Groups E, F and G.
③ Does not include heaters. Select Catalog Numbers of heaters from **Table 13-8**.
④ Tapped for 1-inch conduit on each end.

Toggle Operated

Type 1 Enclosure

Heater Selection ..... **Page 13-7**
Dimensions ..... **Page 13-8**

Table 13-8. Heater Selection

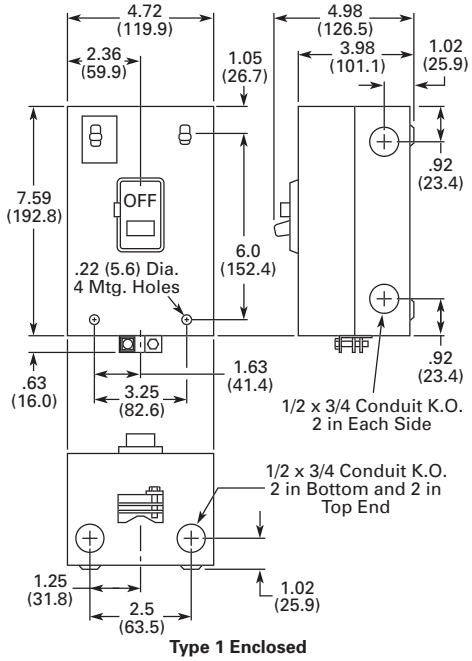
Motor Full Load Current	Max. Fuse Amps	Catalog Number	Motor Full Load Current	Max. Fuse Amps	Catalog Number
Single-Phase Enclosed Starters ①			**Three-Phase Enclosed Starters ②**		
.28 – .29	1	**FH03**	.25 – .26	1	**FH03**
.30 – .33	1	**FH04**	.27 – .29	1	**FH04**
.34 – .36	1	**FH05**	.30 – .32	1	**FH05**
.37 – .40	1	**FH06**	.33 – .35	1	**FH06**
.41 – .45	1	**FH07**	.36 – .39	1	**FH07**
.46 – .50	1	**FH08**	.40 – .44	1	**FH08**
.51 – .56	1	**FH09**	.45 – .49	1	**FH09**
.57 – .63	2	**FH10**	.50 – .55	1	**FH10**
.64 – .70	2	**FH11**	.56 – .61	2	**FH11**
.71 – .78	2	**FH12**	.62 – .68	2	**FH12**
.79 – .86	2	**FH13**	.69 – .75	2	**FH13**
.87 – .95	3	**FH14**	.78 – .83	2	**FH14**
.96 – 1.04	3	**FH15**	.84 – .91	3	**FH15**
1.05 – 1.14	3	**FH16**	.92 – 1.00	3	**FH16**
1.15 – 1.25	4	**FH17**	1.01 – 1.10	3	**FH17**
1.26 – 1.39	4	**FH18**	1.11 – 1.22	4	**FH18**
1.40 – 1.54	5	**FH19**	1.23 – 1.35	4	**FH19**
1.55 – 1.71	5	**FH20**	1.36 – 1.50	5	**FH20**
1.72 – 1.89	6	**FH21**	1.51 – 1.66	5	**FH21**
1.90 – 2.10	7	**FH22**	1.67 – 1.84	6	**FH22**
2.11 – 2.32	8	**FH23**	1.85 – 2.03	7	**FH23**
2.33 – 2.54	8	**FH24**	2.04 – 2.23	7	**FH24**
2.55 – 2.79	9	**FH25**	2.24 – 2.45	8	**FH25**
2.80 – 3.07	10	**FH26**	2.46 – 2.69	9	**FH26**
3.08 – 3.36	10	**FH27**	2.70 – 2.95	10	**FH27**
3.37 – 3.68	10	**FH28**	2.96 – 3.23	10	**FH28**
3.69 – 4.03	10	**FH29**	3.24 – 3.53	10	**FH29**
4.04 – 4.40	15	**FH30**	3.54 – 3.85	10	**FH30**
4.41 – 4.81	15	**FH31**	3.86 – 4.22	10	**FH31**
4.82 – 5.26	15	**FH32**	4.23 – 4.61	15	**FH32**
5.27 – 5.74	15	**FH33**	4.62 – 5.03	15	**FH33**
5.75 – 6.26	20	**FH34**	5.04 – 5.49	15	**FH34**
6.27 – 6.83	20	**FH35**	5.50 – 5.99	20	**FH35**
6.84 – 7.45	25	**FH36**	6.00 – 6.53	20	**FH36**
7.46 – 8.11	25	**FH37**	6.54 – 7.11	25	**FH37**
8.12 – 8.81	30	**FH38**	7.12 – 7.73	25	**FH38**
8.82 – 9.58	30	**FH39**	7.74 – 8.40	25	**FH39**
9.59 – 10.40	35	**FH40**	8.41 – 9.12	30	**FH40**
10.41 – 11.30	35	**FH41**	9.13 – 9.89	35	**FH41**
11.40 – 12.20	40	**FH42**	9.90 – 10.70	35	**FH42**
12.30 – 13.50	45	**FH43**	10.80 – 11.80	40	**FH43**
13.60 – 14.90	50	**FH44**	11.90 – 13.00	45	**FH44**
15.00 – 16.00	50	**FH45**	13.10 – 14.00	50	**FH45**
16.10 – 17.10	60	**FH46**	14.10 – 15.00	50	**FH46**
17.20 – 18.30	60	**FH47**	15.10 – 16.10	50	**FH47**
18.40 – 19.70	70	**FH48**	16.20 – 17.30	60	**FH48**
19.80 – 21.20	70	**FH49**	17.40 – 18.60	60	**FH49**
21.30 – 22.80	80	**FH50**	18.70 – 20.00	70	**FH50**
22.90 – 24.50	88	**FH51**	20.10 – 21.50	70	**FH51**
24.60 – 26.40	90	**FH52**	21.60 – 23.20	80	**FH52**
26.50 – 28.50	90	**FH53**	23.30 – 25.00	80	**FH53**
28.60 – 30.80	100	**FH54**	25.10 – 26.80	90	**FH54**
30.90 – 33.30	110	**FH55**			
33.40 – 36.00	125	**FH56**			
36.10 – 38.90	125	**FH57**			

① Single-Phase Starters require two overload heaters.
② Three-Phase Starters require three overload heaters.

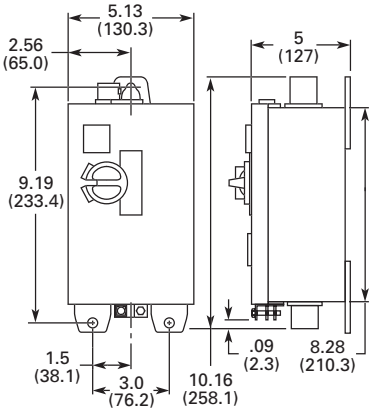
Note: FH Series heaters are for type B100 manual motor starters. Heater element selection is based on motor nameplate's listed full load amperes. Trip rating of this series of elements is 125% of minimum motor full load amperes listed for the element.

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.

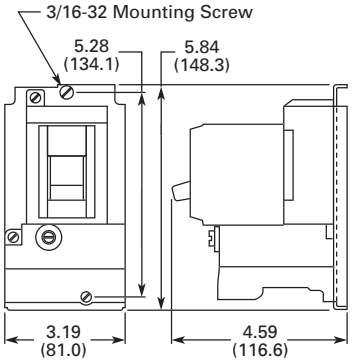
Dimensions



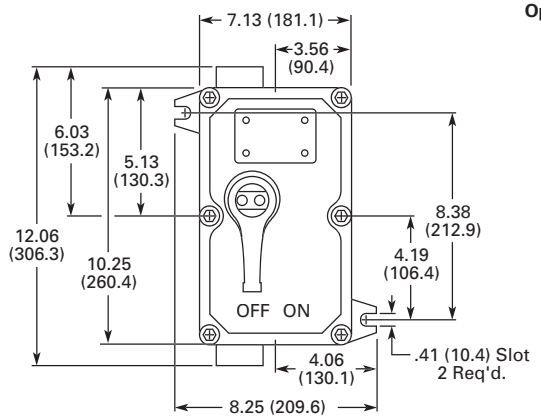
Type 1 Enclosed

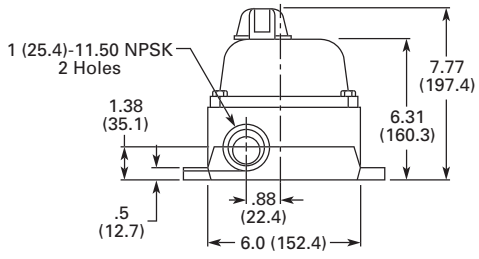


Type 4 Enclosed

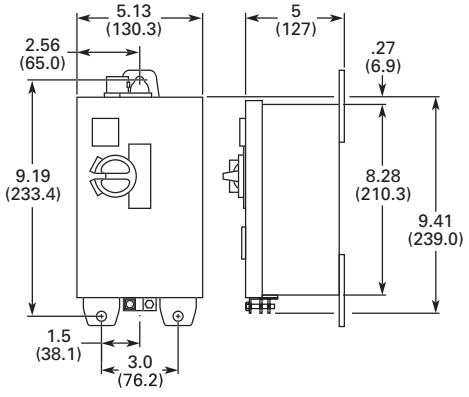


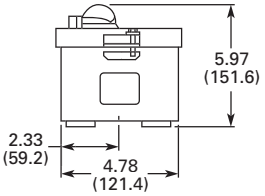
Open, Non-reversing Starter





Type 7 & 9 Enclosed





Type 12 Enclosed

Figure 13-2. Approximate Dimensions in Inches (mm)

April 2008

Alternate Enclosures

Contents

Enclosure Options

Overview

Eaton's Cutler-Hammer® 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.

Nonmetallic Enclosure

Nonmetallic Enclosures

Eaton's Cutler-Hammer 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.

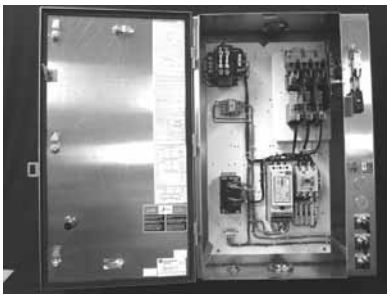
Features

- 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

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** (i.e. ECN2221AAF becomes ECN2225AAF).



316 Stainless Steel Enclosure

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 (i.e. 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** (i.e. ECN2221AAF becomes ECN2229AAF).

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** (i.e. ECN2221AAF becomes ECN222AAAF).

Hazardous Location Enclosure

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 11**, **Page 11-3**.

For ordering this option, change the 7th digit in the Catalog Number to a **6** for Bolted design, and **7** for Threaded design. (i.e. 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.

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, utilizing the latest technologies. Our abilities include:

- AutoCAD
- Mechanical Desktop/Inventor
- Mechanical Engineering
- Electrical Engineering
- UL Test Certification
- Short Circuit/Thermal Testing
- Prototyping

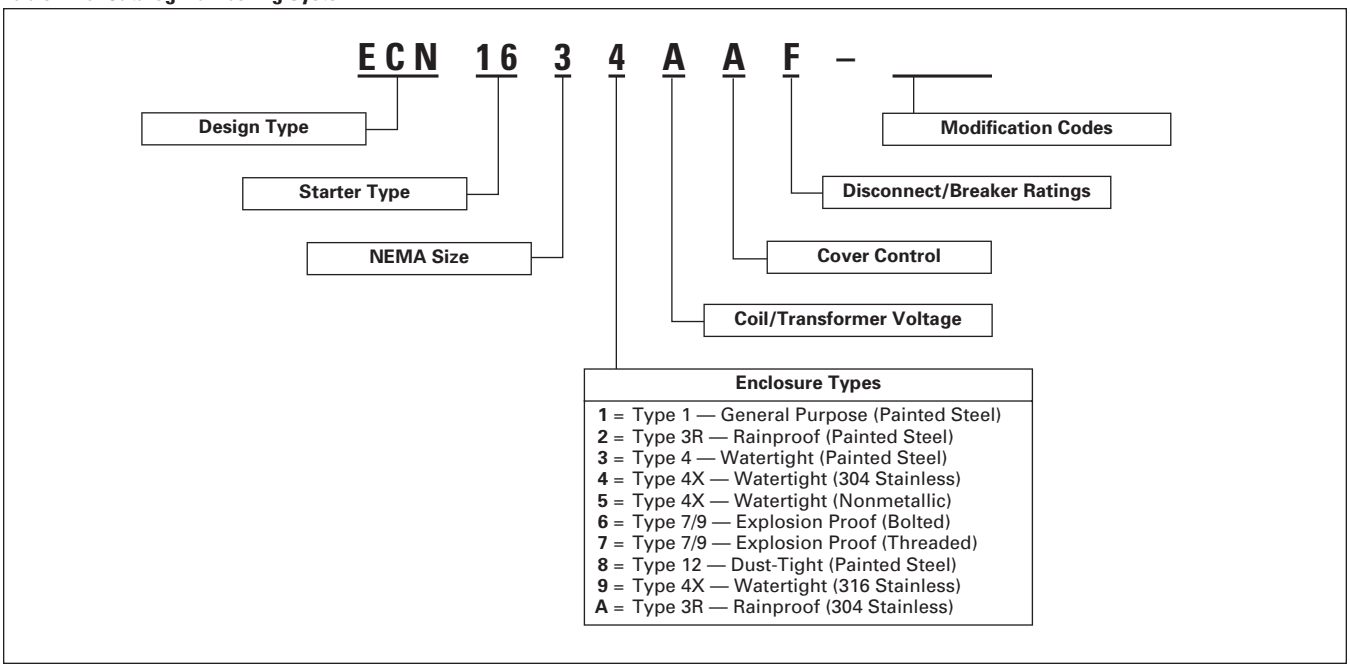
Due to our focus on control panels, we have become highly efficient and strive to exceed our customer expectations on performance, quality and delivery.

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

Ordering Information

Table 14-9. Catalog Numbering System



April 2008

Enclosed Dimensions

Contents

15

Locating dimensions for an enclosed control device is simple:

1. Find the device's NEMA Size/IEC Frame 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 — *IT.*/Freedom

Contactors

Table 15-1. Type 1 *IT.* Contactors

NEMA Size	Box No.	Shipping Weight Lbs. (kg)
Non-reversing Contactors without PSS		
00	1	3 (1.4)
0	1	3 (1.4)
1	1	3 (1.4)
2	2	5 (2.3)
3	2	10 (4.5)
4	2	10 (4.5)
5	3	32 (15)
Reversing Contactors without PSS		
00	1	4 (1.8)
0	1	4 (1.8)
1	1	6 (2.7)
2	2	5 (2.3)
3	3	20 (9.1)
4	3	20 (9.1)
5	3	52 (24)
Non-reversing Contactors with PSS		
00	2	4 (1.8)
0	2	4 (1.8)
1	2	4 (1.8)
2	2	6 (2.7)
3	3	12 (5.4)
4	3	12 (5.4)
5	3	33 (15)
Reversing Contactors with PSS		
00	2	5 (2.3)
0	2	5 (2.3)
1	2	5 (2.3)
2	3	10 (4.5)
3	3	21 (10)
4	3	22 (10)
5	3	54 (25)

Table 15-2. Type 1 Freedom Contactors

NEMA Size (Poles)	Box No.	Shipping Weight Lbs. (kg)
Non-reversing Contactors — without Control Power Transformers		
00 (2P, 3P, 4P)	1	5.25 (2.4)
00 (2P, 3P, 4P) with top adders	2	7.3 (3.3)
0 (2P, 3P, 4P)	1	5.25 (2.4)
0 (2P, 3P, 4P) with top adders	2	7.3 (3.3)
0 (5P)	2	7.3 (3.3)
1 (2P, 3P)	1	7.9 (3.6)
1 (2P, 3P) with top adders	3	11 (5.0)
1 (4P, 5P)	2	8.3 (3.8)
2 (2P, 3P, 4P 5P)	2	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		
00 (2P, 3P, 4P)	2	12 (5.4)
00 (2P, 3P, 4P, 5P) with top adders	3	15 (6.8)
0 (2P, 3P, 4P, 5P)	2	12 (5.4)
0 (2P, 3P, 4P, 5P) with top adders	3	15 (6.8)
1 (2P, 3P)	2	12.2 (5.5)
1 (2P, 3P) with top adders	3	12.5 (5.7)
1 (4P, 5P)	2	12.6 (5.7)
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
3-Pole Reversing Contactors — without Control Power Transformers		
00	2	7.8 (3.5)
0	2	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

① Consult factory.

Table 15-3. Type 3R, 4/4X, 12 *IT.* Contactors

NEMA Size	Box No.	Shipping Weight Lbs. (kg)
Non-reversing without PSS		
00, 0	5	12 (5.4)
1	5	12 (5.4)
2	5	14 (6.4)
3	8	32 (15)
4	8	41 (19)
5	10	99 (45)
Non-reversing with PSS		
00, 0	5	13 (5.9)
1	6	13 (5.9)
2	6	15 (6.8)
3	8	34 (15)
4	8	43 (20)
5	10	101 (46)
Reversing without PSS		
00, 0	6	14 (6.4)
1	6	14 (6.4)
2	6	17 (7.7)
3	8	40 (18)
4	9	48 (22)
5	10	125 (57)

Table 15-4. Type 3R, 4/4X, 12 Freedom Contactors

NEMA Size (Poles)	Box No.	Shipping Weight Lbs. (kg)
Non-reversing Contactors — without Control Power Transformers		
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	②
8	F1E	②
9	F1E	②
Non-reversing Contactors — with Control Power Transformers		
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	②
8	F1E	②
9	F1E	②

② Consult factory.

Note: All Type 7 and 9, see **Tab 11**.

Table 15-4. Type 3R, 4/4X, 12 Freedom Contactors (Continued)

NEMA Size (Poles)	Box No.	Shipping Weight Lbs. (kg)
3-Pole Reversing Contactors — with or without Control Power Transformers		
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

① Consult factory.

Non-combination Starters

Table 15-5. Type 1 *IT.* Non-combination Starters

NEMA Size	Box No.	Shipping Weight Lbs. (kg)
Non-reversing Non-combination Starters		
00	2	8 (3.6)
0	2	8 (3.6)
1	2	8 (3.6)
2	2	11 (5.0)
3	4	16 (7.3)
4	4	16 (7.3)
5	4	36 (16)
Reversing Non-combination Starters		
00	3	9 (4.1)
0	3	9 (4.1)
1	3	9 (4.1)
2	3	15 (6.8)
3	4	24 (11)
4	4	24 (11)
5	4	65 (30)

Table 15-6. Type 1 Freedom Non-combination Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Starters — without Control Power Transformers		
00	1	7 (3.2)
00 with top adders/SSOL	2	10 (4.5)
0	1	7.1 (3.2)
0 with top adders/SSOL	2	10 (4.5)
1	1	7.9 (3.6)
1 – 2 with top adders/SSOL	3	11.5 (5.2)
2	2	8.5 (3.9)
3	4	35 (16)
4	4	47 (21)
5	10	139 (63)
6	F1E	360 (163)
7	F1E	②
8	F1E	②
9	F1E	②
Non-reversing Starters — with Control Power Transformers		
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	②
8	F1E	②
9	F1E	②
Reversing Starters — without Control Power Transformers		
00	2	8 (3.6)
0	2	8 (3.6)
0 with top adders	3	11 (5)
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	②
8	F2E	②
9	F2E	②
Reversing Starters — with Control Power Transformers		
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	②
8	F2E	②
9	F2E	②

② Consult factory.

Table 15-7. Type 3R, 4/4X, 12 *IT.* Non-combination Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Non-combination Starters		
00, 0	5	8 (3.6)
1	5	9 (4.1)
2	7	12 (5.4)
3	8	38 (17)
4	8	38 (17)
5	10	110 (50)
Reversing Non-combination Starters		
00, 0	3	10 (4.5)
1	3	11 (5.0)
2	3	18 (8.2)
3	4	32 (15)
4	4	32 (15)
5	4	92 (42)

Table 15-8. Type 3R, 4/4X, 12 Freedom Non-combination Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Starters — without Control Power Transformers		
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	③
8	F1E	③
9	F1E	③
Non-reversing Starters — with Control Power Transformers		
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	③
7	F1E	③
8	F1E	③
9	F1E	③
Reversing Starters — with or without Control Power Transformers		
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	③
8	F2E	③
9	F2E	③

③ Consult factory.

Note: All Type 7 and 9, see **Tab 11**.

15

Combination Starters — NEMA Size

Table 15-9. Type 1 *IT.* Combination Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Combination		
00, 0	A	35 (16)
1	A	35 (16)
2	A	36 (16)
3	C	60 (27)
4 (HMCP)	C	60 (27)
4 (Disconnect Switch)	E	120 (54)
5	E	140 (64)
Reversing Combination		
00, 0	B	36 (16)
1	B	36 (16)
2	B	37 (17)
3	C	68 (31)
4	E	68 (31)
5	F1E	167 (76)

Table 15-10. Type 1 Freedom and A200 Combination Starters

NEMA Size (Device)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing — with and without Control Power Transformers		
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		
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		
0 – 1 – 2	B	44 (20)

① Consult factory.

Table 15-11. Type 1 Freedom Non-reversing Combination Starters — Narrow Enclosure

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
NEMA 1 Enclosed		
0 – 1 – 2	I	35 (16)
NEMA 12 Enclosed		
0 – 1 – 2	I	36 (16)
NEMA 12 Enclosed with Safety Door Interlock		
0 – 1 – 2	I	37 (17)

Table 15-12. Type 3R, 4/4X, 12 *IT.* Combination Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Combination		
00, 0	A	35 (16)
1	A	35 (16)
2	A	36 (16)
3	C	60 (27)
4 (HMCP)	C	60 (27)
4 (Disconnect Switch	E	120 (54)
5	E	140 (64)
Reversing Combination		
00, 0	B	36 (16)
1	B	36 (16)
2	B	37 (17)
3	C	68 (31)
4	E	68 (31)
5	F1E	167 (76)

Table 15-13. Type 3R, 4/4X, 12 Freedom Combination Starters

NEMA Size (Device)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing — with and without Control Power Transformers		
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	②
8	F2E	②
9	F2E	②
Reversing — with and without Control Power Transformers		
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	②
7	F2E	②
8	F2E	②
9	②	②
Non-reversing — Oversized		
0 – 1 – 2	B	44 (20)

② Consult factory.

Multispeed Starters — Freedom

Table 15-14. Non-combination Multispeed Starters

Size	Type 1		Type 3R, 4X, 12	
	Box No.	Shipping Wt. Lbs. (kg)	Box No.	Shipping Wt. Lbs. (kg)
Class 33: 2-Speed 2-Winding				
0	2	8 (3.6)	6	18 (8.2)
1 – 2	3	11 (5.0)	7	18 (8.2)
3	4	67 (30)	8	75 (34)
4	9	154 (70)	9	170 (77)
5	E	170 (77)	E	190 (86)
6	F1E	335 (152)	F1E	375 (170)
Class 34: 2-Speed 1-Winding, Constant or Variable Torque				
0 – 2	3	19 (8.6)	7	28 (13)
3	9	50 (23)	9	58 (26)
4	E	270 (123)	E	278 (126)
5	F1E	360 (163)	F1E	370 (168)
6	F1E	③	F1E	③
Class 35: 2-Speed 1-Winding, Constant Horsepower				
0 – 2	3	19 (8.6)	7	28 (13)
3	9	50 (23)	9	58 (26)
4	E	270 (123)	E	278 (126)
5	F1E	360 (163)	F1E	370 (168)
6	F1E	③	F1E	③

③ Consult factory.

Note: All Type 7 and 9, see **Tab 11**.

Table 15-15. Combination Multispeed Starters

Size	Type 1		Type 3R, 4X, 12	
	Box No.	Shipping Wt. Lbs. (kg)	Box No.	Shipping Wt. Lbs. (kg)
Class 36: 2-Speed 2-Winding — with Disconnect Switch **Class 39: 2-Speed 2-Winding — with HMCP**				
0 – 2	B	15 (6.8)	B	22 (10)
3	C	82 (37)	C	90 (41)
4	D	174 (79)	D	190 (86)
5	F1E	190 (86)	F1E	210 (95)
6	F1E	355 (161)	F1E	375 (170)
Class 37: 2-Speed 1-Winding, Constant or Variable Torque — with Disconnect **Class 38: 2-Speed 1-Winding, Constant Horsepower — with Disconnect** **Class 40: 2-Speed 1-Winding, Constant or Variable Torque — with Disconnect** **Class 41: 2-Speed 1-Winding, Constant Horsepower — with HMCP**				
0 – 2	B	27 (12)	B	35 (16)
3	C	102 (46)	C	110 (50)
4	E	320 (145)	E	327 (148)
5	F1E	428 (194)	F1E	438 (199)
6	F1E	④	F1E	④

④ Consult factory.

IEC Control — *XT*

Note: Contact Eaton for Box Dimensions not shown in **Figures 15-1** to **15-72**.

Type 1, 3R, 4, 4X, 12 *XT* Non-combination Starters

Table 15-16. Class 09 — FVNR Starters (Non-combination)

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 25A	**1**	3.2 [7]
B – H / 7 – 32A	**5A**	6.4 [14]
B – H / 7 – 32A	**5P**	4.5 [10]
J – L / 40 – 65A	**5A**	18.6 [41]
J – L / 40 – 65A	**5P**	17.7 [39]
M – Q / 80 – 150A	**8**	15.9 [35]

Table 15-17. Class 10 — FVR Starters (Non-combination)

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**2**	5.9 [13]
B – H / 7 – 32A	**5A**	6.8 [15]
B – H / 7 – 32A	**5P**	5.0 [11]
J – L / 40 – 65A	**2**	18.2 [40]
J – L / 40 – 65A	**6A**	24.5 [45]
J – L / 40 – 65A	**6P**	19.1 [42]
M – Q / 80 – 125A	**4**	22.7 [50]
M – Q / 80 – 150A	**8**	18.6 [41]

Table 15-18. Class 11 — FVNR Starters (Non-combination with CPT)

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**2**	6.4 [14]
B – H / 7 – 32A	**5A**	8.4 [19]
B – H / 7 – 32A	**5P**	6.6 [15]
J – L / 40 – 65A	**2**	19.5 [43]
J – L / 40 – 65A	**6A**	23.2 [51]
J – L / 40 – 65A	**6P**	21.8 [48]
M – Q / 80 – 125A	**4**	23.6 [52]
M – Q / 80 – 150A	**8**	24.1 [53]

Type 1, 3R, 4, 4X, 12 *XT* Fusible/ Non-fusible Starters

Table 15-19. Class 19 — FVNR Combination with Disconnect Switch

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – J / 7 – 40A	**7A**	8.6 [19]
B – J / 7 – 40A	**7P**	6.8 [15]
K – N / 50 – 105A	**8**	24.1 [53]
K – N / 50 – 105A	**8P**	22.2 [49]

Table 15-20. Class 19 — FVNR Combination with Disconnect Switch and Fuseblock

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – J / 7 – 40A	**7A**	13.6 [30]
B – J / 7 – 40A	**7P**	11.8 [26]
K – M / 65 – 85A	**8**	25 [55]
K – M / 65 – 85A	**8P**	23.2 [51]

Table 15-21. Class 20 — FVR Combination with Disconnect Switch

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – J / 7 – 40A	**7A**	9.1 [20]
B – J / 7 – 40A	**7P**	7.3 [16]
K – N / 50 – 105A	**8**	26.3 [58]
K – N / 50 – 105A	**8P**	25 [55]

Table 15-22. Class 20 — FVR Combination with Disconnect Switch and Fuseblock

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – J / 7 – 40A	**7A**	14.1 [31]
B – J / 7 – 40A	**7P**	12.3 [27]
K – M / 65 – 85A	**8**	25.4 [56]
K – M / 65 – 85A	**8P**	23.6 [52]

Type 1, 3R, 4, 4X, 12 *XT* HMCP Combination Starters

Table 15-23. Class 25 — FVNR Combination with HMCP

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**7A**	10 [23]
B – H / 7 – 32A	**7P**	8.2 [18]
J – L / 40 – 65A	**7A**	11 [24]
J – L / 40 – 65A	**7P**	8.9 [20]
M – Q / 80 – 125A	**8**	31.8 [70]

Table 15-24. Class 26 — FVR Combination with HMCP

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**7A**	12 [26]
B – H / 7 – 32A	**7P**	10 [22]
J – L / 40 – 65A	**7A**	13 [29]
J – L / 40 – 65A	**7P**	11 [25]
M – P / 80 – 115A	**8**	31.8 [70]

Type 1, 3R, 4, 4X, 12 *XT* Combination Motor Controllers (CMCs)

Table 15-25. Class 76 — Self Protected Starter (CMC)

IEC Size (Frame/Amps)	Box Number	Ship Weight kg [lbs]
B – H/up to 32A	K	6.8 [15]
B – H/up to 32A	5P	5.4 [12]

Table 15-26. Class 77 — Self Protected Starter (CMC) with CPT

IEC Size (Frame/Amps)	Box Number	Ship Weight kg [lbs]
B – H/up to 32A	K	9.5 [21]
B – H/up to 32A	6P	7.0 [17]

Table 15-27. Class 78 — Reversing Self Protected Starter (CMC)

IEC Size (Frame/Amps)	Box Number	Ship Weight kg [lbs]
B – H/7 – 32A	K	7.0 [16]
B – H/7 – 32A	5P	5.2 [12]

Lighting Contactors

Non-combination

Table 15-28. Type 1 Non-combination Lighting Contactors — Electrically Held — CN35

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors — without Control Power Transformers		
10A (2P, 3P, 4P)	1	5 (2.3)
10A (2P, 3P, 4P, 5P, 6P) w/top adders	2	7.3 (3.3)
10A (9P, 10P, 12P, 20P)	3	9.5 (4.3)
20A (2P, 3P)	1	5.2 (2.4)
20A (2P, 3P, 4P, 5P, 6P) w/top adders & 6P w/o top adder	2	7.3 (3.3)
20A (9P, 10P, 12P, 20P)	3	9 (4.1)
20A (9P, 12P) w/top adders	3	9.3 (4.2)
30A (2P, 3P)	1	5.3 (2.4)
30A (2P, 3P, 4P) w/top adders	2	7.3 (3.3)
30A (5P, 6P)	3	9.0 (4.1)
30A (5P, 6P) w/top adders	3	9.2 (4.2)
30A (9P, 10P, 12P, 20P)	3	9.5 (4.3)
30A (9P, 12P) w/top adders	3	9.7 (4.4)
60A (2P, 3P)	1	7 (3.2)
60A (2P, 3P) w/top adders	3	9.8 (4.4)
60A (4P, 5P, 6P, 9P, 10P, 12P)	3	9.5 (4.3)
60A (4P, 5P) w/top adders	3	10 (4.5)
100A (2P, 3P)	4	35 (16)
100A (4P, 5P, 6P, 9P)	4	60 (27)
200A (2P, 3P)	4	70 (32)
200A (4P, 5P, 6P)	10	133 (60)
300A (2P, 3P)	10	113 (51)
300A (4P, 5P, 6P)	10	136 (62)
400A (2P, 3P)	10	125 (57)

Table 15-28. Type 1 Non-combination Lighting Contactors — Electrically Held — CN35 (Continued)

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors — with Control Power Transformers		
10A (2P, 3P, 4P)	2	11 (5.0)
10A (2P, 3P, 4P, 5P, 6P, 9P, 10P, 12P, 20P) w/top adders	3	13.1 (5.9)
20A (2P, 3P, 4P, 6P)	2	11 (5.0)
20A (2P, 3P, 4P, 5P, 6P) w/ top adders	3	13.1 (5.9)
20A (9P, 10P, 12P, 20P)	3	13.5 (6.1)
20A (9P, 12P) w/top adders	3	13.5 (6.1)
30A (2P, 3P, 4P)	2	12 (5.4)
30A (2P, 3P, 4P) w/top adders	3	13.1 (5.9)
30A (5P, 6P)	2	12.5 (5.7)
30A (5P, 6P) w/top adders	3	13.5 (6.1)
30A (9P, 10P, 12P, 20P)	3	13.9 (6.3)
30A (9P, 12P) w/top adders	3	14.1 (6.4)
60A (2P, 3P)	2	12.8 (5.8)
60A (2P, 3P) w/top adders	3	14 (6.4)
60A (4P, 5P, 6P, 9P, 10P, 12P)	3	14 (6.4)
60A (4P, 5P) w/top adders	3	14.2 (6.4)
100A (2P, 3P)	4	39 (18)
100A (4P, 5P, 6P, 9P)	4	67 (30)
200A (2P, 3P)	10	117 (53)
200A (4P, 5P, 6P)	10	140 (64)
300A (2P, 3P)	10	120 (54)
300A (4P, 5P, 6P)	10	143 (65)
400A (2P, 3P)	10	132 (60)

Table 15-29. Type 1 Non-combination Lighting Contactors — Magnetically Latched — A202

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors— without Control Power Transformers		
30A (2P, 3P, 4P, 5P)	2	8.5 (3.9)
30A (6P, 8P, 10P, 12P)	3	13 (5.9)
30A (20P)	4	35 (16)
60A (2P, 3P, 4P, 5P)	2	8.7 (3.9)
60A (6P, 8P, 10P, 12P)	3	13.5 (6.1)
60A (20P)	4	40 (18)
100A (2P, 3P, 4P, 5P)	4	40 (18)
100A (6P, 8P, 10P, 12P)	9	85 (39)
100A (20P)	9	100 (45)
200A (2P, 3P, 4P, 5P)	4	46 (21)
200A (6P, 8P, 10P, 12P)	9	95 (43)
200A (20P)	9	110 (50)
300A (2P, 3P)	10	115 (52)
400A (2P, 3P)	10	125 (57)

Table 15-29. Type 1 Non-combination Lighting Contactors — Magnetically Latched — A202 (Continued)

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors — with Control Power Transformers		
30A (2P, 3P, 4P, 5P)	2	12.5 (5.7)
30A (6P, 8P, 10P, 12P)	3	17 (7.7)
30A (20P)	4	39 (18)
60A (2P, 3P, 4P, 5P)	2	12.7 (5.8)
60A (6P, 8P, 10P)	3	17.5 (7.9)
60A (12P)	9	87 (39)
60A (20P)	4	44 (20)
100A (2P, 3P, 4P, 5P)	4	47 (21)
100A (6P, 8P, 10P, 12P)	9	92 (42)
100A (20P)	9	107 (49)
200A (2P, 3P, 4P, 5P)	4	53 (24)
200A (6P, 8P, 10P, 12P)	9	102 (46)
200A (20P)	9	117 (53)
300A (2P, 3P)	10	122 (55)
400A (2P, 3P)	10	132 (60)

Table 15-30. Type 1 Non-combination Lighting Contactors — C30CN ①

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Lighting Contactors — without Control Power Transformers		
30A (2 – 12)	2	9 (4.1)
Lighting Contactors — with Control Power Transformers		
30A (2 – 12)	3	13.5 (5.9)

① Consult factory for combination enclosures.

Table 15-31. Type 3R, 4X and 12 Non-combination Lighting Contactors — C30CN ②

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Lighting Contactors — without Control Power Transformers		
30A (2 – 12)	6	14 (6.4)
Lighting Contactors — with Control Power Transformers		
30A (2 – 12)	7	20 (9.1)

② Consult factory for combination enclosures.

Note: All Type 7 and 9, see **Tab 11**.

Table 15-32. Type 3R, 4/4X, 12 Non-combination Lighting Contactors — Electrically Held — CN35

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors — without Control Power Transformers		
10A (2P, 3P, 4P, 5P, 6P)	5	12 (5.4)
10A (9P, 10P, 12P, 20P)	7	20 (9.1)
20A (2P, 3P, 4P, 5P)	5	12 (5.4)
20A (6P)	5	14 (6.4)
20A (9P, 10P, 12P, 20P)	7	20 (9.1)
30A (2P, 3P, 4P)	5	13 (5.9)
30A (5P, 6P)	6	14 (6.4)
30A (9P, 10P, 12P, 20P)	7	20 (9.1)
60A (2P, 3P, 4P)	5	13 (5.9)
60A (5P, 6P)	6	16 (7.3)
60A (9P, 10P, 12P)	7	22 (10)
100A (2P, 3P)	8	49 (22)
100A (4P, 5P, 6P, 9P)	8	57 (26)
200A (2P, 3P)	8	110 (50)
300A (2P, 3P)	10	113 (51)
400A (2P, 3P)	10	125 57)
Non-reversing Contactors — with Control Power Transformers		
10A (2P, 3P, 4P, 5P, 6P)	5	16 (7.3)
10A (9P, 10P, 12P, 20P)	7	20 (9)
20A (2P, 3P, 4P, 5P)	5	16 (7.3)
20A (6P, 9P, 10P, 12P, 20P)	7	24 (11)
30A (2P, 3P, 4P)	6	18 (8.2)
30A (5P, 6P)	6	18 (8.2)
30A (9P, 10P, 12P, 20P)	7	24 (11)
60A (2P, 3P)	6	21 (10)
60A (4P, 5P, 6P)	6	23 (10)
60A (9P, 10P, 12P)	7	22 (10)
100A (2P, 3P)	8	56 (25)
100A (4P, 5P, 6P, 9P)	8	64 (29)
200A (2P, 3P)	8	117 (53)
300A (2P, 3P)	10	120 (54)
400A (2P, 3P)	10	132 (60)

Table 15-33. Type 3R, 4/4X, 12 Non-combination Lighting Contactors — Magnetically Latched — A202

Ampere Size (Poles)	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors — without Control Power Transformers		
30A (2P, 3P, 4P, 5P)	5	13 (5.9)
30A (6P, 8P, 10P, 12P)	7	21 (10)
30A (20P)	8	46 (21)
60A (2P, 3P, 4P, 5P)	5	14 (6.4)
60A (6P, 8P, 10P, 12P)	7	22 (10)
60A (20P)	8	48 (22)
100A (2P, 3P, 4P, 5P)	8	50 (23)
100A (6P, 8P, 10P,12P)	9	58 (26)
100A (20P)	10	100 (45)
200A (2P, 3P, 4P, 5P)	8	52 (24)
200A (20P)	10	105 (48)
300A (2P, 3P)	10	113 (51)
400A (2P, 3P)	10	125 (57)
Non-reversing Contactors — with Control Power Transformers		
30A (2P, 3P)	6	15 (6.8)
30A (4P, 5P, 6P, 8P, 10P, 12P)	7	28 (13)
30A (20P)	8	54 (25)
60A (2P, 3P)	6	16 (7.3)
60A (4P, 5P, 6P, 8P, 10P, 12P)	7	29 (13)
60A (20P)	8	55 (25)
100A (2P, 3P, 4P, 5P)	8	57 (26)
100A (6P, 8P, 10P, 12P)	9	65 (30)
100A (20P)	10	112 (51)
200A (2P, 3P, 4P, 5P)	8	59 (27)
300A (2P, 3P)	10	120 (54)
400A (2P, 3P)	10	132 (60)

Combination

Table 15-34. Type 1 Combination Lighting Contactors

Ampere Size	Box No.	Shipping Wt. Lbs. (kg)
Electrically Held — Non-reversing (3P Only) — with or without Control Power Transformers		
30A	A	35 (16)
60A	A	36 (16)
100A	C	65 (30)
200A with Disconnect Switch	D	110 (50)
200A with Thermal Magnetic Breaker	E	150 (68)
300A	E	160 (73)
400A	E	170 (77)
Magnetically Latched — Non-reversing (3P Only) — with or without Control Power Transformers		
30A	A	35 (16)
60A	A	36 (16)
100A	C	65 (30)
200A with Disconnect Switch	D	110 (50)
200A with Thermal Magnetic Breaker	E	150 (68)
300A	E	140 (64)
400A	E	190 (86)

Table 15-35. Type 3R, 4/4X, 12 Combination Lighting Contactors

Ampere Size (Device)	Box No.	Shipping Wt. Lbs. (kg)
Electrically Held — Non-reversing (3P only) — with or without Control Power Transformers		
30A	A	35 (16)
60A	A	36 (16)
100A	C	65 (30)
200A with Disconnect Switch	D	110 (50)
200A with Thermal Magnetic Breaker	E	150 (68)
300A	E	160 (73)
400A	E	170 (77)
Magnetically Latched — Non-reversing (3P Only) — with or without Control Power Transformers		
30A	A	35 (16)
60A	A	36 (16)
100A	C	65 (30)
200A with Disconnect Switch	D	110 (50)
200A with Thermal Magnetic Breaker	E	150 (68)
300A with Disconnect Switch	72"	375 (170)
300A with Thermal Magnetic Breaker	E	160 (73)
400A with Disconnect Switch	72"	425 (193)
400A with Thermal Magnetic Breaker	E	210 (95)

Solid-State Reduced Voltage Starters

Table 15-36. Non-combination Solid-State Reduced Voltage

Rating	SSRV	Non-combination
		Box No. ①
.8 – 27A	S752	6A ②
37A	S801/S811	7A
50A	S752	6A ②
66A	S801/S811	7A
105A	S801/S811	7A
135A	S801/S811	B1
180A	S801/S811	C
240A	S801/S811	③
304A	S801/S811	③
360A	S801/S811	③
420A	S801/S811	10
500A	S801/S811	10
650A	S801/S811	10
720A	S801/S811	10
850A	S801/S811	10
1000A	S801/S811	10

① Enclosure space will also accommodate for an ***IT.*** Power Supply, two 4-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 7A enclosure to include space for a CPT and a full voltage bypass contactor.

③ Contact Eaton for Box Dimensions not shown in **Figures 15-1** to **15-72**.

Note: All Type 7 and 9, see **Tab 11**.

Table 15-37. Combination Solid-State Reduced Voltage

Rating	SSRV	Comb. with Fuses	Comb. with HMCP
		Box No. ④	Box No. ④
.8 – 27A	S752	B1 ⑤	A1 ⑥
37A	S801/S811	B1	A1 ⑥
50A	S752	C	A1 ⑥
66A	S801/S811	C	A1
105A	S801/S811	D	B1
135A	S801/S811	D	C
180A	S801/S811	E	E
240A	S801/S811	F1E	E
304A	S801/S811	F1E	E
360A	S801/S811	F1E	E
420A	S801/S811	F1E	E
500A	S801/S811	F1E	E
650A	S801/S811	F1E	F1E
720A	S801/S811	F1E	F1E
850A	S801/S811	F1E	F1E
1000A	S801/S811	F1E	F1E

④ Enclosure space will also accommodate for an ***IT.*** Power Supply, two 4-pole relays, CPT, and terminal blocks. Also includes space for a DNA module or MOV.

⑤ Enclosure may be reduced to an A1, with all space for all items as in footnote ④, excluding relays and CPTs.

⑥ Same as footnote ④, but CPT is not included. Upsize to B1 enclosure to include space for a CPT and a full voltage bypass contactor.

15

Reduced Voltage Starters — Freedom

Table 15-38. Type 1, 3R, 4/4X, 12 Freedom Reduced Voltage Enclosures

Size	Type 1		Type 3R, 4X, 12	
	Box No.	Shipping Wt. Lbs. (kg)	Box No.	Shipping Wt. Lbs. (kg)
Class 42: Autotransformer — Non-combination **Class 43: Autotransformer — with Disconnect** **Class 44: Autotransformer — with HMCP**				
2 – 4	E2	124 (56)	E2	149 (68)
5	F1E	885 (402)	F1E	1010 (459)
6 ①	F1E	1220 (554)	F1E	1345 (611)
6 ②	F2E	1400 (636)	F2E	1525 (692)
7	F2E	③	F2E	③
8	F2E	③	F2E	③
9	③	③	③	③
Class 45: Part Winding — Non-combination				
2PW	3	25 (11)	7	75 (34)
3PW – 4PW	9	47 (21)	9	95 (43)
5PW	E	125 (47)	E	180 (82)
6PW	F1E	780 (354)	F1E	880 (400)
7PW	F2E	③	F2E	③
8PW	F2E	③	F2E	③
Class 46: Part Winding — with Disconnect **Class 47: Part Winding — with Thermal Magnetic Trip Circuit Breaker**				
2PW	C	68 (31)	C	88 (40)
3PW	D	162 (74)	D	190 (86)
4PW	E	230 (104)	E	270 (123)
5PW	F1E	440 (200)	F1E	530 (241)
6PW ①	F1E	440 (200)	F1E	620 (281)
6PW ②	F2E	515 (234)	F2E	③
7PW	F2E	③	F2E	③
8PW	F2E	③	F2E	③
Classes 48 & 51: Wye Delta — Non-combination **Classes 49 & 52: Wye Delta — with Disconnect** **Classes 50 & 53: Wye Delta — with Thermal Magnetic Trip Circuit Breaker**				
2YD – 4YD	E	185 (84)	E	225 (102)
5YD	F1E	605 (275)	F1E	705 (320)
6YD ①	F1E	635 (288)	F1E	735 (334)
6YD ②	F2E	715 (325)	F2E	830 (377)
7YD	F2E	③	F2E	③
8YD	F2E	③	F2E	③

① Non-combination and breaker.
② Fusible.
③ Consult factory.

Adjustable Frequency Drives

Table 15-39. Type 1/3R MVX Combination and Non-combination

MVX hp	Box No.	Shipping Wt. Lbs. (kg) ④
1/2 – 2 (240V)	L	25 (11)
1 – 3 (480V, 575V)	L	27 (12)
3 – 5 (240V)	B1	31 (14)
5 (480V, 575V)	B1	31 (14)
7-1/2 (240V)	C	42 (19)
7-1/2 – 10 (480V, 575V)	C	42 (19)

④ Weights are for combination units.

Table 15-40. Type 1/3R MVX Combination and Non-combination with Bypass

MVX hp	Box No.	Shipping Wt. Lbs. (kg) ⑤
1/2 – 2 (240V)	M	28 (13)
1 – 3 (480V, 575V)	M	30 (14)
3 – 5 (240V)	B1	35 (16)
5 (480V, 575V)	B1	35 (16)
7-1/2 (240V)	C	55 (25)
7-1/2 – 10 (480V, 575V)	C	57 (26)

⑤ Weights are for combination units.

Table 15-41. Type 12/4/4X MVX Combination and Non-combination

MVX hp	Box No.	Shipping Wt. Lbs. (kg) ⑥
1/2 – 1 (240V)	L	29 (13)
1 – 2 (480V, 575V)	L	29 (13)
2 (240V)	M	32 (15)
3 (480V, 575V)	M	32 (15)
3 (240V)	B1	35 (16)
5 (480V, 575V)	B1	35 (16)
5 (240V)	C	48 (22)
7-1/2 (480V, 575V)	C	48 (22)
7-1/2 (240V)	D	55 (25)
10 (480V, 575V)	D	55 (25)

⑥ Weights are for combination units.

Table 15-42. Type 12/4/4X MVX Combination and Non-combination with Bypass

MVX hp	Box No.	Shipping Wt. Lbs. (kg) ⑦
1/2 – 2 (240V)	M	35 (16)
1 – 3 (480V, 575V)	M	37 (17)
3 – 5 (240V)	C	42 (19)
5 – 7-1/2 (480V, 575V)	C	44 (20)
7-1/2 (240V)	D	60 (27)
10 (480V, 575V)	D	65 (30)

⑦ Weights are for combination units.

Note: All Type 7 and 9, see **Tab 11**.

Pump Panels

Table 15-43. *IT.* Type 3R — Pump Panels

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
1 Narrow 2 Narrow	P1	31 (14)
1 2 3	P3	71 (32)
4	P5	80 (36)
5	P7	110 (50)

Table 15-44. Freedom Type 3R — Pump Panels

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
1 Narrow 2 Narrow	P1	35 (16)
1 2 3	P3	75 (34)
4	P5	120 (54)
5	P7	150 (68)
6	F1E	350 (159)
7	F2E	425 (193)

Table 15-45. Irrigation Pump Panels — Top Entry

Size	HMCPE/ BKR	C362	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 ⑧	8 ⑧	9
3-1/2	8 ⑧	8 ⑧	9
4	9	—	—

⑧ 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.

Table 15-46. Irrigation Pump Panels — Bottom Entry

Size	HMCPE/ BKR	C362	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	—	—

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.

Duplex Pump Panels

Table 15-47. Type 1, 3R, 4X, 12 Duplex Pump Panels Non-combination

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
0 – 2	G	44 (20)
3 – 4	G1	120 (54)
5 – 6	F1E	405 (184)

Table 15-48. Type 1, 3R, 4X, 12 Duplex Pump Panels Combination

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
0 – 2	H	75 (34)
3 – 4	H1 ②	180 (82)
5 – 6	F1E	425 (193)

② Contact Eaton for Box Dimensions not shown in **Figures 15-1** to **15-72**.

HVAC Control

Table 15-49. Type 1 HVAC Starters

NEMA Size	Box No.
0 – 2	7

Vacuum Break

Non-combination

Table 15-50. Type 1 Enclosed — Non-combination Vacuum Contactors and Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors and Starters — with or without Control Power Transformers		
4	4	47 (21)
5	10	135 (61)
6	E	235 (107)
Reversing Contactors — with or without Control Power Transformers		
4	9	54 (25)
5	10	145 (66)
6	E	245 (111)

Table 15-51. Type 3R, 4/4X, 12 Enclosed — Non-combination Vacuum Contactors and Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Contactors and Starters — with or without Control Power Transformers		
4	8	67 (30)
5	10	150 (68)
6	E	250 (114)
Reversing Contactors — with or without Control Power Transformers		
4	9	72 (33)
5	10	175 (79)
6	E	275 (125)

Combination

Table 15-52. Type 1 Enclosed — Combination Vacuum Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Starters: Fusible or Non-fusible Disconnect — with or without Control Power Transformers		
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		
4	C	90 (41)
5	E	180 (82)
6	F1E	280 (127)

Table 15-53. Type 3R, 4/4X, 12 Enclosed — Combination Vacuum Starters

NEMA Size	Box No.	Shipping Wt. Lbs. (kg)
Non-reversing Starters: Fusible or Non-fusible Disconnect — with or without Control Power Transformers		
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		
4	C	90 (41)
5	E	180 (82)
6	F1E	280 (127)

Note: All Type 7 and 9, see **Tab 11**.

15

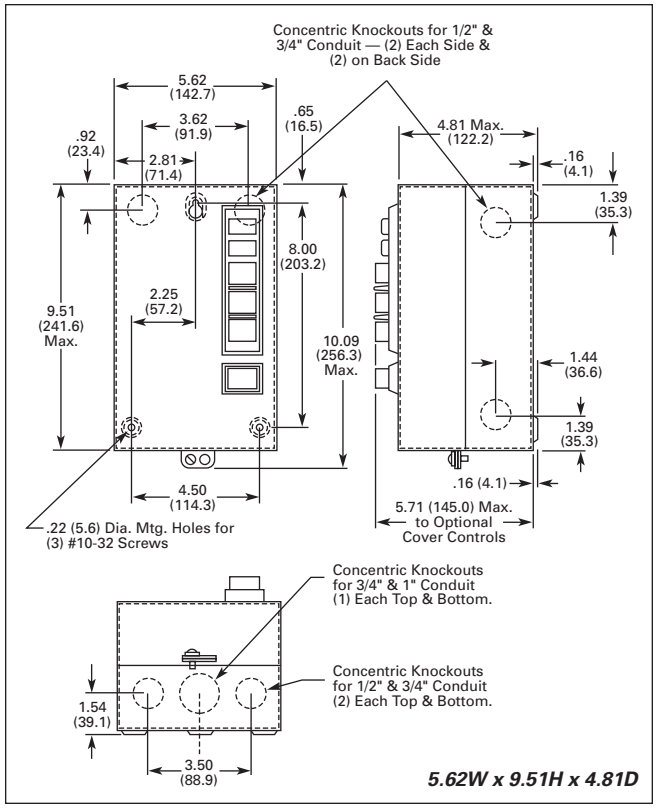


Figure 15-1. Box 1, Type 1 — Approximate Dimensions in Inches (mm)

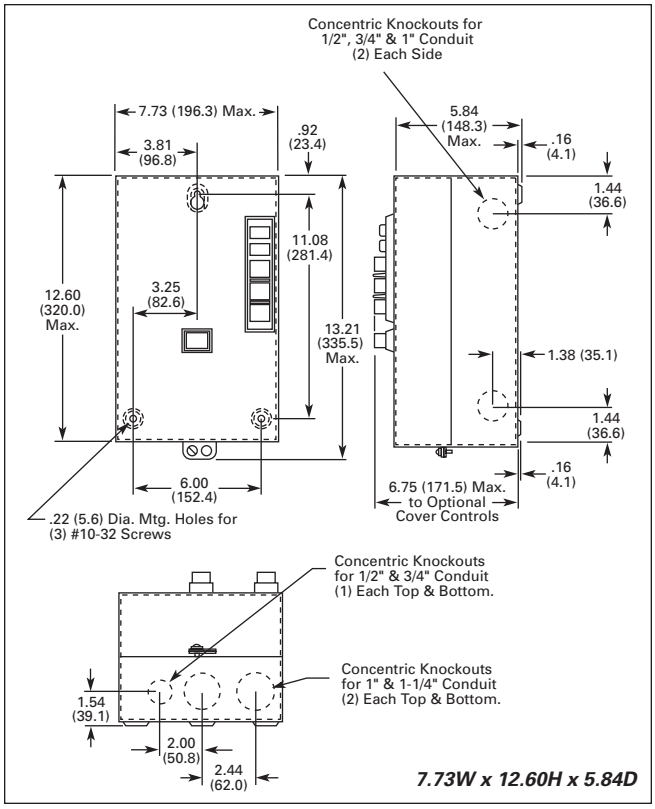


Figure 15-3. Box 2, Type 1 — Approximate Dimensions in Inches (mm)

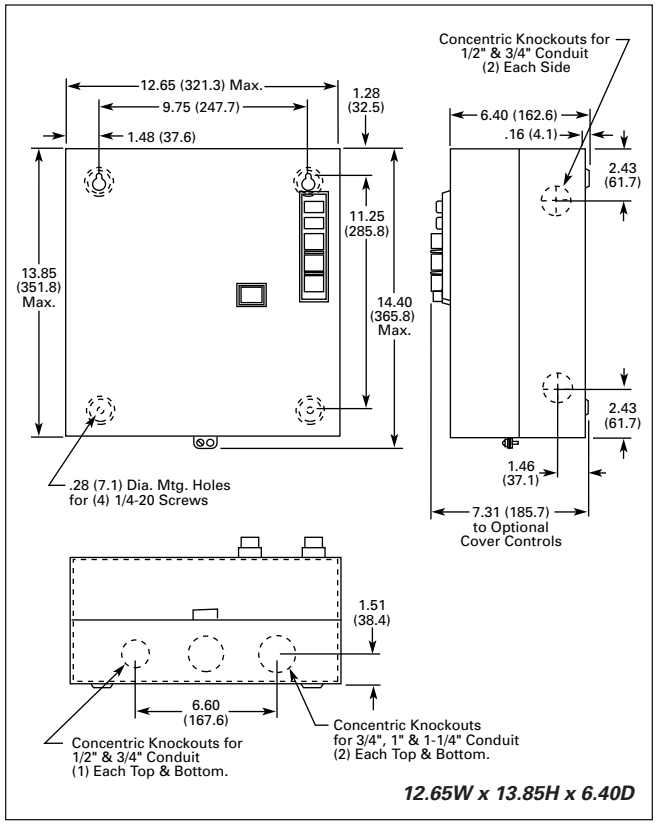


Figure 15-2. Box 3, Type 1 — Approximate Dimensions in Inches (mm)

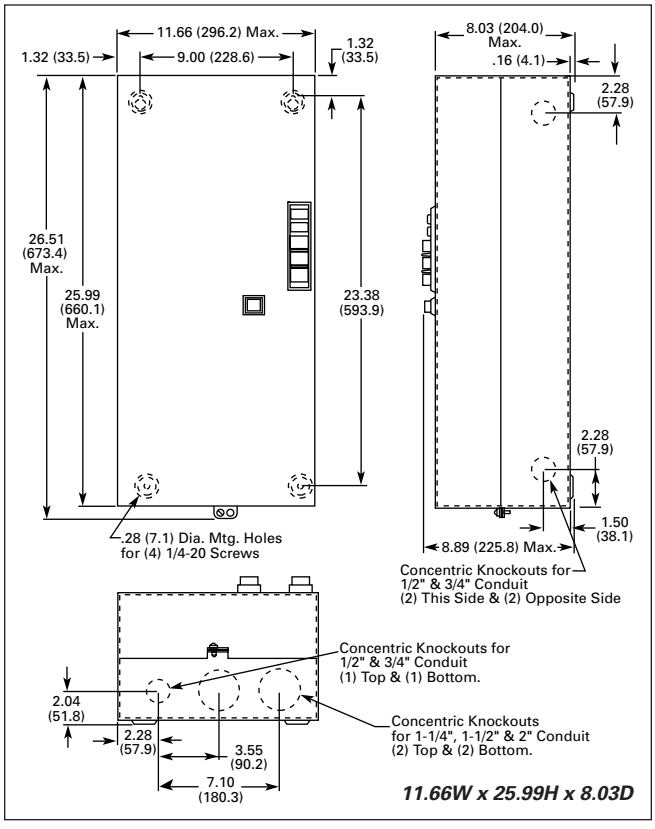


Figure 15-4. Box 4, Type 1 — Approximate Dimensions in Inches (mm)

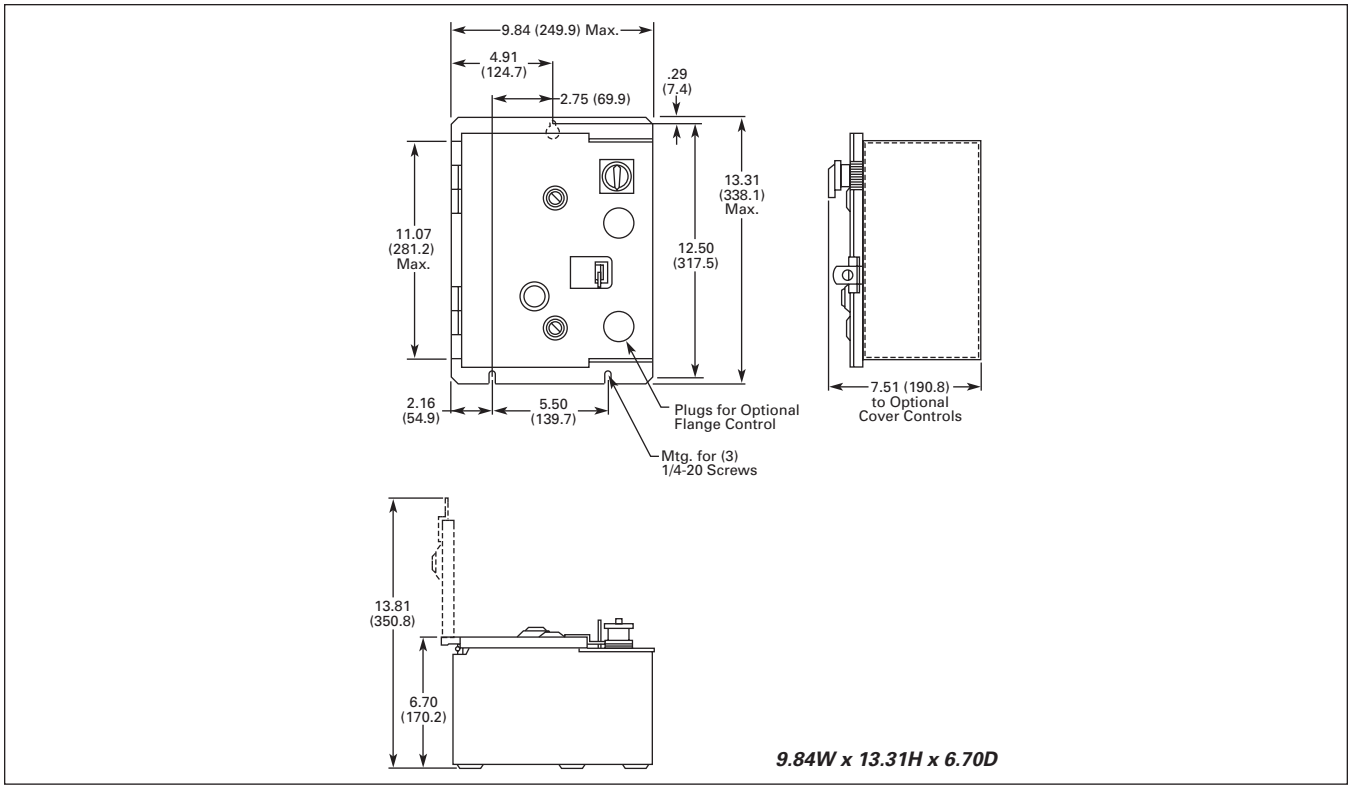


Figure 15-5. Box 5, Type 12 — Approximate Dimensions in Inches (mm)

15

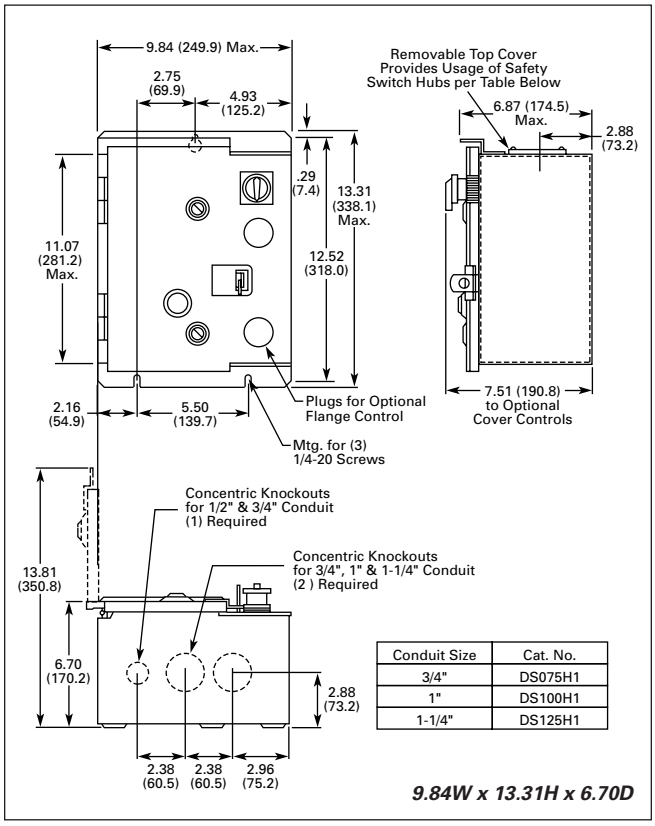


Figure 15-6. Box 5, Type 3R — Approximate Dimensions in Inches (mm)

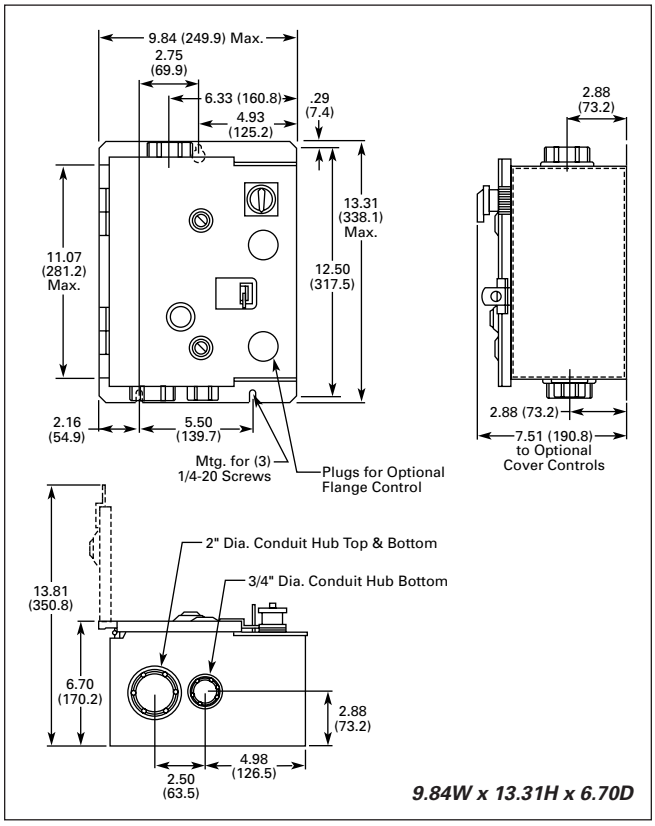


Figure 15-7. Box 5, Type 4X — Approximate Dimensions in Inches (mm)

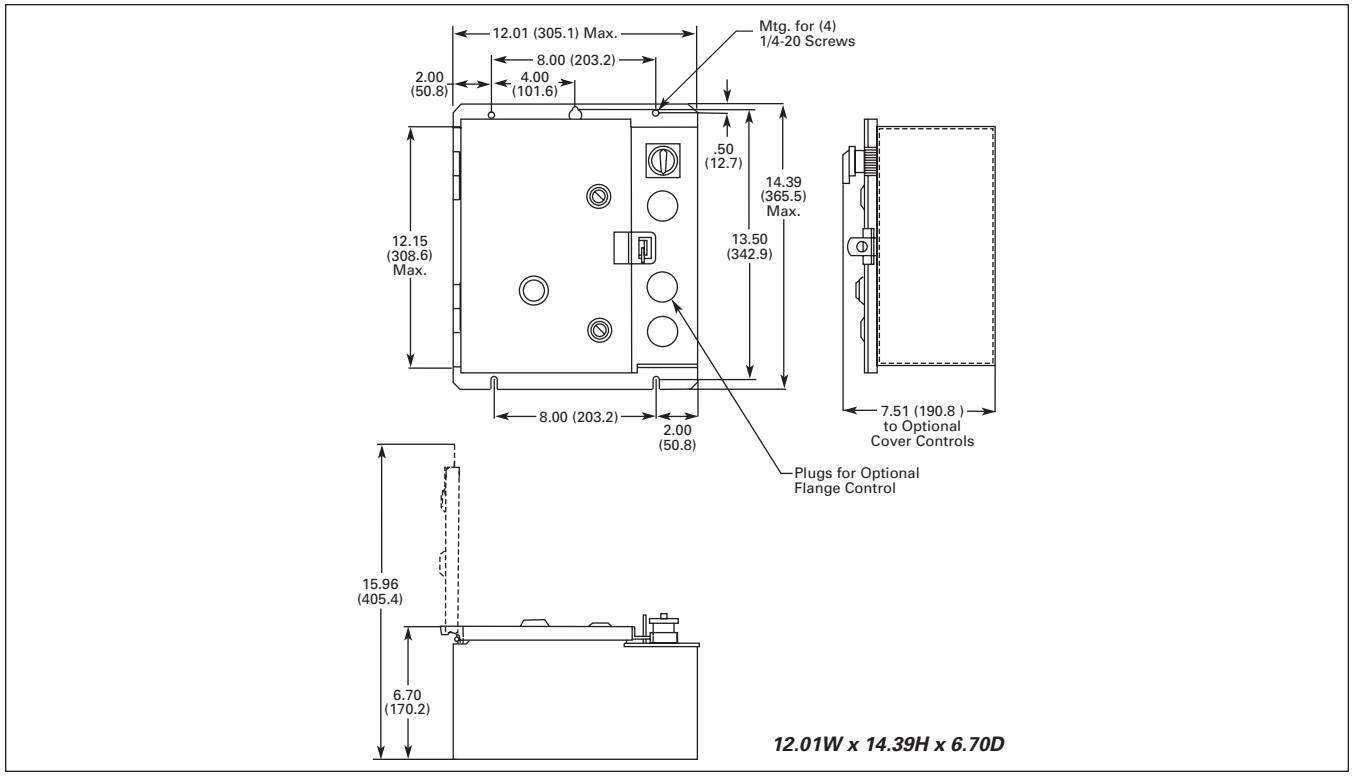
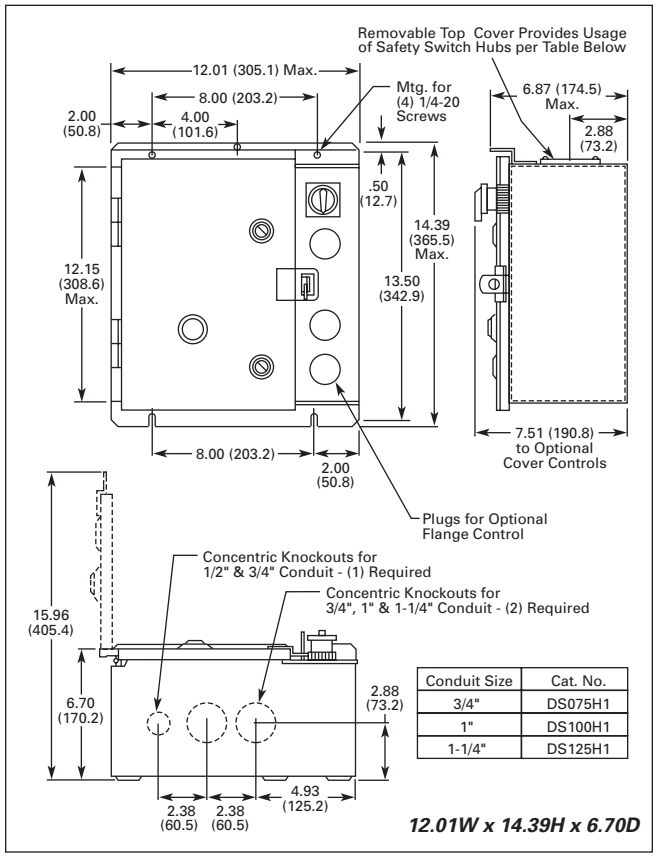


Figure 15-8. Box 6, Type 12 — Approximate Dimensions in Inches (mm)

15



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1

Figure 15-9. Box 6, Type 3R — Approximate Dimensions in Inches (mm)

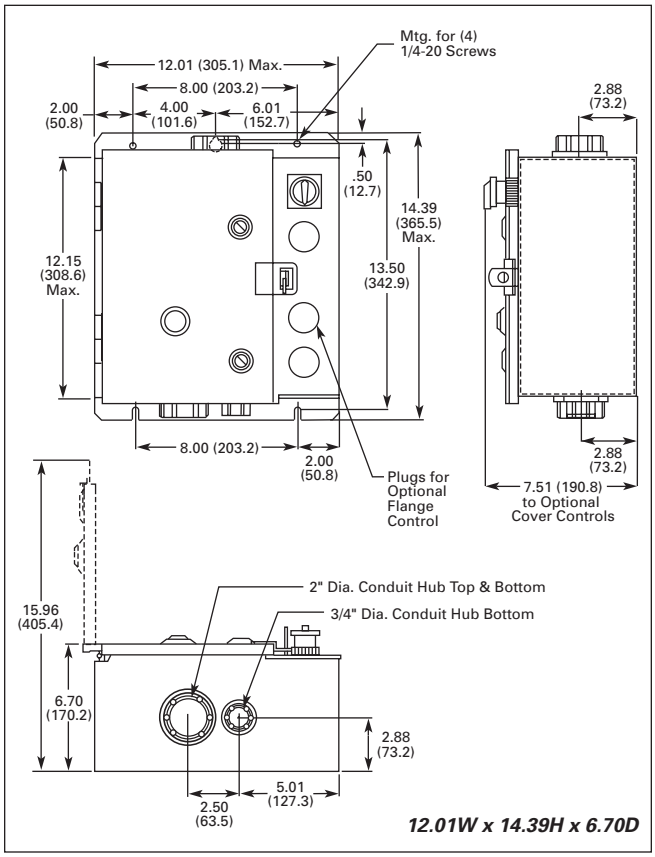


Figure 15-10. Box 6, Type 4X — Approximate Dimensions in Inches (mm)

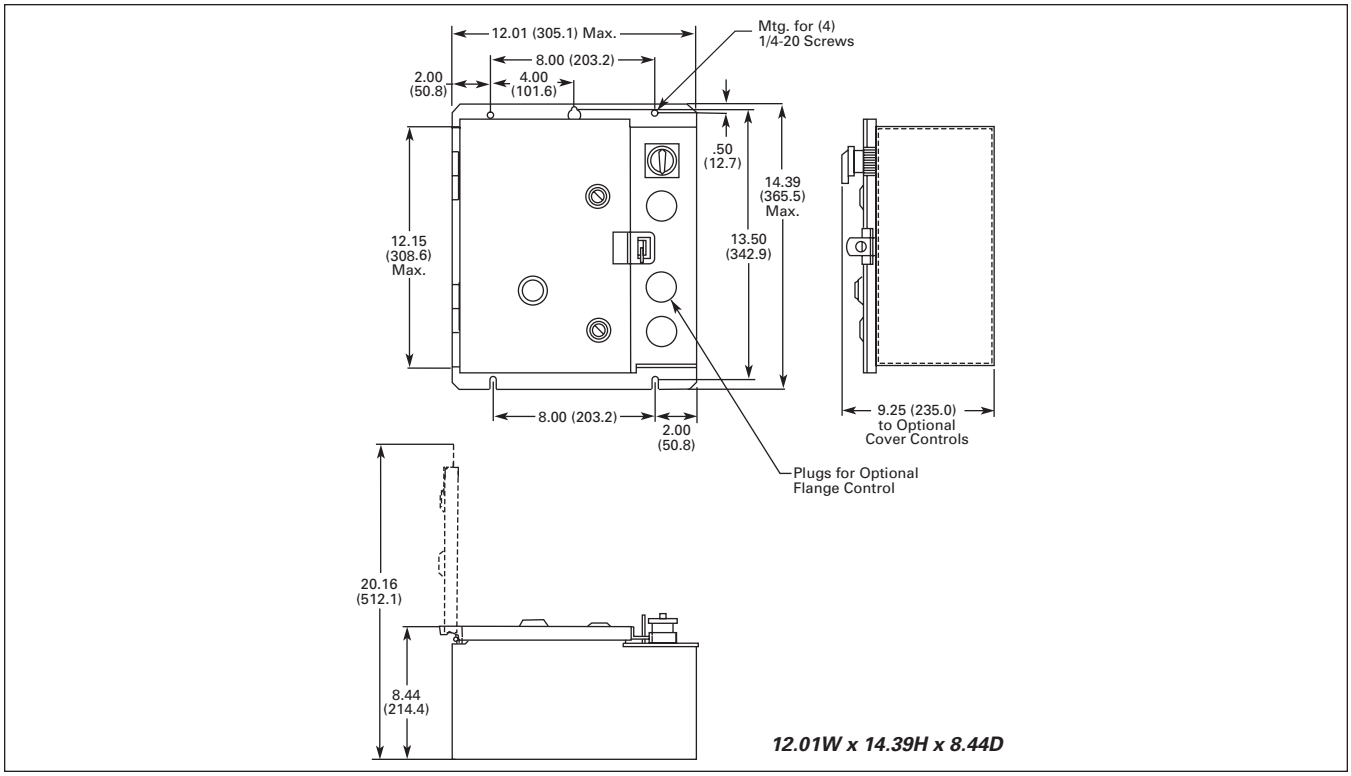
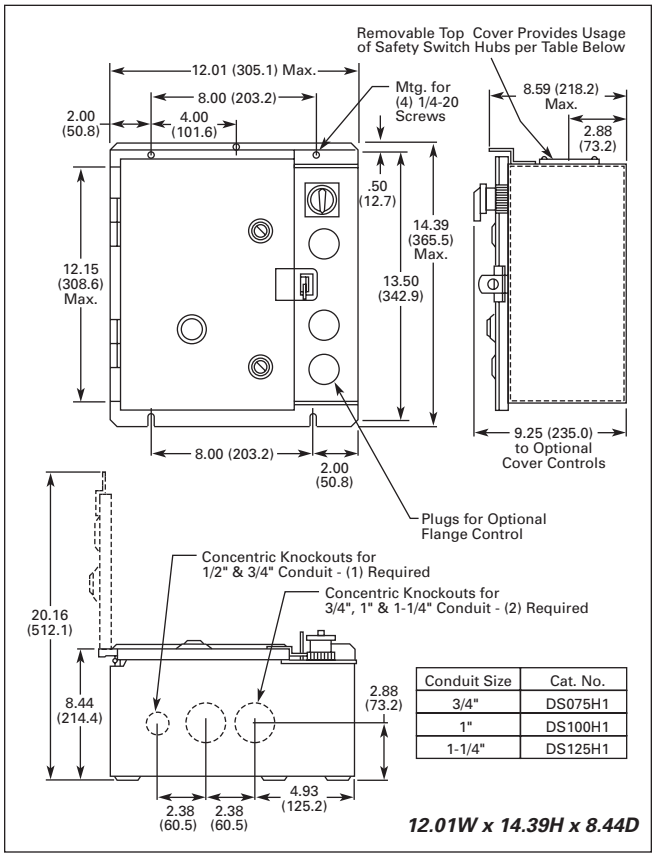


Figure 15-11. Box 6A, Type 12 — Approximate Dimensions in Inches (mm)

15



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1

Figure 15-12. Box 6A, Type 3R — Approximate Dimensions in Inches (mm)

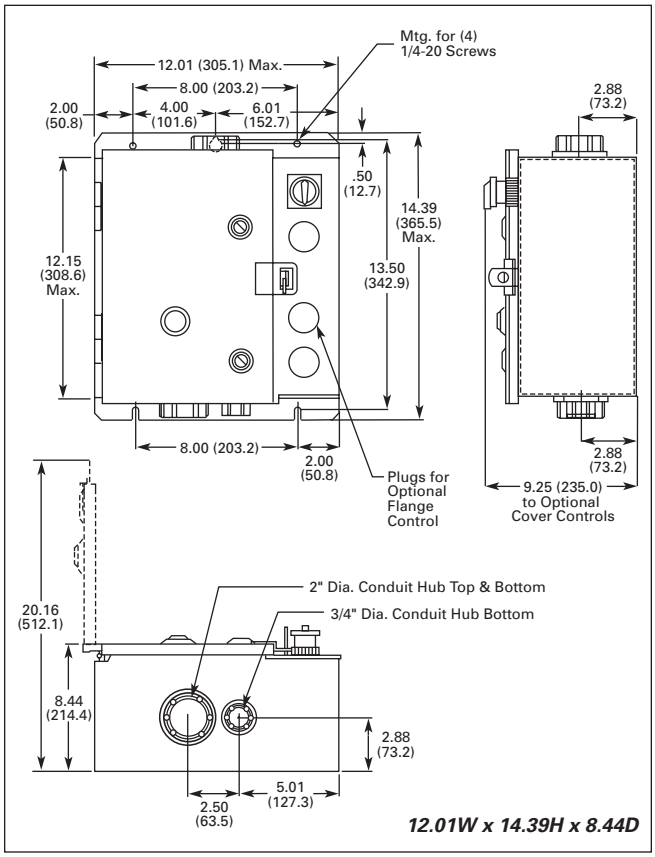


Figure 15-13. Box 6A, Type 4X — Approximate Dimensions in Inches (mm)

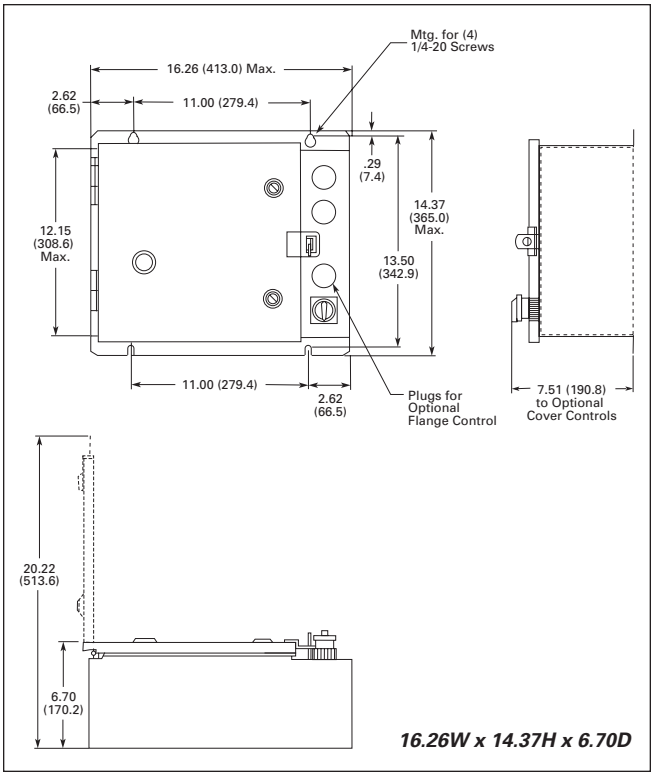


Figure 15-14. Box 7, Type 1 — Approximate Dimensions in Inches (mm)

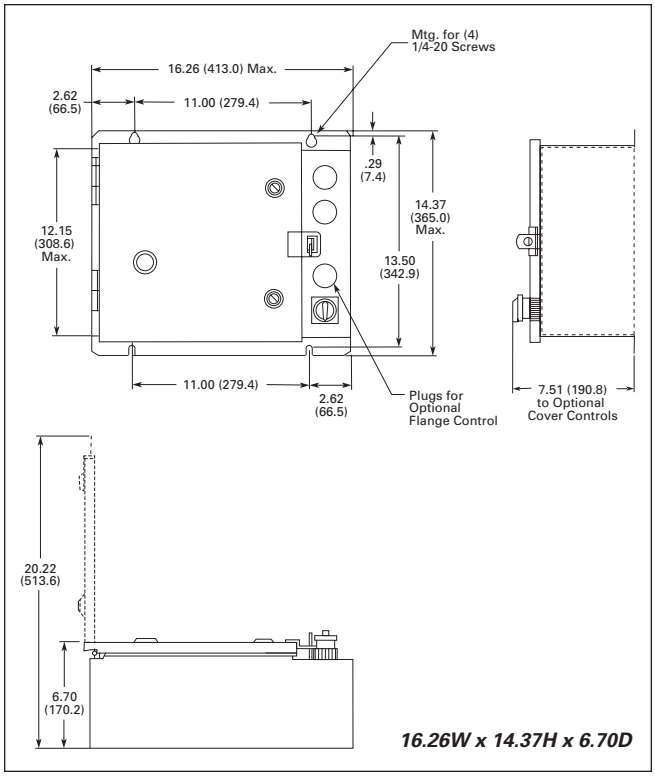
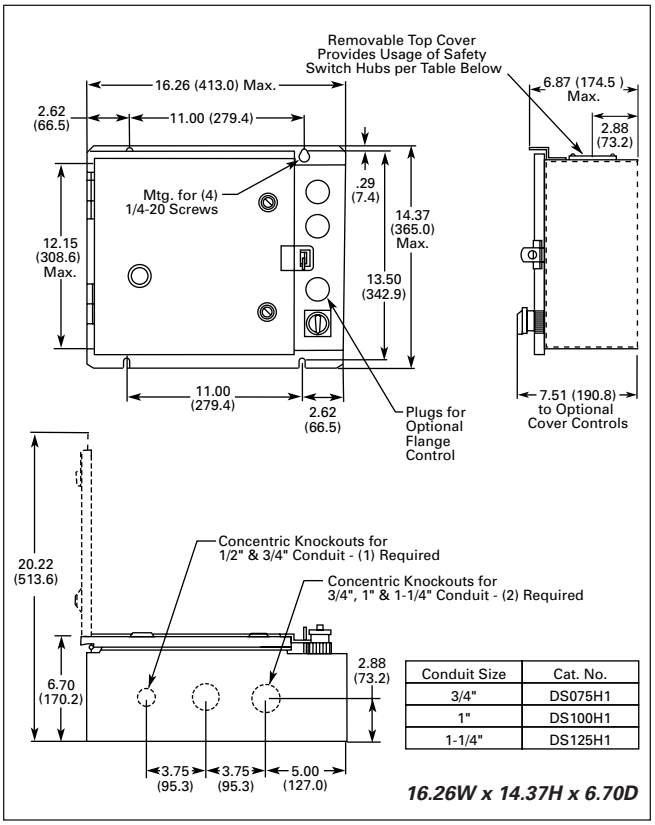


Figure 15-16. Box 7, Type 12 — Approximate Dimensions in Inches (mm)

15



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1

Figure 15-15. Box 7, Type 3R — Approximate Dimensions in Inches (mm)

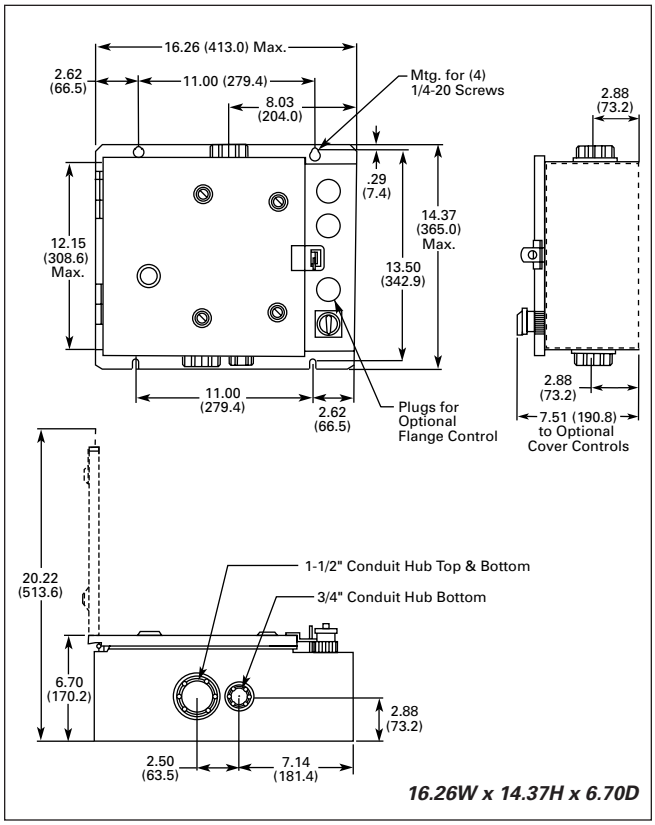


Figure 15-17. Box 7, Type 4X — Approximate Dimensions in Inches (mm)

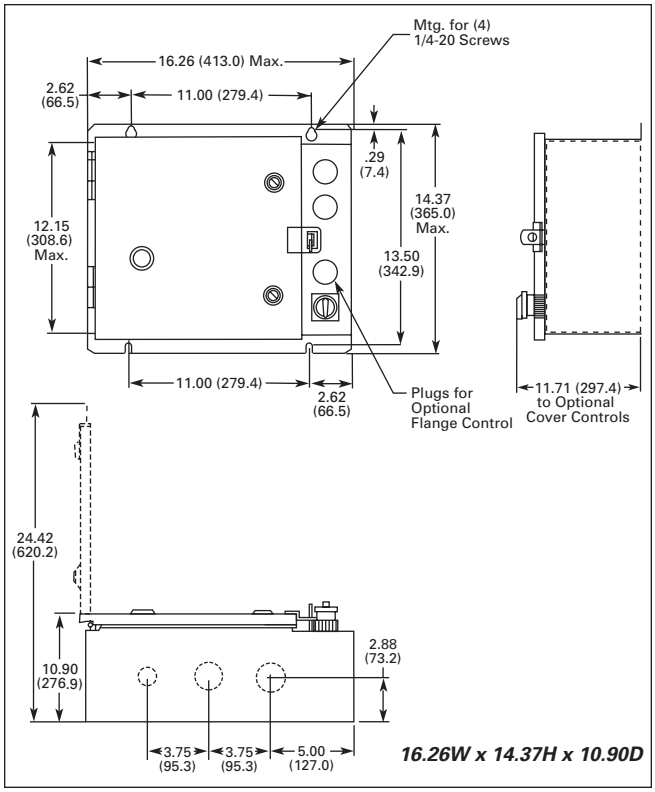
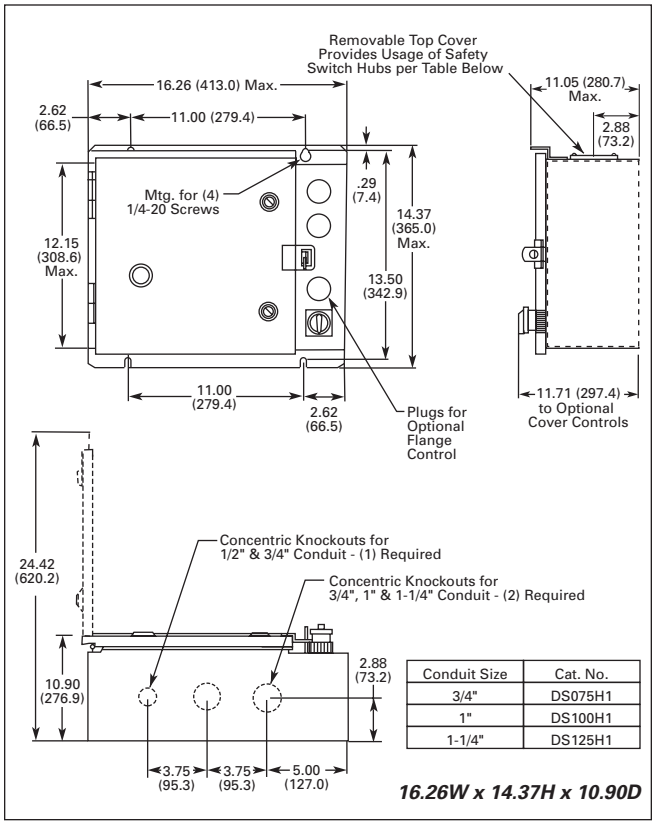


Figure 15-18. Box 7A, Type 1 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1

Figure 15-19. Box 7A, Type 3R — Approximate Dimensions in Inches (mm)

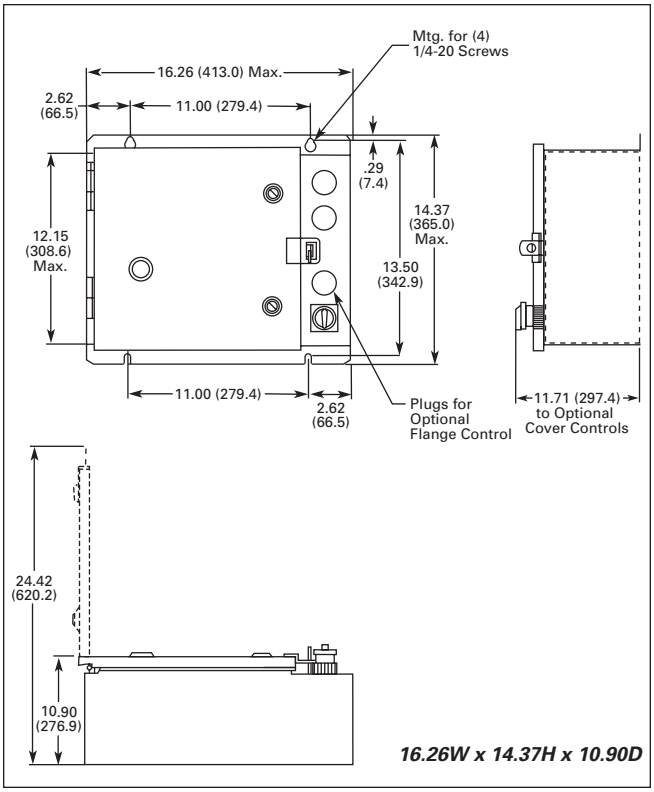


Figure 15-20. Box 7A, Type 12 — Approximate Dimensions in Inches (mm)

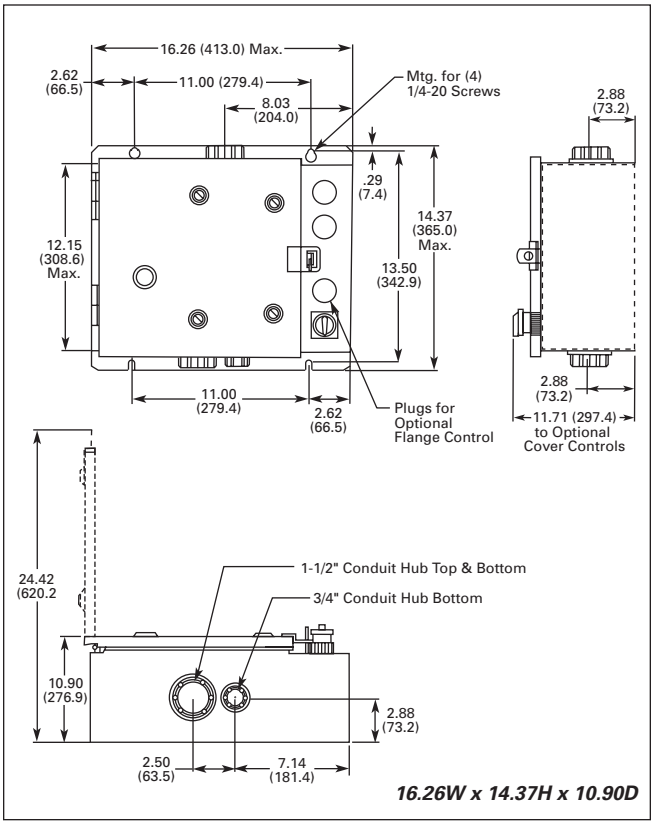


Figure 15-21. Box 7A, Type 4X — Approximate Dimensions in Inches (mm)

15

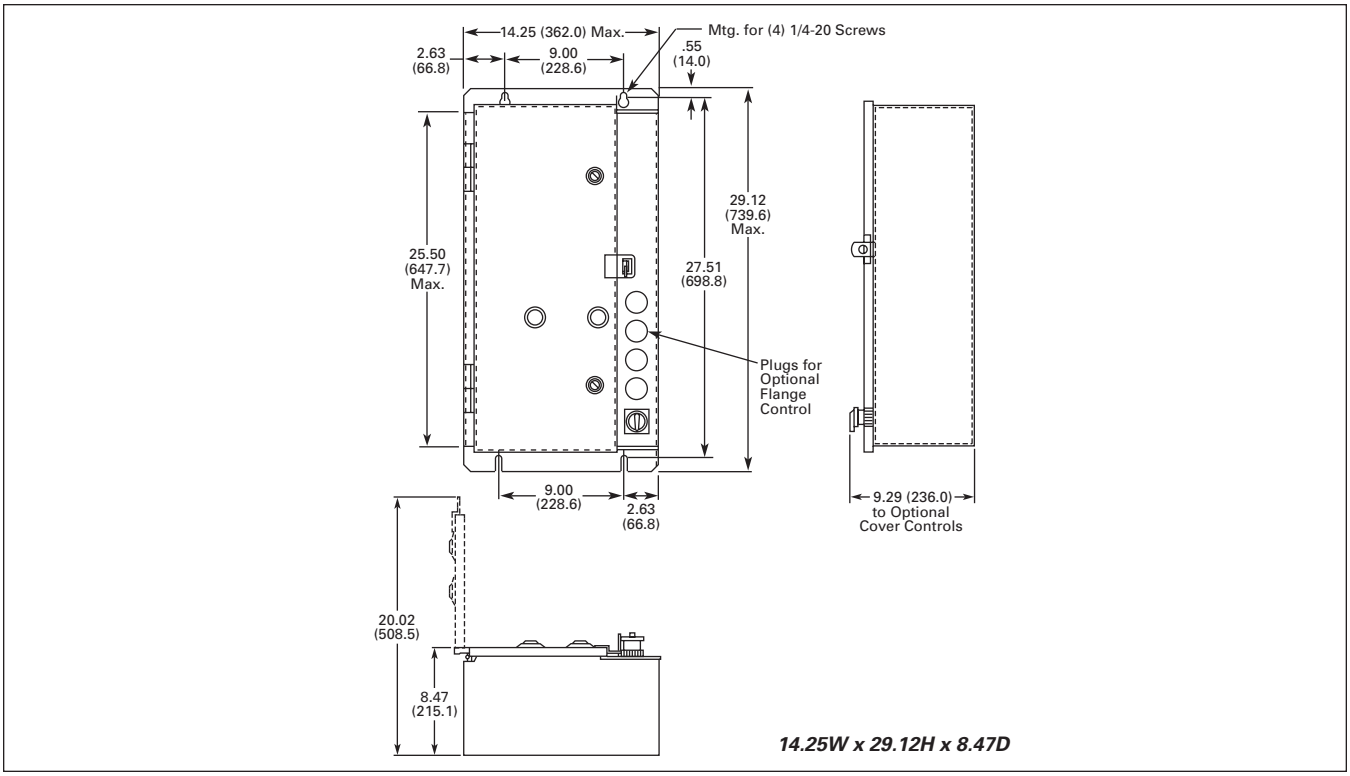
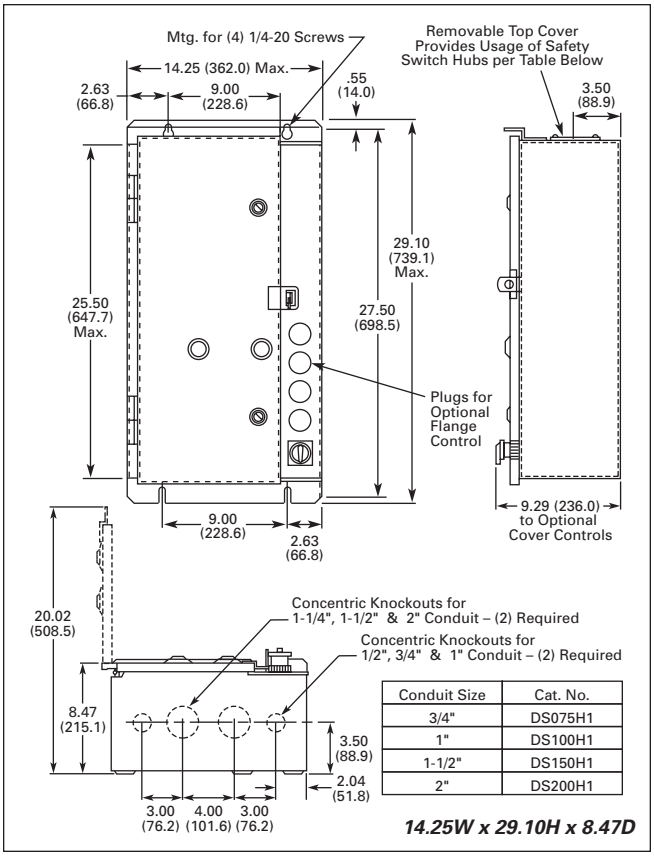


Figure 15-22. Box 8, Type 12 — Approximate Dimensions in Inches (mm)

15



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/2"	DS150H1
2"	DS200H1

Figure 15-23. Box 8, Type 3R — Approximate Dimensions in Inches (mm)

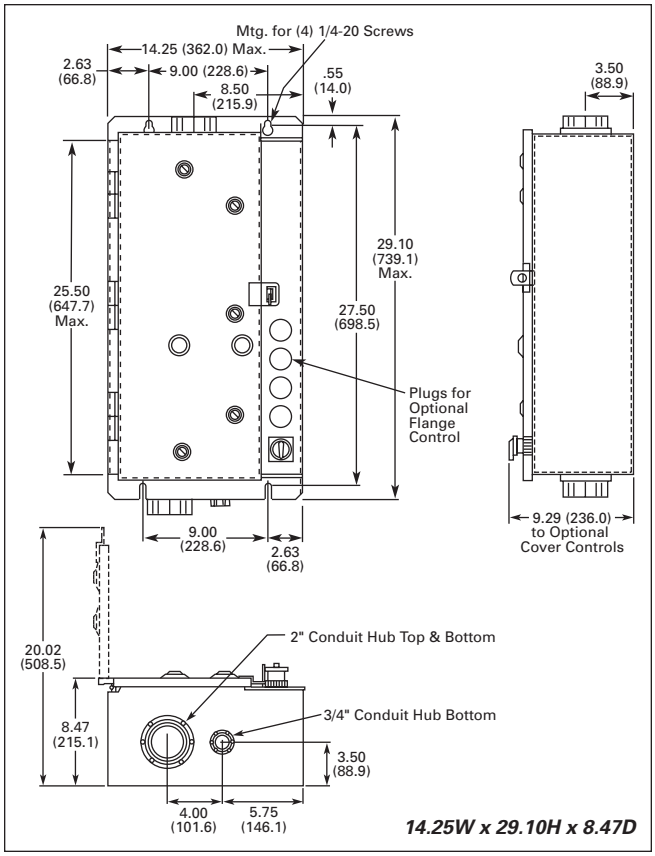


Figure 15-24. Box 8, Type 4X — Approximate Dimensions in Inches (mm)

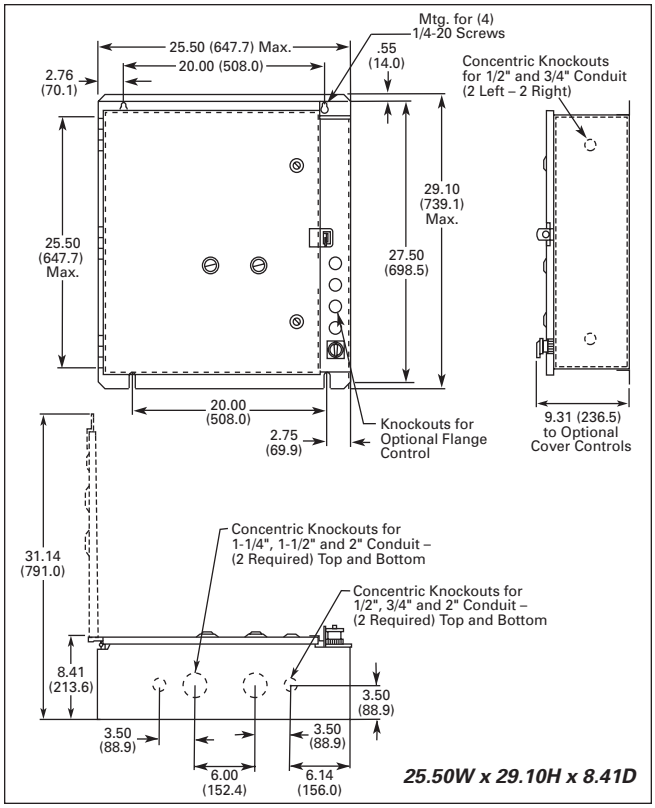


Figure 15-25. Box 9, Type 1 — Approximate Dimensions in Inches (mm)

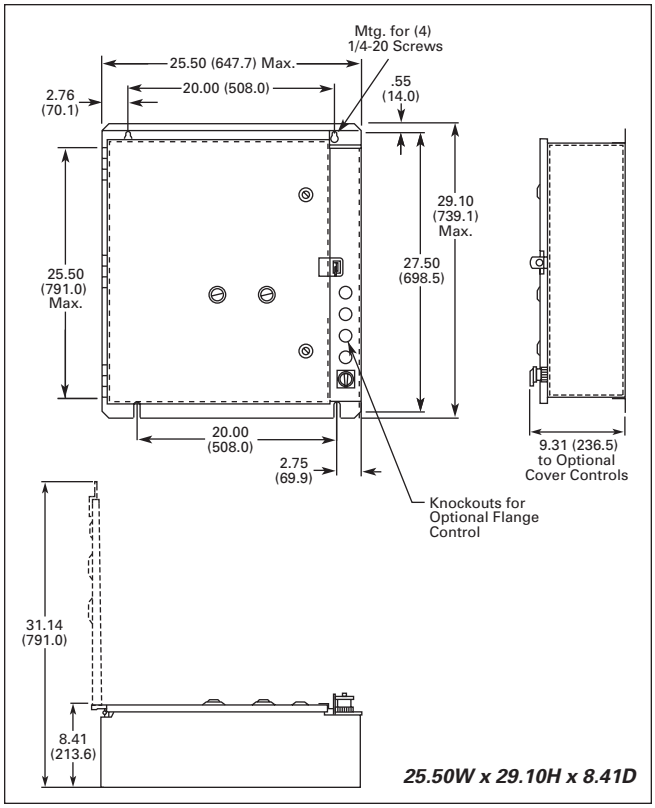
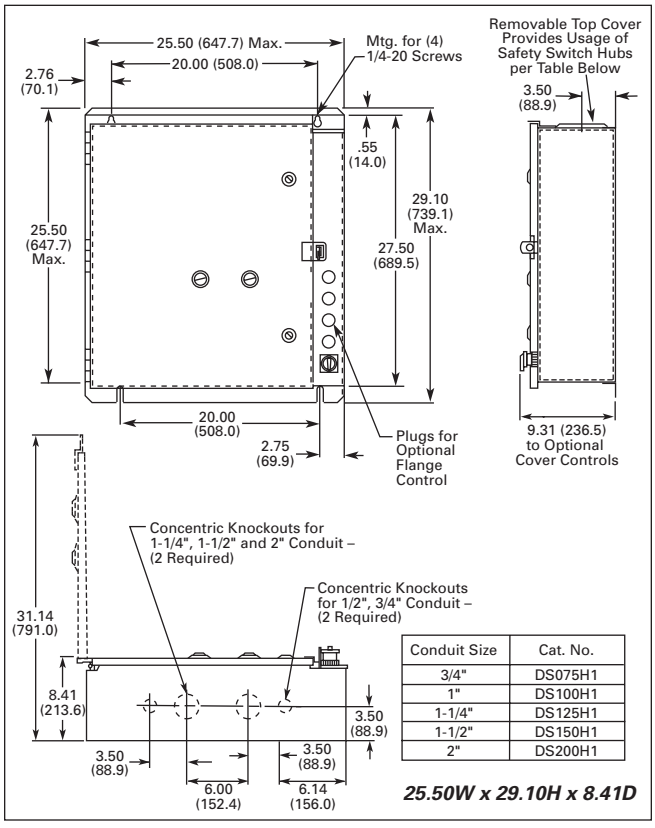


Figure 15-27. Box 9, Type 12 — Approximate Dimensions in Inches (mm)

15



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1
1-1/2"	DS150H1
2"	DS200H1

Figure 15-26. Box 9, Type 3R — Approximate Dimensions in Inches (mm)

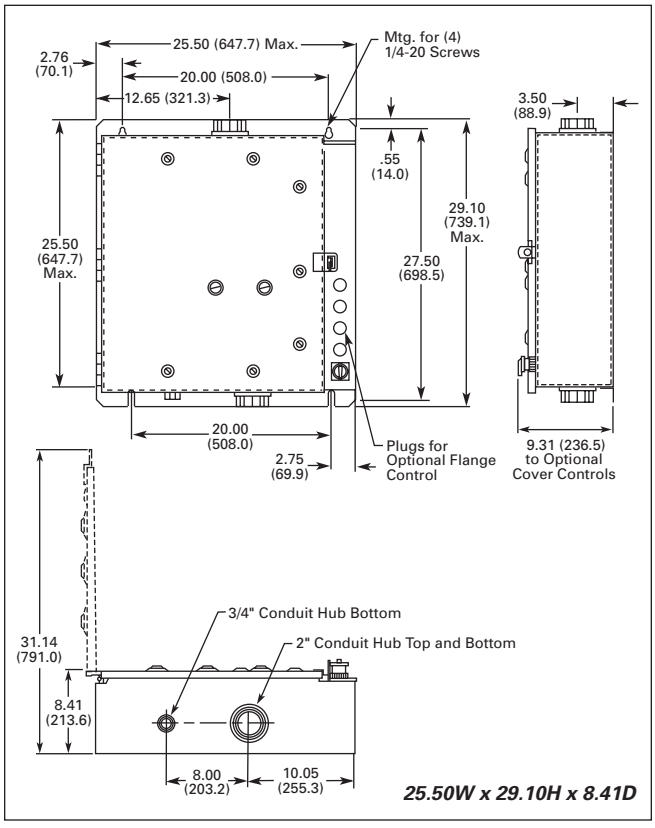


Figure 15-28. Box 9, Type 4X — Approximate Dimensions in Inches (mm)

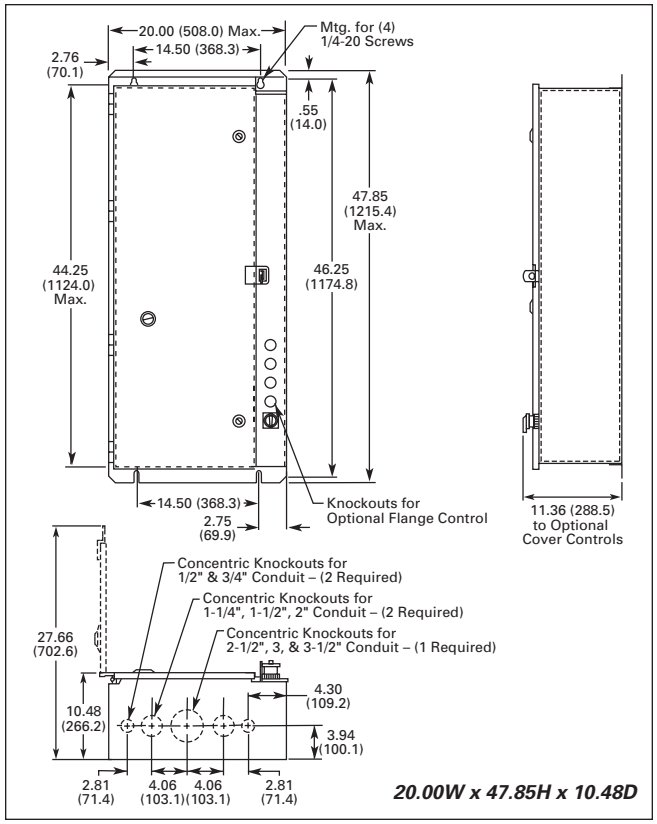


Figure 15-29. Box 10, Type 1 — Approximate Dimensions in Inches (mm)

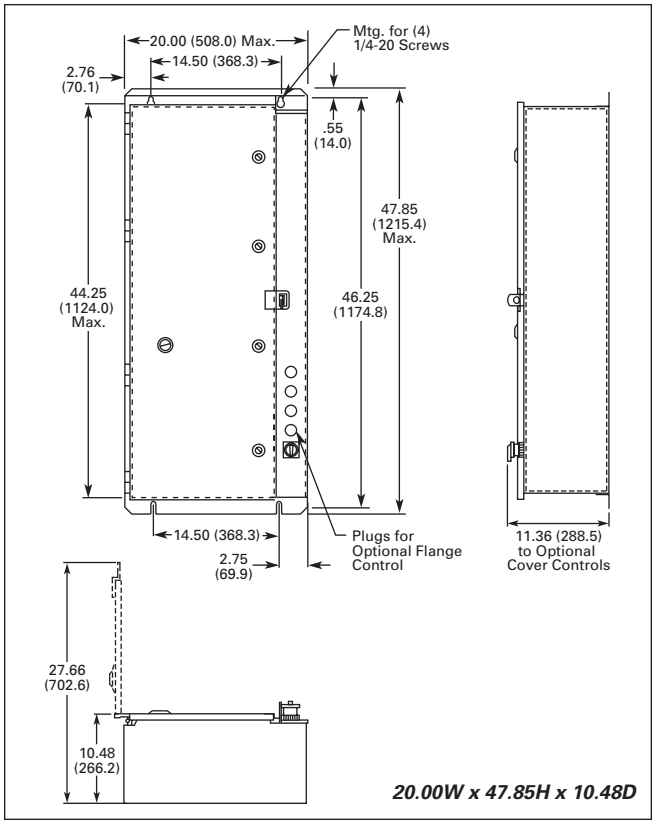
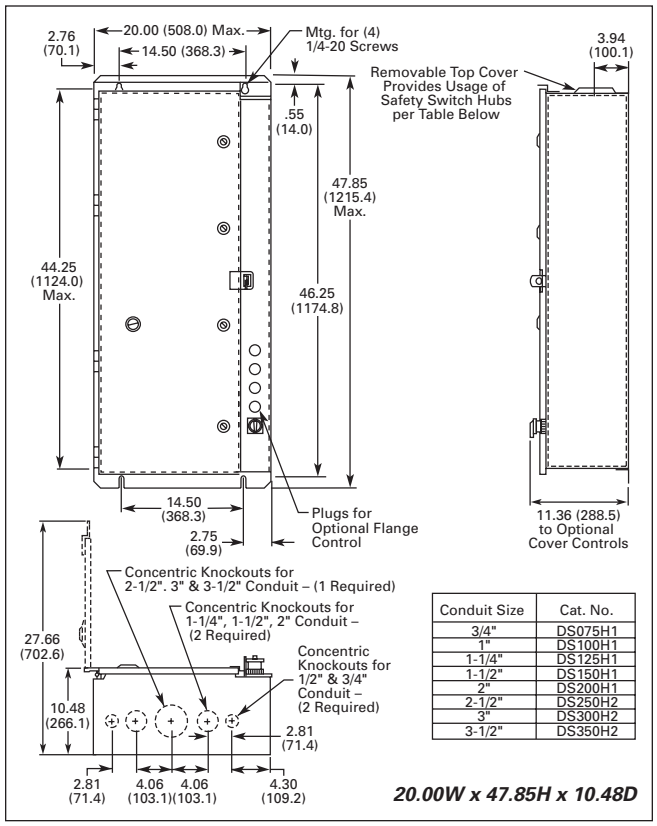


Figure 15-31. Box 10, Type 12 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1
1-1/2"	DS150H1
2"	DS200H1
2-1/2"	DS250H2
3"	DS300H2
3-1/2"	DS350H2

Figure 15-30. Box 10, Type 3R — Approximate Dimensions in Inches (mm)

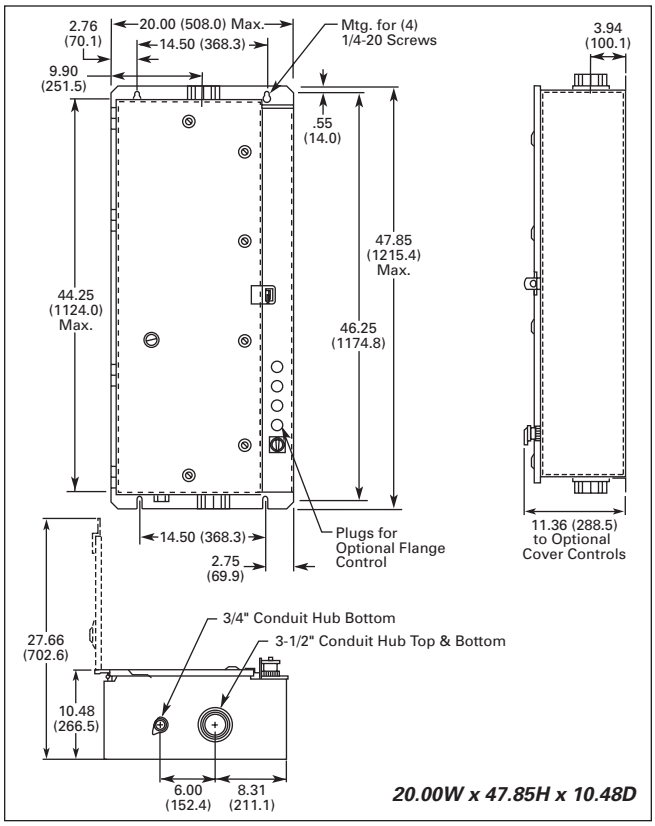


Figure 15-32. Box 10, Type 4X — Approximate Dimensions in Inches (mm)

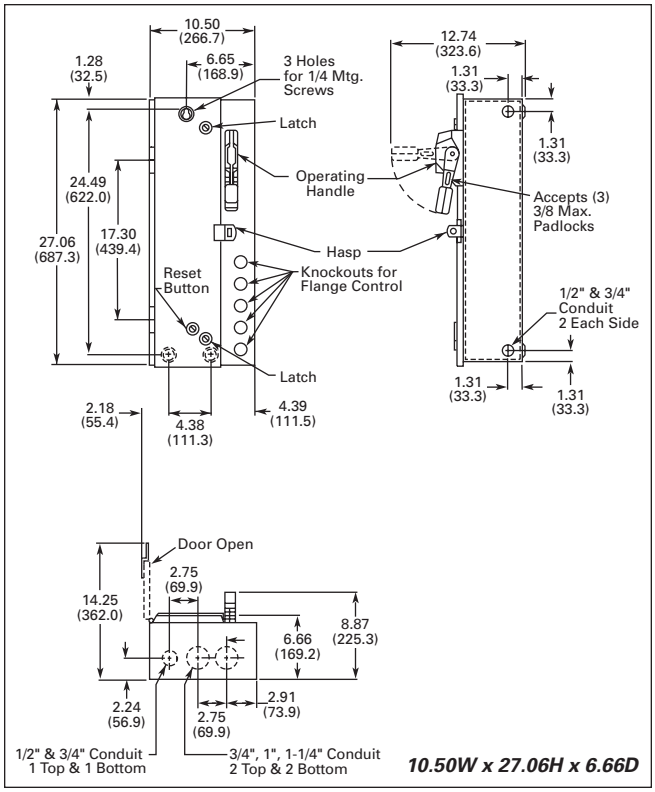


Figure 15-33. Box A, Type 1 — Approximate Dimensions in Inches (mm)

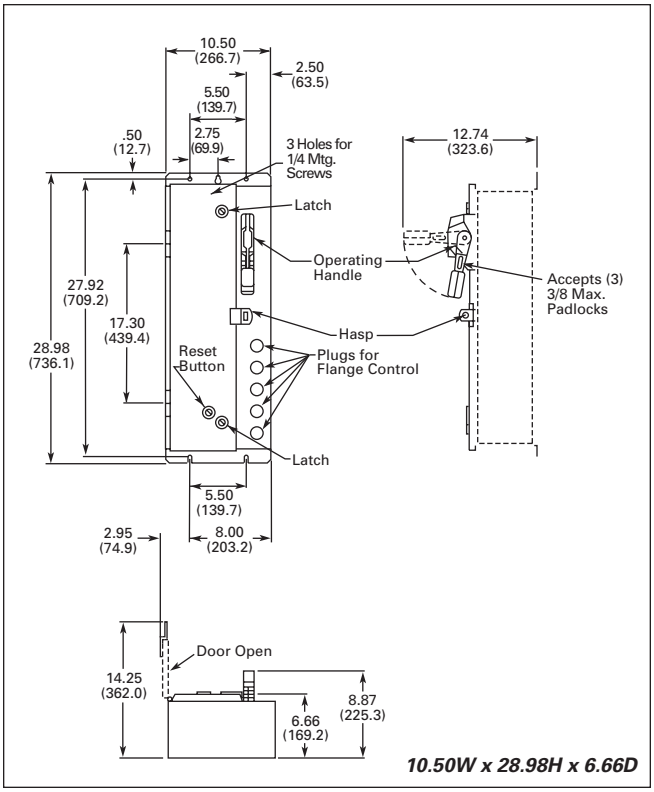
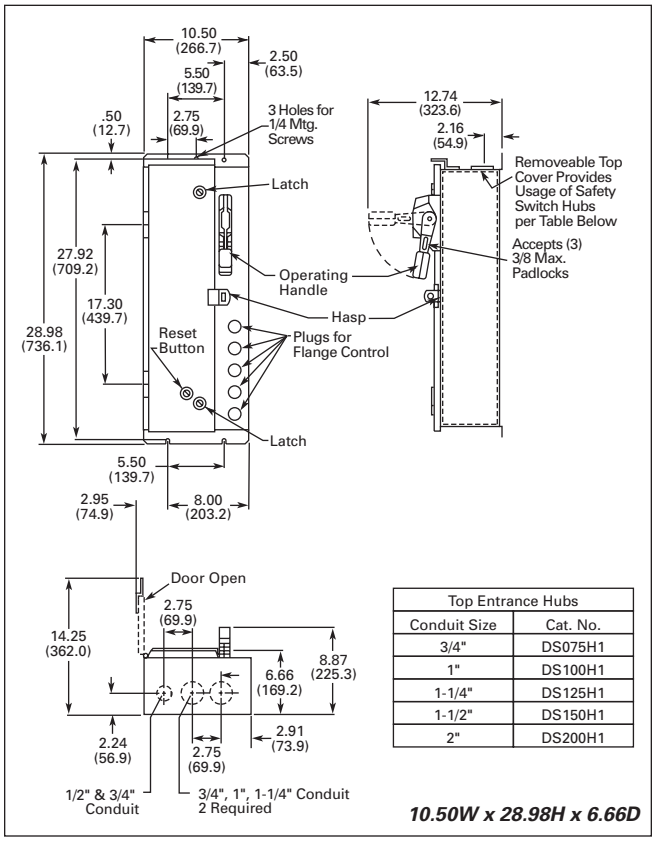


Figure 15-35. Box A, Type 12 — Approximate Dimensions in Inches (mm)

15



Top Entrance Hubs	
Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1
1-1/2"	DS150H1
2"	DS200H1

Figure 15-34. Box A, Type 3R — Approximate Dimensions in Inches (mm)

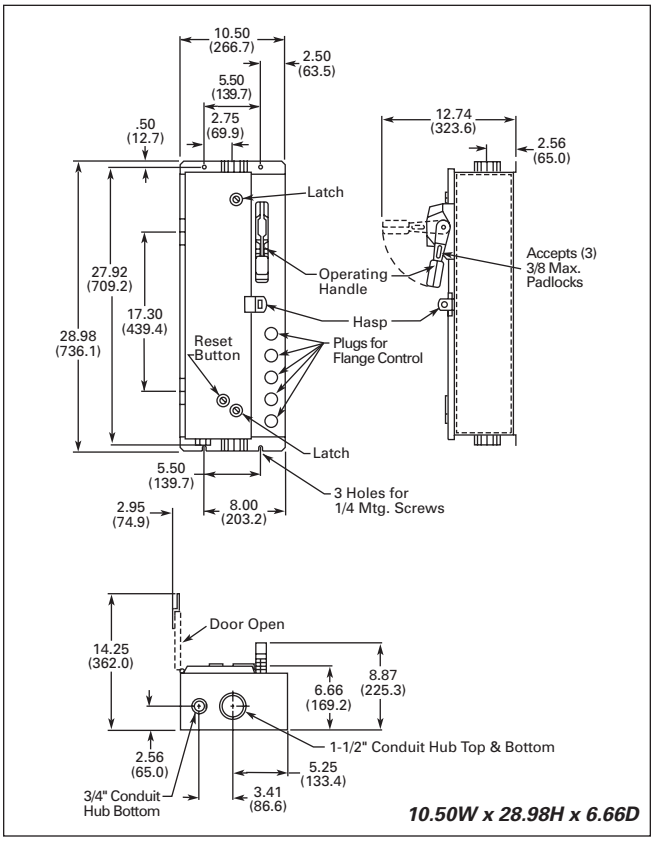


Figure 15-36. Box A, Type 4X — Approximate Dimensions in Inches (mm)

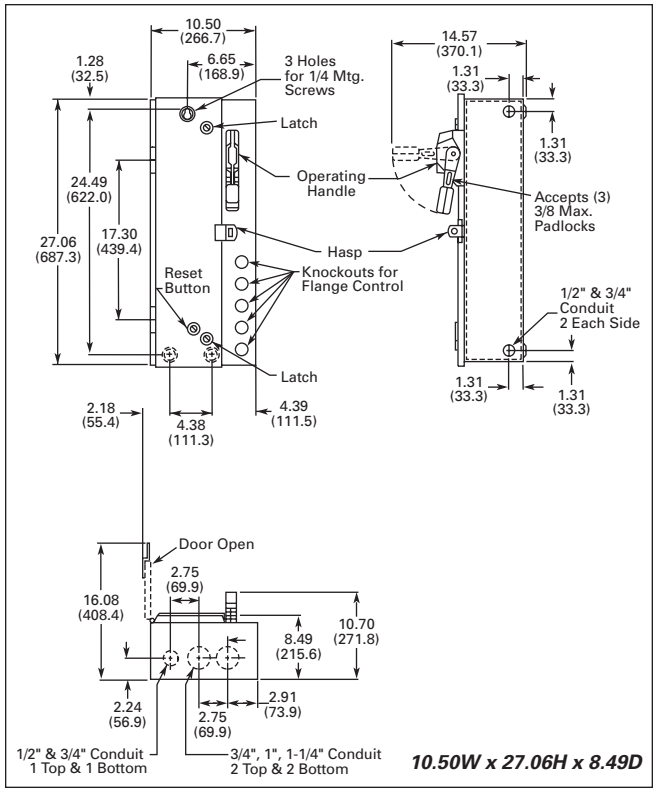


Figure 15-37. Box A1, Type 1 — Approximate Dimensions in Inches (mm)

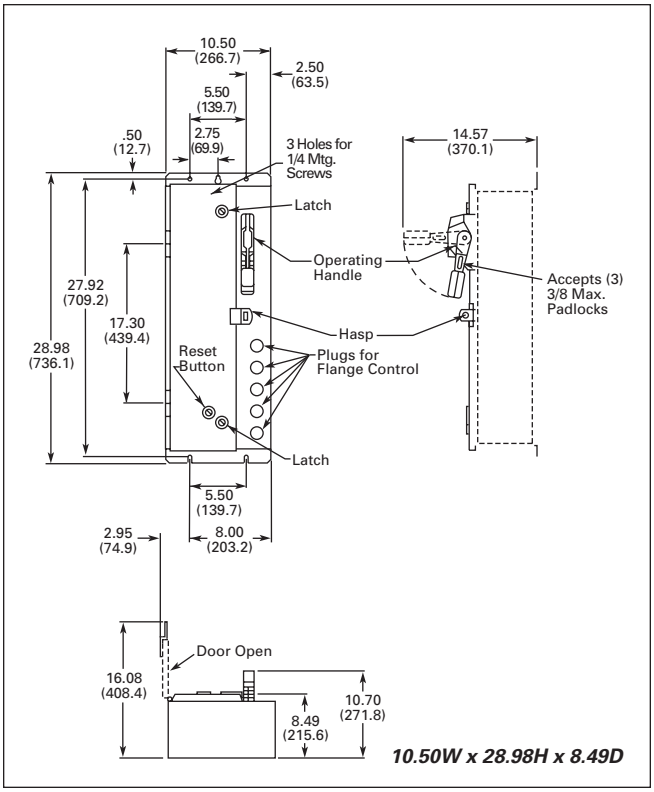
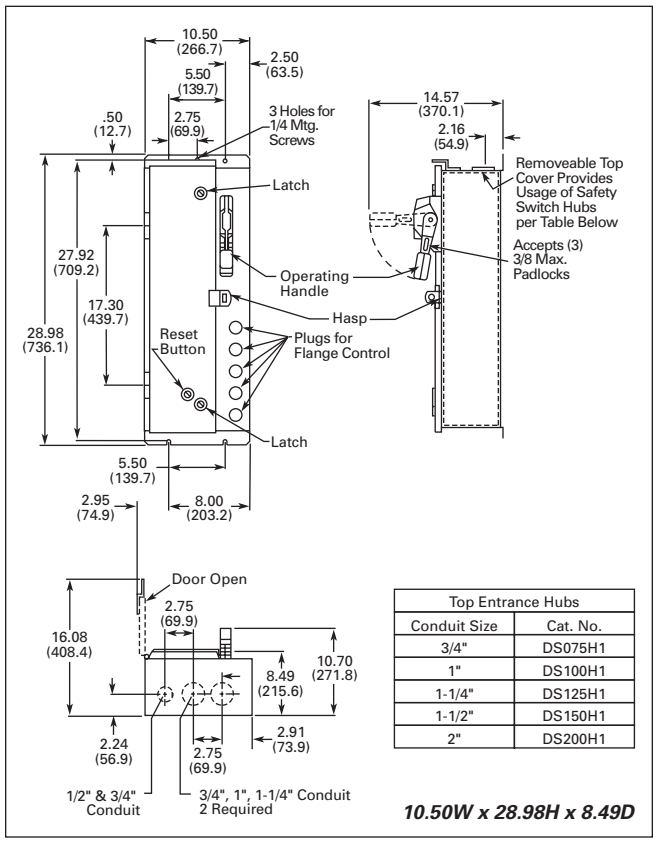


Figure 15-39. Box A1, Type 12 — Approximate Dimensions in Inches (mm)



Top Entrance Hubs	
Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1
1-1/2"	DS150H1
2"	DS200H1

Figure 15-38. Box A1, Type 3R — Approximate Dimensions in Inches (mm)

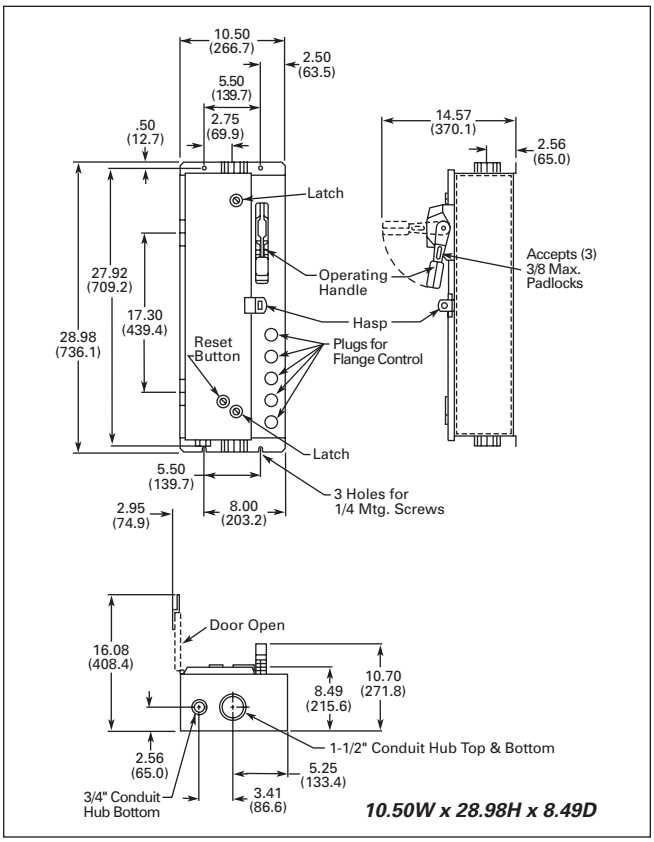


Figure 15-40. Box A1, Type 4X — Approximate Dimensions in Inches (mm)

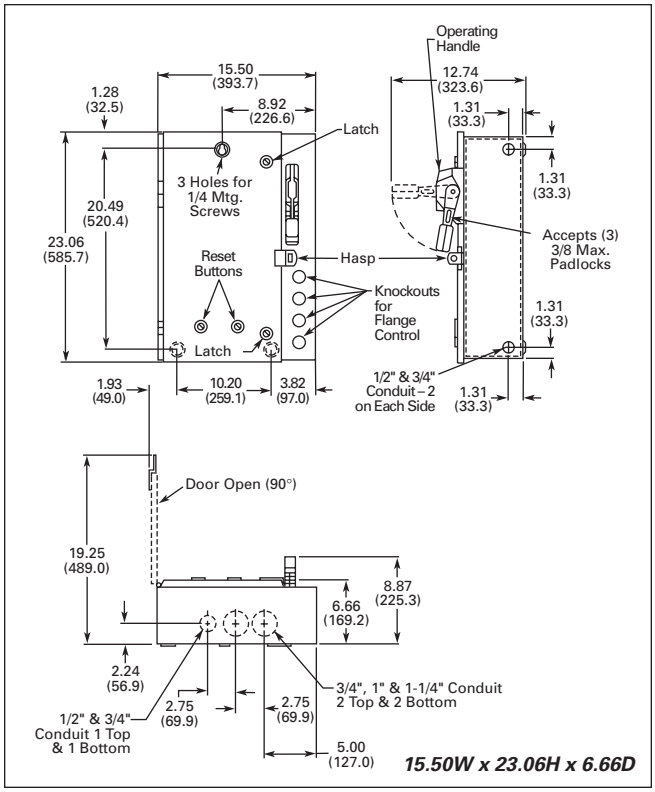


Figure 15-41. Box B, Type 1 — Approximate Dimensions in Inches (mm)

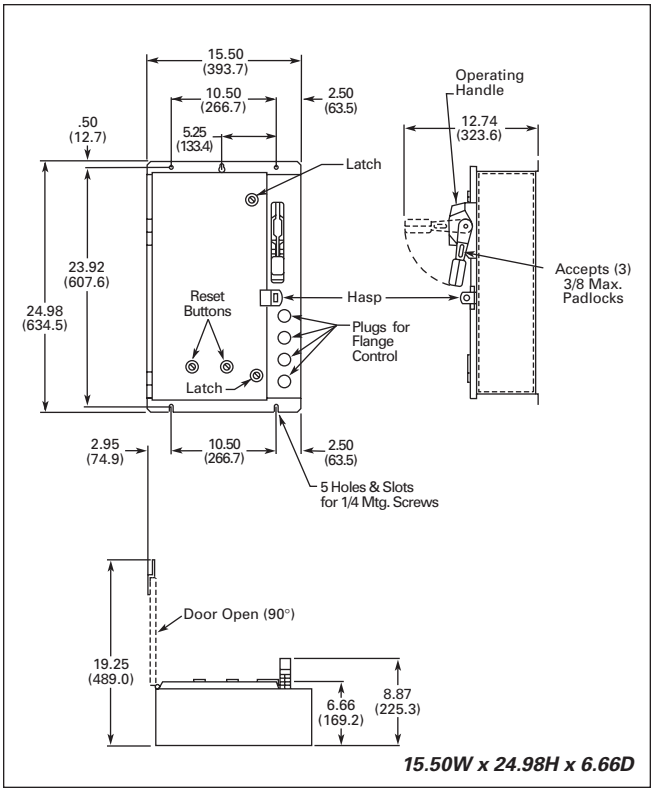
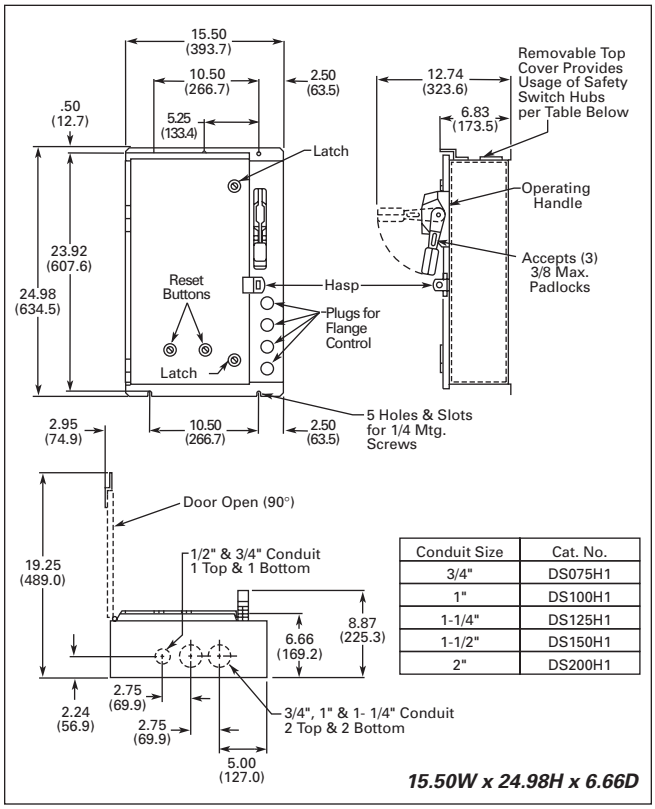


Figure 15-43. Box B, Type 12 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1
1-1/2"	DS150H1
2"	DS200H1

Figure 15-42. Box B, Type 3R — Approximate Dimensions in Inches (mm)

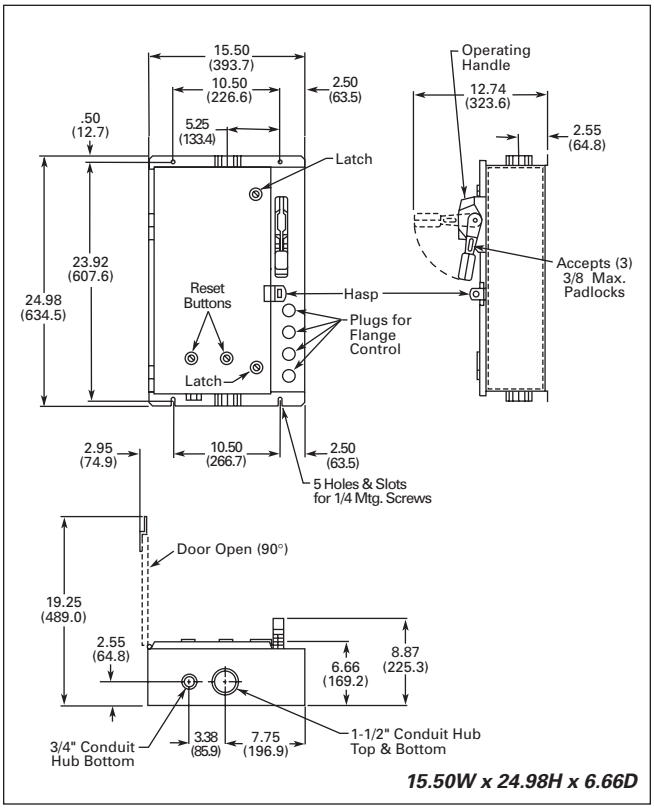


Figure 15-44. Box B, Type 4X — Approximate Dimensions in Inches (mm)

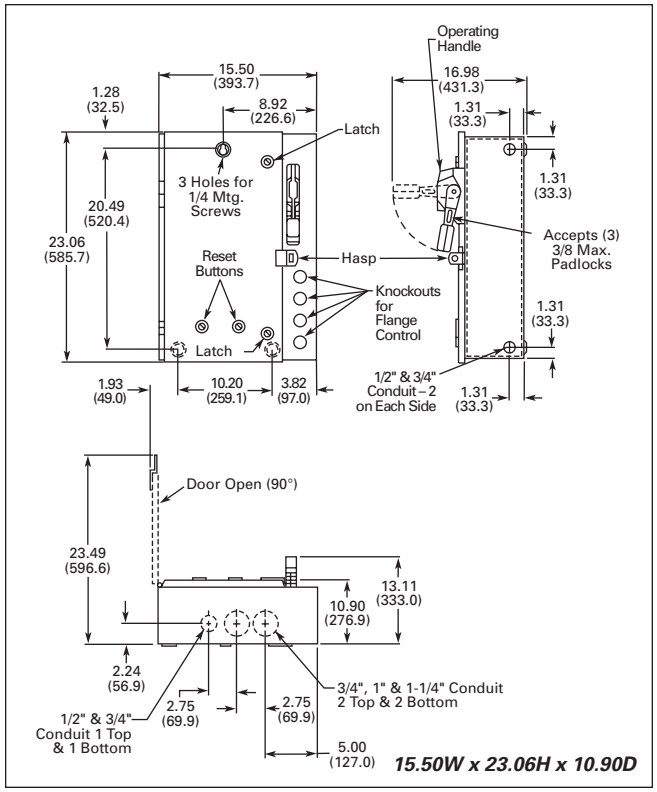


Figure 15-45. Box B1, Type 1 — Approximate Dimensions in Inches (mm)

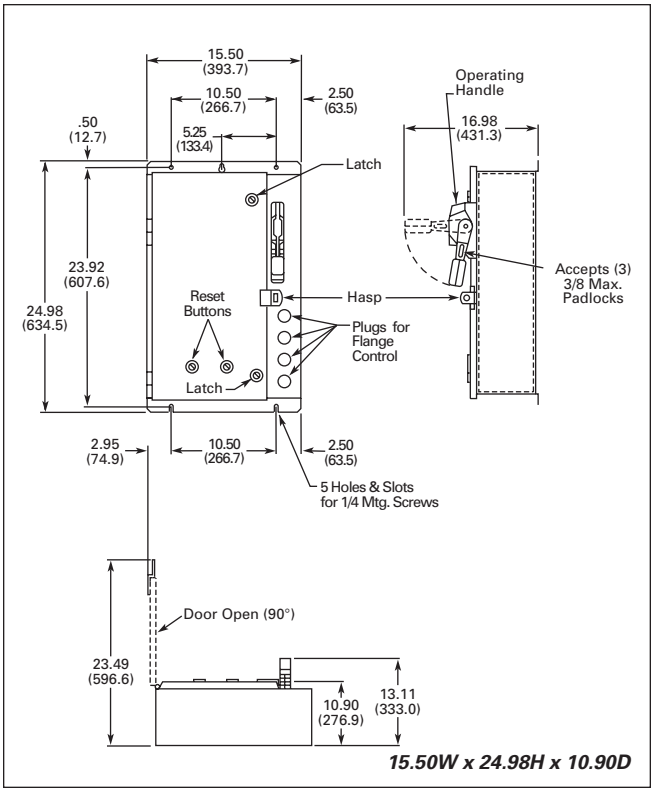
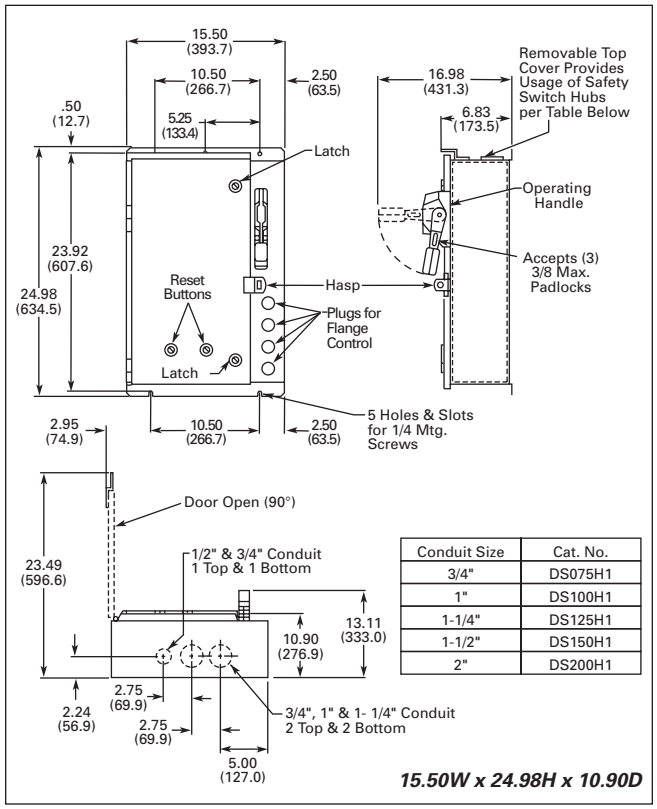


Figure 15-47. Box B1, Type 12 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
3/4"	DS075H1
1"	DS100H1
1-1/4"	DS125H1
1-1/2"	DS150H1
2"	DS200H1

Figure 15-46. Box B1, Type 3R — Approximate Dimensions in Inches (mm)

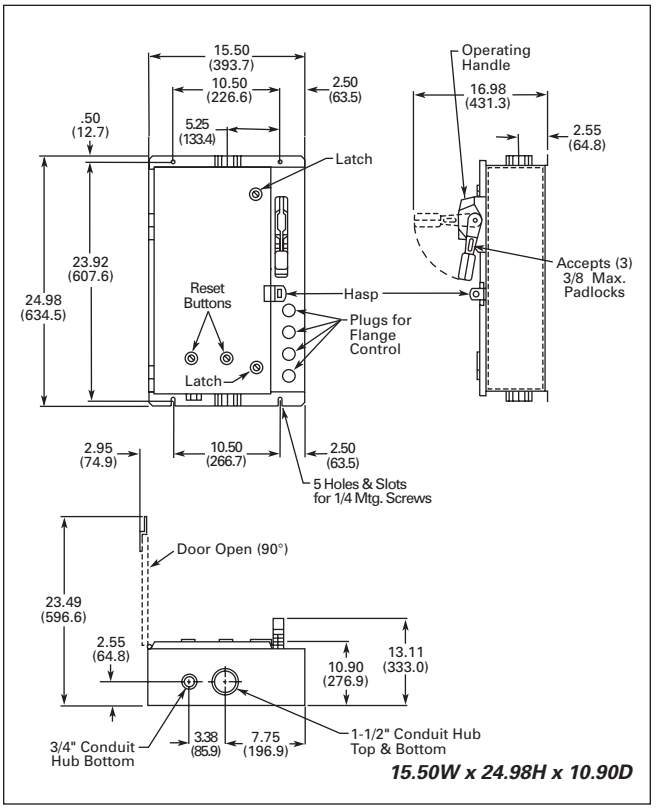


Figure 15-48. Box B1, Type 4X — Approximate Dimensions in Inches (mm)

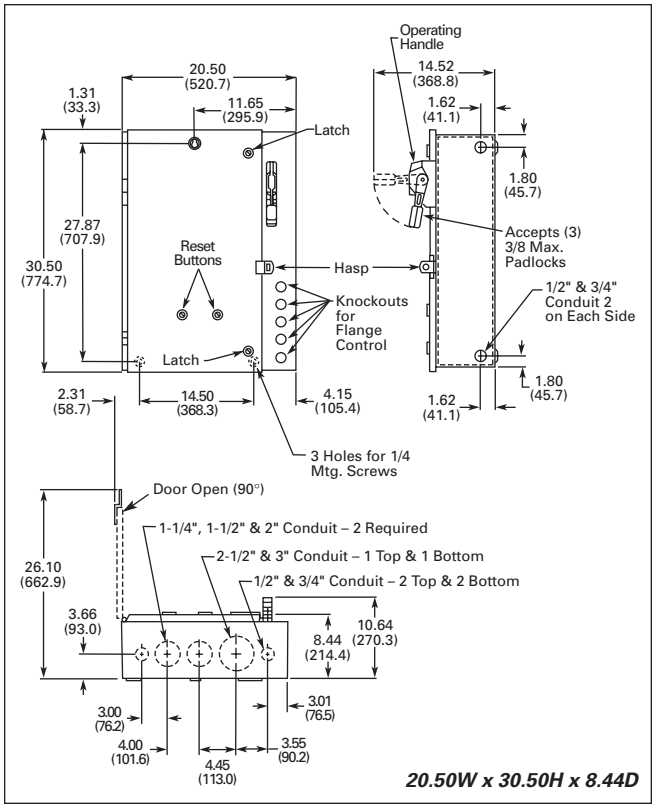


Figure 15-49. Box C, Type 1 — Approximate Dimensions in Inches (mm)

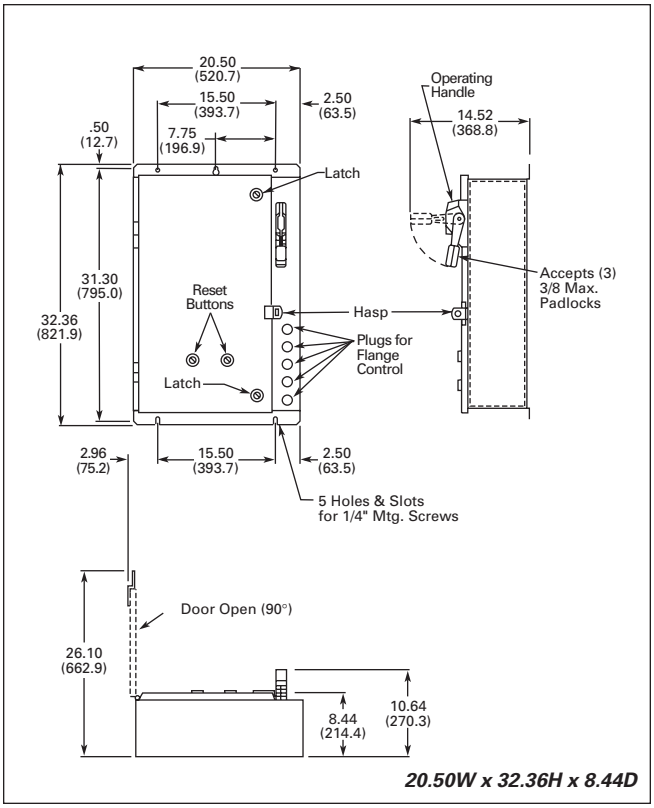
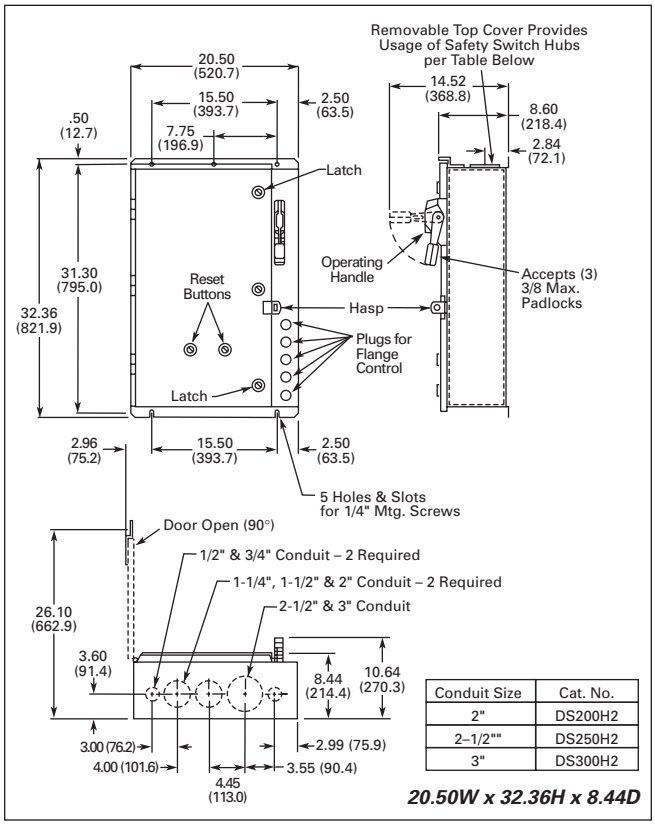


Figure 15-51. Box C, Type 12 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
2"	DS200H2
2–1/2""	DS250H2
3"	DS300H2

Figure 15-50. Box C, Type 3R — Approximate Dimensions in Inches (mm)

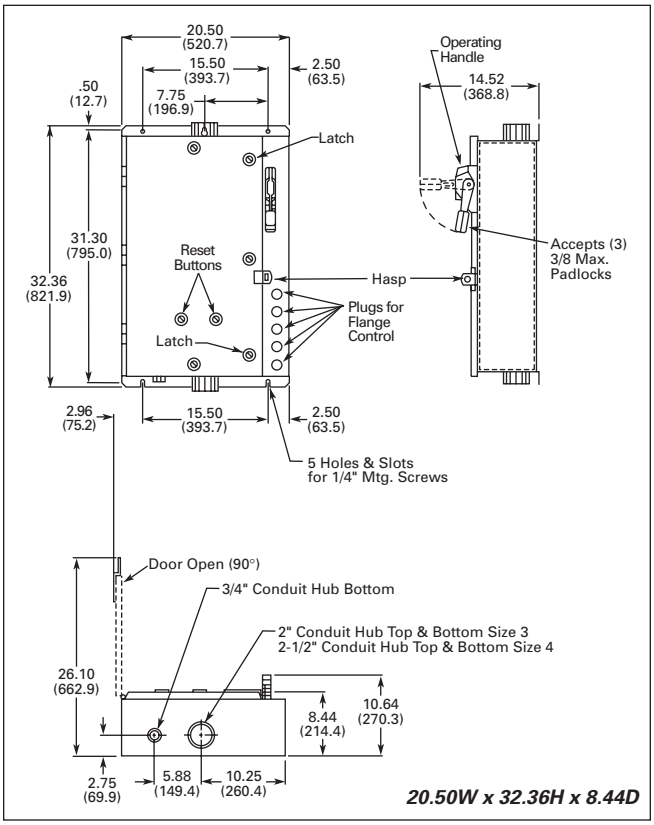


Figure 15-52. Box C, Type 4X — Approximate Dimensions in Inches (mm)

15

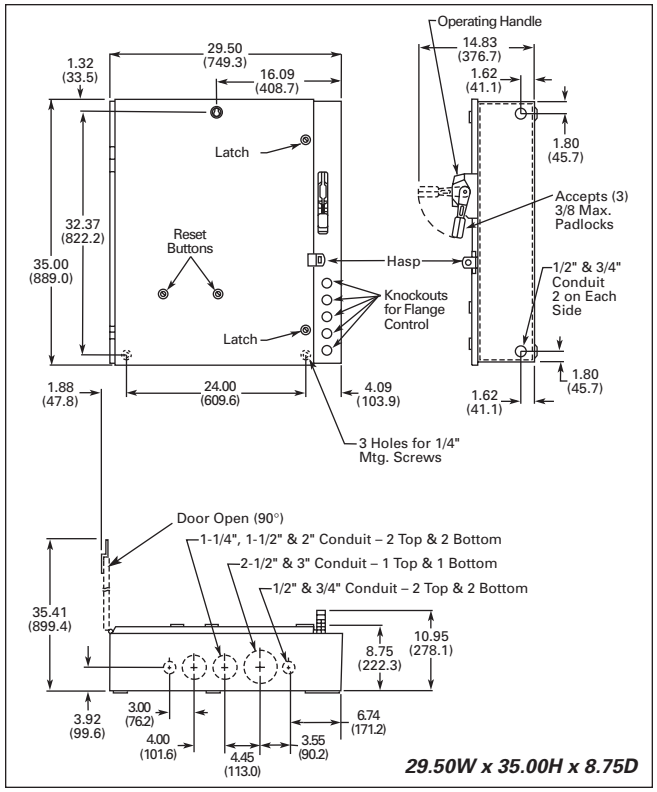


Figure 15-53. Box D, Type 1 — Approximate Dimensions in Inches (mm)

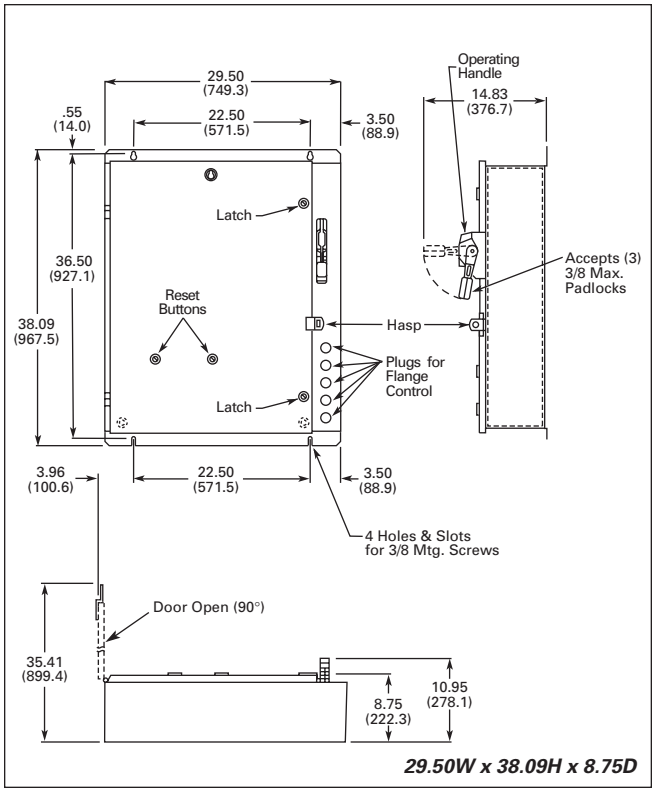
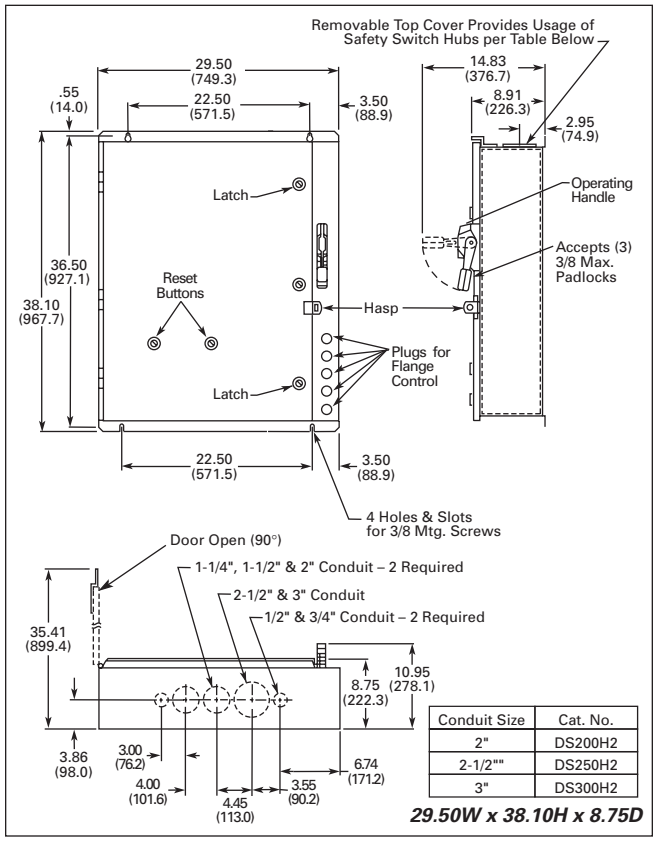


Figure 15-55. Box D, Type 12 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
2"	DS200H2
2-1/2""	DS250H2
3"	DS300H2

Figure 15-54. Box D, Type 3R — Approximate Dimensions in Inches (mm)

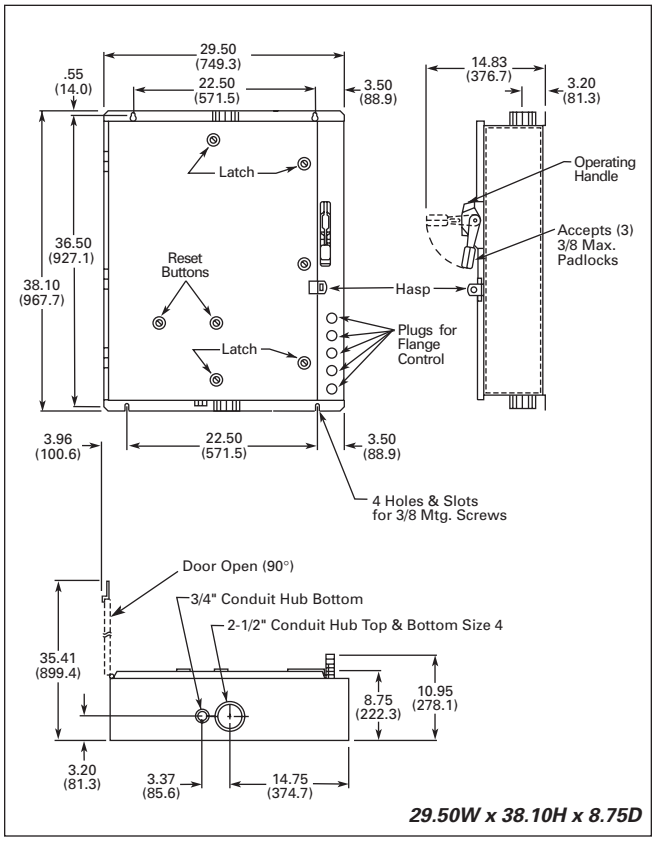


Figure 15-56. Box D, Type 4X — Approximate Dimensions in Inches (mm)

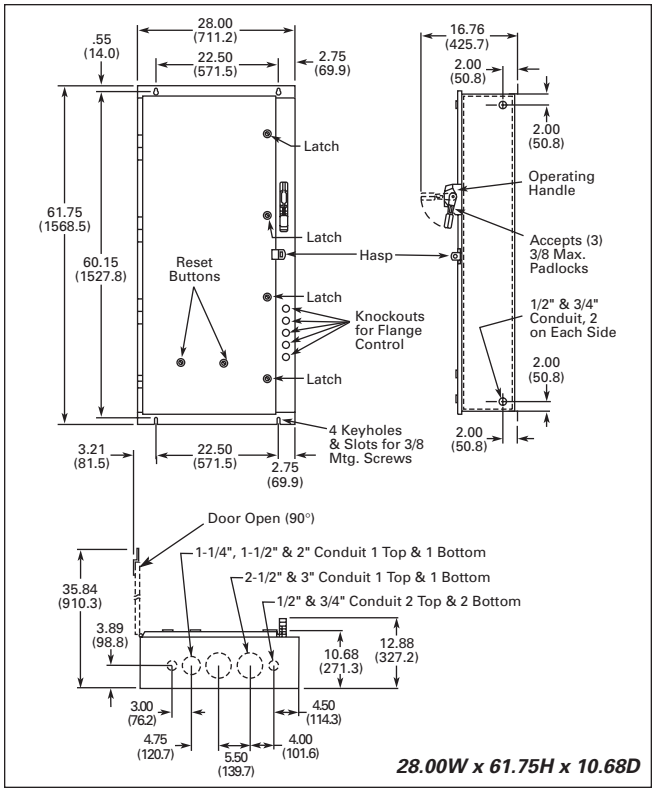


Figure 15-57. Box E, Type 1 — Approximate Dimensions in Inches (mm)

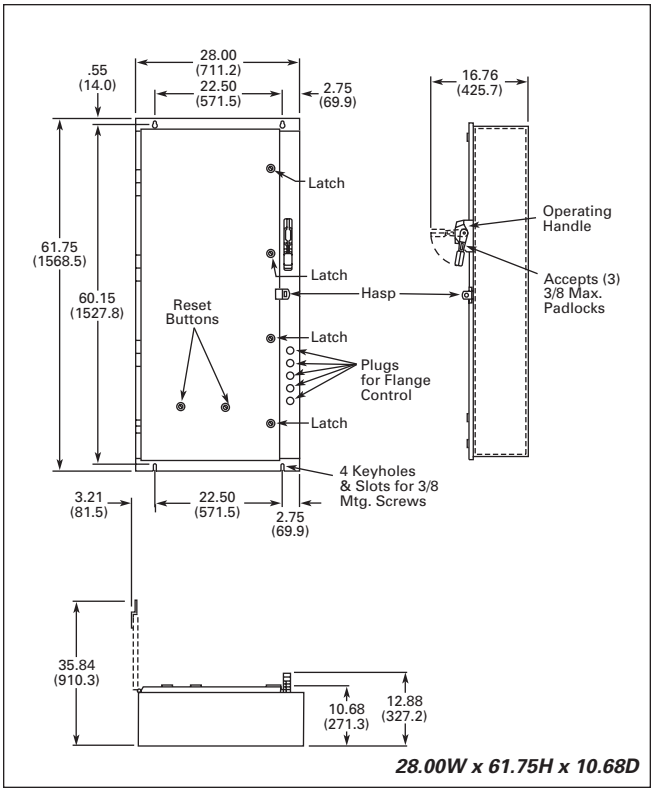
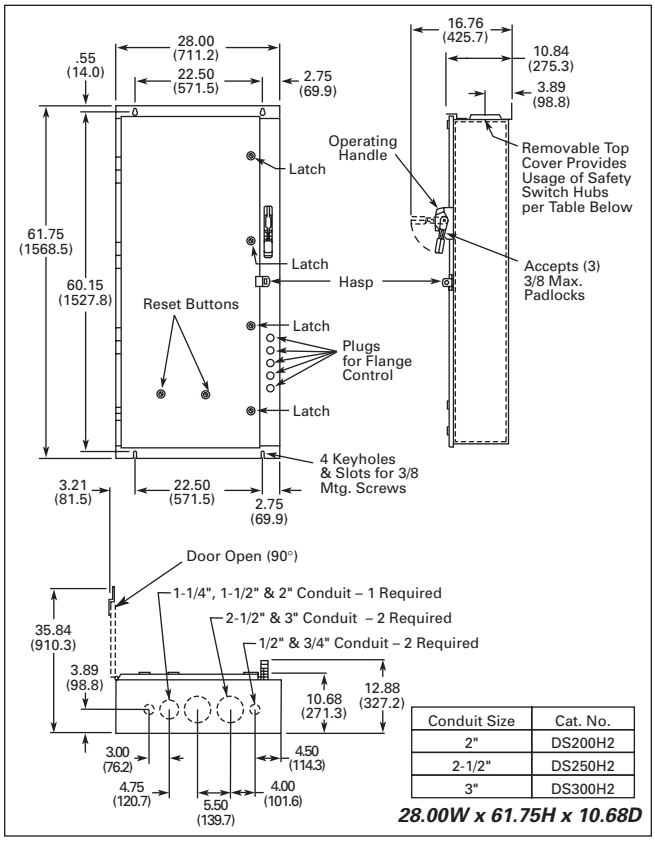


Figure 15-59. Box E, Type 12 — Approximate Dimensions in Inches (mm)



Conduit Size	Cat. No.
2"	DS200H2
2-1/2"	DS250H2
3"	DS300H2

Figure 15-58. Box E, Type 3R — Approximate Dimensions in Inches (mm)

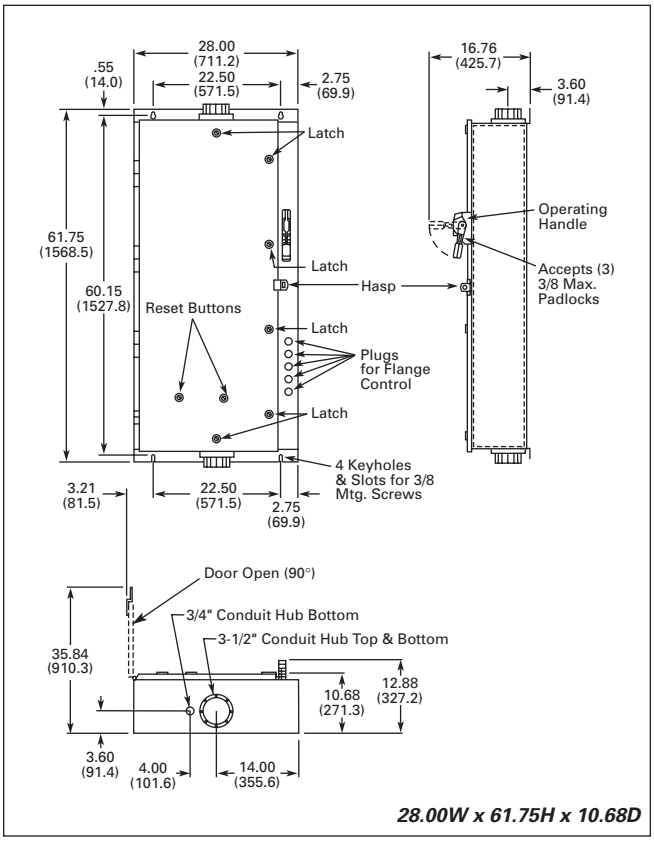


Figure 15-60. Box E, Type 4X — Approximate Dimensions in Inches (mm)

15

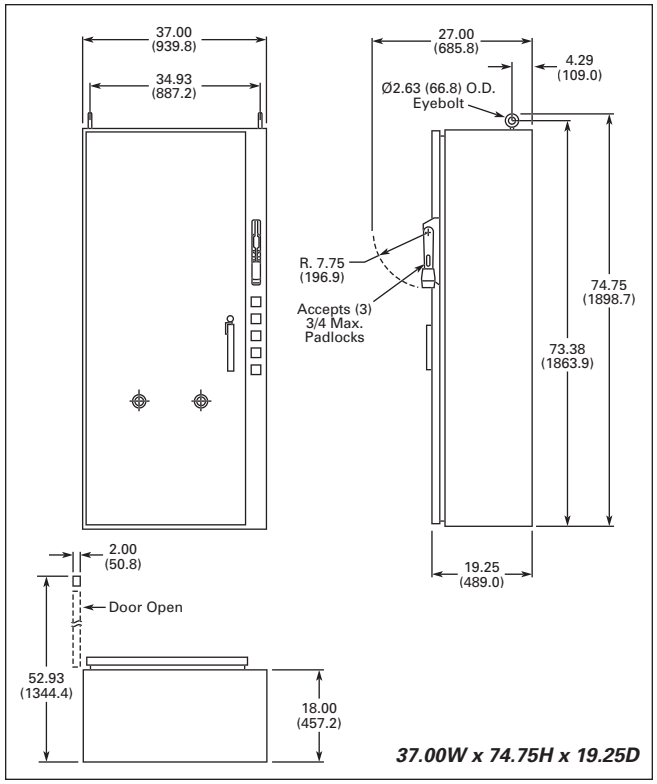


Figure 15-61. Box F1E, Type 1/3R/4/12 — Approximate Dimensions in Inches (mm)

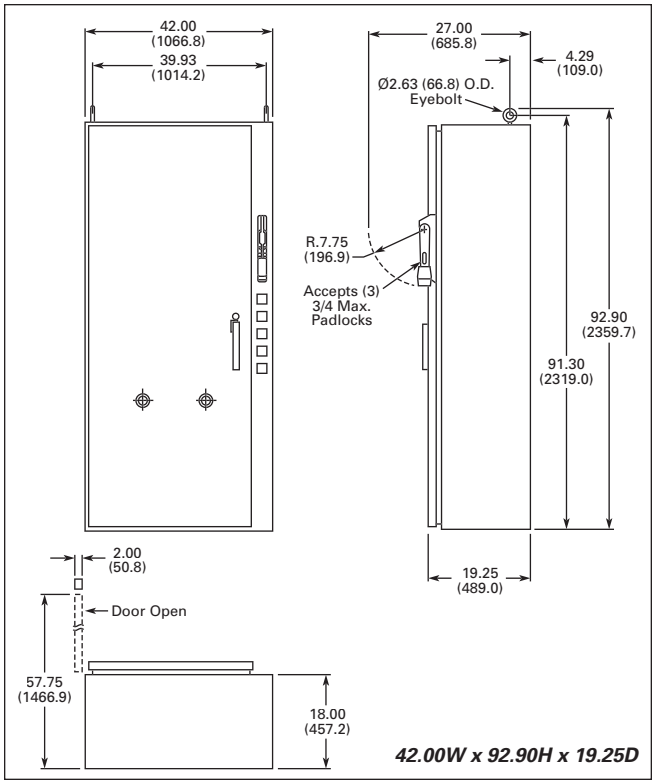


Figure 15-63. Box F2E, Type 1/3R/4/12 — Approximate Dimensions in Inches (mm)

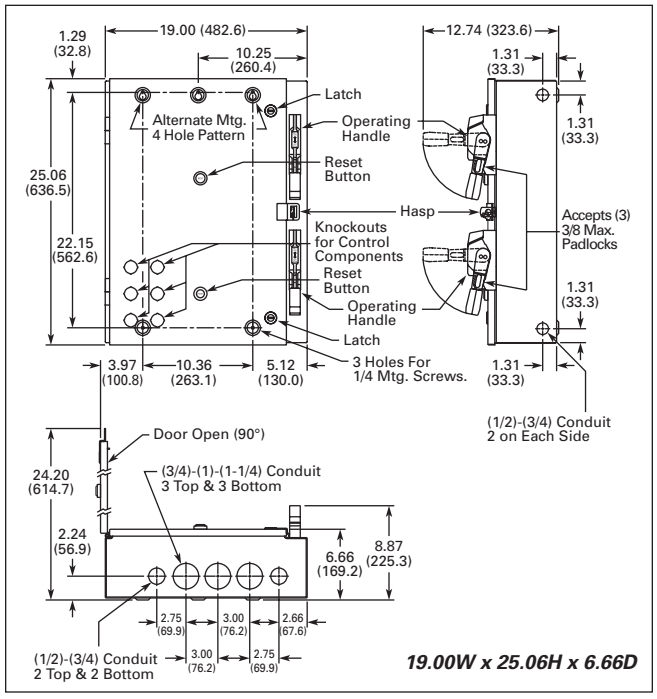


Figure 15-62. Box H, Type 1 — Approximate Dimensions in Inches (mm)

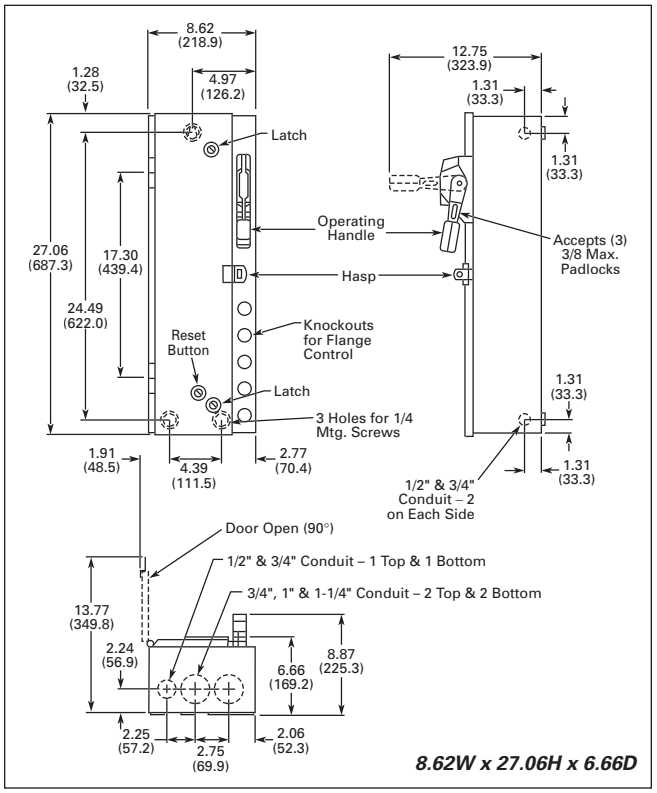


Figure 15-64. Box I, Type 1 ① — Approximate Dimensions in Inches (mm)

① Knockouts are not supplied for Type 12; all other dimensions apply.

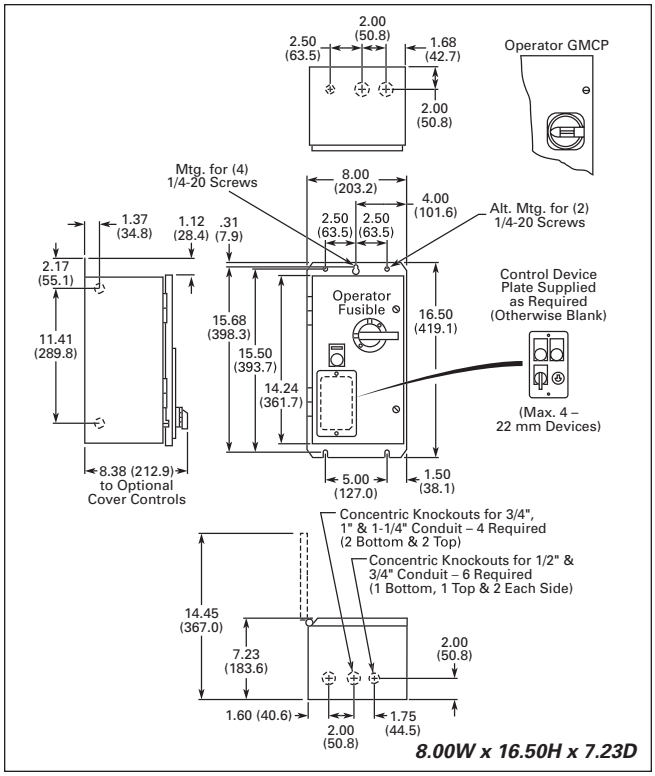


Figure 15-65. Box J ① — Approximate Dimensions in Inches (mm)

① Knockouts are not supplied for Type 12 or 3R types; all other dimensions apply. Consult factory for Type 4X.

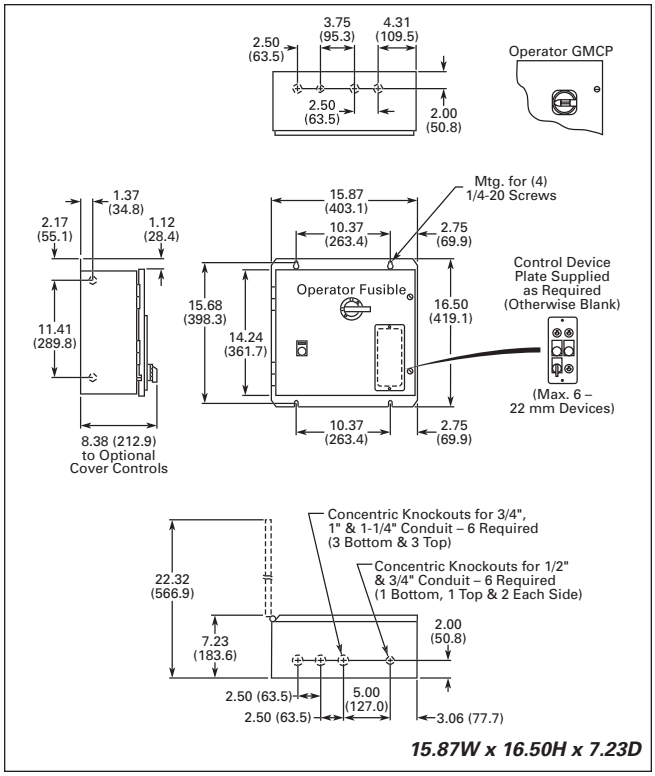


Figure 15-67. Box L ② — Approximate Dimensions in Inches (mm)

② Knockouts are not supplied for Type 12 or 3R types; all other dimensions apply. Consult factory for Type 4X.

15

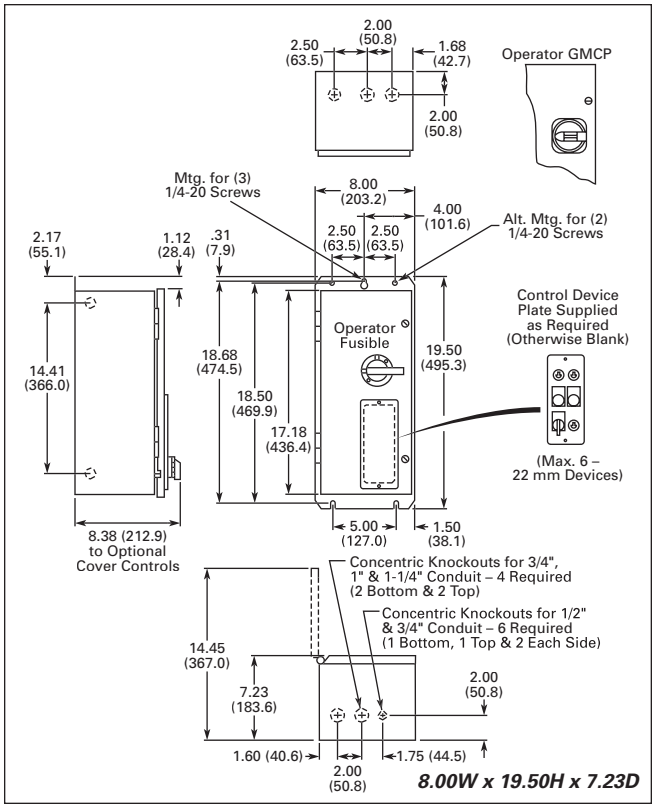


Figure 15-66. Box K ② — Approximate Dimensions in Inches (mm)

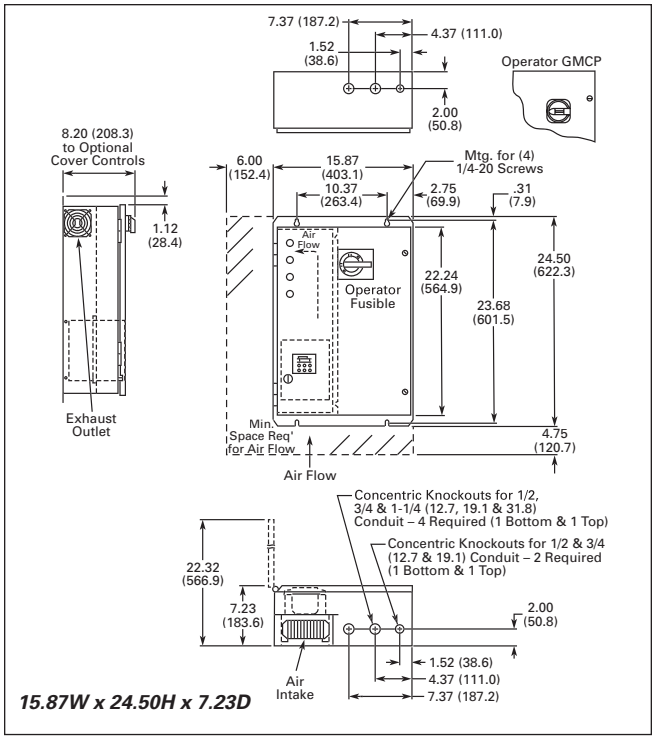


Figure 15-68. Box M, Type 1/12 — Approximate Dimensions in Inches (mm) ③④

③ Knockouts are not supplied for Type 12; all other dimensions apply.

④ For Type 12, clear lens provided.

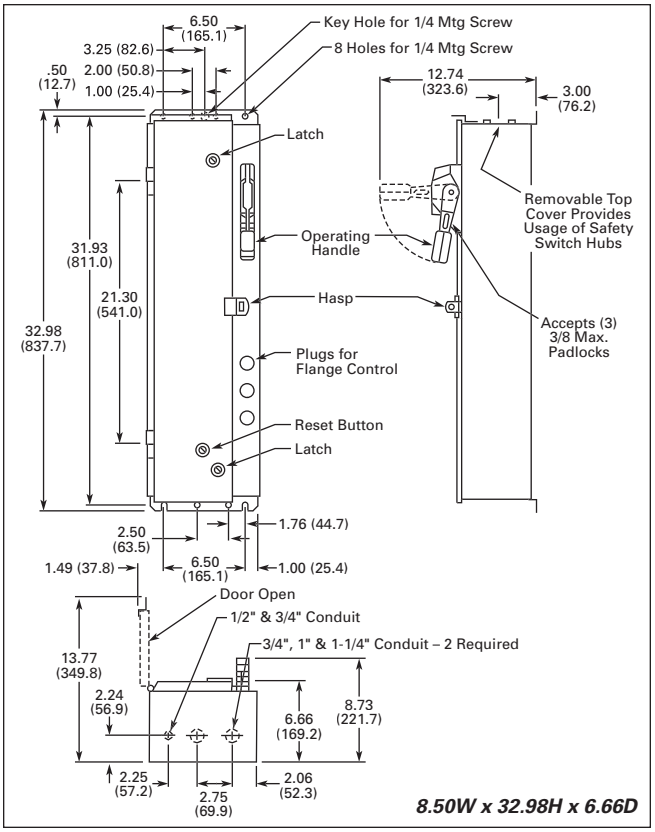


Figure 15-69. Box P1 — Approximate Dimensions in Inches (mm)

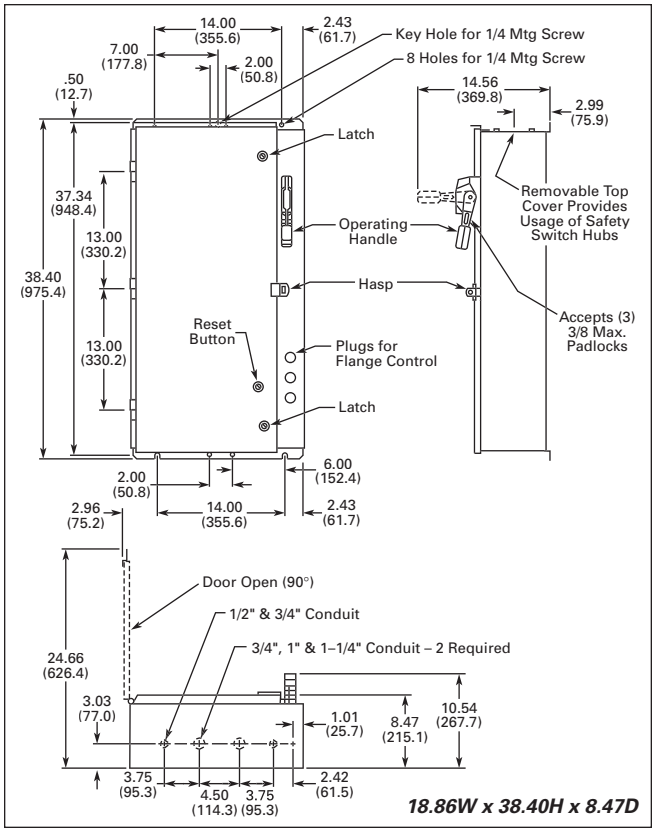


Figure 15-71. Box P3 — Approximate Dimensions in Inches (mm)

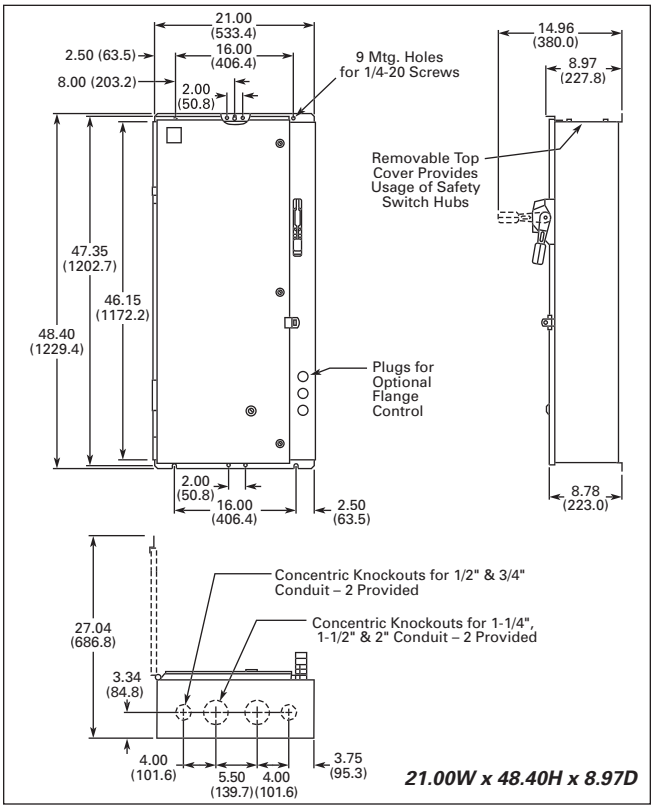


Figure 15-70. Box P5 — Approximate Dimensions in Inches (mm)

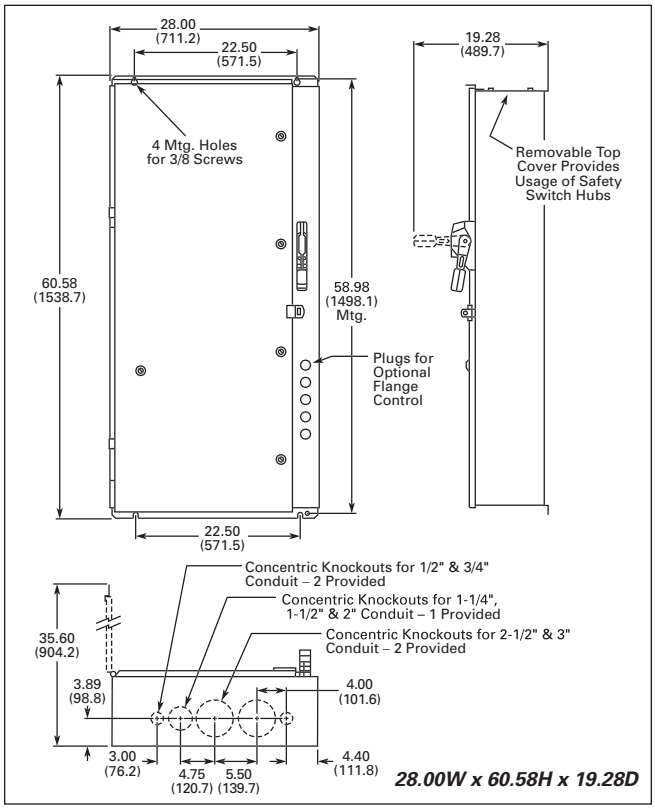


Figure 15-72. Box P7 — Approximate Dimensions in Inches (mm)

April 2008

Accessories & Modification Codes

Contents

Auxiliary Contacts

IT. NEMA

Auxiliary Contacts

Auxiliary Contacts are available for mounting on Eaton's Cutler-Hammer Intelligent Technologies (***IT.***) Electro-Mechanical Contactors and Starters. The various choices available for non-reversing models are shown in **Tables 16-1** and **16-2,** and their ratings in **Tables 16-3** – **16-5**. For reversing models, the number of auxiliaries indicated is for each of the contactors/starters in the assembly.

Table 16-1. Auxiliary Contact Availability — Sizes 00 – 5

Top Mounted (Maximum Auxiliaries per Contactor/Starter) ②						
Contactor/Starter Size					Contact Type	Catalog Number
Size 00, 0	Size 1	Size 2	Size 3, 4	Size 5		
3	3	3	3	—	1NO	**EMA13**
3	3	3	3	—	1NC	**EMA14**
2	2 ①	3	3	—	1NO-1NC	**EMA15**
2	2 ①	3	3	—	2NO	**EMA16**
2	2 ①	3	3	—	2NC	**EMA17**
2	3	3	3	3	Logic Level 1NO-1NC	**EMA70**

① Other combinations: Single, Dual, Single; Dual, Single, Dual; Dual, Logic Level, Dual.
② For reversers, multiply quantities by two.

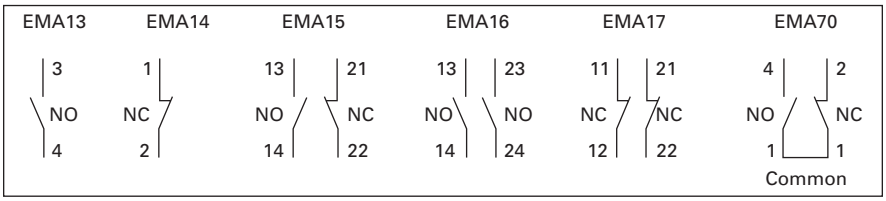


Figure 16-1. Connecting Diagram — Sizes 00 – 5

Table 16-2. Auxiliary Contact — Size 5

Auxiliary Contacts per Non-reversing and Reversing Contactor or Starter			
Max.	Contact Type	Description	Catalog Number
2	1NO	Base auxiliary (max. 1 per side)	**C320KGS41**
2	1NO-1NC	Base auxiliary (max. 1 per side)	**C320KGS42**
6	1NO	C320KGS41 or C320KGS42 required (max. 3 Add-on auxiliaries per side)	**C320KGS20**
2	1NO Logic Level	C320KGS41 or C320KGS42 required (max. 1 Add-on auxiliary per side)	**C320KGS20L**
6	1NC	C320KGS41 or C320KGS42 required (max. 2 Add-on auxiliaries per side)	**C320KGS21**
2	1NC Logic Level	C320KGS41 or C320KGS42 required (max. 1 Add-on auxiliary per side)	**C320KGS21L**
2	1NO-1NC	C320KGS41 or C320KGS42 required (max. 1 Add-on auxiliary per side)	**C320KGS22**
2	1NO-1NC Logic Level	C320KGS41 or C320KGS42 required (max. 1 Add-on auxiliary per side)	**C320KGS22L** ③
3	1NO-1NC Logic Level	Front Mounted Only	**EMA70** ④

③ Form C contacts.
④ For reversers, multiply quantities by two.

Note:

- Side Mounted — Maximum (10) total circuits.
- Front Mounted — Maximum (6) total circuits. ④
- Maximum 4 auxiliaries per side (base + 3 side mounted).
- EMASA/B_ _ have been superseded by the above Catalog Numbers.

Table 16-3. IEC Ratings

DC-13		AC-15	
Ue Voltage	*Ie* Amps.	*Ue* Voltage	*Ie* Amps.
24	5	48	8
48	2.5	120	6
125	1.1	240	4
250	.55	440	2

Table 16-4. NEMA A600 Ratings

Current	AC Voltage			
	120	240	480	600
Make and Interrupting	60	30	15	12
Break	6	3	1.5	1.2
Continuous	10	10	10	10
Thermal	10	10	10	10

Table 16-5. NEMA P300 Ratings

Current	DC Voltage	
	125	250
Make and Interrupting	1.1	.55
Break	1.1	.55
Continuous	5	5
Thermal	5	5

Table 16-6. EMA70 Auxiliary Contact

DC-12		AC-12	
Ue	Ie	Ue	Ie
30	.1	250	.1

Table 16-7. C320KGS20L, C320KGS21L, C320KGS22L Auxiliary Contact Ratings

DC-12		AC-12	
Ue	Ie	Ue	Ie
80	0.1	250	0.1

Starter Network Adapter Product (SNAP)

Cat. No. D77B-DSNAP-X1 with 54 mm IT. Starter

The Starter Network Adapter Product (SNAP) is a front-mount device that serves as a single DeviceNet node, providing communication capability, control and monitoring to Eaton's Cutler-Hammer Intelligent Technologies (***IT.***) Electromechanical Starters as well as the ***IT.*** S75X SoftStart.

When HAND-OFF-AUTO is required, the HOA option will allow for the connection of hard wired operators. This option allows for Hand Control even if the DSNAP is not connected.

For more information and pricing, see Publication No. CA08102001E, Tab 50.

Lug Kits

Table 16-8. Lug Kits

NEMA Size	Description	Catalog Number
1	Contactor or Starter Line or Load (3 Lugs)	**EMLUGKTC**
2	Contactor or Starter Line or Load	**EMLUGKTD**
3, 4	Contactor Line or Load, Starter Line Starter Load	**EMLUGKTLE** **EMLUGKTTE**
5	Contactor or Starter Line or Load, Horizontal Contactor or Starter Line or Load, Vertical	**EMLUGKTFA** **EMLUGKTFB**

Table 16-9. Ring Lug Retrofit Kits

Product	NEMA Sizes 3, 4			NEMA Size 5		
	Catalog Number			Catalog Number		
	Factory Installed	Retrofit Kits ①	Lug Kits ②	Factory Installed	Retrofit Kits ①	Lug Kits ②
N111 **N511**	Add "**-RTX**" Add "**-RTX**"	**EMRTXKTEN** **EMRTXKTER**	**EMLUGREN** **EMLUGRER**	Add "**-RTX**" Add "**-RTX**"	**EMRTXKTF** **EMRTXKTF**	**EMLUGRFC** **EMLUGRFC**
N101 **N501**	Add "**-RTX**" Add "**-RTX**"	**EMRTXKTEN** **EMRTXKTER**	**EMLUGREN** **EMLUGRER**	Add "**-RTX**" Add "**-RTX**"	**EMRTXKTF** **EMRTXKTF**	**EMLUGRFS** **EMLUGRFS**
N05N **N06N**	Add "**-RTX**" Add "**-RTX**"			Add "**-RTX**" Add "**-RTX**"		
N02N **N03N**	Add "**-RTX**" Add "**-RTX**"					
N04N	Add "**-RTX**"					

① Retrofit Kits used to field install ring lugs on standard lug units.
② Lug Kits used to field install standard lugs into factory assembled ring lug units.

Reversing Kits

Includes Fanning Strips, Mechanical Interlock, Mounting Plate and hardware.

Table 16-10. Reversing Kits ③

NEMA Size	Catalog Number
00, 0	**EMRKTB**
1	**EMRKTC**
2	**EMRKTD**
3, 4	**EMRKTE**
5	**EMRKTF**

③ For Contactor and Starter.

Note: Also order separately the appropriate contact blocks and overload relay.

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.

Side Mounted

Top Mounted

Table 16-11. Selection Product

Description	Contact Configuration Code ①	Catalog Number
Side Mounted		
1NO 1NC	10 01	**C320KGS1** **C320KGS2**
1NO-1NC 2NO 2NC 1NO-1NCI 1NO (EC)-1NC (LO) 1NCI	11 20 02 N/A N/A N/A	**C320KGS3** **C320KGS4** **C320KGS5** **C320KGS6** **C320KGS7** **C320KGS8**
Top Mounted		
1NO 1NC	10 01	**C320KGT1** **C320KGT2**
1NO-1NC 2NO 2NC 1NO-1NCI 1NO (EC)-1NC (LO) 1NCI	11 20 02 N/A N/A N/A	**C320KGT3** **C320KGT4** **C320KGT5** **C320KGT6** **C320KGT7** **C320KGT8**
3NO 2NO-1NC 1NO-2NC 3NC 4NO	30 21 12 03 40	**C320KGT9** **C320KGT10** **C320KGT11** **C320KGT12** **C320KGT13**
3NO-1NC 2NO-2NC 1NO-3NC 4NC 3NO-1NCI	31 22 13 04 N/A	**C320KGT14** **C320KGT15** **C320KGT16** **C320KGT17** **C320KGT18**
2NO-1NCI-1NC 2NO-1NO (EC)-1NC (LO) 1NO-1NC-1NO (EC)-1NC (LO)	N/A N/A N/A	**C320KGT19** **C320KGT20** **C320KGT21**

Note: 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 above right.

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

Base Auxiliary Contact
Cat. No. C320KGS42

Auxiliary Contact
Cat. No. C320KGS22

Table 16-12. Product Selection

Circuit	Contact Configuration Code ②	Catalog Number	
Base Auxiliary Contacts — NEMA Sizes 3 – 5			
		NEMA Size 3	**NEMA Sizes 4 – 5**
NO NO-NC	10 11	**C320KGS31** **C320KGS32**	**C320KGS41** **C320KGS42**
Auxiliary Contacts — NEMA Sizes 3 – 5			
		Catalog Number	
NO NC NO-NC ③	10 01 11	**C320KGS20** **C320KGS21** **C320KGS22**	
Auxiliary Contacts — NEMA Sizes 6 – 8			
		Size	**Catalog Number**
NO-NC 2NO-2NC	11 22	NEMA 8 NEMA 6 – 7	**C320KA5** **C320KA6**

② For reference only — not part of Catalog Number. See above.

③ NO-NC occupies two positions — L2 and L3, or R2 and R3. See next page.

Auxiliary Contact Ratings (Amperes)

Table 16-13. Ratings — NEMA A600

Current	AC Volts			
	120V	240V	480V	600V
Make and Interrupting Break Continuous	60 6 10	30 3 10	15 1.5 10	12 1 10

Table 16-14. Ratings — NEMA P300

Continuous Thermal Rating: 5A	
DC Volts	**Make/Break Amperes**
125 250	1.10 .55

Table 16-15. Ratings — Logic Level

Minimum Ratings for Logic Level and Hostile Atmosphere Application	
Minimum Amperes Minimum Volts	20 mA 24V AC/DC

Table 16-16. Ratings — C320KGS20L, C320KGS21L, C320KGS22L

DC-12		AC-12	
Ue	Ie	Ue	Ie
80	0.1	250	0.1

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.

Table 16-17. Auxiliary Contacts

Catalog Number	Size	Poles	Available Mounting Positions ①②	
			Open Type	Enclosed
AN16	00 0 – 2	3 3	T1, L1, R1 T1, L1	L1 L1
AN56	00 – 2	3	T1, T2	—
CN15	00 0 – 2 1, 2 1, 2	2 – 4 2 – 3 4 5	T1, L1, R1 T1, L1 T1, L1 T1, L1	L1 L1 — —
CN35	10A 20 – 60A 60A 60A	2 – 4 2 – 3 4 5	T1, L1, R1 T1, L1 T1, L1 T1, L1	L1 L1 — —
CN55	00 – 2	3	T1, T2	—

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.

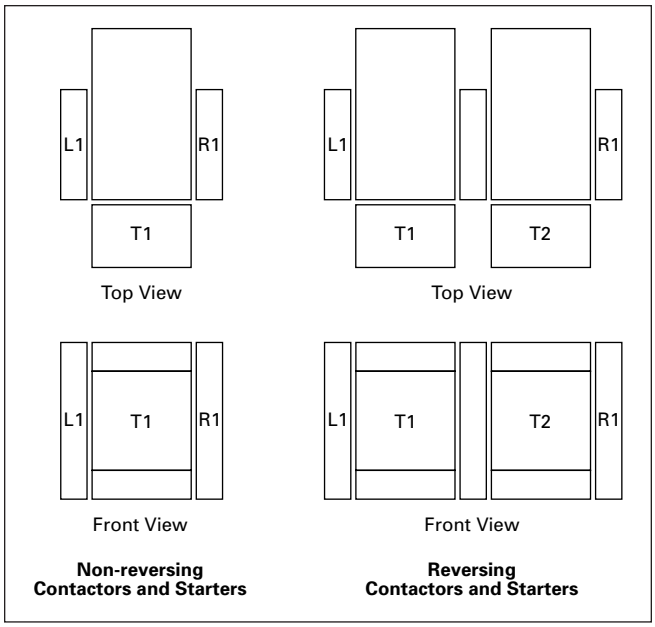


Figure 16-2. Auxiliary Contact Location

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.

Table 16-18. Mounting Positions

Size	Available Mounting Positions ③
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

③ Available positions on contactors or starters other than what is factory installed.

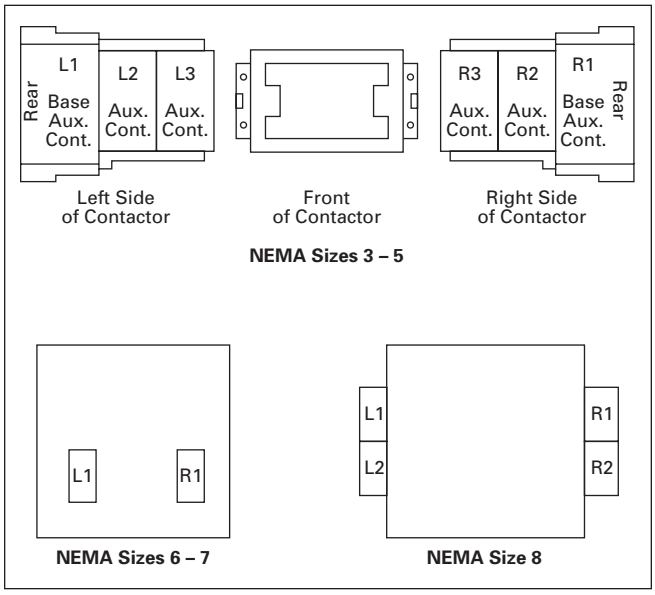


Figure 16-3. Auxiliary Contact Location

16

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**.

Table 16-19. Starters with Series B Overload Relays

NEMA — AN Type	
Size	**Series**
00 – 0	**C**
1 – 2	**B**
5	**B**
6	**C**
7 – 8	**B**

Table 16-20. Fast Trip — Class 10 Heater Selection

Overload Relay Size	Motor Full Load Ampere Rating — Dial Position A	B	C	D	Catalog Number (Includes 3 Heater Packs) ①
For Use with NEMA Sizes 00 – 0 Series C, NEMA Sizes 1 – 2 Series B					
32A or 75A	.260	.313	.367	.420	**H2101B-3**
	.384	.464	.543	.623	**H2102B-3**
	.570	.688	.806	.924	**H2103B-3**
	.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**
	4.96	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**

① Heater packs are shipped 3 to a carton. Catalog Numbers are for 3 heater packs.

② Sizes 5 – 8 use the 32A overload relay with current transformers.

Table 16-21. Standard Trip — Class 20 Heater Selection

Overload Relay Size	Motor Full Load Ampere Rating — Dial Position A	B	C	D	Catalog Number (Includes 3 Heater Packs) ③
For Use with NEMA Sizes 00 – 0 Series C, NEMA Sizes 1 – 2 Series B					
32A or 75A	.254	.306	.359	.411	**H2001B-3**
	.375	.452	.530	.607	**H2002B-3**
	.560	.676	.791	.907	**H2003B-3**
	.814	.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 ④	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 ④	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 ④	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 ④	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**

③ Heater packs are shipped 3 to a carton. Catalog Numbers are for 3 heater packs.

④ 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 24V DC coil, change CN15BN3**A**C to CN15BN3**T1**C.

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:

- 1 Encapsulated DC magnet coil
- 1 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.
- 2 Blue colored connection wires
- 1 Instruction publication

Operation

These DC coil kits have separate pick-up and seal windings. A **special** (side mounted) early-break NCI auxiliary contact is used to either disconnect the pick-up winding or insert the seal winding in series with the pick-up 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: For NEMA Sizes 00 and 0 contactors may utilize either suffix 1 or 4 DC coil kits; starters may utilize suffix 4 DC coil kits only. For NEMA Sizes 1 and 2, both contactors and starters may utilize 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.

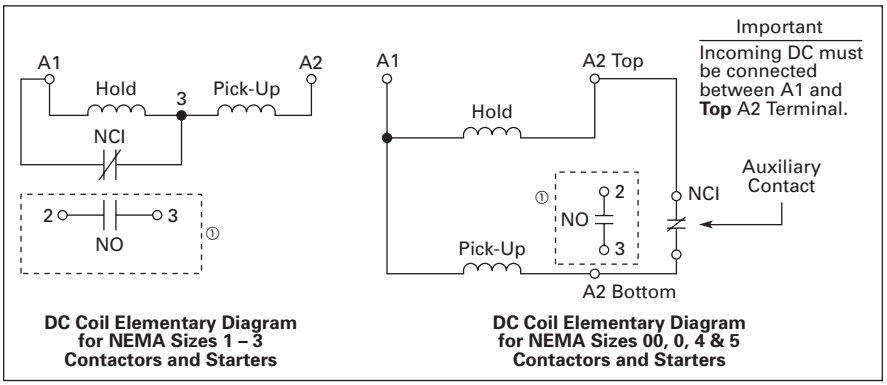
Note: For NEMA Sizes 3 – 5, the special coil NCI clearing contact is an add-on auxiliary (**must** mount on a base mount auxiliary contact; normally a 1NO). This arrangement will normally account for two of the three contact positions on the side of each contactor or starter.

See **Figure 16-4**, **Page 16-8**.

Table 16-22. Product Selection

Contactor or Starter Size	Conversion Data					Complete Conversion Kit		Factory Installed
	Volts	Magnet Coil			NCI Interlock Number			
NEMA		Coil Number	Amps P.U./Seal	Watts P.U./Seal		Catalog Number	Ship Wt. Lbs. (kg)	Code Suffix
Non-reversing — Kit includes NCI Side Mounted Auxiliary Contact								
00 and 0 CN35 – A, B, D D15 Relays	12 24 48 120	**9-2988-11** **9-2988-12** **9-2988-13** **9-2988-14**	6.4/.28 3.2/.14 1.6/.07 .64/.028	76.8/3.36 76.8/3.36 76.8/3.36 76.8/3.36	**C320KGD1** **C320KGD1** **C320KGD1** **C320KGD1**	**C335KD3R1** **C335KD3T1** **C335KD3W1** **C335KD3A1**	1.0 (.5)	**R1** **T1** **W1** **A1**
① 00 and 0 CN35 – A, B, D D15 Relays	12 24 48 120	**9-2988-11** **9-2988-12** **9-2988-13** **9-2988-14**	6.4/.28 3.2/.14 1.6/.07 .64/.028	76.8/3.36 76.8/3.36 76.8/3.36 76.8/3.36	**C320KGD2** ① **C320KGD2** ① **C320KGD2** ① **C320KGD2** ①	**C335KD3R4** **C335KD3T4** **C335KD3W4** **C335KD3A4**	1.0 (.5)	**R4** **T4** **W4** **A4**
1 and 2 CN35 – G	12 24 48 120	**9-2990-1** **9-2990-2** **9-2990-3** **9-2990-4**	15.4/.42 7.7/.21 3.9/.11 1.5/.041	185/4.98 185/4.96 185/5.04 185/4.87	**C320KGD5** **C320KGD5** **C320KGD5** **C320KGD5**	**C335KD4R4** **C335KD4T4** **C335KD4W4** **C335KD4A4**	1.0 (.5)	**R4** **T4** **W4** **A4**
3 CN35 – K	12 24 48 120	**9-3002-1** **9-3002-2** **9-3002-3** **9-3002-4**	24/.40 12/.20 6.1/.097 2.5/.038	293/4.84 288/4.75 295/4.67 298/4.57	**C320KGD3** **C320KGD3** **C320KGD3** **C320KGD3**	**C335KD5R1** **C335KD5T1** **C335KD5W1** **C335KD5A1**	2.0 (.9)	**R1** **T1** **W1** **A1**
4 and 5 CN35 – N, S	24 48 120 240	**9-2026-4** **9-2026-3** **9-2026-2** **9-2026-1**	18/.22 9/.11 3.3/.05 1.7/.02	400/5.3 400/5.2 450/5.4 440/4.9	**C320KGD3** **C320KGD3** **C320KGD3** **C320KGD3**	**C335KA3T1** **C335KA3W1** **C335KA3A1** **C335KA3B1**	2.5 (1.1)	**T1B** **W1B** **A1B** **B1B**
Reversing								
00 and 0 CN35 – A, B, D D15 Relays	12 24 48 120	**9-2988-1** **9-2988-2** **9-2988-3** **9-2988-4**	6.4/.28 3.2/.14 1.6/.07 .64/.028	76.8/3.36 76.8/3.36 76.8/3.36 76.8/3.36	**C320KGD1** **C320KGD1** **C320KGD1** **C320KGD1**	**C335KD3R1** ② **C335KD3T1** ② **C335KD3W1** ② **C335KD3A1** ②	1.0 (0.9)	**R1** ③ **T1** ③ **W1** ③ **A1** ③
1 and 2 CN35 – G	12 24 48 120	**9-2990-1** **9-2990-2** **9-2990-3** **9-2990-4**	15.4/.42 7.7/.21 3.9/.11 1.5/.041	185/4.98 185/4.96 185/5.04 185/4.87	**C320KGD3** **C320KGD3** **C320KGD3** **C320KGD3**	④ ④ ④ ④	—	**R1** ③ **T1** ③ **W1** ③ **A1** ③

① These kits are supplied with a NO/NCI side mounted auxiliary contact in place of the NCI contact.
② Kit does not include mechanical interlock or crossover wiring. Two NO/NCI top mounted auxiliary contacts are supplied for electrical interlocking.
③ Factory installed DC coils on NEMA contactors and starters include a NO/NC top mounted auxiliary contact on each contactor for electrical interlocking.
④ Available factory assembled only.



DC Coil Elementary Diagram for NEMA Sizes 1 – 3 Contactors and Starters

DC Coil Elementary Diagram for NEMA Sizes 00, 0, 4 & 5 Contactors and Starters

Figure 16-4. Elementary Diagrams

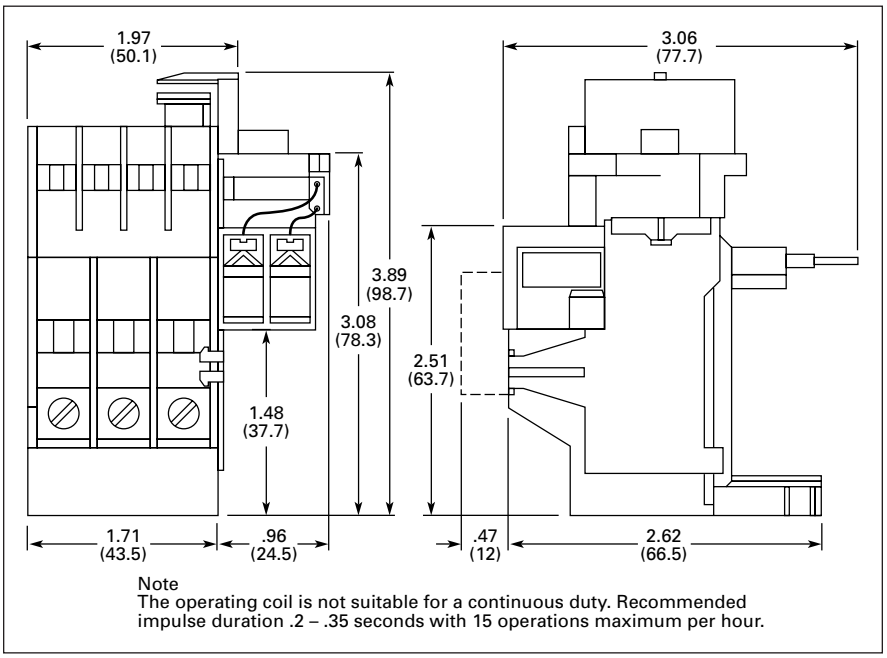
① 1NO available in Suffix 4 kits only.

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 which mounts on the side of the overload relay.

Table 16-23. Product Selection

Remote Reset Module Operating Voltage	Catalog Number
24V 50/60 Hz	**C316RR1U**
110V 50/60 Hz	**C316RR1A**



Note
The operating coil is not suitable for a continuous duty. Recommended impulse duration .2 – .35 seconds with 15 operations maximum per hour.

Figure 16-5. Remote Reset Module — Approximate Dimensions in Inches (mm)

16

3-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

Table 16-24. Fuse Block Kits

Fuse Type	Catalog Number
Class H — 30A 250V Class R — 30A 250V	**C350KH21** **C350KR21**
Class G — 15A 300V Class G — 20A 300V Class G — 30A 300V Class G — 60A 300V	**C350KG37** **C350KG38** **C350KG31** **C350KG32**
Class T — 30A 300V Class T — 60A 300V	**C350KT31** **C350KT32**
Class J — 30A 600V Class J — 60A 600V Type M — 30A 600V ① Class CC — 30A 600V	**C350KJ61** **C350KJ62** **C350KM61** **C350KC63**
Class T — 30A 600V Class T — 60A 600V	**C350KT61** **C350KT62**

① Type M fuse block not approved for branch circuit protection.

Table 16-25. Approximate Dimensions

Fuse Block			Dimensions in Inches (mm)			
Class	Amperes	Volts	Wide A	High B	Deep C	D
G	15, 20, 30 60	300 300	2.40 (61.0) 2.62 (66.5)	3.00 (76.2) 4.25 (108.0)	2.04 (51.8) 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 30 60	300 600 600	3.44 (87.4) 3.75 (95.3) 4.87 (123.7)	3.00 (76.2) 3.31 (84.1) 3.00 (76.2)	2.33 (59.2) 2.26 (57.4) 2.58 (65.5)	— — —

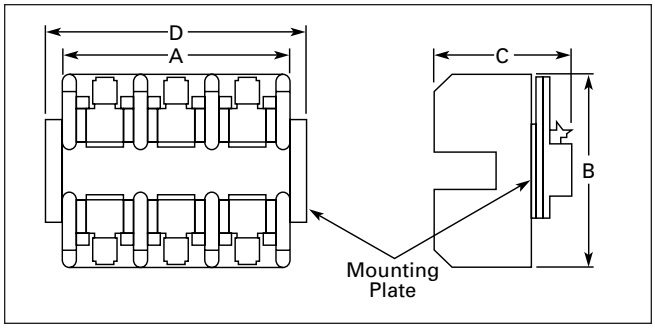


Figure 16-6. Approximate Dimensions in Inches (mm)

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 16-4**.

Cat. No. C321KM60B

Part No. 23-7165

Wire Set

Table 16-26. Mechanical Interlock Only ②③

Application		Catalog Number
NEMA Size	Contactor Mounting	
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 5	Vertical	**C321KM55**
5 to 6	Vertical	**C321KM65**
6	Vertical	**C321KM66**
6 to 7	Vertical	**C321KM67**

② Without cross-wiring.
③ For use with latest series product.

Table 16-27. Reversing Kits (Horizontal Contactor Mounting Only)

Application NEMA Size	Catalog Number
00 0 1 2 3	**C321KM60K14B** **C321KM60K13B** **C321KM60K15B** **C321KM60K16B** **C321KM60K17** ④
— — 4 5 —	**C321KM60K21** ④ **C321KM60K18** ④ **C321KM60K19** ④ **C321KM60K20** ④ **C321KM60K44** ④

④ Kit includes (2) NC auxiliary contacts.

16

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.

Table 16-28. Mounted Timer Product Selection

Timing Range	Catalog Number ①②③
.1 – 1.0 Seconds	**C320TDN1_**
1 – 30 Seconds	**C320TDN30_**
30 – 300 Seconds	**C320TDN300_**
5 – 30 Minutes	**C320TDN2000_**

① Add operating voltage Suffix to Catalog Number. **A** = 120V, **B** = 240V, **E** = 208V

② Rated .5 ampere pilot duty – not to be used on larger contactors.

③ Terminal connections are quick connects only. Two per side.

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.

Table 16-29. Product Selection

Description	Catalog Number
NEMA Size 3	**C321SB18**
NEMA Size 4	**C321SB19**
NEMA Size 5	**C321SB21**
NEMA Size 6	**C321SB22**

16

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.

Table 16-30. Product Selection

Timing Range	Catalog Number
.1 to 30 Seconds	**C320TP1**
10 to 180 Seconds	**C320TP2**

Table 16-31. Maximum Ampere Ratings

Description	Volts AC			
	120	240	480	600
Make	30	15	7.5	6
Break	3	1.5	.75	.6

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.

Table 16-32. 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 an 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.

Table 16-33. Product Selection

Type	Max. Amperes	Catalog Number
Fuse Holder Only	15	**C320FB** ④
	30	**C320FBR** ⑤

④ A fuse is not supplied, but holder will accept a Bussman Type KTK or KTK-R (13/32" x 1-1/2") fuse, 600V maximum.

⑤ Includes a 5A, 600V KTK-R fuse.

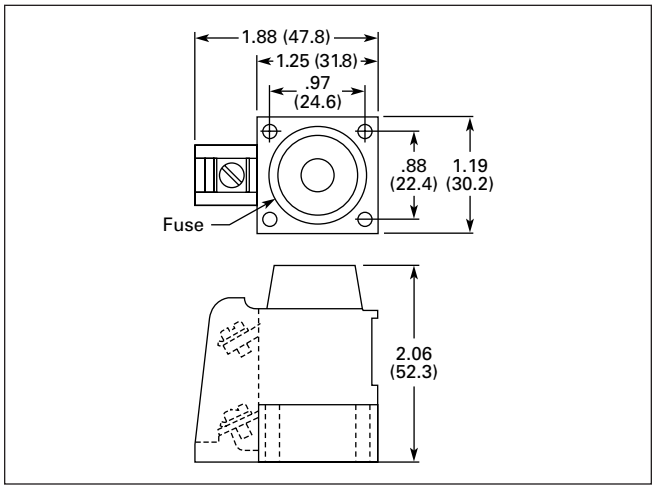


Figure 16-7. Approximate Dimensions in Inches (mm)

Finger Protection Shields

Snap-on shields for both contactors and starters provide Type IP20 Finger Protection. Prevents accidental contact with line/load terminals.

Table 16-34. Product Selection

Application	Catalog Number
NEMA Size 00 NEMA Size 0	**C320LS1** **C320LS2**
NEMA Sizes 1 – 2 Contactors Reversing Contactors	 **C320LS3** **C320LS4**
NEMA Size 1 Starters Reversing Starters	 **C320LS5** **C320LS6**
NEMA Size 2 Starters Reversing 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.

Table 16-35. Product Selection

Description	Catalog Number
Adapter to DIN Rail Mount	**C320DN65**

Transient Suppressor Kits

NEMA Sizes 00 – 2

Cat. No. C320TS2

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.

Table 16-36. Product Selection

Description	Coil Voltage 50/60 Hz ①	Catalog Number
Transient Suppressor	24 – 120V 208 – 240V 277 – 480V	**C320TS1** **C320TS2** **C320TS3**

① Suppressor is compatible with coil voltages/ranges as shown, 50 and 60 Hz.

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.

Table 16-37. Product Selection

Description	Coil Voltage	Catalog Number
Transient Suppressor	120V	**C320AS1**

DC/AC Interface Module

Cat. No. C320DC

The Catalog Number C320DC Interface Module is an optically isolated solid-state switch which provides a means of operating AC coils with 5 – 48V DC 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 **Table 16-38**.

Design Characteristics

- DC Input: 5 – 48V DC at mA nominal
- AC Operating Voltage: 240V AC (360 VA) ±10% 50/60 Hz;
- DC Operating Voltage: 30V DC max. (.5A)
- AC Current Rating
  - 10A make (inrush)
  - 1A break (sealed)

Table 16-38. Controller Coil Voltage Ranges

Controller Catalog Number Prefix	Controller Size or Rating	Coil Range Volts AC
AN16, AN56, CN15, CN55	00 – 0 1 – 2 3	24 _ 240 48 – 240 110 – 240
CN35	10 – 30A 60A 100A	24 – 240 48 – 240 110 – 240

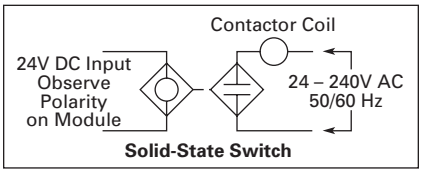


Figure 16-8. Typical Application

Table 16-39. Product Selection

Coil Voltage	Catalog Number
5V DC 6V DC 9V DC	**C320DC2V5** **C320DC2V6** **C320DC2V9**
12V DC 48V DC	**C320DC2V12** **C320DC2V48**

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.

Table 16-40. 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.

Table 16-41. Product Selection — Add-On Power Pole Kit

UL Ampere Rating						IEC 947 Ampere Rating			1NO Power Pole Catalog Number
Inductive 600V	Resistive 600V	hp 1-Phase		Locked Rotor 240V	Lighting Ballast Tungsten 480V	AC-1 600V	AC-3 600V	AC-5a AC-5b 480V	
		115V	230V						
15	20	1/2	2	96	20	20	12	18	**C320PPD10**

Fuse Clips

C351 Fuse Clip Kit

Table 16-42. C351 — Fuse Clip Selection — 3 Poles

Starter Size	Motor Voltage	Maximum hp (3-Phase)	Fuse Clip Rating		Fuse Clip Kit for Field Installation in Non-fusible Starter		Fuse Clip Kit Factory Installed
		Dual Element Fuses	Amperes	Volts	For Non-rejection Type Fuses	For use w/ "R" Rejection Type Fuses	Position 10 Alpha ②
					Catalog Number	Catalog Number	
Non-fusible — without Fuse Clips Installed							A
0	200/230 460/575	3 5	30 30	250 600	**C351KC21** **C351KD22-61**	**C351KC21R** **C351KD22-61R**	**B** **C**
1	200/230 460/575	7-1/2 10	30 30	250 600	**C351KC21** **C351KD22-61**	**C351KC21R** **C351KD22-61R**	**B** **C**
2	200 230 460/575	10 15 25	60 60 60	250 250 600	**C351KD22-61** **C351KD22-61** **C351KD62**	**C351KD22-61R** **C351KD22-61R** **C351KD62R**	**D** **D** **E**
3	200 230 460/575	25 30 50	100 100 100	250 250 600	**C351KE23-63** ① **C351KE23-63** ① **C351KE23-63** ①	**C351KE23-63** ① **C351KE23-63** ① **C351KE23-63** ①	**F** **F** **G**
4	200 230 460/575	40 50 100	200 200 200	250 250 600	**C351KF24-64** ① **C351KF24-64** ① **C351KF24-64** ①	**C351KF24-64** ① **C351KF24-64** ① **C351KF24-64** ①	**H** **H** **J**
5	200 230 460/575	75 100 200	400 400 400	250 250 600	Not Available in Kit Form	Not Available in Kit Form	**K** **K** **L**

① Fuse clip "R" rejection members for use with Class R fuses are supplied loose in the Fuse Clip Kits.
② These fuse clips are for Class R fuses.

Note: Kits do not include fuses.

16

Control Power Transformer Kits

Control Transformer Kit

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.

Table 16-43. Standard Transformer Sizes ①

Size	VA Capacity		
	Freedom	Vacuum	Advantage
0	50	—	—
1, 2	100	—	100
3	150	—	100
4	200	100	100
5	200	150	250
6	250	350	250

① Non-reversing, single contactor only.

When Ordering Specify

- Catalog Number

Table 16-44. 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 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

Table 16-45. Approximate Dimensions and Shipping Weights

Continuous VA	Dimensions in Inches (mm)						Ship Wt. Lbs. (kg)
	Wide A	High B	Deep C	Mounting D	Mounting E	Mounting Slots	
50	3.00 (76.2)	3.00 (76.2)	2.56 (65.0)	2.00 (50.8)	2.50 (63.5)	.203 x .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)	.203 x .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)	.203 x .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)	.203 x .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)	.203 x .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)	.203 x .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)	.203 x .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)	.203 x .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)	.312 x .688 (7.9 x 17.5)	18.0 (8.2)

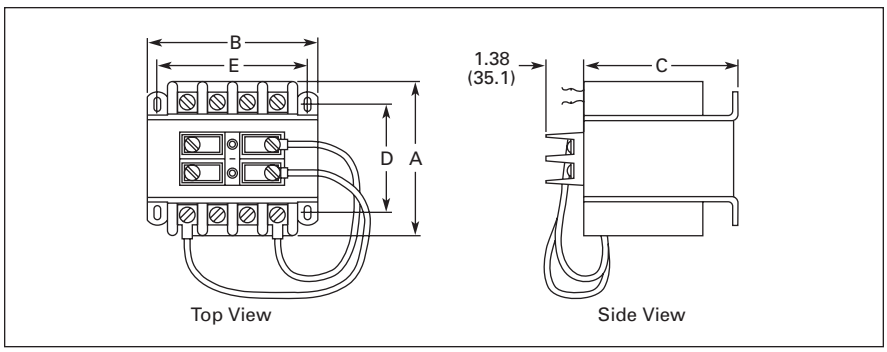


Figure 16-9. Open Type — 50 VA – 500 VA with Fuse Block

DeviceNet™ Communications Module

DeviceNet Module

The DeviceNet Communications module (Catalog Number WPONIDNA) is designed to plug into the Advantage with the attached cable and plug. The module can be snapped onto the top or bottom of the Advantage unit. It can also be mounted separately using the mounting plate assembly (Catalog Number WPONIBASE). The module provides DeviceNet users with the ability to control and monitor the functions of the Advantage system at 125, 250 or 500 kbaud. A connector is provided so that a HAND/OFF/AUTO hard contact may be used to selectively enable or disable the output of the control functions from the module without affecting its ability to monitor. A "Feedback" input is provided so that the state of an auxiliary contact may be read over the DeviceNet network.

Three bicolor LEDs indicate:

- DeviceNet address
- Network status (including connected, not connected, not powered)
- Module status (including normal operation, minor fault, needs commissioning)

Table 16-46. DeviceNet Interface

Description	Catalog Number
DeviceNet Interface Module	**WPONIDNA**
Mounting Plate Assembly	**WPONIBASE**

Note: See *Cutler-Hammer Control Catalog* for WPONI Network Interface.

Type W Auxiliary Contact Modules

- Provides four separate contact sets which wire vertically and are color coded; black designates NC and silver designated NO.
- Up to two auxiliary contact modules can be mounted for a total of up to eight contact sets.
- Provides circuit isolation (no polarity restrictions) and single break bifurcated contacts.
- Common design fits all Sizes 1 – 6.

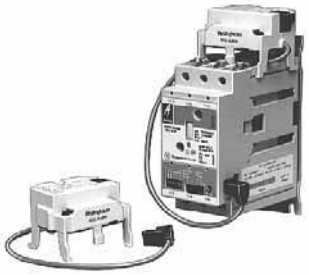
Table 16-47. Ratings

Voltage	Make	Break
NEMA A600 — 120 – 600V AC	7200 VA	720 VA
NEMA Q300 — 125 – 300V DC	69 VA	69 VA

Table 16-48. Auxiliary Contact Modules

Description	Catalog Number
2NO, 2NC	**W22**
3NO, 1NC	**W31**
4NO	**W40**
4NC	**W04**
1NO, 3NC	**W13**
1NO, 1NC and 2 Tie Points	**W11T**

Bell Alarm Module



Bell Alarm Module

- Simple snap-on mounting
- Isolated NO and NC contacts (1 each)
- Plugs into Reset port
- Remote electrical Reset wired to Catalog Number WBELL module

Table 16-49. Ratings

Form C Contact Ratings Maximum Amperes — 120V AC		Catalog Number
Make	Break	
2880 VA	480 VA	**WBELL**
Continuous Current Rating: 5A		

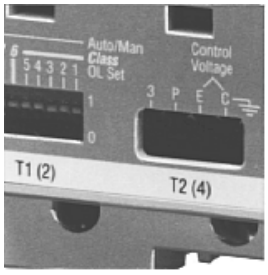
Transformer Pilot Light Kits

Table 16-50. Transformer Pilot Light Kits

Voltage	Color	Legend Plate	Catalog Number	Replacement Part
120	Red	RUN	**PLK1R**	**99-3590-1**
240	Red	RUN	**PLK2R**	**99-3590-3**
480	Red	RUN	**PLK4R**	**99-3590-6**
600	Green	OFF	**PLK1G**	**99-3590-8**

16

OL Selection DIP Switch Window



DIP Switch Window

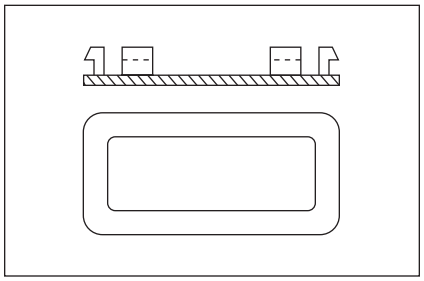


Figure 16-10. DIP Switch Window

- Simple snap-in installation
- Allows clear visibility of DIP switches
- Prevents unwanted tampering of DIP switch settings
- Once in must be pried out from rear
- One window supplied with each starter

Table 16-51. DIP Switch Window

Description	Catalog Number
DIP Switch Window, (Must order in packages of 10)	**WDIPSW10**

DIN Rail Adapter Kit

- Provides snap-on mounting on 35 mm DIN rail
- For use with Sizes 1 and 2 non-reversing contactors and starters

Table 16-52. DIN Rail Adapter Kit

Description	Catalog Number
DIN Rail Adapter Kit	**WDIN**

Internal Trip Indicator

Internal Trip Indicator

- Overload condition indication — indicated by blinking light
- Trip condition — indicated by solid light

Table 16-53. Trip Indicator

Description	Catalog Number
Internal Trip Indicator	**WLED**

Competitive Baseplate Kit

- Allows for direct retrofit of competitive non-reversing starters
- Eliminates the need for re-drilling and tapping of mounting holes
- Simple selection of competitive footprints

Table 16-54. Baseplate Kit

Description	Catalog Number
Sizes 1 and 2	**WBASE12**
Sizes 3 and 4	**WBASE34**

Remote Reset and Trip Indicator Pushbutton

FWD/REV/OFF/AUTO Control

- OL condition indication
- Trip indication — OL phase-loss/unbalance and ground fault
- OL reset capability
- 10250T — for 30 mm mounting
- NEMA 4 oiltight rated
- Mount remotely up to 6 ft. away
- Unit completely assembled including legend plate
- Available also in reset-only form — no trip indication provided

Table 16-55. Remote Pushbuttons

Description	Catalog Number
Reset with Trip Indication	
2 ft. Cable	**WRSTL24**
6 ft. Cable	**WRSTL72**
15 ft. Cable	**WRSTL180**
Reset Only	
2 ft. Cable	**WRST24**
6 ft. Cable	**WRST72**
15 ft. Cable	**WRST180**
Conversion Kit Reset Only to Reset with Trip Indication	**WRLTT**
6 ft. Cable Only	**WRC72**
15 ft. Cable Only	**WRC180**
LED Replacement Bulb	**WRLT**

16

Full Voltage Pushbutton Control Module

Metering Module

Eaton's Cutler-Hammer® Advantage Control Modules (ACMs) provide a cost-effective alternative to push-buttons, selector switches, indicating lights, reset mechanisms, bell alarms and panel meters when used with the Advantage product line. Typical input/output control functions provided by panel mounted devices are conveniently packaged in a series of modules depending on application and complexity.

Sixteen styles cover applications ranging from:

- Full voltage non-reversing
- Full voltage reversing
- Full voltage multispeed
- Reduced voltage
- DeviceNet compatible

Modules exist for each application to provide the functions of:

- Status only
  - ❑ Indicating lights
  - ❑ Reset
- Status, START/STOP and RESET
- Status, HOA and RESET
- Status, START/STOP/HOA and RESET

An additional Metering Module replaces conventional ammeters (three-phase), replaces reset mechanisms and displays trip cause and data, control voltage and status.

This Metering Module can be used independently or in conjunction with any of the ACMs. An extra plug connection is available on the rear of each ACM to accept the Metering Module input.

The ACM family has been designed to save:

- Panel space (versus conventional pushbuttons, selector switches and indicating lights)
- Mounting and assembly labor
- Wiring and installation time

Regardless of the configuration, installation requires mounting only one 2.25 x 3.5 inch module, substantially reducing space requirements. Fitting a standard Greenlee punch and die set, Greenlee #60071, installation is accomplished with only two screws.

ACMs provide savings in wiring costs as well. Regardless of the complexity of the application, wiring is reduced to a single plug-in cable, see photo at left.

Communication is not restricted by use of the Advantage Control Modules. An extra plug connection is available on the rear of the ACM or Metering Module to allow a WPONIDNA or WPONI Communications module to be plugged in.

Full Voltage and Reduced Voltage Control Modules

Status Only

- 4 LEDs indicate that the motor is OFF, Running, Tripped or in Alarm mode (motor current is above the trip current setting)
- Includes RESET button

START/STOP

- Motor START/STOP controlled by START and STOP buttons
- Includes all features of Status Only module

HOA Selector Switch with START/STOP

- In HAND mode, motor will start and stop in response to START/STOP pushbuttons
- In AUTO mode, motor will run in response to remote signal
- Includes all features of Status Only module

ON/OFF/AUTO Selector Switch

- Motor will run in ON mode and not in the OFF mode
- In AUTO mode the motor will run in response to a remote signal
- Includes all features of Status Only module

Reduced Voltage Control Modules

The four reduced voltage pushbutton control modules provide control using two to four starters and/or contactors. The faceplates are identical to the full voltage modules, and the pushbuttons all perform the same functions. The module is programmed for the type of reduced voltage starter which sets the sequence of contact open and closing.

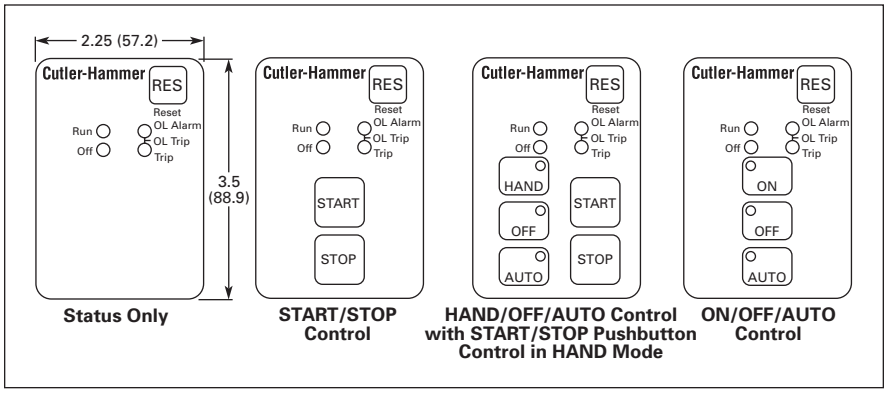


Figure 16-11. Full Voltage and Reduced Voltage Control Modules

16

Reversing and 2-Speed Pushbutton Modules

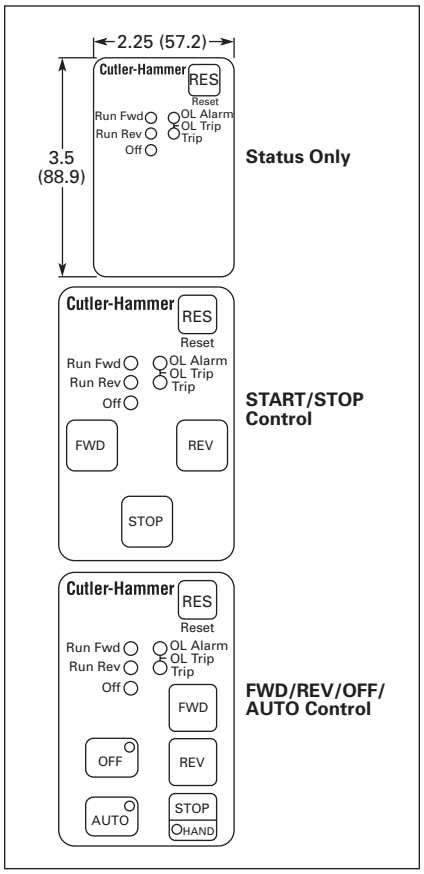


Figure 16-12. Reversing and 2-Speed Pushbutton Module

ACM Specifications

- Input supply requirements: 120V AC (supplied by the Advantage motor controller)
- Max. distance from Advantage motor controller: 6 ft. (1.83m)
- Operating frequency: 50 or 60 Hz
- Operating temperature: -20° to 70°C
- Storage temperature: -20° to 85°C
- Humidity: 0 to 95%, non-condensing
- Remote input wire size: 18 – 14 AWG
- Maximum distance between remote pushbuttons and ACM: 200 ft. (60.9m)
- Cutout dimensions: 2.25 x 3.5 inches (57.2 x 88.9 mm) (see above). The cutout can be made using a Greenlee rectangular punch #600710
- Enclosure type: Type 1 or 12, when properly installed

Status Only

- 5 LEDs which indicate that the motor is OFF, running forward (FAST), running reverse (SLOW), tripped or in alarm mode
- Includes RESET button

FORWARD (FAST)/REVERSE (SLOW)/STOP

- Pushbuttons control whether motor is running forward (FAST), running reverse (SLOW) or stopped
- Includes all features of Status Only module

FWD/REV/OFF/AUTO

- In AUTO mode, motor is running forward (FAST), running reverse (SLOW) or OFF in response to a remote signal
- All features of FORWARD/REVERSE/ STOP module

Note: For 2-speed modules, FAST replaces FWD and SLOW replaces REV.

Metering Module

The Advantage Metering Module monitors status of a motor along with any of the pushbutton modules. It may be plugged into the pushbutton control module, and communicates to the starter through it, or plugged directly into the starter when a pushbutton control module is not used.

The four digit display will show the current in each phase, control voltage or cause of trip. The STEP button may be pressed to step through these values, and the five LEDs will indicate which value is being displayed. It is also equipped with a reset button and Trip Lockout LED.

16

Table 16-56. Control Modules/Accessories

Description	Catalog Number
Full Voltage	
Status Only with Reset	**WPBFV1**
START/STOP	**WPBFV2**
START/STOP/HOA	**WPBFV3**
ON/OFF/AUTO	**WPBFV4**
LOCAL/OFF/REMOTE with Lockable ACM ①	**WPBFV5** ①
LOCAL/OFF/REMOTE with Network Health ①	**WPBFV7** ①
Reversing	
Status Only with Reset	**WPBR1**
FWD/REV/STOP	**WPBR2**
FWD/REV/STOP/HOA	**WPBR3**
2-Speed	
Status Only with Reset	**WPB2S1**
FAST/SLOW/STOP	**WPB2S2**
FAST/SLOW/STOP/HOA	**WPB2S3**
Reduced Voltage	
Status Only with Reset	**WPBRV1**
START/STOP	**WPBRV2**
START/STOP/HOA	**WPBRV3**
ON/OFF/AUTO	**WPBRV4**
Metering Module	**WMETER**
10 ft. Interconnect Cable (3m)	**WACM10**
6 ft. Interconnect Cable (1.8m)	**WACM6**
3 ft. Interconnect Cable (.9m)	**WACM3**
1 ft. Interconnect Jumper (.3m)	**WACM1**

① The WPBFV5 and WPBFV7 are DeviceNet® only. They can only be used when an active network is connected.

A200 NEMA

Factory Modifications

Table 16-57. A200 Factory Modifications

Modifications	Description	Catalog Number Suffix	NEMA Size								
			00 – 1	2	3	4	5	6	7	8	9
Control Circuit	1 Extra Auxiliary Contact (1NO-1NC) Non-reversing, Reversing, 2-Speed Unwired	**J1**	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔
	2 Extra Auxiliary Contact Non-reversing, Reversing, 2-Speed Unwired	**J2**	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔	 ✔ ✔
	3 Extra Auxiliary Contact Non-reversing, Unwired	**J3**	✔	✔	✔	✔					
	4 Extra Auxiliary Contact Non-reversing, Unwired	**J4**	✔	✔	✔	✔					
	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

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.

Table 16-58. Auxiliary Contact Ratings

Voltage	Make	Break
NEMA A600		
120 – 600V AC 72 – 120V AC 28 – 72V AC	7200 VA 60A 60 VA	720 VA 720 VA 10A
NEMA R300		
28 – 300V DC	28 VA	28 VA

Table 16-59. 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**

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.

Table 16-60. 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		Catalog Number
		Full Load Current of Motor Amps		
For Size 4 Starters	For Size 3 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**
		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**
		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**
		123 – 129	111 – 122	**FH92**
		130 – 133	123 – 128	**FH93**
		—	129 – 133	**FH94**

Table 16-61. 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	Catalog Number
Full Load Current of Motor (Amps)		
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**
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.

Table 16-62. 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		Heater (One Heater per Catalog Number)	Non-compensating Enclosed Starters		Heater
	Block Type Overload Using 3 Heaters	Single-Pole Type Overload	Catalog Number	Block Type Overload Using 3 Heaters	Single-Pole Type Overload	Catalog Number
	Full Load Current of Motor (Amps)					
For Size 2 Starters	.25 – .27	.29 – .31	**FH03**	.24 – .25	.28 – .30	**FH03**
	.28 – .31	.32 – .35	**FH04**	.26 – .28	.31 – .34	**FH04**
	.32 – .34	.36 – .39	**FH05**	.29 – .31	.35 – .37	**FH05**
	.35 – .38	.40 – .43	**FH06**	.32 – .35	.38 – .42	**FH06**
	.39 – .42	.44 – .48	**FH07**	.36 – .39	.43 – .47	**FH07**
	.43 – .46	.49 – .53	**FH08**	.40 – .43	.48 – .52	**FH08**
	.47 – .50	.54 – .58	**FH09**	.44 – .47	.53 – .56	**FH09**
	.51 – .55	.59 – .64	**FH10**	.48 – .51	.57 – .63	**FH10**
	.56 – .62	.65 – .71	**FH11**	.52 – .57	.64 – .70	**FH11**
	.63 – .68	.72 – .79	**FH12**	.58 – .63	.71 – .77	**FH12**
	.69 – .75	.80 – .87	**FH13**	.64 – .70	.78 – .85	**FH13**
	.76 – .83	.88 – .96	**FH14**	.71 – .77	.86 – .94	**FH14**
	.84 – .91	.97 – 1.06	**FH15**	.78 – 85	.95 – 1.03	**FH15**
	.92 – 1.00	1.07 – 1.16	**FH16**	.86 – .93	1.04 – 1.13	**FH16**
	1.01 – 1.11	1.17 – 1.28	**FH17**	.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 – .78	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**
For Size 1 Starters	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	3.80 – 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**
For Size 0 Starters						

SS-56 Surge Suppressor

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, Max. Amplitude
- Max. Ambient Temperature: 65°C
- Nominal Limiting Volts: 270 Peak
- Nominal Rate of Volt Rise: .5 per mS

Table 16-63. Surge Suppressor ①

Type Mounting	Kit Catalog Number
Starter	**SS-56**

① Can be used on Sizes 5 and 6 with 120V coil. Mounting bracket required — order separately. Mounting Bracket 177C043G04.

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.

Table 16-66. Mechanical Interlock

Contactor 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**

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.

Table 16-64. 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 120V AC control relay, and will operate on as little as 40V AC 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 feet using 18 AWG wire.

Table 16-65. Interposing Relay

Type Mounting	Kit Catalog Number
Starter or Panel	**R56-AA**

B3NO Bell Alarm Contact

- Isolated Normally Open Bell Alarm Contact.
- Mounts in Type B block-type overload relay.

Table 16-67. Bell Alarm Contact

Kit Catalog Number
B3NO-2
B3NO-4 ②

② For Size 3 and 4.

Table 16-68. 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**, i.e., BA13**B**.

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.

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.
- 600V AC.
- Continuous current rating of 18A for Size 0, 27A for Size 1.

Table 16-69. Power Pole Kit ③

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**

③ Do not use with DC operated contactors.

16

Replacement Auxiliary Contacts

Table 16-70. Replacement Auxiliary Contacts

Contactor Size	Contact Arrangement	Aux. Elect. Contact	
		Catalog Number	Style Number
5, 6	1NO + 1NC 2NO 2NC	**J11** **J20** **J02**	**9084A17G01** **9084A17G02** **9084A17G03**
7, 8	1NO 1NC	— —	**578D461G01** **578D461G03**
9	1NO + 1NC 2NO 2NC	— — —	**843D943G04** **843D943G05** **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.

Table 16-71. Extra Auxiliary Contact Kits

Contactor Size	Contact Arrangement	Style Number
5, 6	1NO + 1NC 2NO 2NC	**3463D94G18** **3463D94G04** **3463D94G19**
7, 8 ①	2NO 1NO	**818D498G06** **818D498G04**

① Size 7 and larger use DC coils as standard.

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.

Table 16-72. DC Coil Conversion Kits

Size	Voltage	Kit Style Number
5	110-120 220-240 440-480	**7864A28G01** **7864A28G02** **7864A28G03**
6	110-120 220-240 440-480	**7864A29G01** **7864A29G02** **7864A29G03**

Mechanical Interlocks

Table 16-73. Mechanical Interlocks

Contactor Sizes	Style Numbers	
	Horizontal	Vertical
3, 4 and 5 5 and 5 5 and 6 6 and 6 6 and 7, 8	**2050A11G75** **2050A11G25** **2050A11G27** **2050A11G26** —	**2050A11G65** **2050A11G15** **2050A11G17** **2050A11G16** **2050A11G55**
7, 8 and 7, 8 7, 8 and 9 9 and 9	No (Rear Conn.) No (Rear Conn.) No (Rear Conn.)	**567D624G01** **9944D56G06** **9944D56G01**

Overload Protection

Overload Protection Size 5 Starters

Type B overload relay 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.

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.

Table 16-74. Overload Relay Kits

Kit Size	Kit Part Number
5 6	**2057A34G01** **6379D80G10**

Table 16-75. Replacement Terminal Lugs ②

Contactor Size	Cable Size	Terminals		Kit Style Number
		Qty. in Kit	Qty. Req'd. per Pole	
5	1-500 MCM	6	2	**2119A76G01**
6	2-500 MCM	6	2	**7858A96G01**
7	4-500 MCM	12	4	**7858A96G02**
8	4-500 MCM	12	4	**7858A96G03**

② All mounting hardware is included in kit.

XT IEC

Auxiliary Contacts

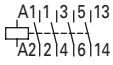
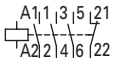
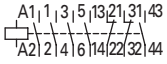
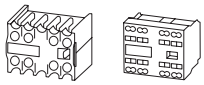
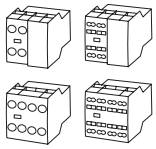
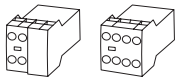
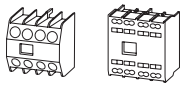
Front mounted snap-on auxiliary contacts for ***XT*** contactors are available with screw or spring cage terminals in a variety of contact configurations.

Notes:
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. 6 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_).

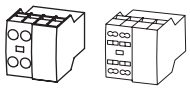
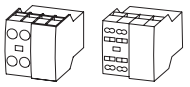
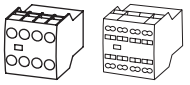
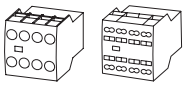
Table 16-76. XTCE and XTCS Auxiliary Contact Overview

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_ ①
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	**2-Pole & 4-Pole (Screw or Spring Cage):** 	**Standard 2-Pole & 4-Pole Versions (Screw or Spring Cage):**  **Tall Version (Screw Only):** 		**2-Pole (Screw Only):**  **4-Pole (Screw or Spring Cage):** 			N/A
Side Mount Auxiliary	N/A	N/A	**2-Pole (Screw Only):** 	**2-Pole (Screw or Spring Cage):** 			

① Frame L – R auxiliary contacts also apply to XTCS185L... – XTCS500M... contactors.

16

Table 16-77. 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	**XTCEXFDCC11** ②
	16	2	2NC		5	**XTCEXFCC02** ②	**XTCEXFCCC02** 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	**XTCEXFCCC22** ②

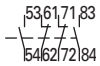
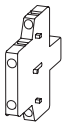
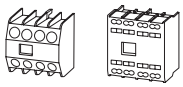
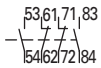
① 1 early-make contact ($1NO_E$), 1 late-break contact ($1NC_L$).

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_).

16

Technical Data ..... **Page 18-26**

Table 16-77. 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 ②							
	16	2	2NO		5	**XTCEXFATC20**	—
	16	2	1NO-1NC		5	**XTCEXFATC11**	—
	16	2	2NC		5	**XTCEXFATC02**	—
	16	4	2NO-2NC		5	**XTCEXFATC22**	—
Frame C — Side Mount							
	10	2	1NO-1NC		1	**XTCEXSCC11** ③	—
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	**XTCEXFBLG22** ①	**XTCEXFBLGC22** ①

① 1 early-make contact ($1NO_E$), 1 late-break contact ($1NC_L$).

② 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.

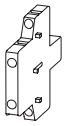
③ Can be mounted to the left side of contactor only. Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

Notes:

- 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.

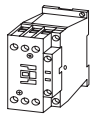
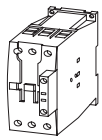
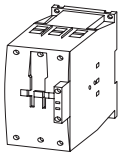
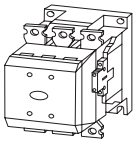
Technical Data ..... **Page 18-26**

Table 16-78. 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 Terminals Catalog Number	Spring Cage Terminals Catalog Number
Frame D – R							
	10	2	1NO-1NC		1	**XTCEXSBN11**	**XTCEXSBNC11**
	10	2	$1NO_E$-$1NC_L$		1	**XTCEXSBLN11** ①	—
	10	2	1NO-1NC		1	**XTCEXSCN11** ②	**XTCEXSCNC11** ②

① 1 early-make contact ($1NO_E$), 1 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_.

Table 16-79. Auxiliary Contacts Possible Combinations

Frame Size	Catalog Number	Contactor	Built-In Auxiliary	Front (Top) Mount 2-Pole	Front (Top) Mount 4-Pole	Side Mount 2-Pole	Total Auxiliary Contacts Available
A	**XTMC6A… – XTMC9A…**		1NO or 1NC	1	—	—	3
				—	1	—	5
						—	—
B	**XTCE007B… – XTCE015B…**		1NO or 1NC	1	—	—	3
				—	1	—	5
						—	—
C	**XTCE018C… – XTCE032C…**		1NO or 1NC	1	—	—	3
				—	1	—	5
				—	—	1	3
							—
D	**XTCE040D00_ – XTCE065D00_**		—	1	—	2	6
				—	1	1	6
							—
F – G	**XTCE080F00_ – XTCE150G00_**		—	1	—	2	6
				—	1	2	8
				—	—	4	8
							—
L – R	**XTCE185L22_ – XTCEC20R22_**		2NO-2NC	—	—	2	8
				—	—		—

Notes:
- 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.

Technical Data ..... **Page 18-26**

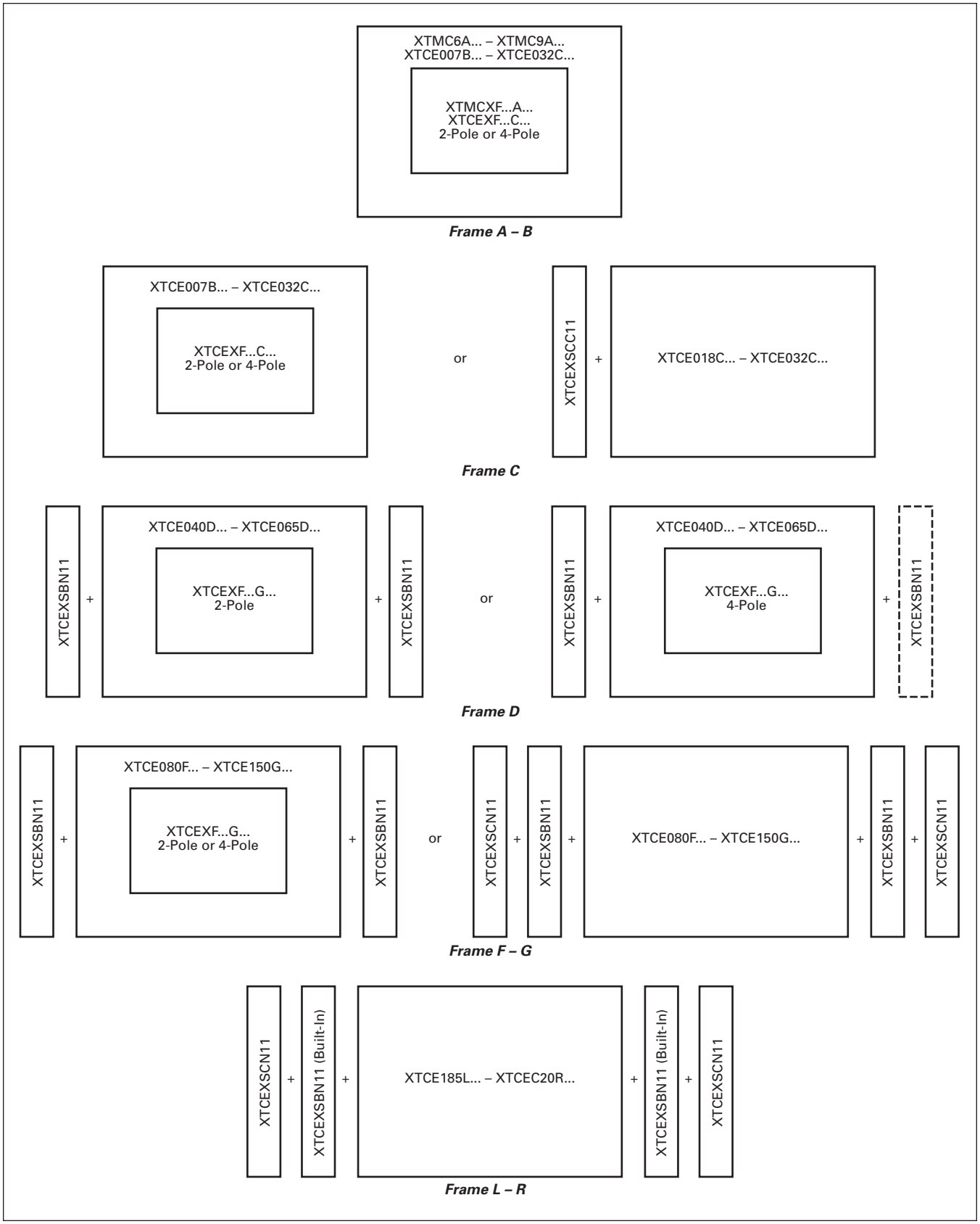


Figure 16-13. Auxiliary Contact Combinations

16

Type 1 Enclosures

Table 16-80. Type 1 Enclosures — NEMA (Freedom and *IT.* Type)

Starter Type	Box Number	NEMA Size AN16	Catalog Number
Non-reversing Starter	1	00 – 1	**C799B11** ① ④
	1	—	**C799B12** ①
	2	2	**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**

① In order to install cover control kits for NEMA Sizes 00 – 2 and IEC Sizes A – F, the starter must be provided with a **side mounted** auxiliary contact or a separately ordered Dummy Contact Block, **C320KGSD** from **Table 16-81**, to serve as a mounting base. **Note:** NEMA Size 00 open type devices **are not** supplied as standard with side mounted auxiliaries.

② Sub panel drilled for 50 – 200 VA CPTs.

③ Enclosure drilled for 150 – 300 VA CPTs.

④ If 8 AWG wire is used with NEMA Size 1 starter, the enclosure should be changed to a Box 2 (C799B13).

Note: Box 1 will **not** accept devices with top mounted auxiliaries. Box 2 will accept NEMA Sizes 00 and 0 starters with top mounted auxiliaries.

Type 1

Type 3R

Table 16-81. Dummy Contact Block

Application	Catalog Number
Dummy Contact Block	**C320KGSD**

16

Type 3R, 4X and 12 Enclosures

Table 16-82. Type 3R, 4X and 12 Enclosures — NEMA (Freedom and *IT.* Type)

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**	**C799B43**
	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**

① Blank cover provided.

Table 16-83. Type 3R, 4X and 12 Enclosures — NEMA (Advantage Type) — with Hole Plugs

Starter Type	Box Number	Size	Type 3R Catalog Number	Type 12 Catalog Number	Type 4X Catalog Number
Non-reversing Starter	5	1 – 2	**C799B22**	**C799B82**	**C799B42**
Non-reversing Starter with Space for CPT and Reversing	6	1 – 2	**C799B26**	**C799B86**	**C799B45**
Non-reversing Starter, Non-reversing Starter with Space for CPT, and Reversing	8	3	**C799B213**	**C799B813**	**C799B410**
	9	4	**C799B216**	**C799B816**	**C799B412**
	10	5	**C799B219**	**C799B819**	**C799B414**

Table 16-84. Type 3R, 4X and 12 Enclosures — NEMA (Advantage Type) — with Cutout for 1 ACM and Hole Plugs ②

Starter Type	Box Number	Size	Type 3R Catalog Number	Type 12 Catalog Number
Non-reversing Starter	5	1 – 2	**C799B23**	**C799B83**
Non-reversing Starter with Space for CPT and Reversing	6	1 – 2	**C799B27**	**C799B87**
Non-reversing Starter, Non-reversing Starter with Space for CPT Reversing	8	3	**C799B214**	**C799B814**
	9	4	**C799B217**	**C799B817**
	10	5	**C799B220**	**C799B820**

② All boxes have 1 ACM cutout. In addition, Box 5 has one 30 mm round hole, Boxes 6 and 7 have two; Boxes 8, 9 and 10 have three holes plugged.

Table 16-85. Enclosures — IEC (*XT* Type)

Starter Type	Box Number	IEC Size	Catalog Number
XT Starters, 15A and 25A, with reset	1	B – C	**C799B31**
XT Contactors/Starters without reset	1	B – C	**C799B33**
XT Contactors/Starters with reset	2	B – C – D	**C799B36**
XT Contactors/Starters without reset	2	B – C – D	**C799B34**
XT Contactors/Starters with resets	1	B – C	**C799B35**
XT Contactors/Starters with resets	2	B – C – D	**C799B37**

16

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

Table 16-86. Electrically Held Base Contactor

Power Poles	Catalog Number ①
2NO	**C30CNE20_0**

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 **Table 16-87**.

Table 16-87. Coil Base Voltage (Digit 9)

Voltage (Digit 9)	Code Suffix
115 – 120V 60 Hz/110V 50 Hz	**A**
230 – 240V 60 Hz/220V 50 Hz	**B**
460 – 480V 60 Hz/440V 50 Hz	**C**
575 – 600V 60 Hz/550V 50 Hz	**D**
200 – 208V 60 Hz	**E**
265 – 277V 60 Hz/240V 50 Hz	**H**
24V 60 Hz/20V 50 Hz	**T**
28V 60 Hz/24V 50 Hz	**V**
347V 60 Hz	**X**

Power Poles for C30CNM/ECC

Power Poles

The C30CNM contactor accepts up to a maximum 6 single- or double-pole (or combinations) power poles. These can be used to form up to:

- 12 NO poles max. when 6 double-poles are used in NO positions (1 – 6) or
- 8 NC poles max. with 4 double-poles in the NC position (1 – 4) and 4 NO poles with 2 double-poles in the 2 NO positions (5 – 6)

Table 16-88. Power Poles

Power Poles	Catalog Number
Single-Pole	**C320PRP1**
Double-Pole	**C320PRP2**

Mechanically Held Module Kits for C30CN/ECC

Conversion Kits

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.

Table 16-89. Mechanically Held Module Kits

Coil Volts	Control Volts	Catalog Number
2-Wire		
24 – 277V AC	110 – 120V AC 200 – 277V AC 24V AC 12 – 24V DC	**C320MH2WA0** **C320MH2WH0** **C320MH2WT0** **C320MH2WT1**
3-Wire		
24 – 277V AC	110 – 120V AC 200 – 277V AC 24V AC 12 – 24V DC	**C320MH3WA0** **C320MH3WH0** **C320MH3WT0** **C320MH3WT1**

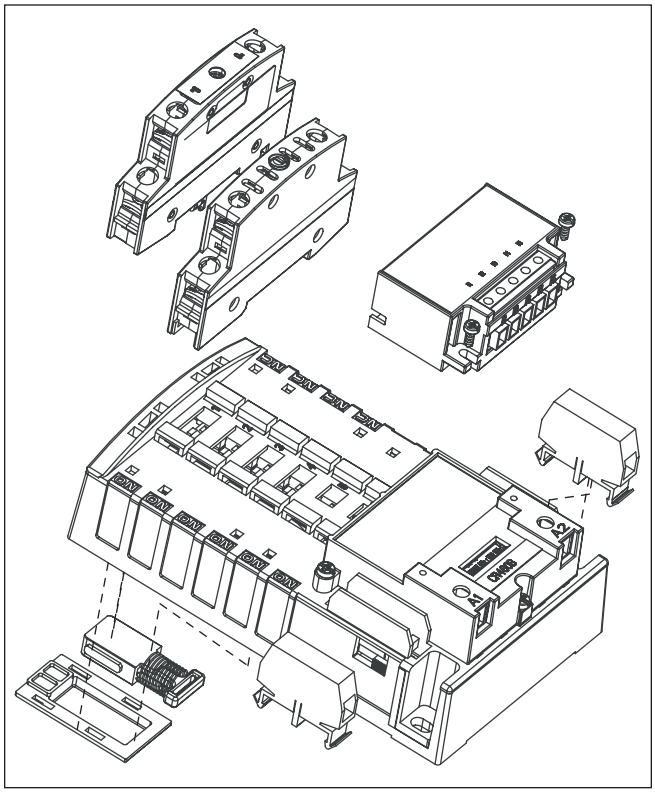


Figure 16-14. C30CNM Components — Exploded View

16

Auxiliary Contacts for C30CN/ECC

A Mechanically Held Contactor with a 2-wire control module uses 1NC auxiliary contact as standard for the control wiring circuit. The Mechanically Held Contactor with a 3-wire control module uses 1NO-1NC auxiliary contacts as standard for the control wiring circuit. See **Table 16-90** for possible additional auxiliary contact configurations.

Table 16-90. Auxiliary Contact Configurations

2-Wire	3-Wire
None 1NO (single-pole) 2NO (double-pole) 1NC (double-pole) 1NO-1NC (NO single pole, NC double-pole) 2NO-1NC (double-pole)	1NC (double-pole) 1NO (double-pole) 1NO-1NC (double-pole)

Auxiliary Contacts

Table 16-91. Auxiliary Contacts

Auxiliary Block	Catalog Number
Single-Pole	**C320AMH1**
Double-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.

Cat. No. C320TS2

These devices mount directly to the coil terminals of lighting contactors 10 – 60A.

Table 16-92. Kits for 10 – 60A

Description	Coil Voltage	Catalog Number
Transient Suppressor	24 –120V 240V 480V	**C320TS1** **C320TS2** **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.

Cat. No. C320TS2

Limits high voltage transients produced in the circuit when power is removed from the coil.

Table 16-93. Kits for 100 – 300A

Description	Coil Voltage	Catalog Number
Transient Suppressor	120V	**C320AS1**

16

Auxiliary Contacts for CN35/ECL

CN35 Lighting Contactors include a 1NO maintaining auxiliary contact mounted on right hand side (on 10A, 2- and 3-pole devices, auxiliary contact occupies 4th 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 2 circuits — per auxiliary contact) and on the top (up to 4 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 2 screws.

Auxiliary Contacts — 10 – 60A Contactors

Side Mounted

Top Mounted

Auxiliary Contacts — 100 – 400A Contactors

Base Auxiliary Contact Cat. No. C320KGS42

Auxiliary Contact Cat. No. C320KGS22

Contact Configuration Code

This 2-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.

Table 16-94. 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**

① For Reference Only — not part of Catalog Number. See below left.
② Cannot be added to contactors or starters mounted in Box 1 (Type 1).

Table 16-95. Auxiliary Contacts — 100 – 400A Contactors

Circuit	Contact Configuration Code ③	100A Contactors	200 & 300A Contactors
		Catalog Number	Catalog Number
Base Auxiliary Contacts — 100 – 400A Contactors			
NO	10	**C320KGS31**	**C320KGS41**
NO-NC	11	**C320KGS32**	**C320KGS42**

Circuit	Contact Configuration Code ③	Catalog Number
Auxiliary Contacts — 100 – 400A Contactors		
NO	10	**C320KGS20**
NC	01	**C320KGS21**
NO-NC ④	11	**C320KGS22**

③ For Reference Only — not part of Catalog Number. See below left.
④ NO-NC occupies two positions — L2 & L3 or R2 & R3. See **Page 16-33**.

Table 16-96. Auxiliary Contact Ratings (Amperes)

Current	AC Volts			
	120V	240V	480V	600V
NEMA A600				
Make & 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

NEMA P300	
Continuous Thermal Rating: 5 Amperes	
DC Volts	**Make/Break Amperes**
125	1.10
250	0.55

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.

Table 16-97. Auxiliary Contact Mounting Positions

Size	Poles	Available Mounting Positions ①②③		
		Open Type	Type 1	Type 3R, 4X, 12
10 Ampere	2 – 4	T1, L1, R1	L1	L1, T1
20 – 60 Ampere	2 – 3	T1, L1	L1	L1, T1
60 Ampere	4	T1, L1	—	L1, T1
60 Ampere	5	T1, L1	—	L1, T1
100 Ampere	2 – 3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3
200 Ampere	2 – 3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3
300 Ampere	2 – 3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3
400 Ampere	2 – 3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3	R2, R3, L1, L2, L3

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.

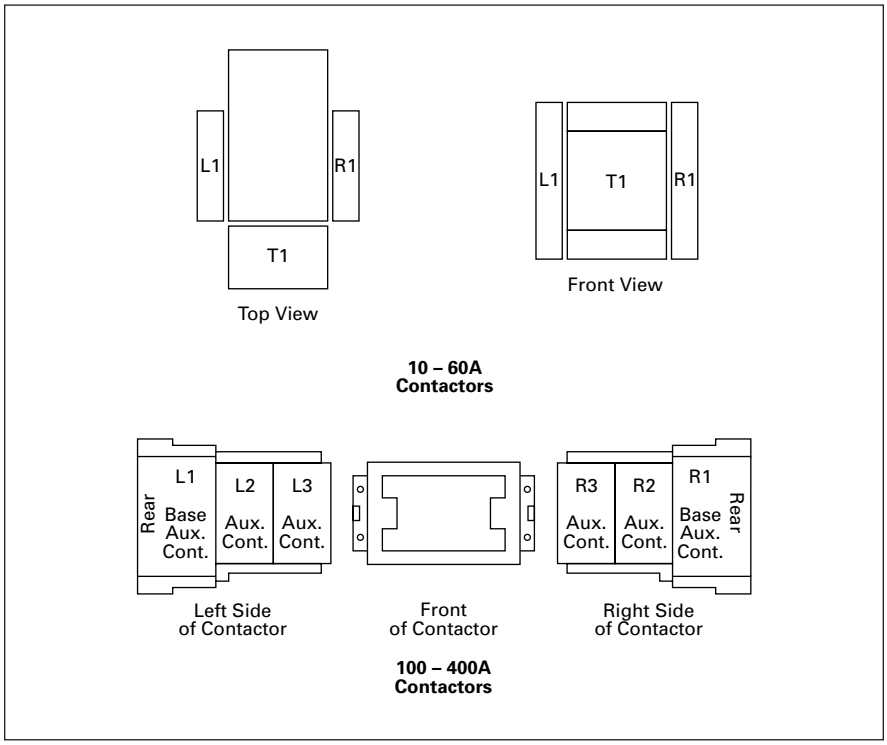


Figure 16-15. Auxiliary Contact Location

Pneumatic Timers — Top Mounted for CN35/ECL

Pneumatic Timer

Attachment mounts on top of 10 – 60A lighting contactors (top mounted auxiliary contacts can not 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.

Table 16-98. Pneumatic Timers

Timing Range	Catalog Number
.1 to 30 Seconds	**C320TP1**
10 to 180 Seconds	**C320TP2**

Table 16-99. 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.

Table 16-100. Product Selection — Mounted Timer

Timing Range	Catalog Number ④⑤⑥
.1 – 1.0 Seconds	**C320TDN1_**
1 – 30 Seconds	**C320TDN30_**
30 – 300 Seconds	**C320TDN300_**
5 – 30 Minutes	**C320TDN3000_**

④ Add operating voltage Suffix to Catalog Number. **A** = 120V, **B** = 240V, **E** = 208V
⑤ Rated .5 ampere pilot duty — not to be used on larger contactors.
⑥ Terminal connections are quick connects only. Two per side.

16

Type J Auxiliary Contact

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.

Table 16-101. Auxiliary Contact Ratings

Voltage	Make	Break
NEMA A600		
120 – 600V AC 72 – 120V AC 28 – 72V AC	7200 VA 60A 60 VA	720 VA 720 VA 10A
NEMA R300		
28 – 300V DC	28 VA	28 VA

Table 16-102. 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

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: .5 per mS

Table 16-103. Surge Suppressor ①

Type Mounting	Kit Catalog Number
Starter	**SS-56**

① Can be used on Sizes 5 and 6 with 120V coil. Mounting bracket required — order separately. Mounting Bracket 177C043G04.

F-56 Fuse Block for A202/ECL

- 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.

Table 16-104. 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 120V AC control relay, and will operate on as little as 40V AC 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 feet using 18 AWG wire.

Table 16-105. 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.
- 600V AC.
- Continuous current rating of 18A for Size 0, 27A for Size 1.

Table 16-106. Power Pole Kit ②

Continuous Current Rating	Kit Size	Kit Catalog Number
Normally Open		
18 27	0 1	**PNO-0** **PNO-1**
Normally Closed		
18 27	0 1	**PNC-0** **PNC-1**

② Do not use with DC operated contactors.

16

Replacement Auxiliary Contacts for A202/ECL

Table 16-107. Replacement Auxiliary Contacts

Contactor Size	Contact Arrangement	Aux. Elect. Contact	
		Catalog Number	Style Number
5, 6	1NO + 1NC 2NO 2NC	**J11** **J20** **J02**	**9084A17G01** **9084A17G02** **9084A17G03**
7, 8	1NO 1NC	— —	**578D461G01** **578D461G03**
9	1NO + 1NC 2NO 2NC	— — —	**843D943G04** **843D943G05** **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.

Table 16-108. Extra Auxiliary Contact Kits

Contactor Size	Contact Arrangement	Style Number
5, 6	1NO + 1NC 2NO 2NC	**3463D94G18** **3463D94G04** **3463D94G19**
7, 8 ①	2NO 1NO	**818D498G06** **818D498G04**

① Size 7 and larger use DC coils as standard.

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.

Table 16-109. DC Coil Conversion Kits

Size	Voltage	Kit Style Number
5	110-120 220-240 440-480	**7864A28G01** **7864A28G02** **7864A28G03**
6	110-120 220-240 440-480	**7864A29G01** **7864A29G02** **7864A29G03**

16

IT. Solid-State Soft Starters

Auxiliary Contacts for S752

The S752 allows for the use of top mounted auxiliary contacts. These contacts can be used for up-to-speed indication.

Table 16-110. S752 Auxiliary Contacts

Poles	Catalog Number
1NO 1NC 1NO/1NC	**EMA13** **EMA14** **EMA15**
2NO 2NC 1NO/1NC Logic Level	**EMA16** **EMA17** **EMA70**

Table 16-111. S752 — Maximum Number of Auxiliary Contacts

EMA13 1NO	EMA14 1NC	EMA15 1NO/1NC	EMA16 2NO	EMA17 2NC	EMA70 1NO/1NC Logic Level
3	3	2 ①	2 ①	2 ①	3

① One EMA70 or one EMA13/EMA14 may be used in the center position in conjunction with two of these devices in the outer positions.

Table 16-112. S752 — Auxiliary Contact Ratings (EMA13 – EMA17)

DC-13		AC-15	
U_e Voltage	I_e Amps	U_e Voltage	I_e Amps
24 48	5 2.5	48 120	8 6
125 250	1.1 0.55	240 440	4 2

Table 16-113. S752 — Auxiliary Contact Ratings (EMA70)

DC-12		AC-12	
U_e Voltage	I_e Amps	U_e Voltage	I_e Amps
30	0.1	250	0.1

Starter Network Adapter Product (SNAP)

Cat. No. D77B-DSNAP-X1 with 54 mm IT. Starter

The Starter Network Adapter Product (SNAP) is a front-mount device that serves as a single DeviceNet node, providing communication capability, control and monitoring to Eaton's Cutler-Hammer Intelligent Technologies (***IT.***) Electromechanical Starters (B – F Frames) as well as the ***IT.*** S752 SoftStart.

When HAND-OFF-AUTO is required, the HOA option will allow for the connection of hard wired operators. This option allows for Hand Control even if the DSNAP is not connected.

For more information and pricing, see Publication No. CA08102001E, Tab 50.

Control Terminal Block for S752

Table 16-114. S752 Control Terminal Block

Description	Catalog Number
Locking Terminal Block	**EMA76LS**

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 Suppressor Mounted on a 200 mm Device

Table 16-115. Surge Suppressors

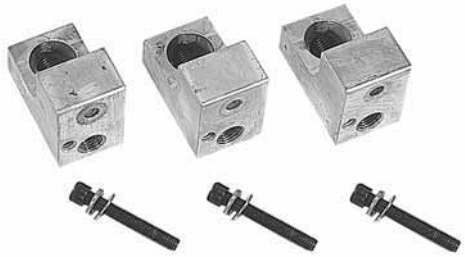
Description	Catalog Number
600V MOV for ***IT.*** Soft Starters	**EMS39**
690V MOV for ***IT.*** Soft Starters	**EMS41**

16

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 — EML23

Table 16-116. Lug Kits

Frame Size	Frame Designation	Description	Catalog Number
200 mm SSRV	T, U	2 cable connections, 4 AWG to 1/0 cable 1 cable connection, 4/0 to 500 MCM cable 2 cable connections, 4/0 to 500 MCM cable 1 cable connection, 2/0 to 300 MCM cable 2 cable connections, 2/0 to 300 MCM cable	**EML22** **EML23** **EML24** **EML25** **EML26**
290 mm SSRV	V	2 cable connections, 4/0 to 500 MCM cable 4 cable connections, 4/0 to 500 MCM cable 6 cable connections, 4/0 to 500 MCM cable 4 cable connections, 2/0 to 300 MCM cable	**EML28** **EML30** **EML32** **EML33** ①

① The EML33 does not have a CSA Listing.

Lug Cover Kits for S801/S811

Replacement covers for the T and V frame are available in case of damage to the existing covers.

Table 16-117. 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.

Table 16-118. 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 5 ft. Cable 8 ft. Cable 10 ft. Cable	 **EMA69A** **EMA69B** **EMA69C** **EMA69D**

Control Wire Connector

Table 16-119. 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.

Table 16-120. 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**

Adapter Plates

The Adapter Plate allows customers to retrofit a V-Frame 290 mm Soft Starter with the U-Frame 200 mm Soft Starter.

Table 16-121. Adapter Plates

Description	Catalog Number
Adapter Plates ②	**EMM13U**

② For more information see Pub51719.

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.

Table 16-122. 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

24V DC Power Supply which can be used with the S752, S801 or S811 SSRV or as a stand-alone device.

Table 16-123. Power Supplies

Description	SSRV	Catalog Number
115V – 240V AC Input	**S752**	**PSS25E**
380V – 480V AC Input	**S752**	**PSS25F**
115V AC Input	**S801/S811**	**PSS55A**
230V AC Input	**S801/S811**	**PSS55B**
380 – 480V AC Input	**S801/S811**	**PSS55C**

DIN Rail Power Supply Mounting Kit (35 mm)

Table 16-124. DIN Rail Mounting Kit

Description	Catalog Number
DIN Rail Mounting Kit (35 mm)	**PSSDIN**

16

MVX900 Microdrives

Table 16-125. Field Options Kits

Description	Catalog Number
Keypads	
Copy Keypad	**MVXCOPY**
Standard Keypad	**MVXKPD**
Remote Kit	**MVXRM**
Miscellaneous Options	
Extension I/O	**MVXEIO**
DIN Rail	**MVXDR**
Communications	
DeviceNet Module	**MVXDN**
Type 1 Enclosure	
Small Frame	**MVXENCS**
Large Frame	**MVXENCL**
3% Line Reactor, 1-phase	
1/2 hp, 240V	**K64-000988-8091**
1 hp, 240V	**K64-000988-0120**
2 hp, 240V	**K64-000988-0180**
3 hp, 240V	**K64-000988-0250**
3% Line Reactor, 3-phase	
1 hp, 480V	**K64-000989-2091**
2 hp, 480V	**K64-000989-4091**
3 hp, 480V	**K64-000989-4091**
5 hp, 480V	**K64-000989-8091**
7-1/2 hp, 480V	**K64-000989-0180**
10 hp, 480V	**K64-000989-0250**
1/2 hp, 240V	**K64-000988-2091**
1 hp, 240V	**K64-000988-4091**
2 hp, 240V	**K64-000988-8091**
3 hp, 240V	**K64-000988-0120**
5 hp, 240V	**K64-000988-0180**
7-1/2 hp, 240V	**K64-000988-0250**
Output Line Reactor	
1 hp, 480V	**K64-000989-2091**
2 hp, 480V	**K64-000989-4091**
3 hp, 480V	**K64-000989-4091**
5 hp, 480V	**K64-000989-8091**
7-1/2 hp, 480V	**K64-000989-0120**
10 hp, 480V	**K64-000989-0180**
EMI Filter	
1/2 hp, 240V AC, Single-Phase	**K13-000034-0111**
1 hp, 240V AC, Single-Phase	**K13-000034-0111**
2 hp, 240V AC, Single-Phase	**K13-000034-0111**
3 hp, 240V AC, Single-Phase	**K13-000034-0112**
1/2 hp, 240V AC, Three-Phase	**K13-000034-0113**
1 hp, 240V AC, Three-Phase	**K13-000034-0113**
2 hp, 240V AC, Three-Phase	**K13-000034-0113**
3 hp, 240V AC, Three-Phase	**K13-000034-0113**
5 hp, 240V AC, Three-Phase	**K13-000034-0115**
7-1/2 hp, 240V AC, Three-Phase	**K13-000034-0115**
1 hp, 480V AC, Three-Phase	**K13-000034-0114**
2 hp, 480V AC, Three-Phase	**K13-000034-0114**
3 hp, 480V AC, Three-Phase	**K13-000034-0114**
5 hp, 480V AC, Three-Phase	**K13-000034-0116**
7-1/2 hp, 480V AC, Three-Phase	**K13-000034-0116**
10 hp, 480V AC, Three-Phase	**K13-000034-0117**
Dynamic Braking Resistor	
1/2 – 1 hp, 240V	**K13-000034-0821**
2 – 3 hp, 240V	**K13-000034-0824**
5 hp, 240V	**K13-000034-0825**
7-1/2 hp, 240V	**K13-000034-0826**
1 hp, 480V	**K13-000034-0841**
2 – 3 hp, 480V	**K13-000034-0843**
5 hp, 480V	**K13-000034-0844**
7-1/2 hp, 480V	**K13-000034-0845**
10 hp, 480V	**K13-000034-0846**

NEMA Vacuum Break Control

Lug Sizes

- Size 4 — 12 – 4/0
- NEMA Size 5 & 6 and 320A, 540A & 610A — Supplied without Line or Load Lugs.

Table 16-126. 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 Dbl. Barrel	**C325KAL9**
610A	1/0 – 600 kcmil Dbl. 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.

Table 16-127. Auxiliary Electrical Contacts

Contact Arrangement	Catalog Number
1NO, 1NC	**J11**
2NO	**J20**
2NC	**J02**

Table 16-128. Horizontal Mechanical Interlock

Size	Catalog Number
4	**180C113G04**
5	**180C113G16**
6	**180C113G17**

Heater Coils

Table 16-129. 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**
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**

① Three are required per overload relay.

Note: For information on H2001 heaters, see **Page 16-6**.

16

Modification Codes

Table 16-130. A — Ammeters, Auxiliary Contacts, Accelerating Relays, Autotransformers

Modification	Catalog Number Suffix	Description
Ammeter ①	**A1**	Panel Type Wired to Current Transformer in Line 1, Type 1, 12
		Panel Type Wired to Current Transformer in Line 1, Type 3R, 4X
	A2	Panel Type, Selector Switch and 3 Current Transformers Wired to Ammeter via Switch, Type 1, 12
		Panel Type, Selector Switch and 3 Current Transformers Wired to Ammeter via Switch, Type 3R, 4X
	A3	Miniature (Single-Phase), Type 1, 12
	A4	Miniature with Selector Switch, Type 1, 12
	A5	Switchboard (Single-Phase), Type 1, 12
		Switchboard (Single-Phase), Type 3R, 4X
	A6	Switchboard with Selector Switch, Type 1, 12
		Switchboard with Selector Switch, Type 3R, 4X
	A7	3-Panel Type (Single-Phase), Type 1, 12
		3-Panel Type (Single-Phase), Type 3R, 4X
	A10	3 Miniature (Single-Phase), Type 1, 3R, 4X, 12
	A11	3 Switchboard Type (Single-Phase), Type 1, 12
		3 Switchboard Type (Single-Phase), Type 3R, 4X
	A12	Ammeter Order by Description, Type 1, 3R, 4X, 12
Auto-transformers	**A8**	hp Rating selection, see **Pages 6-21 – 6-28**
	A9	Order by Description
Top Mounted Auxiliary Contacts ②③ (Unwired)	**A13**	1NO
	A14	1NC
	A15	1NO-1NC
	A16	2NO
NEMA Sizes 00 – 2 only (Unwired)	**A17**	2NC
	A18	2NO-1NC
	A19	1NO-2NC
	A20	3NO
IEC Sizes B – L Only (Unwired) ***XT*** Series	**A21**	3NC
	A22	3NO-1NC
	A23	2NO-2NC
	A24	1NO-3NC
	A25	4NO
	A26	4NC
Side Mounted Auxiliary Contacts ③④	**A27**	1NO
	A28	1NC
	A29	1NO-1NC
	A30	2NO
	A31	2NC
	A32	2NO-1NC
	A33	1NO-2NC
	A34	3NO

Table 16-130. A — Ammeters, Auxiliary Contacts, Accelerating Relays, Autotransformers (Continued)

Modification	Catalog Number Suffix	Description
Side Mounted Auxiliary Contacts, continued ③④	**A35**	3NC
	A36	3NO-1NC
	A37	2NO-2NC
	A38	1NO-3NC
	A39	4NO
	A40	4NC
Auxiliary Contacts ③	**A42**	Contacts Mounted on Operating Mechanism of Disconnect Switch, 1NO-1NC
	A43	Contacts Mounted on Operating Mechanism of Disconnect Switch, 2NO-2NC
	A44	With Auxiliary Contact Omitted
Accelerating Relay	**A46**	For 2-Speed
	A47	2NO/2NC 24V DC Auxiliary Relay — ***IT.*** Only

① Oversize enclosure will be provided for ***IT.*** Starters.
② Top mounted auxiliary contacts cannot be added to contactors in Box 1 (Type 1).
③ Not available for ***IT.*** Starters.
④ Available on ***XT*** Starters for 40A and greater only.

Table 16-131. B — Breaker Modifications, Backspin Timer, Undervoltage Release, Bell Alarm, Bus Choke

Modification	Catalog Number Suffix	Description
Breaker	**B1**	1NO-1NC Auxiliary Contact on Breaker
	B2	2NO-2NC Auxiliary Contacts on Breaker
	B3	Shunt Trip on Circuit Breaker — 48 – 127V AC or DC
	B4	Shunt Trip on Circuit Breaker — 9 – 24V AC or DC
	B5	Shunt Trip on Circuit Breaker — 208 – 380V AC
	B6	Shunt Trip on Circuit Breaker — 415 – 600V AC or 220 – 250V DC
	B8	Undervoltage Release for Breaker
	B9	Current Limiter Mounted to Breaker
	B10	Breaker — Order by Description
	B11	Thermal Magnetic Breaker
Backspin Timer	**B12**	180 Seconds
Undervoltage Release	**B13**	Undervoltage Release for Circuit Breaker — 208 – 240V AC
	B14	Undervoltage Release for Circuit Breaker — 380 – 480V AC
	B15	Undervoltage Release for Circuit Breaker — 525 – 600V AC
Bell Alarm	**B16**	Bell Alarm for Circuit Breaker
Bus Choke (MVX)	**B20**	DC Bus Choke, Open Core and Coil ⑤

⑤ A DC bus choke may be used in place of an AC line reactor for line harmonic current reduction and for power source exceeding 500 kVA. The DC bus choke will not provide any protection for line voltage unbalance or transients.

Table 16-132. 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, Custom for Advantage, Contactors, Counter, E-Stop Relay, DC/AC Interface, Separate Source Disconnect, Bypass Contactors

Modification	Catalog Number Suffix	Description
Control Power Transformers Make sure 8th character specifies primary/ secondary voltage.	**C1**	Standard Size Control Transformer, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C2	Standard Size Control Transformer, 24V/60 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C42	50 VA Extra Capacity CPT 120V/60 Hz, 110V/50 Hz with 2 Primary and 1 Secondary
	C3	100 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C4	100 VA Extra Capacity CPT, 24V/60 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C5	200 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C6	200 VA Extra Capacity CPT, 24V/60 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C7	300 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C8	400 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C9	1 kVA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C10	2 kVA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse
	C11	Control Transformer — Order by Description
	C34	CPT with Power Supply for ***IT.*** or ***XT***
Power Supplies (***IT.*** and ***XT*** Only)	**C27**	Separate Control 120V AC to 24V DC
	C28	Power Supply with Extra Capacity — Order by Description
Control Relays	**C12**	4-Pole Interposing Relay, 600V (2NO/2NC)
	C13	Run Relay, 24V DC (MVX)
	C14 ①	4-Pole, Unwired, A600 Rtg. — 2NO-2NC
	C15 ①	8-Pole, Unwired, A600 Rtg. — 4NO-4NC
	C16	Control Relay — Order by Description
	C18 ①②	3-Wire Control Module (C30 Lighting)
	C20 ①②	2-Wire Control Relay for Mechanical/ Magnetic Lighting Contactors
Cover Control	**C17** ①	Convert Position 7 to E30 Type Cover Control
	C19 ①	Lock-Off Attachment Added on Cover Control
	C29	Change to E22 (22 mm) Cover Controls

① Not available for ***IT.*** Starters.
② Not available for ***XT*** Starters.

Table 16-132. 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, Custom for Advantage, Contactors, Counter, E-Stop Relay, DC/AC Interface, Separate Source Disconnect, Bypass Contactors (Continued)

Modification	Catalog Number Suffix	Description
Current Transformer(s)	**C21**	In Phase 1
	C22	In Phases 1 and 2
	C23	In 3 Phases
Compelling Relay	**C25** ③	—
Control Wiring	**C26**	Omit Control Wiring
	C30 ③	With Separate Control Wiring and Two 250V Fuses in Holder
	C31 ③	With Common Control Wiring and Two 600V (Class C) Fuses in Holder
	C33	Control Wiring Type — Order by Description
Control Circuit Breaker	**C32** ③	Order by Description
Separate Control	**C35**	Wired for Separate Control (Reduced Voltage)
Customer Supplied Components	**C36**	Customer Supplied Components to Be Installed
	C37	Customer Supplied Wiring Diagram to Use
Custom for Advantage	**C39**	Advantage+ Starter Supplied
Contactor/ Starter	**C40** ③	Contactor/Starter — Order by Description
Counter	**C41** ③	Operations Counter
E-Stop Relay	**C43** ③	E-Stop Relay (DeviceNet)
DC/AC Interface	**C44** ③⑤	DC/AC Interface Module
Separate Source Disconnect	**C45** ③	IEC Separate Source Disconnect for Control Circuitry
Bypass Contactors for ***IT.***/MVX Starters (MVX: 1/2 to 5 hp Only)	**C46/J1**	Isolation Contactor
	C46/J2	Output Contactor
	C46/J3	Bypass Contactor
	C46/J4	Isolation/Output/Bypass Contactor
	C46/J5	3-Contactor Bypass Pkg. for MVX ④

③ Not available for ***IT.*** Starters.
④ Includes CPT, Pilot Lights, Selector Switch, Auxiliary Contacts and Control Relay.
⑤ Not available for ***XT*** Starters.

16

Table 16-133. D — Device Labels, Deceleration Relay, Drain and Breather, Duplex Modifications

Modification	Catalog Number Suffix	Description
Device Labels	**D1**	(Each Label)
Decel. Relay ①	**D2**	2-Speed
Drain and Breather (Type 7/9 Enclosure) ①	**D5**	Drain and Breather
	D6	Drain Only
	D7	Breather Only
Duplex Modifications	**D12**	Alternator Omitted (Deduct Price)
	D14	START/STOP Pushbuttons — Supplied for Each Motor
	D15	HAND/OFF/AUTO Selector Switch — Supplied for Each Motor
	D16	No. 1 Lead - No. 2 Lead Selector Switch for Manual Selection of Lead Pump (Alternator is Omitted)
	D17	Red RUN Pilot Light — Supplied for Each Motor
	D18	Push-to-Test Red RUN Pilot Light — Supplied for Each Motor
	D19	TEST Pushbutton for Each Motor
	D20	CPT, 120V Secondary, 2 Pri. Fuses & 1 Sec. Fuse — Supplied for Ea. Motor
	D21	CPT w/100VA Extra Capacity, 120V Sec., 2 Pri. Fuses & 1 Sec. Fuse — Supplied for Each Motor
	D22	CPT w/200VA Extra Capacity, 120V Sec., 2 Pri. Fuses & 1 Sec. Fuse — Supplied for Each Motor
	D23	CPT for Duplex — Order by Description
	D24	Add 2 Relays to Modify Controller to Operate w/Single-Pole Pilot Devices
	D25	Add 3 Relays to Modify Controller to Operate w/Single-Pole Pilot Devices
	D26	Green — OFF for each starter
	D27	Green — Push-to-Test OFF for ea. starter

① Not available for ***IT.*** or ***XT*** Starters.

Table 16-134. E — Enclosure Modifications, Elapsed Time Meter, Duplex Outlet, Enclosure for Starter, Enclosure Clear Cover, Enclosure Material

Modification	Catalog Number Suffix	Description
Enclosure Modifications	**E3**	Oversize Enclosure
	E4	Enclosure — Order by Description
	E8	Service Entrance Rating w/Ground Bar
	E11	Safety Door Interlock
Elapsed Time Meter	**E9**	Wired Across Coil, Type 1, 12
		Wired Across Coil, Type 3R, 4X
	E10	Elapsed Time Meter — Order by Description
Duplex Outlet	**E12**	Convenience Duplex Outlet Mounted in Side of Enclosure
Enclosure for Starter ②	**E13**	Horizontal Combination Starter, Size 0 – 2
	E14	Narrow Combination Starter, Size 0 – 2
Enclosure Clear Cover for ***XT***	**E19**	Clear Cover for Halyester Enclosure Nonmetallic
Enclosure Material	**E20**	Convert to 316 Stainless Steel
	E21	Convert from Type 3R to Stainless Steel

② Not available for ***IT.*** or ***XT*** Starters.

Table 16-135. F — Fuse Clips, Fuse Blocks, Fungus Protection, Fingerproof Covers, EMI Filter

Modification	Catalog Number Suffix	Description
Fuse Clips ④	**F1**	Change Fuse Clips in Position 8 to Class J
	F2	Change Fuse Clips in Position 8 to Class H & K (30 & 60 Ampere Only)
Fuse Blocks	**F4**	Power Fuses Included — Order by Description
	F5	30 Ampere Control Circuit Fuseholder (KTK) Mounted on Panel (Unwired), Fuse Not Supplied
	F6	30 Ampere Control Circuit Fuseholder Mounted on Panel (Unwired), FNQR Fuse Supplied
	F7	3-Pole Power Fuseholder Mounted on Front Contactor
	F8	Separate Fusing of Control Power Supply — ***IT.***
	F10	Blown Fuse Indicator (Not for PFC)
	F21	Class CC Fuses
EMI Filter (MVX)	**F22**	3-Phase ③
	F23	1-Phase ③

③ The EMI filter is not necessary to meet the CE mark requirements for EMC when installing the MVX in an EC country.

④ Not available for ***XT*** Starters.

Table 16-136. G — Ground Fault Relay, Grounding

Modification	Catalog Number Suffix	Description
Ground Fault Relay	**G1**	Ground Fault Relay (Wired)
	G3	Ground Fault Relay (Unwired)
Grounding	**G5**	Special Grounding — Order by Description
	G6	Ground Fault Protection Omitted (Advantage)
	G7	Ground Fault Protection and Monitoring Panel

Table 16-137. H — Heater (Space), Heater Packs Installed

Modification	Catalog Number Suffix	Description	
Space Heater	**H1**	Space Heater and Thermostat	
	H2	Space Heater and NC Interlock	
Install Heater Packs (Freedom Series)	**H5**	**Class 20**	**Class 10**
		/D1 H2001B-3 /D2 H2002B-3 /D3 H2003B-3 /D4 H2004B-3 /D5 H2005B-3	/D25 H2101B-3 /D26 H2102B-3 /D27 H2103B-3 /D28 H2104B-3 /D29 H2105B-3
		/D6 H2006B-3 /D7 H2007B-3 /D8 H2008B-3 /D9 H2009B-3 /D10 H2010B-3	/D30 H2106B-3 /D31 H2107B-3 /D32 H2108B-3 /D33 H2109B-3 /D34 H2110B-3
		/D11 H2011B-3 /D12 H2012B-3 /D13 H2013B-3 /D14 H2014B-3 /D15 H2015B-3	/D35 H2111B-3 /D36 H2112B-3 /D37 H2113B-3 /D38 H2114B-3 /D39 H2115-3
		/D16 H2016B-3 /D17 H2017B-3 /D18 H2018-3 /D19 H2019-3 /D20 H2020-3	/D40 H2116-3 /D41 H2117-3
		/D21 H2021-3 /D22 H2022-3 /D23 H2023-3 /D24 H2024-3	

Table 16-138. K — MVX Keypad ①

Modification	Catalog Number Suffix	Description
Keypad (MVX)	**K1**	Door-Mounted AFD Keypad (Type 1 and 12)
	K2	Door-Mounted AFD Keypad (Type 3R)
	K3	AFD Copy Keypad (mounted on drive)
	K4	Door-Mounted AFD Copy Keypad (Type 1 and 12)
	K5	Door-Mounted AFD Copy Keypad (Type 3R)

① See **Tab 7** for more MVX Modifcations.

Table 16-139. L — Labels, Line and Load Reactors, Lighting Contactors

Modification	Catalog Number Suffix	Description
Carton Label	**L10**	Customer Marking — Specify
Line Reactors (MVX)	**L12**	3% Input Line Reactor, 3-Phase, Open Core and Coil ②
	L13	3% Input Line Reactor, 1-Phase, Open Core and Coil ②
	L14	5% Input Line Reactor, 3-Phase, Open Core and Coil ②
	L15	5% Input Line Reactor, 1-Phase, Open Core and Coil ②
	L16	Line Reactor — Order by Description
Load Reactors (MVX)	**L17**	Output Line DV/DT Filter, Open Core and Coil ③
	L18	Load Reactor — Order by Description
Lighting Contactors	**L21**	1 NC Pole
	L22	2 NC Pole
	L23	3 NC Pole
	L24	4 NC Pole
	L25	5 NC Pole
	L26	6 NC Pole
	L27	7 NC Pole
	L28	8 NC Pole
	L29A	3-Wire 120V AC
	L29B	3-Wire 240V AC
	L29C	3-Wire 24V AC
	L29D	3-Wire 24V DC
	L29E	2-Wire 120V AC
	L29F	2-Wire 240V AC
	L29G	2-Wire 24V AC

② If the power source exceeds 500 kVA, 3% line unbalance, or if transient voltages from power factor capacitor switching events are present, an input line reactor must be used. The input line reactor will also reduce line current harmonics.

③ The output line DV/DT filter is required when the distance from the drive to the motor exceeds 33 feet (10m). The total cable run should not exceed 165 feet (50m).

Table 16-140. N — Nameplates

Modification	Catalog Number Suffix	Description
Nameplates	**N1**	Enclosure Nameplates

Table 16-141. P — Pilot Lights, Pushbuttons, Phase Relays, Potential Transformers, Power Factor Correction Capacitors, Program Timer, Percentage Timer, Photocell

Modification	Catalog Number Suffix	Description
Push-to-Test Pilot Lights	**P1**	Push-to-Test Pilot Light (Red RUN) Wired to Coil
	P2	Push-to-Test Pilot Light (Green OFF) Wired in Series with Auxiliary Contact
	P3	Combination of **P1** and **P2** Above
	P4	Push-to-Test Pilot Light (Amber RUN) Wired to Coil
	P49	Push-to-Test Pilot Light (Green RUN)
	P54 ①	Push-to-Test Pilot Light — Red BYPASS (MVX)
	P56 ①	Push-to-Test Pilot Light — Amber INVERTER ENABLE (MVX)
	P57	Push-to-Test Pilot Light — Green STOP
Pushbuttons	**P5**	EMERGENCY STOP — Mushroom Head
	P6 ①	Pushbutton Omitted
	P7	START/STOP
	P8	ON/OFF
	P9	START
	P10	ON
	P11	OFF
	P12 ①	FORWARD/REVERSE/STOP
	P13 ①	FAST/SLOW/STOP
	P14 ①	FAST/OFF/SLOW
	P15 ①	HIGH/LOW/STOP
	P16 ①	HIGH/LOW
	P17 ①	SLOW/FAST
	P18 ①	Pushbutton with Legend Plate
	P52	UP/STOP/DOWN
	P53	OPEN/STOP/CLOSE
Pilot Lights	**P19**	With 1 Amber Pilot Light Marked POWER AVAILABLE Wired to Load Side of 2 Fuses or Circuit Breaker
	P20	Pilot Light (Amber RUN) Wired to Coil
	P21 ①	With 1 Red Pilot Light Marked RUN Wired thru NO Auxiliary Contact
	P22 ①	With 1 Push-to-Test Red Light Marked RUN Wired thru NO Auxiliary Contact
	P23	Pilot Light — Red RUN
	P24	Pilot Light — Red ON
	P25	Pilot Light — Green OFF
	P26	Pilot Light — Order by Description
	P29	Pilot Light — Red STOP

① Not available for ***IT.*** Starters.

Table 16-141. P — Pilot Lights, Pushbuttons, Phase Relays, Potential Transformers, Power Factor Correction Capacitors, Program Timer, Percentage Timer, Photocell (Continued)

Modification	Catalog Number Suffix	Description
Pilot Lights (Continued)	**P58**	Pilot Light — Red BYPASS (MVX)
	P59 ②	Pilot Light — Amber INVERTER ENABLE (MVX)
	P60 ②	Pilot Light — Red INVERTER RUNNING (MVX)
	P61	Pilot Light — Green STOP
	P62 ②	FORWARD/REVERSE Red Pilot Lights
	P63 ②	UP/DOWN Red Pilot Lights
	P64 ②	OPEN/CLOSE Red Pilot Lights
	P65 ②	HIGH/LOW Red Pilot Lights
	P66 ②	FAST/SLOW Red Pilot Lights
	P67	Green RUN Light
	P68	LED Bulbs
	P69	Blue OVERLOAD Light
Illuminated Pushbutton	**P27**	Illuminated Pushbutton — Order by Description
Phase Loss Relay	**P28**	Phase Loss Relay
	P36	Phase Loss Protection Omitted (Advantage)
	P37	Extended Phase Loss Trip Time (Advantage)
Phase Reversal Relay	**P30**	Phase Reversal Relay
Phase Unbalance Relay	**P32**	Phase Unbalance Relay
Phase Monitoring Relay	**P34**	Phase Monitoring Relay
Power Factor Correction Capacitors	**P38**	/F1 20 kVar /F2 25 kVar /F3 30 kVar /F4 35 kVar /F5 40 kVar /F6 45 kVar /F7 50 kVar /F8 60 kVar /F9 70 kVar /F10 75 kVar /F11 80 kVar /F12 90 kVar /F13 100 kVar /F14 125 kVar /F15 150 kVar /F16 175 kVar /F17 200 kVar /F18 225 kVar /F19 250 kVar /F20 300 kVar /F21 350 kVar /F22 400 kVar
Potential Transformers	**P39** ②	Potential Transformer — Wired L1 – L2
	P40 ②	Potential Transformer — Wired L1– L2 and L2 – L3
	P41 ②	Potential Transformer — 3 Phases
Pump Controller	**P42**	Pump Controller for ***IT.***
Program Timers	**P43**	15-Minute Program Timer
	P44	24-Hour Program Timer
	P45	7-Day Program Timer with Day Omission Feature
Percentage Timers	**P47**	15-Minute Percentage Timer
	P48	60-Minute Percentage Timer
Photocell	**P70** ②	Photoelectric Receptacle with Photocell

② Not available for ***IT.*** Starters.

Table 16-142. Q — IQ Products, DN50

Modification	Catalog Number Suffix	Description
IQ Products	**Q1**	IQ 500
	Q3	IQ 1000
	Q5	IQ 4000
	Q8	With Wponi (Advantage)
	Q9	With WCTLponi (Advantage)
IQ Data Metering Module	**Q12** ①	IQ Data Metering Module
	Q14	IQ 220 with Cable
DN50	**Q13** ①	DeviceNet Input/Output Module

① Not available for ***IT.*** Starters.

Table 16-143. R — Ramp, Relays, Solid-State Electronic Overload Relays, Resets, Overload Relay Modifications, Reversing, DeviceNet Interface

Modification	Catalog Number Suffix	Description	
Ramp	**R1**	Extended Ramp of ***IT.***	
Relay ②	**R2**	Overvoltage Relay	
Fixed Heater Overload Relay ③	**R8**	C316FNA3C	.25 – .40A
	R9	C316FNA3D	.40 – .63A
	R10	C316FNA3E	.63 – 1.00A
	R11	C316FNA3F	1.00 – 1.40A
	R12	C316FNA3G	1.30 – 1.80A
	R13	C316FNA3H	1.70 – 2.40A
	R14	C316FNA3J	2.20 – 3.10A
	R15	C316FNA3K	2.80 – 4.00A
	R16	C316FNA3L	3.50 – 5.00A
	R17	C316FNA3M	4.50 – 6.50A
	R18	C316FNA3N	6.00 – 8.50A
	R19	C316FNA3P	7.50 – 11.00A
	R20	C316FNA3Q	10.00 – 14.00A
	R21	C316FNA3R	13.00 – 19.00A
	R22	C316FNA3S	18.00 – 24.00A
	R23	C316FNA3T	24.00 – 32.00A
	R24	C316KNA3A	18.00 – 25.00A
	R25	C316KNA3B	22.00 – 32.00A
	R26	C316KNA3C	29.00 – 42.00A
	R27	C316KNA3D	36.00 – 52.00A
	R28	C316KNA3E	45.00 – 63.00A
	R29	C316KNA3F	60.00 – 80.00A
	R30	C316PNA3A	65.00 – 90.00A
	R31	C316PNA3B	80.00 – 100.00A
	R32	C316PNA3C	100.00 – 135.00A
	R33	C316PNA3D	110.00 – 150.00A
	R34	C316PNA3E	130.00 – 175.00A
	R35	C316PNA3F	150.00 – 200.00A
	R36	C316SNA3A	130.00 – 185.00A
	R37	C316SNA3B	165.00 – 235.00A
	R38	C316SNA3C	220.00 – 310.00A
	R39	C316SNA3D	285.00 – 400.00A
	R40	C316UNA3A	355.00 – 500.00A
	R41	C316UNA3B	465.00 – 650.00A
	R42	C316UNA3C	610.00 – 850.00A

② Not available for ***IT.*** Starters.
③ Not available for ***XT*** Starters.

Table 16-143. R — Ramp, Relays, Solid-State Electronic Overload Relays, Resets, Overload Relay Modifications, Reversing, DeviceNet Interface (Continued)

Modification	Catalog Number Suffix	Description		
Fixed Heater Overload Relay, continued ③	**R43**	Fixed Heater Overload Relay — Order by Description		
	R55	C316FNA3F w/Current Transformer		60.00 – 84.00 FLA
	R56	C316FNA3G w/Current Transformer		78.00 – 108.00 FLA
	R57	C316FNA3H w/Current Transformer		102.00 – 144.00 FLA
	R58	C316FNA3J w/Current Transformer		132.00 – 186.00 FLA
	R59	C316FNA3K w/Current Transformer		168.00 – 240.00 FLA
	R60	C316FNA3L w/Current Transformer		210.00 – 310.00 FLA
Solid-State Electronic Overload Relay ⑤	IEC Frame	NEMA Size	Full Load Current Adjustment Range (A)	3-Phase Automatic/ Manual Reset
				Class 5/10/20/30
	Catalog Number Suffix ➡ ⑥			**R61_**
	B & C	00	0.1 – 0.5 0.4 – 2.0 1.0 – 5.0 1.6 – 8.0	**A** **B** **C** **D**
	C & D	0 & 1	0.1 – 0.5 0.4 – 2.0 1.0 – 5.0 1.6 – 8.0 6.4 – 32	**A** **B** **C** **D** **E**
	D	2	9 – 45	**F**
		3	15 – 75	**G**
	F & G		22 – 110	**H**
	G	4	30 – 150	**J**
	N/A	5	96 – 300	**C**
	N/A	6	192 – 600	**C**
Resets ④	**R5**	Change External Reset to Internal Reset — Hole Covered with Plug		
	R6	Internal Reset — No Hole Plug		
	R44	Manual Reset Only on Overload Relay		
	R45	Auto Reset Only on Overload Relay		
	R47	Internal Trip Indicator — No External Reset		
	R48	External Reset with External Trip Indicator		
	R49	External Reset with Bell Alarm		
	R71	N3R Reset Boot Added (Type 1/12 Only)		
Reversing ④	**R54**	Reversing Contactor/Starter		
Overload Relay Mods	**R53**	Anti Plug-In		
	R61	C395 DNA DeviceNet Module		
	R62	C395 Bell Alarm		
	R63	C395 Load Module		
	R64	C395 Program Key		
DeviceNet Interface	**R69**	DeviceNet Interface		
	R65	Standard Reset for DeviceNet		
	R66	Lighted Reset for DeviceNet		
	R67	Trip Indicator for DeviceNet		
	R68	DeviceNet Communication Interface (MVX)		

④ Not available for ***IT.*** or ***XT*** Starters.
⑤ Features:
- Self-Powered
- Phase Loss Protection
- Current Adjustment Knob
- ± 1% Repeat Accuracy
- 1NO and 1NC Isolated Contacts

⑥ Complete Modification Code includes overload range. Example **R61/C**.

16

Table 16-144. S — System Voltage, Selector Switches, Suppressor, Incomplete Sequence Protection, Single-Phase Jumper, Surge Capacitor, Speed Potentiometer

Modification	Catalog Number Suffix	Description
System Voltage Selection	**S1**	System Voltage Selection for Internal Components
		/H1 208V 60 Hz /H2 240V 60 Hz /H3 277V 60 Hz, 1-Ph /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
	S2	System Voltage Selection — Specify on Order
Selector Switches ①	**S3**	HAND/OFF/AUTO
	S4	HAND/AUTO
	S5	HAND/OFF/AUTO Selector Switch with 1 Red RUN Pilot Light
	S6	RUN/OFF/AUTO
	S7	AUTO/OFF/TEST
	S8	AUTO/OFF/TEST Selector Switch with 1 Red RUN Pilot Light
	S9	AUTO/OFF/TEST Selector Switch with 1 Red RUN Pilot Light and 1 Green Pilot Light
	S10	OFF/AUTO
	S11	START/STOP
	S12	OFF/ON
	S13 ②	HIGH/LOW
	S14 ②	FAST/OFF/SLOW
	S15 ②	SLOW/FAST
	S16 ②	FORWARD/REVERSE
	S17 ②	HIGH/OFF/LOW
	S18 ②	HIGH/LOW/OFF/AUTO
	S21	HAND/OFF/AUTO Spring Return from Left
	S38 ②	INVERTER/OFF/BYPASS (MVX)
	S41 ②	OPEN/OFF/CLOSE
	S42 ②	FORWARD/OFF/REVERSE
	S43 ②	FAST/OFF/SLOW/AUTO
	S19 ②	Selector Switch Omitted (Pump Panels Only)
	S40	Selector Switch — Order by Description
Suppressor	**S24** ②	Transient Suppressor Mounted on Magnet Coil
Surge Suppression	**S20**	MOV (***IT.***)
Sequence Timer	**S26** ②	Sequence Timer (Pump Panels)
Sequence Protection	**S27** ②	Incomplete Sequence Protection
Pump	**S28**	480V BP9000 Pump
Single Phase ②	**S29**	Convert Contactor or Starter from Three-Phase to Single-Phase — Install Jumper
	S30	Single-Phase Rev. 120V
	S31	Single-Phase Rev. 240V
Surge Capacitor	**S37** ②	Surge Capacitor Wired to Disconnect Line Side
Speed Potentiometer	**S39** ②	Speed Potentiometer (MVX)

① When using 3-position selector switch with magnetic lighting contactor, mod **C20** must also be used (ECL04, ECL13, ECL15).
② Not available for ***IT.*** Starters.

Table 16-145. T — Timers, Time Delay Relays, Terminal Blocks, Terminal Points, Ring Lug Connections

Modification	Catalog Number Suffix	Description
Timers	**T1** ③	Pneumatic Timer Installed on Contactor, Unwired, 30 Sec. Max.
	T2 ③	Pneumatic Timer Installed on Contactor, Unwired, 180 Sec. Max.
	T3	Pneumatic Timer Mounted in Enclosure, Unwired, 180 Sec. Max.
	T4	Solid-State ON Delay Timer (1 – 30 sec)
	T5	Solid-State ON Delay Timer (30 – 300 sec)
	T25	Timer — Order by Description
Time Delay Relays	**T6**	Time Delay Relay, 3 Minutes Maximum, Unwired, ON DELAY
	T7	Time Delay Relay, 3 Minutes Maximum, Unwired, OFF DELAY
	T8	Time Delay Low Voltage Release Relay
Terminal Blocks	**T9**	With 1 Single Circuit Terminal Block, Unwired
	T10	With 2 Single Circuit Terminal Block, Unwired
	T24 ③	Power Terminal Block for DeviceNet Overload
Terminal Points	**T11**	With 6 Terminal Points, Unwired
	T12	With 12 Terminal Points, Unwired
	T13	With 18 Terminal Points, Unwired
	T14	Terminal Point per Customer Specification, Unwired (Price Each)
	T15	Terminal Point per Customer Specification, Wired (Price Each)
	T21 ③	3 Terminals Mounted Between Contactor and Overload for Power Factor Capacitors — Sizes 0 – 2
	T22 ③	3 Terminals Mounted Between Contactor and Overload for Power Factor Capacitors — Sizes 3 – 4
	T23 ③	Quick-Connect Terminals Added to DP Contactor/Starter
Ring Lug Connections	**T16** ④	Ring Lug Connections on Power Wires
	T17 ③	Ring Lug Connections on Control Wires
IT./EM	**T30**	Reset Only
	T31	STOP with Reset
	T32	START/STOP with Reset
	T33A	HAND/OFF/AUTO with Reset 120V AC
	T33D	HAND/OFF/AUTO with Reset 24V DC
	T34	ON/OFF
	T40	Reset Only (DeviceNet)
	T41	STOP with Reset (DeviceNet)
	T42	START/STOP with Reset (DeviceNet)
	T43A	HAND/OFF/AUTO with Reset 120V AC (DeviceNet)
	T43D	HAND/OFF/AUTO with Reset 24V DC (DeviceNet)
	T44	ON/OFF
	T50	Reset Only
	T51	STOP with Reset
	T52	FORWARD/REVERSE/STOP with Reset
	T53A	FORWARD/REVERSE/STOP with Reset 120V AC
	T53D	FORWARD/REVERSE/STOP with Reset 24V DC
	T54	ON/OFF

③ Not available for ***IT.*** Starters.
④ Not available for ***XT*** Starters.

Table 16-145. T — Timers, Time Delay Relays, Terminal Blocks, Terminal Points, Ring Lug Connections (Continued)

Modification	Catalog Number Suffix	Description
IT./EM, continued	**T60**	Reset Only (DeviceNet)
	T61	STOP with Reset (DeviceNet)
	T62	FORWARD/REVERSE/STOP with Reset (DeviceNet)
	T63A	FORWARD/REVERSE/STOP with Reset 120V AC (DeviceNet)
	T63D	FORWARD/REVERSE/STOP with Reset 24V DC (DeviceNet)
	T64	ON/OFF
	T70	Reset Only
	T71	START/STOP with Reset
	T72	HAND/OFF/AUTO – START with Reset
	T73	FORWARD/REVERSE/STOP with Reset
	T74	HAND/OFF/AUTO – FORWARD/REVERSE with Reset
	T75	ON/OFF with Reset
	T76	FAST/SLOW/STOP with Reset
	T77	HAND/OFF/AUTO – FAST/SLOW with Reset

Table 16-146. U — Undervoltage Relay, Time Delay Undervoltage Relay

Modification	Catalog Number Suffix	Description
Undervoltage Relays	**U1**	Undervoltage Relay, Non-adjustable
	U2	Undervoltage Relay, Adjustable
Time Delay Undervoltage Relays	**U4** ①	Time Delay Undervoltage Relay, Non-adjustable
	U5	Time Delay Undervoltage Relay, Adjustable
Under- and Overvoltage Relay	**U7**	Under- and Overvoltage Relay

① Not available for ***IT.*** Starters.

Table 16-147. V — Voltmeter, Varmeter, Vacuum Starter

Modification	Catalog Number Suffix	Description
Voltmeters	**V1**	1 Panel Type Voltmeter Wired L1 – L2
	V2	Panel Type Voltmeter and Selector Switch Wired to Read Three Line Voltages
	V3 ②	Miniature Voltmeter Wired L1 – L2
	V4 ②	Miniature Voltmeter and Selector Switch Wired to Read Three Line Voltages
	V5	Switchboard Type Voltmeter Wired L1 – L2
	V6 ②	Switchboard Type Voltmeter and Selector Switch Wired to Read Three Line Voltage
	V7	3 Panel Type Voltmeters Wired in Each Phase
	V8 ②	3 Miniature Voltmeters Wired in Each Phase
	V9	3 Switchboard Type Voltmeters Wired in Each Phase
	V10	Voltmeter — Order by Description
Varmeter ③	**V11**	Varmeter
	V12	Varmeter — Order by Description
Vacuum Starter ③	**V13**	Vacuum Starter — 1500V Rating

② Type 1/12 only.
③ Not available for ***XT*** Starters.

Table 16-148. W — Wattmeter, Watt-Hour Meter, Wiremarkers, Wiring Diagram

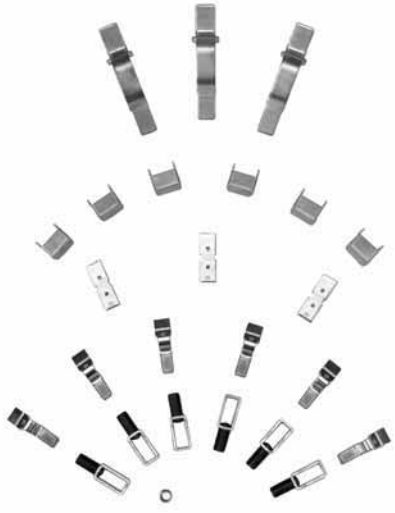
Modification	Catalog Number Suffix	Description
Wattmeter ④	**W1**	Wattmeter
Watt-Hour Meter ④	**W3**	Watt-Hour Meter
	W5	Watt-Hour Meter with Demand Attachment
Wiremarkers	**W7**	Wiremarkers
	W8	Wiremarkers — Order per Customer Diagram or Specifications
	W9	Wiremarkers — Order by Description
WYE-Delta hp	**W10** ⑤	See **Pages 6-34 – 6-48**
Windows in Enclosure	**W11**	Enclosure Windows (MVX)
Wiring Diagram	**W12**	Reduced Copy of Custom Wiring Diagram Laminated on Inside of Door

④ Type 1/12 only.
⑤ Not available for ***XT*** Starters.

April 2008

Renewal Parts

Contents



Contact Kits

NEMA Contact Block

Table 17-1. NEMA Contact Block

Size	Amperes	Catalog Number
00	9	**N04NBSAX3N**
0	18	**N04NBS0X3N**
1	27	**N04NCS1X3N**
2	45	**N04NDS2X3N**
3	90	**N04NES3X3N**
4	135	**N04NES4X3N**

NEMA Coil Controller

Size 00-1 Non-reversing (pictured)

Table 17-2. NEMA Coil Controller

Size	Catalog Number
Non-reversing	
00, 0	**N02NBXCXNN**
1	**N02NCXCXNN**
2	**N02NDXCXNN**
3, 4	**N02NEXCXNN**
5	**EMUCCF**
Reversing	
00, 0	**N03NBXCXNN**
1	**N03NCXCXNN**
2	**N03NDXCXNN**
3, 4	**N03NEXCXNN**
5	**EMUCCF**

Coils

Table 17-3. 24V DC Coils

Description	Catalog Number
Size 00, 0 Coil	**EMCB**
Size 1 Coil	**EMCC**
Size 2 Coil	**EMCD**
Size 3, 4 Coil	**EMCE**
Size 5 Coil	**EMCF**

NEMA Solid-State Overload Relay

Table 17-4. NEMA Solid-State Overload Relay

Size	Overload Adjustment Range (Amperes)	Catalog Number
Non-reversing		
00, 0	.25 – .8	**N05NBXRA3A**
	.59 – 1.9	**N05NBXRB3A**
	1.4 – 4.4	**N05NBXRC3A**
	2.8 – 9.0	**N05NBXRD3A**
	6.3 – 20	**N05NBXRG3A**
0	10 – 32	**N05NBXRJ3A**
1	.25 – .8	**N05NCXRA3A**
	.59 – 1.9	**N05NCXRB3A**
	1.4 – 4.4	**N05NCXRC3A**
	2.8 – 9.0	**N05NCXRD3A**
	5.0 – 16	**N05NCXRF3A**
	8.4 – 27	**N05NCXRH3A**
	16 – 50	**N05NCXRL3A**
2	5.0 – 16	**N05NDXRF3A**
	8.4 – 27	**N05NDXRH3A**
	14 – 45	**N05NDXRK3A**
	31 – 100	**N05NDXRN3A**
3, 4	14 – 45	**N05NEXRK3A**
	28 – 90	**N05NEXRM3A**
	42 – 135	**N05NEXRP3A**
4	63 – 200	**N05NEXRR3A**
5	42 – 135	**N05NFXRP3A**
	84 – 270	**N05NFXRS3A**
	131 – 420	**N05NFXRT3A**
Reversing		
00, 0	.25 – .8	**N06NBXRA3A**
	.59 – 1.9	**N06NBXRB3A**
	1.4 – 4.4	**N06NBXRC3A**
	2.8 – 9.0	**N06NBXRD3A**
	6.3 – 20	**N06NBXRG3A**
0	10 – 32	**N06NBXRJ3A**
1	.25 – .8	**N06NCXRA3A**
	.59 – 1.9	**N06NCXRB3A**
	1.4 – 4.4	**N06NCXRC3A**
	2.8 – 9.0	**N06NCXRD3A**
	5.0 – 16	**N06NCXRF3A**
	8.4 – 27	**N06NCXRH3A**
	16 – 50	**N06NCXRL3A**
2	5.0 – 16	**N06NDXRF3A**
	8.4 – 27	**N06NDXRH3A**
	14 – 45	**N06NDXRK3A**
	31 – 100	**N06NDXRN3A**
3, 4	14 – 45	**N06NEXRK3A**
	28 – 90	**N06NEXRM3A**
	42 – 135	**N06NEXRP3A**
4	63 – 200	**N06NEXRR3A**
5	42 – 135	**N06NFXRP3A**
	84 – 270	**N06NFXRS3A**
	131 – 420	**N06NFXRT3A**

Contact Kits

Table 17-5. NEMA 3-Pole Contact Kits

Size	Description	Catalog Number
1	Hold Open Non Hold Open	**EMCKTS1** **EMCKTS1NH**
2	Hold Open Non Hold Open	**EMCKTS2** **EMCKTS2NH**
3	Hold Open	**EMCKTS3**
4	Hold Open	**EMCKTS4**
5	Hold Open	**EMCKTS5**

Fanning Strips

Table 17-6. Reversing Fanning Strips

NEMA Size	Description	Catalog Number
00,0	Line Side Load side	**EMFRLB** **EMFRTB**
1	Line Side Load side	**EMFRLC** **EMFRTC**
2	Line Side Load side	**EMFRLD** **EMFRTD**
3, 4	Line Side Load side	**EMFRLE** **EMFRTE**
5	Line Side Bus Bar Set Load side Bus Bar Set	**EMFRLF** **EMFRTF**

Lug Kits and Reversing Kits

For Lug Kits and Reversing Kits, see Accessories, **Page 16-3**.

NEMA Sizes 00, 0, 1, 2 and 3

Table 17-7. NEMA Sizes 00 and 0 — See Contactor/Starter Nameplate to Determine Series A1, B1 or C1.

Description		NEMA Size 00-0	NEMA Size 00		NEMA Size 0	
		Series A1	Series B1	Series C1	Series B1	Series C1
		Part Number	Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		None	None	None	None	None
Contact Kits						
2-Pole		①	①	①	①	①
3-Pole		①	①	①	①	①
4-Pole		①	①	①	①	①
5-Pole		①	①	①	①	①
Magnet Coils	**Coil Suffix**					
120V 60 Hz or 110V 50 Hz	A	9-2650-1	9-2875-1	9-2875-1	9-2876-1	9-2876-1
240V 60 Hz or 220V 50 Hz	B	9-2650-2	9-2875-2	9-2875-2	9-2876-2	9-2876-2
480V 60 Hz or 440V 50 Hz	C	9-2650-3	9-2875-3	9-2875-3	9-2876-3	9-2876-3
600V 60 Hz or 550V 50 Hz	D	9-2650-4	9-2875-4	9-2875-4	9-2876-4	9-2876-4
208V 60 Hz	E	9-2650-5	9-2875-5	9-2875-5	9-2876-5	9-2876-5
277V 60 Hz	H	9-2650-13	9-2875-12	9-2875-12	9-2876-12	9-2876-12
208/240V 60 Hz	J	—	9-2875-37	9-2875-37	9-2876-17	9-2876-17
240V 50 Hz	K	9-2650-12	9-2875-11	9-2875-11	9-2876-11	9-2876-11
380 – 415V 50 Hz	L	9-2650-6	9-2875-6	9-2875-6	9-2876-6	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	9-2876-36
24V 60 Hz	T	9-2650-7	—	—	—	—
24V 50 Hz	U	9-2650-14	9-2875-36	9-2875-36	9-2876-36	9-2876-36
32V 50 Hz	V	9-2650-9	9-2875-16	9-2875-16	9-2876-16	9-2876-16
48V 60 Hz	W	9-2650-8	9-2875-8	9-2875-8	9-2876-8	9-2876-8
48V 50 Hz	Y	9-2650-10	9-2875-9	9-2875-9	9-2876-9	9-2876-9
Magnet Frame Armature						
Lower Magnet Frame		①	①	①	①	①
Upper Magnet Frame		①	①	①	①	①

① Replace with complete contactor.

Table 17-8. NEMA Sizes 1, 2 and 3 — See Contactor/Starter Nameplate to Determine Series A1 or B1.

Description		NEMA Size 1		NEMA Size 2		NEMA Size 3
		Series A1	Series B1	Series A1	Series B1	
		Part Number	Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		20861	22177	20861	22177	20426
Contact Kits						
2-Pole		6-65	6-65	6-65-7	6-65-7	6-43-5
3-Pole		6-65-2	6-65-2	6-65-8	6-65-8	6-43-6
4-Pole		6-65-9	6-65-9	6-65-15	6-65-15	—
5-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	9-2703-1	9-2703-1	9-2703-1	9-2703-1	9-2756-1
240V 60 Hz or 220V 50 Hz	B	9-2703-2	9-2703-2	9-2703-2	9-2703-2	9-2756-2
480V 60 Hz or 440V 50 Hz	C	9-2703-3	9-2703-3	9-2703-3	9-2703-3	9-2756-3
600V 60 Hz or 550V 50 Hz	D	9-2703-4	9-2703-4	9-2703-4	9-2703-4	9-2756-4
208V 60 Hz	E	9-2703-9	9-2703-9	9-2703-9	9-2703-9	9-2756-5
277V 60 Hz	H	9-2703-7	9-2703-7	9-2703-7	9-2703-7	9-2756-9
208/240V 60 Hz	J	—	—	—	—	—
240V 50 Hz	K	9-2703-14	9-2703-14	9-2703-14	9-2703-14	9-2756-13
380 – 415V 50 Hz	L	9-2703-8	9-2703-8	9-2703-8	9-2703-8	—
380V 50 Hz	L	—	—	—	—	9-2756-12
415V 50 Hz	M	—	—	—	—	9-2756-8
550V 50 Hz	N	—	—	—	—	9-2756-14
24V 60 Hz – 24V 50 Hz	T	—	—	—	—	—
24V 60 Hz	T	9-2703-6	9-2703-6	9-2703-6	9-2703-6	9-2756-6
24V 50 Hz	U	9-2703-12	9-2703-12	9-2703-12	9-2703-12	9-2756-11
32V 50 Hz	V	9-2703-10	9-2703-10	9-2703-10	9-2703-10	9-2756-10
48V 60 Hz	W	9-2703-11	9-2703-11	9-2703-11	9-2703-11	9-2756-15
48V 50 Hz	Y	9-2703-13	9-2703-13	9-2703-13	9-2703-13	9-2756-7
Magnet Frame Armature						
Lower Magnet Frame		17-18200	17-18200	17-18200	17-18200	17-8955-2
Upper Magnet Frame		48-1936	48-1936	48-1936	48-1936	48-1902

NEMA Sizes 4, 5 and 6

Table 17-9. NEMA Sizes 4, 5 and 6 — See Contactor/Starter Nameplate to Determine Series A1 or B1.

Description		NEMA Size 4		NEMA Size 5		NEMA Size 6	
		Series A1	Series B1	Series A1	Series B1	Contactor & Starter Series A1, Starter Series B1	Contactor Series B1, Starter Series C1
		Part Number	Part Number	Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		20428	20428	20429	20429	20146	23349
Contact Kits							
2-Pole		6-44	6-26	6-45	6-45	6-601-2	—
3-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	9-1891-1	9-1891-1	9-1891-1	9-2698	9-3006
240V 60 Hz or 220V 50 Hz	B	9-1891-2	9-1891-2	9-1891-2	9-1891-2	9-2698-2	9-3006-2
480V 60 Hz or 440V 50 Hz	C	9-1891-3	9-1891-3	9-1891-3	9-1891-3	9-2698-3	9-3006-3
600V 60 Hz or 550V 50 Hz	D	9-1891-4	9-1891-4	9-1891-4	9-1891-4	9-2698-4	9-3006-4
208V 60 Hz	E	9-1891-13	9-1891-13	9-1891-13	9-1891-13	9-2698-5	—
277V 60 Hz	H	9-1891-26	9-1891-26	9-1891-26	9-1891-26	—	—
208/240V 60 Hz	J	—	—	—	—	—	—
240V 50 Hz	K	9-1891-20	9-1891-20	9-1891-20	9-1891-20	—	—
380 – 415V 50 Hz	L	—	—	—	—	9-2698-6	9-3006-7
380V 50 Hz	L	9-1891-14	9-1891-14	9-1891-14	9-1891-14	—	—
415V 50 Hz	M	9-1891-21	9-1891-21	9-1891-21	9-1891-21	—	—
550V 50 Hz	N	9-1891-8	9-1891-8	9-1891-8	9-1891-8	—	—
24V 60 Hz – 24V 50 Hz	T	—	—	—	—	—	9-3006-8
24V 60 Hz	T	9-1891-15	9-1891-15	9-1891-15	9-1891-15	—	—
24V 50 Hz	U	9-1891-16	9-1891-16	9-1891-16	9-1891-16	—	—
32V 50 Hz	V	9-1891-27	9-1891-27	9-1891-27	9-1891-27	—	—
48V 60 Hz	W	—	—	—	—	9-2698-8	9-3006-9
48V 50 Hz	Y	9-1891-18	9-1891-18	9-1891-18	9-1891-18	—	—
Overload Relays							
For Replacement on Existing Starters 3-Pole — Ambient Compensated Bimetallic		10-6530-4	10-6530-4	C306DN3B	C306DN3B	C306DN3B	C306DN3B
Current Transformer							
		—	—	42-3564	42-3564	42-3598	42-3598
Magnet Frame Armature							
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	—	—

Feeder Group Renewal ①

Volts	Hertz	NEMA Size 4		NEMA Size 5		NEMA Size 6	
		Series A1	Series B1	Series A1	Series B1	Contactor & Starter Series A1, Starter Series B1	Contactor Series B1, Starter Series C1
110 – 120	50/60	—	—	—	—	9-2705	9-3007
220 – 240	50/60	—	—	—	—	9-2705-2	9-3007-2
440 – 480	50/60	—	—	—	—	9-2705-3	9-3007-3
550 – 600	50/60	—	—	—	—	9-2705-4	9-3007-4
208	50/60	—	—	—	—	9-2705-5	9-3007-5
380 – 415	50/60	—	—	—	—	9-2705-6	9-3007-7
48 – 52	50/60	—	—	—	—	9-2705-8	9-3007-6

① Voltage ratings of the main coils must match those of the feeder group for proper operation of the starter/contactor.

17

NEMA Sizes 7 and 8

Table 17-10. NEMA Sizes 7 and 8 — See Contactor/Starter Nameplate to Determine Series A1 or B1.

Description		NEMA Size 7		NEMA Size 8	
		Series A1	Series B1	Series A1	Series B1
		Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		20848	20848	20849	20849
Contact Kits					
2-Pole		—	—	—	—
3-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	9-2654
240V 60 Hz or 220V 50 Hz	B	9-2698-2	9-2698-2	9-2654-2	9-2654-2
480V 60 Hz or 440V 50 Hz	C	9-2698-3	9-2698-3	9-2654-3	9-2654-3
600V 60 Hz or 550V 50 Hz	D	9-2698-4	9-2698-4	9-2654-4	9-2654-4
208V 60 Hz	E	9-2698-5	9-2698-5	9-2654-6	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	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 3-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		—	—	—	—

17

Feeder Group Renewal ②

Volts	Hertz	NEMA Size 7		NEMA Size 8	
		Series A1	Series B1	Series A1	Series B1
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

① Consult factory.

② Voltage ratings of the main coils must match those of the feeder group for proper operation of the starter/contactor.

Contact Kits and Coils

Table 17-11. Replacements for Contact Kits and Coils

Product	Description	Catalog Number
Contact Kits 	Replacement Contact Kit, Size 1, 3-Pole Replacement Contact Kit, Size 2, 3-Pole Replacement Contact Kit, Size 3, 3-Pole Replacement Contact Kit, Size 4, 3-Pole Replacement Contact Kit, Size 5, 3-Pole Replacement Contact Kit, Size 6, 3-Pole	**WCK13** **WCK23** **WCK33** **WCK43** **WCK53** **WCK63**
Coils 	Size 1 and 2, 110/120V 60 Hz Size 3 and 4, 110/120V 60 Hz Size 5 and 6, 110/120V 60 Hz	**WCOIL12F** **WCOIL34F** **WCOIL56F**

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 Cutler-Hammer 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 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 Cutler-Hammer replacement parts should be used.

This section identifies the replacements parts which are available. Order by style number.

JF Autostarters

Table 17-12. 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**

Note: Kits contain a complete set of moving contacts, stationary contacts and springs.

Table 17-13. Solenoid Assembly with Coil (All Sizes) ①

Volt	Hz	Style Number ②
115	60	**5264C05H01**
230	60	**5264C05H02**
460	60	**5264C05H03**
575	60	**5264C05H04**

① When replacing solenoid assembly series 416C160 use adapter plate style 9917D02H01 — 1 required.

② These styles replace coil style 296B892G__. When ordering new style as replacement, customer must order adapter plate 9917D02H01, Quantity 1 required.

17

AC Starters, Contactors A200, A201

Table 17-14. AC Contactors Model J Sizes 00, 0, 1, 2 Kits ①

Part	Poles	Size 00	Size 0	Size 1	Size 2
		Style Number	Style Number	Style Number	Style Number
Contact Kit	2 3 4 5	373B331G17 373B331G18 373B331G18 373B331G19	373B331G02 373B331G04 373B331G04 373B331G05	373B331G07 373B331G09 373B331G09 373B331G10	373B331G11 373B331G12 373B331G13 ③
Arc Box ②	2, 3, 4 5	6714C74G01 6714C74G04	6714C74G02 6714C74G05	6714C74G03 6714C74G06	6714C74G07 ④ 6714C74G08 ⑤
Cross Bar	2, 3 4, 5	N/A N/A	N/A N/A	N/A N/A	672B788G32 672B788G34
Upper Base (for single rated coils only)	2, 3 4, 5	N/A N/A	N/A N/A	N/A N/A	672B788G33 672B788G35
Lower Base	2, 3 4, 5	N/A N/A	N/A N/A	N/A N/A	1250C33G09 1250C33G05
KO Spring (Pk of 10)	All	N/A	N/A	N/A	503C796G01
Terminal Line/Load (Pk of 3)	All	N/A	N/A	N/A	371B870G03

① Model C contact tips and coils 00-4, 2-, 3-, 4- and 5-pole contactors are same as Model J. All other parts are unavailable.
② Mounting hardware included.
③ Use one each of 373B331G11 and 373B331G12.
④ 2-, 3-pole.
⑤ 4-, 5-pole.

Table 17-15. AC Coils

Voltage	Hz	Size 00, 0, 1		Size 2	
		2-, 3-, 4-Pole	5-Pole	2-, 3-Pole	4-, 5-Pole
		Style Number	Style Number	Style Number	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

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.

Table 17-16. DC Coil ⑨

Voltage	Size 0, 1	Size 2
	1, 2, 3, 4 Pole	1, 2, 3 Pole
	Style Number	
12	1268C86G07	
24	1268C86G04	
48	1268C86G05	
125	1268C86G02	
250	1268C86G01	
125/250 ⑧	1268C86G03	

⑧ Dual Voltage Coils. Use only on contactors or starters originally supplied with a dual voltage coil.
⑨ 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.

Table 17-17. AC-DC Coil Conversion Kits

Voltage	Size 5	Size 6
	Style Number	Style Number
120V AC	7864A28G01	7864A29G01
240V AC	7864A28G02	7864A29G02
480V AC	7864A28G03	7864A29G03

Table 17-18. Replacement Coils for Above

Voltage	Size 5	Size 6
	Style Number	Style Number
120V AC	7856A15G05	7856A16G05
240V AC	7856A15G10	7856A16G10
480V AC	7856A15G15	7856A16G15

AC Starters, Contactors A200, A201 (Continued)

Accessories for Size 5 – 9 AC Contactors

Table 17-19. 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

Table 17-20. Auxiliary Electrical Interlocks

Catalog Number (Obsolete)	Style Number (Obsolete)	Circuits	Catalog Number Current	Style Number Current
(L-56)	(2609D01G01)	1NO & 1NC 2NO	**J11**	**9084A17G01**
(L-56D)	(2609D01G02)	1NO & 1NC	**J20**	**9084A17G02**
(L-56E)	(2609D01G03)	2NO 2NO	**J11**	**9084A17G01**
(L-56B)	(2609D01G04)		**J20**	**9084A17G02**
(L-56H)	(2609D01G05)		**J20**	**9084A17G02**
(L-56J)	(2609D01G06)	1NO & 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 & 1NC DB	**J1C**	**9084A17G04**
(L-56C)	(2609D01G11)	2NC	**J02**	**9084A17G03**
(L-56M)	(2609D01G12)	N/A	**N/A**	**N/A**
(L-56P)	(2609D01G17)	1NO & 1NC 2NC	**J11**	**9084A17G01**
(L-56R)	(2609D01G18)	1NO & 1NC	**J02**	**9084A17G03**
(L-56S)	(2609D01G19)		**J11**	**9084A17G01**

17

Model J – K, Sizes 3 and 4

Table 17-21. Model J – K Series 3, 4 Kits ①

Part	Poles	Size 3 – Model J	Size 4 – Model J ③	Size 4 – Model K ②
		Style Number	Style Number	Style Number
Contact Kit	2 3 4 5	**626B187G12** **626B187G13** ④ ⑤	**626B187G16** **626B187G17** ⑥ ⑦	**5250C81G16** **5250C81G17** **5250C81G18** **5250C81G19**
Arc Box	2, 3 4, 5	**6714C74G09** **6714C74G10**	**6714C74G11** **6714C74G12**	**6714C74G11** **6714C74G12**
Cross Bar	2, 3 4, 5	**672B788G36** **672B788G38**	**672B788G36** **672B788G38**	**672B788G40**
Upper Base	2, 3 4, 5	**672B788G37** **672B788G39**	**672B788G37** **672B788G39**	**672B788G52**
Lower Base	2, 3 4, 5	**1250C33G03** **1250C33G06**	**1250C33G03** **1250C33G06**	**1250C33G10**
KO Spring (Pk of 10)	All	**503C796G02**	**503C796G02**	**672B788G50**
Terminal Line/Load (Pk of 3)	All	**372B357G12**	**372B357G18**	**372B357G18**

① Model C contact tips and coils 00-4, 2-, 3-, 4- and 5-pole contactors are same as model J. All other parts are unavailable.
② Model K replaces Model J, offering superior design life characteristics. Renewal parts are different. Use parts for proper model only.
③ For 200 Amp A202 Magnetically Latched Lighting Contactors order 3-pole contact kit style 672B788G07.
④ Use Qty. 2 of 626B187G12.
⑤ Use Qty. 1 each of 626B187G12 and 626B187G13.
⑥ Use Qty. 2 of 626B187G16.
⑦ Use Qty. 1 each of 626B187G16 and 626B187G17.

AC Starters, Contactors A200, A201 (Continued)

Accessories for Model J – K, Series 3, 4

Table 17-22. DC Coils ①

Voltage	Model J Size 3, 4
	2-, 3-Pole
	Style Number
24	1255C68G04
48	1255C68G05
125	1255C68G01
250	1255C68G02
125/250 ②	1255C68G03

① Use only on units originally supplied with DC coil.
② Dual Voltage Coils. Use only on contactors or starters originally supplied with dual voltage coil.

Table 17-23. AC Coils

Voltage	Hz	Model J Size 3, 4		Model K Size 4 ③	
		2-, 3-Pole	4-, 5-Pole	2-, 3-Pole	4-, 5-Pole
		Style Number	Style Number	Style Number	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 ④	60/60	505C633G03	505C635G03	5250C79G03	5250C80G03
120/244 ④	60/60	505C633G10	505C635G10	5250C79G10	5250C80G10

③ Model K replaces Model J, offering superior design life characteristics. Renewal parts are different. Use parts for proper model only.
④ Dual Voltage Coils. Use only on contactors or starters originally supplied with dual voltage coil.

A201 Contactors — Size 5 – 9

Table 17-24. GCA 530/630 — GPD 7, 8, 9 Kits ⑤

Part	Size 5	Size 6	Size 7	Size 8	Size 9
	Style Number	Style Number	Style Number	Style Number	Style Number
Contact Kit (1 per pole)	477B477G05 ⑥	2066A10G11	461A757G17	646C829G05	5264C42G01 ⑨ 5264C42G02 ⑩
Arc Box	2050A15G45	2066A10G45	831D580G01	831D580G01	9917D69G02
Magnet Assy.	2050A15G46	2050A15G46	N/A	N/A	N/A
Mag. Spg. 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 ⑨
Cross Bar	2050A15G12	2066A10G15	N/A	N/A	N/A
Shunt	N/A	2066A10G48	650C129G01	646C831G02 ⑧	5264C39G02 ⑪

⑤ Catalog Number A201/A200 Series replaces GCA/GPD series. Renewal parts are the same.
⑥ Use 477B477G06 for Silver Tungsten applications.
⑦ C.T. kit which replaces the single molded 1 CT 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 3.
⑨ R.C.
⑩ F.C.
⑪ Set of 4.

17

Accessories for A201 Contactors — Size 5 – 9

Table 17-25. Coils

Voltage	Hz	Size 5	Size 6
		Style Number	Style Number
Sizes 5 and 6			
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**

Line Voltage	Size 7, 8	Required
	Style Number	
Sizes 7 and 8		
125V DC	**438C805G04**	2
230V DC	**438C805G02**	2
250V DC	**438C805G03**	2
110/120V AC ① ④	**438C805G12**	2
220/240V AC ② ④	**438C805G11**	2
380V AC ③ ④	**438C805G15**	2
440/480V AC ③ ④	**438C805G10**	2
550/575V AC ③ ④	**438C805G13**	2

Line Voltage	Size 9
	Style Number
Size 9	
110V DC	**5264C34G01** ⑤

① Rectifier 125V 2018A40G01 (1 required).
② Rectifier 250V 2018A40G02 (1 required).
③ Rectifier 600V 2018A40G03 (1 required).
④ These coils require an external rectifier. If the rectifier needs replacement, order by the appropriate style number.
⑤ Contains coil and resistor.

17

Coils and Kits

Table 17-26. Replacement Coils

Voltage	Coil Suffix	Catalog Number
Frame C		
110/50 120/60	**A**	**XTCERENCOILCA**
110 – 130V DC	**AD**	**XTCERENCOILCAD**
220/50 240/60	**B**	**XTCERENCOILCB**
200 – 240V DC	**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 – 14V DC	**RD**	**XTCERENCOILCRD**
24/50 24/60	**T**	**XTCERENCOILCT**
24 – 27V DC	**TD**	**XTCERENCOILCTD**
24/50	**U**	**XTCERENCOILCU**
42/50 48/60	**W**	**XTCERENCOILCW**
48 – 60V DC	**WD**	**XTCERENCOILCWD**
48/50	**Y**	**XTCERENCOILCY**
Frame D		
110/50 120/60	**A**	**XTCERENCOILDA**
110 – 130V DC	**AD**	**XTCERENCOILDAD**
220/50 240/60	**B**	**XTCERENCOILDB**
200 – 240V DC	**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**	**XTCERENCOILDP**
12/50 12/60	**R**	**XTCERENCOILDR**
12 – 14V DC	**RD**	**XTCERENCOILDRD**
24/50 24/60	**T**	**XTCERENCOILDT**
24 – 27V DC	**TD**	**XTCERENCOILDTD**
24/50	**U**	**XTCERENCOILDU**
42/50 48/60	**W**	**XTCERENCOILDW**
48 – 60V DC	**WD**	**XTCERENCOILDWD**
48/50	**Y**	**XTCERENCOILDY**
Frame F ①		
110/50 120/60	**A**	**XTCERENCOILFA**
110 – 130V DC	**AD**	**XTCERENCOILFAD**
220/50 240/60	**B**	**XTCERENCOILFB**
200 – 240V DC	**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 – 27V DC	**TD**	**XTCERENCOILFTD**
24/50	**U**	**XTCERENCOILFU**
42/50 48/60	**W**	**XTCERENCOILFW**
48 – 60V DC	**WD**	**XTCERENCOILFWD**
48/50	**Y**	**XTCERENCOILFY**

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.

Voltage	Coil Suffix	Catalog Number
Frame G ③		
100 – 120V 50/60	**A**	**XTCERENCOILGA**
110 – 130V DC	**AD**	**XTCERENCOILGAD**
190 – 240V 50/60	**B**	**XTCERENCOILGB**
200 – 240V DC	**BD**	**XTCERENCOILGBD**
480 – 500V 50/60	**C**	**XTCERENCOILGC**
380 – 440V 50/60	**L**	**XTCERENCOILGL**
24/50 24/60	**T**	**XTCERENCOILGT**
24 – 27V DC	**TD**	**XTCERENCOILGTD**
42 – 48V 50/60	**W**	**XTCERENCOILGW**
48 – 60V DC	**WD**	**XTCERENCOILGWD**
Frame L ②		
110 – 250V AC/DC	**A**	**XTCERENCOILLA**
250 – 500V 40 – 60	**C**	**XTCERENCOILLC**
24 – 48V DC	**TD**	**XTCERENCOILLTD**
48 – 110V AC/DC	**Y**	**XTCERENCOILLY**
Frame M ②		
110 – 250V AC/DC	**A**	**XTCERENCOILMA**
250 – 500V 40 – 60	**C**	**XTCERENCOILMC**
24 – 48V DC	**TD**	**XTCERENCOILMTD**
48 – 110V AC/DC	**Y**	**XTCERENCOILMY**
Frame N ②		
110 – 250V AC/DC	**A**	**XTCERENCOILNA**
250 – 500V 40 – 60	**C**	**XTCERENCOILNC**
48 – 110V AC/DC	**Y**	**XTCERENCOILNY**

② Electronic modules including coils.

③ Frame G replacement coils can only be used with contactors having date codes of 2706 or later.

Table 17-27. Replacement Contact Kits

For Use with…	Catalog Number
XTCE040D – XTCE065D	**XTCERENCONTACTD**
XTCE185L – XTCE250L	**XTCERENCONTACTL**
XTCE300M – XTCE500M	**XTCERENCONTACTM**
XTCE085F – XTCE095F	**XTCERENCONTACTF**
XTCE115G – XTCE150G	**XTCERENCONTACTG**

Table 17-28. Replacement Vacuum Tube Assembly

For Use with…	Catalog Number
XTCE580N	**XTCERENVACT580**
XTCE650N	**XTCERENVACT650**
XTCE750N	**XTCERENVACT750**
XTCE820N	**XTCERENVACT820**

Table 17-29. Replacement Arc Chambers

For Use with…	Catalog Number
XTCE185L	**XTCERENARC185**
XTCE225L	**XTCERENARC225**
XTCE250L	**XTCERENARC250**
XTCE300M	**XTCERENARC300**
XTCE400M	**XTCERENARC400**
XTCE500M	**XTCERENARC500**

IEC Contact Block

Table 17-30. IEC Contact Block

Frame	Amperes	Catalog Number
B-Frame 45 mm	18	**E04NB18X3N**
	25	**E04NB25X3N**
	32	**E04NB32X3N**
C-Frame 54 mm	40	**E04NC40X3N**
	50	**E04NC50X3N**
D-Frame 76 mm	65	**E04ND65X3N**
	85	**E04ND85X3N**
	100	**E04ND10X3N**
E-Frame 105 mm	125	**E04NE12X3N**
	160	**E04NE16X3N**
	200	**E04NE20X3N**

IEC Coil Controller

B Frame
Non-reversing
(pictured)

Table 17-31. IEC Coil Controller

Frame	Catalog Number
Non-reversing	
B-Frame — 45 mm	**E02NBXCXNN**
C-Frame — 54 mm	**E02NCXCXNN**
D-Frame — 76 mm	**E02NDXCXNN**
E-Frame — 105 mm	**E02NEXCXNN**
F-Frame — 140 mm	**EMUCCF**
Reversing	
B-Frame — 45 mm	**E03NBXCXNN**
C-Frame — 54 mm	**E03NCXCXNN**
D-Frame — 76 mm	**E03NDXCXNN**
E-Frame — 105 mm	**E03NEXCXNN**
F-Frame — 140 mm	**EMUCCF**

Coils

Table 17-32. 24V DC Coils

Description	Catalog Number
B-Frame Coil	**EMCB**
C-Frame Coil	**EMCC**
D-Frame Coil	**EMCD**
E-Frame Coil	**EMCE**
F-Frame Coil	**EMCF**

IEC Solid-State Overload Relay

Table 17-33. IEC Solid-State Overload Relay

Frame	Overload Adjustment Range (Amperes)	Catalog Number
Non-reversing		
A-Frame 27 mm	.25 – .8	**E05NAXRA3A**
	.59 – 1.9	**E05NAXRB3A**
	1.4 – 4.4	**E05NAXRC3A**
	2.8 – 9.0	**E05NAXRD3A**
	3.8 – 12	**E05NAXRE3A**
B-Frame 45 mm	.25 – .8	**E05NBXRA3A**
	.59 – 1.9	**E05NBXRB3A**
	1.4 – 4.4	**E05NBXRC3A**
	2.8 – 9.0	**E05NBXRD3A**
	6.3 – 20	**E05NBXRG3A**
	10 – 32	**E05NBXRJ3A**
C-Frame 54 mm	.25 – .8	**E05NCXRA3A**
	.59 – 1.9	**E05NCXRB3A**
	1.4 – 4.4	**E05NCXRC3A**
	2.8 – 9.0	**E05NCXRD3A**
	5.0 – 16	**E05NCXRF3A**
	8.4 – 27	**E05NCXRH3A**
	16 – 50	**E05NCXRL3A**
D-Frame 76 mm	5.0 – 16	**E05NDXRF3A**
	8.4 – 27	**E05NDXRH3A**
	14 – 45	**E05NDXRK3A**
	31 – 100	**E05NDXRN3A**
E-Frame 105 mm	14 – 45	**E05NEXRK3A**
	28 – 90	**E05NEXRM3A**
	42 – 135	**E05NEXRP3A**
	63 – 200	**E05NEXRR3A**
F-Frame 140 mm	42 – 135	**E05NFXRP3A**
	84 – 270	**E05NFXRS3A**
	131 – 420	**E05NFXRT3A**
Reversing		
B-Frame 45 mm	.25 – .8	**E06NBXRA3A**
	.59 – 1.9	**E06NBXRB3A**
	1.4 – 4.4	**E06NBXRC3A**
	2.8 – 9.0	**E06NBXRD3A**
	6.3 – 20	**E06NBXRG3A**
	10 – 32	**E06NBXRJ3A**
C-Frame 54 mm	.25 – .8	**E06NCXRA3A**
	.59 – 1.9	**E06NCXRB3A**
	1.4 – 4.4	**E06NCXRC3A**
	2.8 – 9.0	**E06NCXRD3A**
	5.0 – 16	**E06NCXRF3A**
	8.4 – 27	**E06NCXRH3A**
	16 – 50	**E06NCXRL3A**
D-Frame 76 mm	5.0 – 16	**E06NDXRF3A**
	8.4 – 27	**E06NDXRH3A**
	14 – 45	**E06NDXRK3A**
	31 – 100	**E06NDXRN3A**
E-Frame 105 mm	14 – 45	**E06NEXRK3A**
	28 – 90	**E06NEXRM3A**
	42 – 135	**E06NEXRP3A**
	63 – 200	**E06NEXRR3A**

Contact Kits

Table 17-34. IEC Contact Kits

Frame Size	Description	Catalog Number
C	3-Pole, 40A	**EMCKT40** ①
	3-Pole, 50A	**EMCKT50** ①
D	3-Pole, 65A	**EMCKT65** ①
	3-Pole, 85A	**EMCKT85** ①
	3-Pole, 100A	**EMCKT100** ①
E	3-Pole, 125A 3-Pole, 160A 3-Pole, 200A	**EMCKT125** **EMCKT160** **EMCKT200**
F	3-Pole, 250A 3-Pole, 315A 3-Pole, 420A	**EMCKT250** **EMCKT315** **EMCKT420**

① Includes set of Hold Open and Non-hold Open movable contacts.

24V DC Coils

Table 17-35. 24V DC Coils

	Frame Size	Catalog Number
	B	**EMCB**
	C	**EMCC**
	D	**EMCD**
	E	**EMCE**
	F	**EMCF**

Fanning Strips

Table 17-36. Reversing Fanning Strips

IEC Frame	Description	Catalog Number
A-Frame	Line and Load Side, Wire Sets	**EMFRA**
B-Frame	Line Side Load side	**EMFRLB** **EMFRTB**
C-Frame	Line Side Load side	**EMFRLC** **EMFRTC**
D-Frame	Line Side Load side	**EMFRLD** **EMFRTD**
E-Frame	Line Side Load side	**EMFRLE** **EMFRTE**
F-Frame	Line Side Bus Bar Set Load side Bus Bar Set	**EMFRLF** **EMFRTF**

Lug Kits and Reversing Kits

For Lug Kits and Reversing Kits, see Accessories, **Page 16-3**.

Connectors

Table 17-37. Control Terminal Connectors

No. of Pins	Pitch (mm)	Description	Catalog Number ②
4 8 5	5 5 5	Frames A – C, Locking Frames A – F, Locking Frame F, Locking	**EMA78L** **EMA76L** **EMA77L**
4 5	5 5	Frame A Frame A	**EMA78** **EMA77**
5	5	Frame F, Locking	**EMA77LR**
6 6	3.5 3.5	Frame A Frame A, Locking	**EMA81** **EMA81L**
—	—	Reversing Wiring Harness, Frame F	**EMA80L**

② Suffix L indicates locking.

Mechanical Interlock

Table 17-38. IEC Mechanical Interlock

Frame ③	Catalog Number
B – E F ④	**EMMB** **C321KM50**

③ The A-Frame 27 mm does not have a separate mechanical interlock due to its embedded design and board requirements.

④ The F-Frame 140 mm uses the Freedom Series Mechanical Interlock.

Reversing Interface

Table 17-39. IEC 2-Wire Reversing Interface

Description	Catalog Number
8-pin for 45 – 140 mm (IEC 6A – 420A, NEMA Size 00 – 5) Reversing Starters	**EMA2WR8**
8-pin for 45 – 105 mm (IEC 18A – 200A, NEMA Size 00 – 4) Reversing Contactors	
5-pin for 27 mm (IEC 6A – 12A) or 140 mm (IEC 250A – 420A, NEMA Size 5) Reversing Contactors	**EMA2WR5**

17

IEC Frames A – F

Table 17-40. IEC Frames A – F — See Contactor/Starter Nameplate to Determine Series A1, B1 or C1.

Description		IEC Frames A – F	IEC Frames A – C ①		IEC Frames D – F ①	
		Series A1	Series B1	Series C1	Series B1	Series C1
		Part Number	Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		None	None	None	None	None
Contact Kits						
2-Pole		②	②	②	②	②
3-Pole		②	②	②	②	②
4-Pole		②	②	②	②	②
5-Pole		②	②	②	②	②
Magnet Coils	**Coil Suffix**					
120V 60 Hz or 110V 50 Hz	**A**	**9-2650-1**	**9-2875-1**	**9-2875-1**	**9-2876-1**	**9-2876-1**
240V 60 Hz or 220V 50 Hz	**B**	**9-2650-2**	**9-2875-2**	**9-2875-2**	**9-2876-2**	**9-2876-2**
480V 60 Hz or 440V 50 Hz	**C**	**9-2650-3**	**9-2875-3**	**9-2875-3**	**9-2876-3**	**9-2876-3**
600V 60 Hz or 550V 50 Hz	**D**	**9-2650-4**	**9-2875-4**	**9-2875-4**	**9-2876-4**	**9-2876-4**
208V 60 Hz	**E**	**9-2650-5**	**9-2875-5**	**9-2875-5**	**9-2876-5**	**9-2876-5**
277V 60 Hz	**H**	**9-2650-13**	**9-2875-12**	**9-2875-12**	**9-2876-12**	**9-2876-12**
208/240V 60 Hz	**J**	**—**	**9-2875-37**	**9-2875-37**	**9-2876-37**	**9-2876-37**
240V 50 Hz	**K**	**9-2650-12**	**9-2875-11**	**9-2875-11**	**9-2876-11**	**9-2876-11**
380 – 415V 50 Hz	**L**	**9-2650-6**	**9-2875-6**	**9-2875-6**	**9-2876-6**	**9-2876-6**
24V 60 Hz – 24V 50 Hz	**T**	**—**	**9-2875-36**	**9-2875-36**	**9-2876-36**	**9-2876-36**
24V 60 Hz	**T**	**9-2650-7**	**—**	**—**	**—**	**—**
24V 50 Hz	**U**	**9-2650-14**	**9-2875-13**	**9-2875-13**	**9-2876-13**	**9-2876-13**
32V 50 Hz	**V**	**9-2650-9**	**9-2875-16**	**9-2875-16**	**9-2876-16**	**9-2876-16**
48V 60 Hz	**W**	**9-2650-8**	**9-2875-8**	**9-2875-8**	**9-2876-8**	**9-2876-8**
48V 50 Hz	**Y**	**9-2650-10**	**9-2875-9**	**9-2875-9**	**9-2876-9**	**9-2876-9**
Overload Relays						
For Replacement on Existing Starters: 3-Pole — Ambient Compensated Bimetallic		**C306DN3B**	**C306DN3B**	**C306DN3B**	**C306DN3B**	**C306DN3B**
Current Transformer						
Transformer		**—**	**—**	**—**	**—**	**—**
Magnet Frame Armature						
Lower Magnet Frame		②	②	②	②	②
Upper Magnet Frame		②	②	②	②	②

① Non-encapsulated coils.
② Replace with complete contactor.

IEC Frames G, H and J

Table 17-41. IEC Frames G, H and J — See Contactor/Starter Nameplate to Determine Series A1 and B1.

Description		IEC Frame G		IEC Frame H		IEC Frame J	
		Series A1	Series B1	Series A1	Series B1	Series A1	Series B1
		Part Number	Part Number	Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		**20862**	**22178**	**20862**	**22178**	**20862**	**22178**
Contact Kits							
2-Pole		**6-65-3**	**6-65-3**	**6-65-5**	**6-65-5**	**6-65-7**	**6-65-7**
3-Pole		**6-65-4**	**6-65-4**	**6-65-6**	**6-65-6**	**6-65-8**	**6-65-8**
4-Pole		**6-65-11**	**6-65-11**	**6-65-13**	**6-65-13**	**6-65-15**	**6-65-15**
5-Pole		**6-65-12**	**6-65-12**	**6-65-14**	**6-65-14**	**6-65-16**	**6-65-16**
Magnet Coils	**Coil Suffix**						
120V 60 Hz or 110V 50 Hz	**A**	**9-2703-1**	**9-2703-1**	**9-2703-1**	**9-2703-1**	**9-2703-1**	**9-2703-1**
240V 60 Hz or 220V 50 Hz	**B**	**9-2703-2**	**9-2703-2**	**9-2703-2**	**9-2703-2**	**9-2703-2**	**9-2703-2**
480V 60 Hz or 440V 50 Hz	**C**	**9-2703-3**	**9-2703-3**	**9-2703-3**	**9-2703-3**	**9-2703-3**	**9-2703-3**
600V 60 Hz or 550V 50 Hz	**D**	**9-2703-4**	**9-2703-4**	**9-2703-4**	**9-2703-4**	**9-2703-4**	**9-2703-4**
208V 60 Hz	**E**	**9-2703-9**	**9-2703-9**	**9-2703-9**	**9-2703-9**	**9-2703-9**	**9-2703-9**
277V 60 Hz	**H**	**9-2703-7**	**9-2703-7**	**9-2703-7**	**9-2703-7**	**9-2703-7**	**9-2703-7**
240V 50 Hz	**K**	**9-2703-14**	**9-2703-14**	**9-2703-14**	**9-2703-14**	**9-2703-14**	**9-2703-14**
380 – 415V 50 Hz	**L**	**9-2703-8**	**9-2703-8**	**9-2703-8**	**9-2703-8**	**9-2703-8**	**9-2703-8**
24V 60 Hz – 24V 50 Hz	**T**	**—**	**—**	**—**	**—**	**—**	**—**
24V 60 Hz	**T**	**9-2703-6**	**9-2703-6**	**9-2703-6**	**9-2703-6**	**9-2703-6**	**9-2703-6**
24V 50 Hz	**U**	**9-2703-12**	**9-2703-12**	**9-2703-12**	**9-2703-12**	**9-2703-12**	**9-2703-12**
32V 50 Hz	**V**	**9-2703-10**	**9-2703-10**	**9-2703-10**	**9-2703-10**	**9-2703-10**	**9-2703-10**
48V 60 Hz	**W**	**9-2703-11**	**9-2703-11**	**9-2703-11**	**9-2703-11**	**9-2703-11**	**9-2703-11**
48V 50 Hz	**Y**	**9-2703-13**	**9-2703-13**	**9-2703-13**	**9-2703-13**	**9-2703-13**	**9-2703-13**
Overload Relays							
For Replacement on Existing Starters: 3-Pole — Ambient Compensated Bimetallic		**C306DN3B**	**C306DN3B**	**C306DN3B**	**C306DN3B**	**C306GN3B**	**C306GN3B**
Current Transformer							
Transformer		**—**	**—**	**—**	**—**	**—**	**—**
Magnet Frame Armature							
Lower Magnet Frame		**17-18200**	**17-18200**	**17-18200**	**17-18200**	**17-18200**	**17-18200**
Upper Magnet Frame		**48-1936**	**48-1936**	**48-1936**	**48-1936**	**48-1936**	**48-1936**

IEC Frames K, L, M and N

Table 17-42. IEC Frames K, L, M and N

Description		IEC Frame K		IEC Frame L	IEC Frame M	IEC Frame N
		Series A1	Series B1			
		Part Number	Part Number	Part Number	Part Number	Part Number
Renewal Parts Publication Number		**20862**	**22178**	**20427**	**20427**	**20427**
Contact Kits						
2-Pole		**6-65-18**	**6-65-18**	**6-43-3**	**6-43**	**6-43-5**
3-Pole		**6-65-17**	**6-65-17**	**6-43-4**	**6-43-2**	**6-43-6**
4-Pole		—	—	—	—	—
5-Pole		—	—	—	—	—
Magnet Coils	**Coil Suffix**					
120V 60 Hz or 110V 50 Hz	**A**	**9-2703-1**	**9-2703-1**	**9-2756-1**	**9-2756-1**	**9-2756-1**
240V 60 Hz or 220V 50 Hz	**B**	**9-2703-2**	**9-2703-2**	**9-2756-2**	**9-2756-2**	**9-2756-2**
480V 60 Hz or 440V 50 Hz	**C**	**9-2703-3**	**9-2703-3**	**9-2756-3**	**9-2756-3**	**9-2756-3**
600V 60 Hz or 550V 50 Hz	**D**	**9-2703-4**	**9-2703-4**	**9-2756-4**	**9-2756-4**	**9-2756-4**
208V 60 Hz	**E**	**9-2703-9**	**9-2703-9**	**9-2756-5**	**9-2756-5**	**9-2756-5**
277V 60 Hz	**H**	**9-2703-7**	**9-2703-7**	**9-2756-9**	**9-2756-9**	**9-2756-9**
240V 50 Hz	**K**	**9-2703-14**	**9-2703-14**	**9-2756-13**	**9-2756-13**	**9-2756-13**
380 – 415V 50 Hz	**L**	**9-2703-8**	**9-2703-8**	**—**	**—**	**—**
380V 50 Hz	**L**	**—**	**—**	**9-2756-12**	**9-2756-12**	**9-2756-12**
415V 50 Hz	**M**	**—**	**—**	**9-2756-8**	**9-2756-8**	**9-2756-8**
550V 50 Hz	**N**	**—**	**—**	**9-2756-14**	**9-2756-14**	**9-2756-14**
24V 60 Hz – 24V 50 Hz	**T**	**—**	**—**	**—**	**—**	**—**
24V 60 Hz	**T**	**9-2703-6**	**9-2703-6**	**9-2756-6**	**9-2756-6**	**9-2756-6**
24V 50 Hz	**U**	**9-2703-12**	**9-2703-12**	**9-2756-11**	**9-2756-11**	**9-2756-11**
32V 50 Hz	**V**	**9-2703-10**	**9-2703-10**	**9-2756-10**	**9-2756-10**	**9-2756-10**
48V 60 Hz	**W**	**9-2703-11**	**9-2703-11**	**9-2756-15**	**9-2756-15**	**9-2756-15**
48V 50 Hz	**Y**	**9-2703-13**	**9-2703-13**	**9-2756-7**	**9-2756-7**	**9-2756-7**
Overload Relays						
For Replacement on Existing Starters 3-Pole — Ambient Compensated Bimetallic		**C306GN3B**	**C306GN3B**	**10-6530**	**10-6530-2**	**10-6530-3**
Current Transformer						
Transformer		**—**	**—**	**—**	**—**	**—**
Magnet Frame Armature						
Lower Magnet Frame		**17-18200**	**17-18200**	**17-8955-2**	**17-8955-2**	**17-8955-2**
Upper Magnet Frame		**48-1936**	**48-1936**	**48-1902**	**48-1902**	**48-1902**

IEC Frames P, R, S, T, U and V

Table 17-43. IEC Frames P, R and S

Description		IEC Frame P	IEC Frame R	IEC Frame S
		Part Number	Part Number	Part Number
Renewal Parts Publication Number		22278	22278	22278
Contact Kits	Size	6-294	6-288	6-286
Magnet Coils	Coil Suffix			
120V 60 Hz or 110V 50 Hz	A	9-1891-1	9-1891-1	9-1891-1
200V 50 Hz or 118V 60 Hz	E	—	—	—
240V 60 Hz or 220V 50 Hz	B	9-1891-2	9-1891-2	9-1891-2
254V 50 Hz or 277V 60 Hz	H	—	—	—
380V 50 Hz or 415V 60 Hz	L	—	—	—
480V 60 Hz or 440V 50 Hz	C	9-1891-3	9-1891-3	9-1891-3
600V 60 Hz or 550V 50 Hz	D	9-1891-4	9-1891-4	9-1891-4
208V 60 Hz	E	9-1891-13	9-1891-13	9-1891-13
277V 60 Hz	H	9-1891-26	9-1891-26	9-1891-26
240V 50 Hz	K	9-1891-20	9-1891-20	9-1891-20
380V 50 Hz	L	9-1891-14	9-1891-14	9-1891-14
415V 50 Hz	M	9-1891-21	9-1891-21	9-1891-21
24V 60 Hz	T	9-1891-15	9-1891-15	9-1891-15
Overload Relays				
Reference C316 Overload Relays				
Magnet Frame Armature				
Lower Magnet Frame		48-1030-2	48-1030-2	48-1030-2
Upper Magnet Frame		48-1029-4	48-1029-4	48-1029-4

Table 17-44. IEC Frames T, U and V

Description		IEC Frame T	IEC Frame U	IEC Frame V
		Part Number	Part Number	Part Number
Renewal Parts Publication Number		22275	22276	22586
Contact Kits	Size	6-621	6-622	6-601
Magnet Coils	Coil Suffix			
120V 60 Hz or 110V 50 Hz	A	9-3006	9-3006	9-2698
200V 50 Hz or 118V 60 Hz	E	9-3006-5	9-3006-5	—
240V 60 Hz or 220V 50 Hz	B	9-3006-2	9-3006-2	9-2698-2
254V 50 Hz or 277V 60 Hz	H	9-3006-6	9-3006-6	9-2698-2
380V 50 Hz or 415V 60 Hz	L	9-3006-7	9-3006-7	9-2698-6
480V 60 Hz or 440V 50 Hz	C	9-3006-3	9-3006-3	9-2698-3
600V 60 Hz or 550V 50 Hz	D	9-3006-4	9-3006-4	9-2698-4
208V 60 Hz	E	—	—	9-2698-5
277V 60 Hz	H	—	—	—
240V 50 Hz	K	—	—	—
380V 50 Hz	L	—	—	—
415V 50 Hz	M	—	—	—
24V 60 Hz	T	—	—	—
Overload Relays				
Reference C316 Overload Relays				
Magnet Frame Armature				
Lower Magnet Frame		—	—	—
Upper Magnet Frame		—	—	—

C30CN Lighting Contactors

Magnet Coils for the Base Contactor

Magnetic Coils

Table 17-45. 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

Table 17-46. Renewal Parts for CN35 Lighting Contactors

Description		10A	20A, 30A	60A	100A	200A	300A
		Series C1	Series C1	Series B1			Series B1
		Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
Contact Kits							
2-Pole		①	①	**6-65-7**	**6-43-5**	**6-44**	**6-45**
3-Pole		①	①	**6-65-8**	**6-43-6**	**6-44-2**	**6-45-2**
4-Pole		①	①	**6-65-15**	**—**	**—**	**—**
5-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**	**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**	**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**	**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**	**9-1891-4**
208V 60 Hz	**E**	**9-2875-5**	**9-2876-5**	**9-2703-9**	**9-2756-5**	**9-1891-13**	**9-1891-13**
277V 60 Hz	**H**	**9-2875-12**	**9-2876-12**	**9-2703-7**	**9-2756-9**	**9-1891-26**	**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**	**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**	**9-1891-14**
415V 50 Hz	**M**	**—**	**—**	**—**	**9-2756-8**	**9-1891-21**	**9-1891-21**
550V 50 Hz	**N**	**—**	**—**	**—**	**9-2756-14**	**9-1891-8**	**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**	**9-1891-15**
24V 50 Hz	**U**	**9-2875-36**	**9-2876-13**	**9-2703-12**	**9-2756-11**	**9-1891-16**	**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**	**9-1891-18**

① Replace with complete contactor.

A202 Lighting Contactors

Table 17-47. AC Coil Renewal Parts for A202 — Magnetically Latched

Voltage	Hz	2-, 3-, 4-Pole	5-Pole
		Part Number	Part Number
30 Ampere			
110/120	50/60	**7874A93G01**	**7874A89G01**
208/240		**7874A93G02**	**7874A89G02**
277		**7874A93G03**	**7874A89G03**
440/480		**7874A93G04**	**7874A89G04**
575		**7874A93G05**	**7874A89G05**
60 Ampere			
		2-, 3-Pole	**4-, 5-Pole**
110/120	50/60	**7874A93G01**	**7874A87G01**
208/240		**7874A93G02**	**7874A87G02**
277		**7874A93G03**	**7874A87G03**
440/480		**7874A93G04**	**7874A87G04**
575		**7874A93G05**	**7874A87G05**
100 and 200 Ampere			
110/120	50/60	**7874A85G01**	**7874A83G01**
208/240		**7874A85G02**	**7874A83G02**
277		**7874A85G03**	**7874A83G03**
440/480		**7874A85G04**	**7874A83G04**
550/575		**7874A85G05**	**7874A83G05**

Table 17-48. Terminals (Line and Load)

2-Pole	3-Pole	4-Pole	5-Pole
Part Number	Part Number	Part Number	Part Number
30 Ampere			
N/A	**N/A**	**N/A**	**N/A**
60 Ampere			
179C755G17	**179C755G16**	**179C755G17** ①	**179C755G16** **179C755G17** ②
100 Ampere			
179C755G19	**179C755G18**	**179C755G19** ①	**179C755G18** **179C755G19** ②
200 Ampere Model K Electrically Held			
179C755G28	**179C755G27**	**179C755G28** ①	**179C755G27** **179C755G28** ②
200 Ampere Model J Magnetically Latched			
179C755G31	**179C755G30**	**179C755G31** ①	**179C755G30** **179C755G31** ②

① Order quantity of two for 4-pole design.
② Group members for the 5-pole terminal represent the combination of the 2- and 3-pole number.

Table 17-49. 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 200 ampere unit. It uses Catalog Number 672B788G07 for the 3-pole device. For other poles, consult Eaton.

Replacement Coils

Table 17-50. Vacuum Contactor — Replacement Coils

Description	Suffix	Part Number
Size 4		
110/120V AC, 50/60 Hz	**J**	**9085A57G01**
220/240V AC, 50/60 Hz	**K**	**9085A57G02**
380/415V AC, 50/60 Hz	**H**	**1D89221G07**
440/480V AC, 50/60 Hz	**U**	**9085A57G03**
Size 5		
110/120V AC, 50/60 Hz	**J**	**7874A09G01** ①
220/240V AC, 50/60 Hz	**K**	**7874A09G04** ②
380/415V AC, 50/60 Hz	**H**	**7874A09G10**
440/480V AC, 50/60 Hz	**U**	**7874A09G05**
Size 6		
110/120V AC, 50/60 Hz	**J**	**7874A24G01** ①
220/240V AC, 50/60 Hz	**K**	**7874A24G02** ②
380/415V AC, 50/60 Hz	**H**	**7874A24G07**
440/480V AC, 50/60 Hz	**U**	**7874A24G03**

① 125V DC can be directly applied to the Size 5 and 6 coil rated for 120V/60 Hz AC (cannot be applied to Size 4).

② 250V DC 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 & Specifications

Contents

Standards and Certifications

UL File Numbers

The Cutler-Hammer® enclosed control products from Eaton's electrical business 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 Cutler-Hammer 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 Cutler-Hammer products:

- QA-1597-X — Product Quality Assurance
- 63-HS385744-PDA — Design Assessment

cUL Label

Listed

The Cutler-Hammer 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 number 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 Cutler-Hammer enclosed control products from Eaton's electrical business. 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 Cutler-Hammer enclosed control, please refer to the Cutler-Hammer Control Products Catalog.

Short Circuit Testing

Interrupting Ratings — All Cutler-Hammer 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.

Sample Specification

NEMA IT. Combination Starter

Furnish as indicated Cutler-Hammer® Class ECT combination starters manufactured by Eaton's electrical business or approved equal. All starters shall be UL listed and conform to the latest NEMA Standards and the National Electric Code.

Table 18-1. Non-reversing

Description	Catalog Number
Disconnect Switch	**ECT16**
Disconnect Switch with Control Power Transformer	**ECT18**
Circuit Breaker (HMCPE/HMCP)	**ECT22**
Circuit Breaker with Control Power Transformer	**ECT24**

Table 18-2. Reversing

Description	Catalog Number
Disconnect Switch	**ECT17**
Circuit Breaker (HMCPE/HMCP)	**ECT23**

General

- All motor starters shall be NEMA Sizes 1 – 5.
- Overload relays shall be solid-state and provide motor protection accuracy to 2%. Phase loss, 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 DIP switches. Optional electrical reset with trip indication is available.
- 24V DC power supplies are available with primary ratings from 480 – 120V AC, and have ratings available from 10 – 160 Watts. Power supplies are equipped with 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 120V AC. 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.

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 inch 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 480V AC.

Technical Data

Table 18-3. Specifications

Description	Size 00, 0	Size 1	Size 2	Size 3, 4	Size 5
Overall Dimensions in Inches (mm) ① — *w* x *h* x *d*					
Non-reversing Contactor	1.8 x 4.4 x 2.4 (45 x 111 x 60)	2.1 x 4.4 x 2.4 (54 x 113 x 60)	3.0 x 5.9 x 3.1 (76 x 150 x 79)	4.1 x 8.0 x 3.5 (105 x 203 x 90)	5.6 x 14.0 x 7.0 (142 x 355 x 178)
Reversing Contactor	3.8 x 5.9 x 2.7 (96 x 149 x 69)	4.5 x 5.9 x 2.6 (114 x 149 x 67)	6.2 x 7.4 x 3.3 (158 x 188 x 84)	8.5 x 9.5 x 3.8 (216 x 242 x 97)	11.7 x 17.2 x 7.0 (296 x 436 x 178)
Non-reversing Starter	1.8 x 5.0 x 2.5 (45 x 127 x 63)	2.1 x 5.4 x 2.5 (54 x 138 x 63)	3.0 x 5.9 x 3.1 (76 x 150 x 79)	4.1 x 8.0 x 3.5 (105 x 203 x 90)	5.7 x 19.4 x 7.0 (145 x 492 x 178)
Reversing Starter	3.8 x 5.9 x 2.7 (96 x 149 x 69)	4.5 x 5.9 x 2.6 (114 x 149 x 67)	6.2 x 7.4 x 3.3 (158 x 188 x 84)	8.5 x 9.5 x 3.8 (216 x 242 x 97)	11.8 x 21.0 x 7.0 (300 x 533 x 178)
Mounting Hole Spacing in Inches (mm) — *w* x *h*					
Non-reversing Contactor	1.33 x 4.0 (33.8 x 101)	1.46 x 4.10 (37 x 104)	.94 x 2.87 (24 x 73)	1.33 x 4.13 (33.8 x 105)	1.75 x 13.0 (44.5 x 330)
Reversing Contactor	3.15 x 5.35 (80 x 136)	3.15 x 5.35 (80 x 136)	5.51 x 6.89 (140 x 175)	7.87 x 9.06 (200 x 230)	7.82 x 13.0 (198.5 x 330)
Non-reversing Starter	1.33 x 4.62 (33.8 x 117.3)	1.46 x 5.04 (37 x 128)	.94 x 2.87 (24 x 73)	1.33 x 4.13 (33.8 x 105)	1.75 x 18.3 (44.5 x 465)
Reversing Starter	3.15 x 5.35 (80 x 136)	3.15 x 5.35 (80 x 136)	5.51 x 6.89 (140 x 175)	7.87 x 9.06 (200 x 230)	7.82 x 18.3 (198.5 x 465)
Mounting Positions					
Panel-Vertical	Yes	Yes	Yes	Yes	Yes
Panel-Horizontal	Yes	Yes	Yes	Yes	Yes
DIN Rail Mountable	Yes ②	Yes ②	Yes ②	No	No
Weights in Lb. (kg)					
Non-reversing Contactor	.7 (.31)	.9 (.42)	2.8 (1.27)	6.7 (3.05)	20.0 (9.1)
Reversing Contactor	1.9 (.86)	2.6 (1.17)	6.9 (3.13)	16.9 (7.67)	48.0 (21.8)
Non-reversing Starter	.9 (.40)	1.2 (.53)	2.9 (1.32)	7.1 (3.20)	27.0 (12.3)
Reversing Starter	2.0 (.90)	2.6 (1.20)	7.1 (3.20)	16.8 (7.60)	55.0 (25.0)
Mechanical Operating Rate ③					
Maximum	3/sec	3/sec	2/sec	2/sec	1/sec
Mechanical Life					
	10,000,000	10,000,000	8,000,000	8,000,000	5,000,000
Humidity ④					
	95% Non-condensing	95% Non-condensing	95% Non-condensing	95% Non-condensing	95% Non-condensing
Insulation Voltage (Ui)					
	690V	690V	690V	690V	690V
Impulse Withstand Voltage (Uimp)					
	6 kV	6 kV	6 kV	6 kV	6 kV

① Auxiliaries add approximately 1.0" (25 mm) to depth for single, 1.2" (30 mm) for dual.
② Non-reversing contactors and starters only.
③ No load condition.
④ Up to 99% humidity depending on application. Consult factory.

Table 18-3. Specifications (Continued)

Description	Size 00, 0	Size 1	Size 2	Size 3, 4	Size 5
Finger Protection					
Front	IP20	IP20	IP20	IP20	IP20
At Terminals	IP10	IP10	IP00	IP00	IP00
At Terminals with max. size wire installed	IP20	IP10	IP10	IP00	IP00
Terminals L1, L2, L3/T1, T2, T3 ①					
1 Wire per Terminal (stranded or solid)	14 – 8 AWG (1.5 – 10 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)	14 – 1 AWG (1.5 – 35 mm^2)	6 – 250 MCM (16 – 120 mm^2)	4 – 750 MCM (25 – 420 mm^2)
2 Wires per Terminal (stranded or solid)	14 – 10 AWG (1.5 – 4 mm^2)	14 – 6 AWG (1.5 – 16 mm^2)	14 – 2 AWG (1.5 – 25 mm^2)	6 – 3/0 AWG (16 – 70 mm^2)	1/0 — 300 MCM (50 — 150 mm^2)
Strip Length	.45" (11 mm)	.5" (12 mm)	.7" (18 mm)	.8" (21 mm)	1.5" (40 mm)
Torque (max.)	20 lb-in (2.2 Nm) for 14 – 10 AWG (1.5 – 6 mm^2); 25 lb-in (2.8 Nm) for 8 AWG (10 mm^2)	35 lb-in (4.0 Nm) for 14 – 10 AWG (1.5 – 6 mm^2); 40 lb-in (4.5 Nm) for 8 AWG (10 mm^2); 45 lb-in (5.0 Nm) for 6 – 4 AWG (16 mm^2)	45 lb-in (5.0 Nm) for Single 14 – 8 AWG (1.5 – 10 mm^2); 100 lb-in (11 Nm) for Single 6 – 1 AWG (16 – 35 mm^2) and Dual Wire Combinations	250 lb-in (28 Nm)	550 lb-in (62 Nm)
Driver	2.5 mm Hex Key	3 mm Hex Key	5/32" (4 mm) Hex Key	5/16" (8 mm) Hex Key	5/16" (8 mm) Hex Key
Operation Performance					
Coil Voltage (nominal)	24V DC	24V DC	24V DC	24V DC	24V DC
Coil Operating Voltage Range (V DC)	20 – 28	20 – 28	20 – 28	20 – 28	20 – 28
Control Terminals					
(- and +) 1 Wire per Terminal	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)
(- and +) 2 Wires per Terminal	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)
(P, F, R, 1, 2, 3) 1 Wire per Terminal	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)
(P, F, R, 1, 2, 3) 2 Wires per Terminal	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)
Torque (max.)	4.5 lb-in (.5 Nm)	4.5 lb-in (.5 Nm)	4.5 lb-in (.5 Nm)	4.5 lb-in (.5 Nm)	4.5 lb-in (.5 Nm)
Strip Length	.25 (7 mm)	.25 (7 mm)	.25 (7 mm)	.25 (7 mm)	.25 (7 mm)
Driver	.13 (3.5 mm) Flat	.13 (3.5 mm) Flat	.13 (3.5 mm) Flat	.13 (3.5 mm) Flat	.13 (3.5 mm) Flat
Temperature ②					
Operating	-40° to +149°F (-40° to +65°C)	-40° to +149°F (-40° to +65°C)	-40° to +149°F (-40° to +65°C)	-40° to +149°F (-40° to +65°C)	-40° to +149°F (-40° to +65°C)
Storage	-58° to +176°F (-50° to +80°C)	-58° to +176°F (-50° to +80°C)	-58° to +176°F (-50° to +80°C)	-58° to +176°F (-50° to +80°C)	-58° to +176°F (-50° to +80°C)
Environmental					
Shock/Vibration	15G/5G	15G/5G	15G/5G	15G/5G	15G/5G ③
Altitude ②	6600 FT (2000M)	6600 FT (2000M)	6600 FT (2000M)	6600 FT (2000M)	6600 FT (2000M)
Pull-In Time (mS) @ 24V					
Excl. Debounce Time	15	15	25	30	70 – 200
Incl. Debounce Time	75	80	88	95	120 – 300
Dropout Time (mS) @ 24V					
Excl. Debounce Time	5	5	12	15	50 – 150
Incl. Debounce Time	65	70	75	80	70 – 250

① Use Class B 75°C copper wire only (or 90°C copper wire sized for 75°C operation per NEC).

② Consult factory for higher ratings.

③ The Non-reversing Starter requires the use of all six mounting screws for the maximum rating.

Note: At other temperatures expressed in °C, for either inrush or sealed, use the 20°C value from the table in the following

$Watts = W_{20} [1.1 – .005(T)]$ and
$Amps = A_{20} [1.1 – .005(T)]$
For example, inrush requirements for a NEMA Size 2 Starter at -25°C would be:
Watts = 130 [1.1 – .005 (-25)] = 160
Amps = 5.4 [1.1 – .005 (-25)] = 6.6

Notes:

- Response time for Control Inputs = Debounce Time
- The time between operating forward and reverse must be greater than the Debounce Time.

Table 18-4. 24V DC Power Supply Requirements @ 68°F (20°C) (see Note at left)

Contactor/Starter Size		Sealed In		Inrush		
Catalog Number ④	NEMA Size	Wattage	Amps	Wattage	Amps	Duration (mS)
N_11B_ _X3N	00, 0	3.7	.15	80	3.3	50
N_01B_ _ _3A	00, 0	3.2	.13	80	3.3	50
N_11C_ _X3N	1	4.2	.18	90	3.8	50
N_01C_ _ _3A	1	3.6	.15	90	3.8	50
N_ _1D_ _ _3_	2	5.0	.21	130	5.4	65
N_ _1E_ _ _3_	3, 4	5.6	.23	140	5.8	85
N_ _1F_ _ _3_	5	12.0	.50	200	8.3	250
N_01F_ _ _3_	5	13.0	.54	200	8.3	250

④ _ indicates missing digit/character of the Catalog Number; may have multiple values.

Electrical Life — AC-1, AC-2, AC-3 and AC-4 Utilization Categories

Table 18-5. Utilization Categories

The International Electrotechnical Commission (IEC) has developed utilization categories for contactors and auxiliary contacts. The IEC utilization categories are used to define the type of electrical load for estimating electrical life, and do not imply the devices are IEC rated.

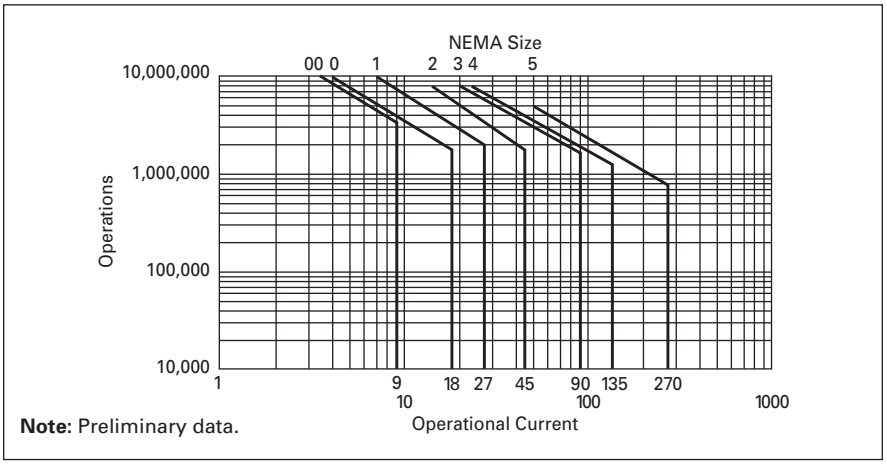
Category	Typical Application
AC-1	Non-inductive or slightly inductive loads: Resistance furnaces, heating.
AC-2	Slip-ring motors: Starting and stopping of running motors
AC-3	Squirrel cage motors: Starting, switching off motors during running (motors in most industrial applications typically fall into this category).
AC-4	Squirrel cage motors: Starting, plugging ①, inching ② (very few applications in industry are totally AC-4).

① Plugging is stopping or reversing the motor rapidly by reversing the connections while the motor is running.
② Inching or jogging is energizing the motor once or repeatedly for short durations to obtain small movements of the motor driven load.

Life Load Curves — Eaton's Cutler-Hammer *IT.* Electro-Mechanical Series NEMA contactors have been designed and manufactured for superior life performance. All testing has been based on requirements as found in IEC 60947-4-1 and conducted by us. When selecting a contactor, the specifier must give attention to the specific load, utilization category and the required electrical life. For a definition of Utilization Categories, see **Table 18-5** above.

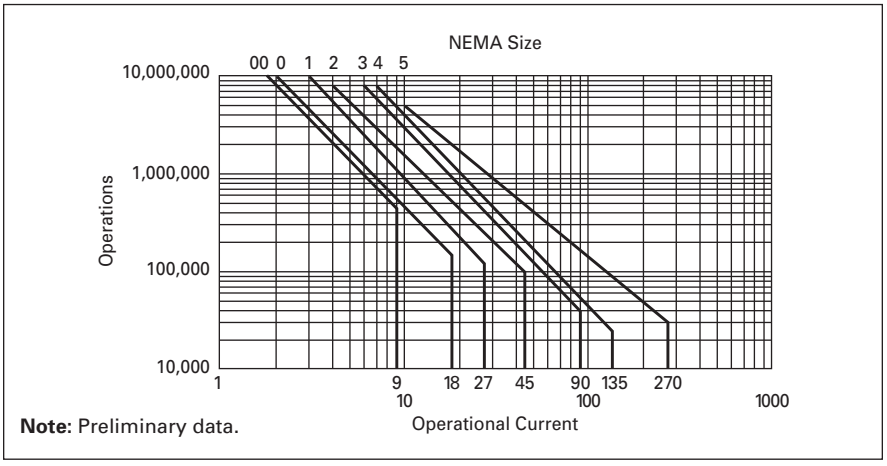
Note: AC-3 tests are conducted at rated device currents and AC-4 tests are conducted at six-times rated device currents. All tests have been run at 460V, 60 Hz.

Actual application life may vary, depending on environmental conditions and application duty cycle.



Note: Preliminary data.

Figure 18-1. Electrical Life — AC-3 Utilization Category



Note: Preliminary data.

Figure 18-2. Electrical Life — AC-4 Utilization Category

Contactor Choice —

- Decide what utilization category the application is and choose the appropriate curve from **Figure 18-1** or **Figure 18-2**.
- Locate the intersection of the life-load curve with the operational current (Ie) of the application, as found on the horizontal axis.
- Read the estimated contact life along the vertical axis in number of operations.

Trip Times

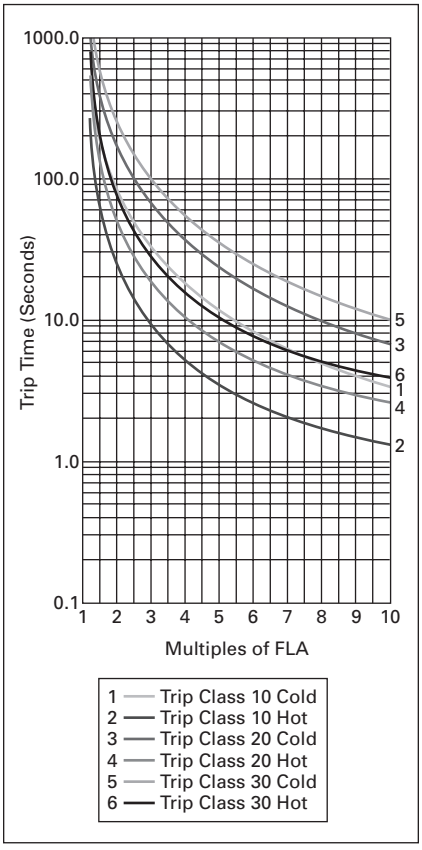


Figure 18-3. Class 10, 20 and 30 Trip Curves

Sample Specification

NEMA Freedom Combination Starters

Furnish as indicated Cutler-Hammer® Class ECN combination starters manufactured by Eaton's electrical business or approved equal. All starters shall be UL listed and conform to the latest Standards and the National Electric Code.

Table 18-6. 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**

Table 18-7. 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 trouble-shooting 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 120V AC. 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 inch 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 480V AC.
- Note specific short-circuit ratings for the ECP Irrigation Pump Panel and the HVAC Panel on **Page 18-2**.

Technical Data

Table 18-8. Coil Data Notes

P.U.	Pick-up time is the average time taken from closing of the coil circuit to main contact touch.
D.O.	Drop-out 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.

All data is based on a standard contactor with no auxiliary devices and a 120V AC or 24V DC magnet coil. Coil data has a ±5% range depending on the application, therefore specific data may vary.

Table 18-9. 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	4th 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	600V AC	600V AC	600V AC	600V AC	600V AC
Continuous Ampere Ratings (I)	9A	18A	27A	45A	90A
Maximum Horsepower (hp)					
1-Phase 115V	1/3	1	2	3	7-1/2
230V	1	2	3	7-1/2	15
3-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					
Pick-Up Volts — Cold	74%	74%	74%	74%	72%
Pick-Up Volts — Hot	78%	78%	78%	78%	76%
Pick-Up Voltamperes	80	100	230	230	390
Pick-Up 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
Drop-Out Volts — Cold	45%	45%	49%	49%	50%
Drop-Out Volts — Hot	46%	46%	50%	50%	52%
Maximum Operation Rate — Ops/Hour	12,000	12,000	12,000	12,000	7,200
Pick-Up Time (mS)	12	12	20	20	14
Drop-Out 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, **Page 16-7**.				
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	20,000,000	20,000,000	10,000,000	10,000,000	6,000,000
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				

Table 18-10. 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	600V AC	600V AC	600V AC	600V AC	600V AC
Continuous Ampere Ratings (I)	135A	270A	540A	810A	1215A
Maximum Horsepower (hp)					
1-Phase 115V	—	—	—	—	—
230V	—	—	—	—	—
3-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					
Pick-Up Volts — Cold	72.5%	75%	75%	75%	75%
Pick-Up Volts — Hot	76%	77%	75%	75%	75%
Pick-Up Voltamperes	1158	1158	1600	1600	2450
Pick-Up Watts	240	240	1345	1345	2060
Sealed Voltamperes	100	100	25	25	75
Sealed Watts	27.2	27.2	22	22	60
Drop-Out Volts — Cold	54%	63%	①	①	①
Drop-Out Volts — Hot	56%	64%	①	①	①
Maximum Operation Rate — Ops/Hour	2,400	2,400	N/A	N/A	N/A
Pick-Up Time (mS)	28	25	105	105	70
Drop-Out 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, **Page 16-7**.				
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				

① 20 – 30% of rated coil voltage.

18

Electrical Life — AC-3 and AC-4 Utilization Categories

Life Load Curves

Eaton's Cutler-Hammer 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 (Ie), as found on the horizontal axis.
- Read the estimated contact life along the vertical axis in number of operational cycles.

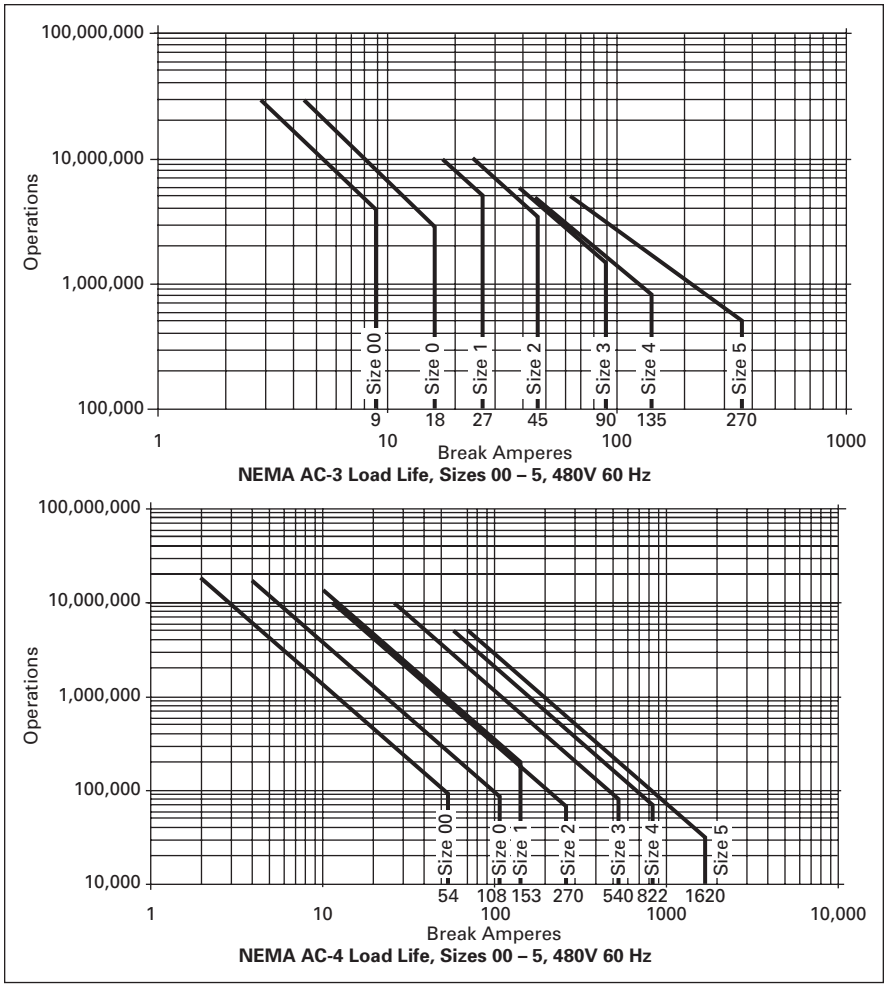
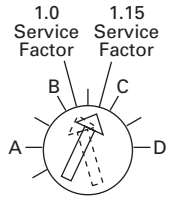


Figure 18-4. AC-3 and AC-4 Utilization Categories

C306 Overload Relay Setting



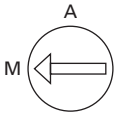
Example of 12.0 FLA setting for heater pack number H2011B showing position for 1.0 or 1.15 service factor motors.

Figure 18-5. FLA Dial Adjustment

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).



Example of setting for manual reset.

Figure 18-6. Manual/Automatic 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

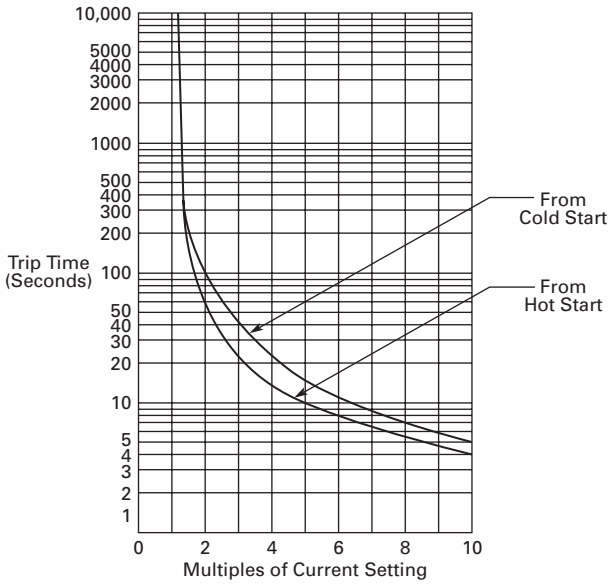
The time-current characteristics of an overload relay is an expression of performance which defines its operating time at various multiples of its current setting. Tests are run at Underwriters Laboratories (UL) in accordance with NEMA Standards and the NEC. UL requires:

- 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.

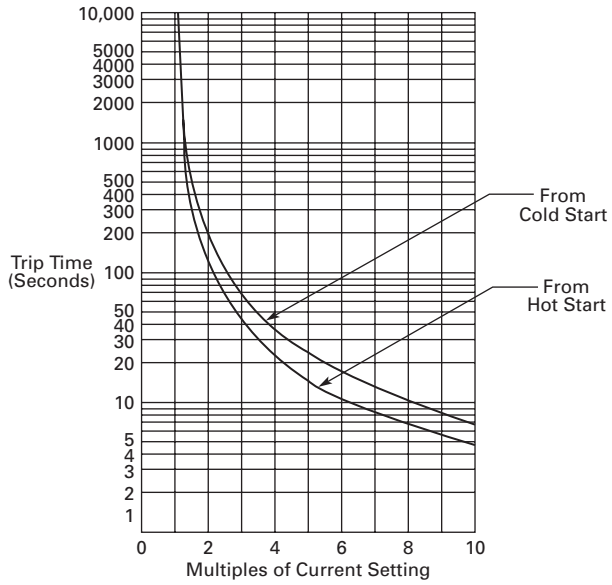
"Current Rating" is defined as the minimum current at which the relay will trip. Per NEC, an overload must ultimately trip at 125% of FLA current (heater) setting for a 1.15 service factor motor and 115% FLA for a 1.0 service factor motor.

"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 Overload Relay 25°C Open Rating



Class 20 Overload Relay 25°C Open Rating

Figure 18-7. Class 10 and Class 20 Trip Curves

18

Relays

Table 18-11. Wire (75°C) Sizes — AWG or kcmil — NEMA Sizes 00 – 2 — Open

NEMA Size	Cu Only
Power Terminals — Line	
00 0 1 2	12 – 16 Stranded, 12 – 14 Solid 8 – 16 Stranded, 10 – 14 Solid 8 – 14 Stranded or Solid 3 – 14 (Upper) and/or 6 – 14 (Lower) Stranded or Solid ①

Power Terminals — Load — Cu Only (Stranded or Solid)		
Catalog Number	**Terminal**	**Wire Size**
C306DN3B	32A	14 – 6 AWG
C306GN3B	75A	14 – 2 AWG

Control Terminals — Cu Only
12 – 16 AWG Stranded, 12 – 14 AWG Solid

① Two compartment box lug.

Table 18-12. 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 6 – 7 8	750 kcmil — 2 or (2) 250 kcmil — 3/0 Cu/Al (2) 750 kcmil — 3/0 Cu/Al (2) 750 kcmil — 1/0 Cu/Al
Control Terminals — Cu Only	
12 – 16 AWG Stranded, 12 – 14 AWG Solid	

Table 18-13. Power Terminal Torque Line and Load Terminals

Terminal	Catalog Number	Torque in lb-in
32A	**C306DT3B**	20
75A	**C306GT3B**	35 (14 – 10 AWG) 40 (8 AWG) 45 (6 – 4 AWG) 50 (3 – 2 AWG)
105A	**C306KN3** (Socket Head Screw)	120 (3/16) 200 (1/4) 250 (5/16)
144A	**C306NN3** (Socket Head Screw)	120 (3/16) 200 (1/4) 250 (5/16)
	C306NN3 (Slotted Head Screw)	35 (14 – 10 AWG) 40 (8 AWG) 45 (6 – 4 AWG) 50 (3 – 1/0 AWG)

Table 18-14. Plugging and Jogging Service Horsepower Ratings ②

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

② 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.

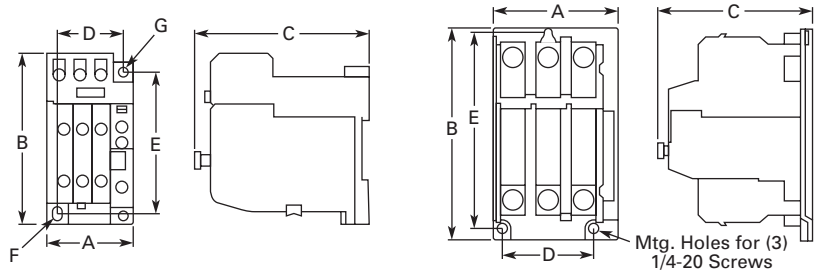
Table 18-15. Overload Relay UL/CSA Contact Ratings Control Circuit ③

AC Volts	120V	240V	480V	600V
NC Contact B600				
Make and Break Amps	30	15	7.5	6
Break Amps	3	1.5	.75	.6
Continuous Amps	5	5	5	5
NO Contact C600				
Make and Break Amps	15	7.5	3.375	3
Break Amps	1.5	.75	.375	.3
Continuous Amps	2.5	2.5	2.5	2.5

③ DC ratings cover Freedom Series coils only.

Table 18-16. C306 Stand-Alone Overload Relays — Approximate Dimensions and Shipping Weight

Ampere Size	Dimensions in Inches (mm)							Ship. Wt. Lbs. (kg)
	Wide A	High B	Deep C	Mounting D	E	F (Slot)	G (Hole)	
32A	1.77 (45.0)	4.13 (104.9)	3.69 (93.7)	1.36 (34.5)	3.74 (95.0)	.18 x .30 (4.6 x 7.6)	.18 (4.6) Dia.	.8 (.4)
75A	2.54 (64.5)	4.69 (119.1)	3.74 (95.0)	2.00 (50.8)	3.45 (87.6)	.22 x .26 (5.6 x 6.6)	.21 (5.3) Dia.	1.4 (.6)
105 & 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)



32A and 75A Sizes
C306DT3B and C306GT3B

105A and 144A Sizes
C306KN3 and C306NN3

Figure 18-8. Approximate Dimensions — Stand-Alone Overload Relays

Sample Specification

NEMA Advantage Combination Starter

Furnish as indicated Cutler-Hammer® Class ECA combination starters manufactured by Eaton's electrical business or approved equal. All starters shall be UL listed and conform to the latest NEMA Standards and the National Electric Code.

Table 18-17. Non-reversing

Description	Catalog Number
Disconnect Switch	**ECA16**
Disconnect Switch with Control Power Transformer	**ECA18**
Circuit Breaker (HMCPE/HMCP)	**ECA22**
Circuit Breaker with Control Power Transformer	**ECA24**

Table 18-18. Reversing

Description	Catalog Number
Disconnect Switch	**ECA17**
Circuit Breaker (HMCPE/HMCP)	**ECA23**

General

- All motor starters shall be NEMA Sizes 1 – 6.
- Overload relays shall be solid-state and provide motor protection accuracy to 2%. Phase loss, phase unbalance protection and Class II ground fault 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 DIP switches. Optional electrical reset with trip indication is available.
- Control circuit transformers, where specified, shall be encapsulated. Primary and secondary fusing shall be provided. Unless otherwise specified, the secondary shall be 120V AC. 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.

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 inch 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 480V AC.

Technical Data

Table 18-19. Electrical Characteristics, Sizes 1 – 6

Description	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6
Maximum Voltage Rating	600V	600V	600V	600V	600V	600V
Ampere Rating — Open	30A	50A	100A	150A	300A	600A
— Enclosed	27A	45A	90A	135A	270A	540A
Maximum Horsepower — Squirrel Cage Motor						
200V, 60 Hz	7-1/2 hp	10 hp	25 hp	40 hp	75 hp	150 hp
230V, 60 Hz	7-1/2 hp	15 hp	30 hp	50 hp	100 hp	200 hp
380V, 50 Hz	10 hp	25 hp	50 hp	75 hp	150 hp	300 hp
460 – 575V, 60 Hz	10 hp	25 hp	50 hp	100 hp	200 hp	400 hp
Resistive Heating, kW ① — Three-Phase, 3-Pole						
120V	5 kW	8.5 kW	17 kW	26 kW	52 kW	105 kW
240V	10 kW	17 kW	34 kW	68 kW	105 kW	210 kW
480V	20 kW	34 kW	68 kW	105 kW	210 kW	415 kW
600V	25 kW	43 kW	86 kW	130 kW	260 kW	515 kW
Capacitor Switching kVAR — Three-Phase						
240V	—	12 kVAR	27 kVAR	40 kVAR	80 kVAR	160 kVAR
480V	—	25 kVAR	53 kVAR	80 kVAR	160 kVAR	320 kVAR
600V	—	32 kVAR	67 kVAR	100 kVAR	200 kVAR	400 kVAR
Transformer Switching, kVA ② — Three-Phase, 3-Pole						
208V	3.6 kVA	6.3 kVA	12 kVA	20 kVA	41 kVA	81 kVA
240V	4.3 kVA	7.2 kVA	14 kVA	23 kVA	47 kVA	94 kVA
480V	8.5 kVA	14 kVA	28 kVA	47 kVA	94 kVA	188 kVA
600V	11 kVA	18 kVA	35 kVA	59 kVA	117 kVA	234 kVA

① Resistive loads having inrush currents not exceeding 1.5 times continuous rating.
② Transformers having inrush currents not more than 20 times peak of continuous current ratings.

Table 18-20. 380V, 50 Hz Starters — Maximum Horsepower Ratings

NEMA Size	1	2	3	4	5	6
Maximum hp	10	25	50	75	150	300

Ground Current Sensing Protection

Eaton's Cutler-Hammer Advantage starters with ground current sensing protection feature provide equipment protection against ground currents between a factory-set low level and a lockout current. It is designed to open the circuit when it senses the low-level and arcing ground currents often occurring in motor branch circuits. This feature is standard with Cutler-Hammer Advantage starters. The ground current sensing protection feature can either be omitted from devices supplied by the factory, or omitted in the field by modifying the device with an Advantage Programming Module (WAPM).

Note: These devices are NOT Ground Fault Interrupters (GFIs) designed to protect people. Additionally, branch circuit short-circuit protective devices are to be used to clear faults that exceed the interrupting rating of the starter.

Table 18-21. Ground Current Sensing

Size	Trip Current	Lockout Current	Trip Time
IL	10	24	.4 sec.
1	10	48	.4 sec.
2	20	86	.4 sec.
3	40	171	.4 sec.
4	60	256	.4 sec.
5	240	1045	.4 sec.
6	240	1045	.4 sec.

The table above gives trip amperes and lockout amperes for each size of the starter. Lockout current is the sum of the phase current and ground current.

Phase Unbalance

If the unbalance of any two phases is greater than 30% of the DIP switch selected trip rating of the starter, a phase unbalance is declared and a trip occurs. No time delay is required for reset. This feature is standard in the Cutler-Hammer Advantage starter. To customize your protection, phase unbalance can be omitted by disabling the protection using an Advantage Programming Module (WAPM).

Phase Loss

The Advantage starter will trip on phase loss, after two seconds, if the current in any one phase is lower than the currents listed in the table below. No time delay is required for reset. Phase loss protection is standard on the Cutler-Hammer Advantage starter. The phase loss protection feature can either be omitted from devices supplied by the factory, or omitted in the field by modifying the device with an Advantage Programming Module (WAPM).

Table 18-22. Phase Trip Time

	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6
Phase Unbalance Level	30% Unbalance					
Phase Unbalance Trip Delay	6 sec.		9 sec.		12 sec.	
Phase Loss Trip after 2 sec. if Phase Current is below:	.15A ③ 1.15A	1.15A	2.5A	2.5A	11A	11A

③ Size 1 Lower Current Range for motor hp range of 1/4 hp to 2 hp at 460V.

Table 18-23. Operating Coil Characteristics at Rated Coil Volts, Sizes 1 – 6

Description	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6
AC Coil						
Burden — Inrush VA	250 VA	250 VA	500 VA	500 VA	2600 VA	2600 VA
Closed VA	25 VA	25 VA	50 VA	50 VA	50 VA	50 VA
Closed Watts	5W	5W	10W	10W	10W	10W
Pick-Up Volts ①	78V	78V	78V	78V	78V	78V
Drop-Out Volts ①	60V	60V	60V	60V	60V	60V
Recommended VA rating for machine tool control power transformers	100 VA	100 VA	150 VA	150 VA	300 VA	300 VA

Note: The above represent typical production test values and should not be interpreted as a guarantee of actual performance.
① Values may vary based upon control power transformer capacities.

Advantage contactors will withstand 110% of their rated voltage continuously without injury to the operating coils and will close successfully at 65% of their rated voltage.

Table 18-24. Mechanical Characteristics — Sizes 1 – 6

Description	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6
Dimensions in Inches (mm)						
Height	6.50 (165.1)	6.50 (165.1)	8.00 (203.2)	8.00 (203.2)	10.08 (256.0)	10.08 (256.0)
Width	2.50 (63.5)	2.50 (63.5)	3.68 (93.5)	3.68 (93.5)	7.07 (179.6)	7.07 (179.6)
Depth	4.96 (126.0)	4.96 (126.0)	6.54 (166.1)	6.54 (166.1)	7.64 (194.1)	7.64 (194.1)
Panel area, square inches	16.25	16.25	29.44	29.44	71.27	71.27
Shipping weight, lbs.	2.00	2.00	6.00	6.00	30.00	30.00
Maximum cable size/phase copper — AWG/MCM ②	8 AWG	4 AWG	250 MCM ②	250 MCM ②	(1) 500 MCM ②	(2) 500 MCM ②
Auxiliary Electrical Circuits Available	8	8	8	8	8	8
Maximum wire size for auxiliary electrical circuit — AWG	12	12	12	12	12	12
Maximum wire size for control circuit — AWG	(2) 14	(2) 14	(2) 14	(2) 14	(2) 14	(2) 14
Mechanical interlock combinations available	Vert. Horiz.	Vert. Horiz.	Vert. Horiz.	Vert. Horiz.	Vert. Horiz.	Vert. Horiz.

② Also referenced as "kcmil" (1990 NEC).

Motor FLA, Three-Phase AC

Table 18-25. Data from Table 430-150 of 1990 NEC

Horsepower	Squirrel Cage AC			
	200V	230V	460V	575V
1/4	1.15	1	.6	.5
1/2	2.3	2.0	1.0	.8
3/4	3.2	2.8	1.4	1.1
1	4.1	3.6	1.8	1.4
1-1/2	6.0	5.2	2.6	2.1
2	7.8	6.8	3.4	2.7
3	11.0	9.6	4.8	3.9
5	17.5	15.2	7.6	6.1
7-1/2	25.3	22	11	9
10	32.2	28	14	11
15	48.3	42	21	17
20	62.1	54	27	22
25	78.2	68	34	27
30	92	80	40	32
40	120	104	52	41
50	150	130	65	52
60	177	154	77	62
75	221	192	96	77
100	286	248	124	99
125	359	312	156	125
150	414	360	180	144
200	552	480	240	192

Note: These current values are for motors running at usual speeds and with normal torque characteristics. Motors for special low speed or high torque may require higher current. In all cases, OL trip current setting should be selected on basis of information on motor nameplate or motor card data.

Table 18-26. Temperature Specifications, Sizes 1 – 6

Ambient Temperature	
Storage	-40° to 100°C (-40° to 212°F)
Operating	-40° to 40°C (-40° to 104°F)
External (NEMA Enclosed)	-40° to 40°C (-40° to 104°F)

Table 18-27. DIP Switch Overload Protection Settings

Reset Method	Position 8
MANUAL (Non-automatic — wait 5 minutes)	0
AUTOMATIC (Reset time is based on protection Class)	1

Overload Class	Position 7	Position 6
10	0	0
20	0	1
30	1	0
None	1	1

18

Overload Trip Current Settings

Full Voltage Starters

To select the overload current trip setting, find the starter size table. Locate the full load current from motor nameplate in column A or B. Change DIP switch positions 5 – 1 to correspond to the table.

Reduced Voltage Starters

Multiply the full load current from motor nameplate by factor below for your type of reduced voltage starter. Find this adjusted full load current in starter Size table in Column A or B. Change DIP switch positions 5 – 1 to correspond to the table.

Table 18-28. Factor

Catalog Number	Multiplier Factor
W600 Autotransformer	1.0
W700 Part Winding	.5
W800, W890 Wye-Delta	.575

Table 18-29. Size 1 — Lower Current Range

Column A Service Factor 1.15 to 1.25 Min.	Column A Service Factor 1.15 to 1.25 Max.	Column B Service Factor 1.0 Min.	Column B Service Factor 1.0 Max.	Trip Rating Amperes	DIP Switch Setting ① (Positions) (54321)
.47	.51	.51	.56	.59	00000
.52	.56	.57	.61	.65	00001
.57	.61	.62	.67	.71	00010
.62	.68	.68	.74	.78	00011
.69	.75	.75	.82	.86	00100
.76	.82	.83	.89	.95	00101
.83	.90	.90	.98	1.04	00110
.91	1.00	.99	1.09	1.14	00111
1.01	1.09	1.10	1.19	1.26	01000
1.10	1.21	1.20	1.31	1.38	01001
1.22	1.33	1.32	1.44	1.52	01010
1.34	1.46	1.45	1.59	1.67	01011
1.47	1.61	1.60	1.75	1.84	01100
1.62	1.77	1.76	1.93	2.02	01101
1.78	1.95	1.94	2.12	2.23	01110
1.96	2.14	2.13	2.33	2.45	01111
2.15	2.36	2.34	2.56	2.69	10000
2.37	2.60	2.57	2.82	2.96	10001
2.61	2.85	2.83	3.10	3.26	10010
2.86	3.14	3.11	3.42	3.58	10011
3.15	3.46	3.43	3.76	3.94	10100
3.47	3.81	3.77	4.14	4.34	10101

① All settings not shown are equivalent to 00000.

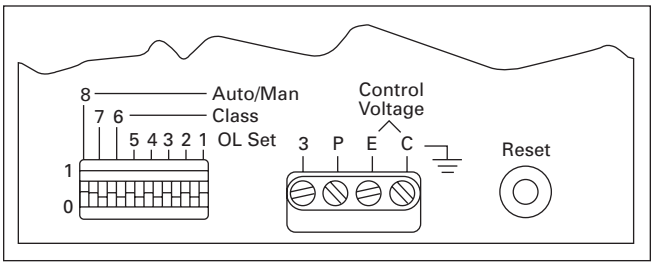


Figure 18-9. DIP Switch, Terminals and Reset

Table 18-30. Size 1 — Upper Current Range

Column A Service Factor 1.15 to 1.25 Min.	Column A Service Factor 1.15 to 1.25 Max.	Column B Service Factor 1.0 Min.	Column B Service Factor 1.0 Max.	Trip Rating Amperes	DIP Switch Setting ② (Positions) (54321)
3.15	3.46	3.43	3.75	3.93	00000
3.47	3.81	3.76	4.13	4.33	00001
3.82	4.19	4.14	4.55	4.77	00010
4.20	4.61	4.56	4.99	5.25	00011
4.62	5.0	5.00	5.4	5.77	00100
5.2	5.5	5.5	6.0	6.35	00101
5.6	6.0	6.1	6.5	6.9	00110
6.1	6.6	6.6	7.2	7.7	00111
6.7	7.3	7.3	8.0	8.5	01000
7.4	8.1	8.1	8.8	9.3	01001
8.2	8.9	8.9	9.6	10.2	01010
9.0	9.8	9.7	10.6	11.2	01011
9.9	0.8	10.7	11.7	12.4	01100
10.9	11.9	11.8	12.9	13.6	01101
12.0	13.1	13.0	14.2	15.0	01110
13.2	14.4	14.3	15.7	16.5	01111
14.5	15.8	15.8	17.2	18.1	10000
15.9	17.4	17.3	18.9	19.9	10001
17.5	19.2	19.0	20.9	21.9	10010
19.3	21.1	21.0	22.9	24.1	10011
21.2	23.3	23.0	25.2	26.5	10100
23.4	25.6	25.3	27.0	29.1	10101
25.7	27.0	—	—	32.1	10110

② All settings not shown are equivalent to 00000.

Table 18-31. Size 2 — Current Range

Column A Service Factor 1.15 to 1.25 Min.	Column A Service Factor 1.15 to 1.25 Max.	Column B Service Factor 1.0 Min.	Column B Service Factor 1.0 Max.	Trip Rating Amperes	DIP Switch Setting ③ (Positions) (54321)
3.15	3.46	3.43	3.75	3.93	00000
3.47	3.81	3.76	4.13	4.33	00001
3.82	4.19	4.14	4.55	4.77	00010
4.20	4.61	4.56	4.99	5.25	00011
4.62	5.0	5.00	5.4	5.77	00100
5.1	5.5	5.5	6.0	6.35	00101
5.6	6.0	6.1	6.5	6.9	00110
6.1	6.6	6.6	7.2	7.7	00111
6.7	7.3	7.3	8.0	8.5	01000
7.4	8.1	8.1	8.8	9.3	01001
8.2	8.9	8.9	9.6	10.2	01010
9.0	9.8	9.7	10.6	11.2	01011
9.9	10.8	10.7	11.7	12.4	01100
10.9	11.9	11.8	12.9	13.6	01101
12.0	13.1	13.0	14.2	15.0	01110
13.2	14.4	14.3	15.7	16.5	01111
14.5	15.8	15.8	17.2	18.1	10000
15.9	17.4	17.3	18.9	19.9	10001
17.5	19.2	19.0	20.9	21.9	10010
19.3	21.1	21.0	22.9	24.1	10011
21.2	23.2	23.0	25.2	26.5	10100
23.3	25.6	25.3	27.8	29.1	10101
25.7	28.1	27.9	30.5	32.1	10110
28.2	31.0	30.6	33.7	35.3	10111
31.1	34.1	33.8	37.0	38.9	11000
34.2	37.5	37.1	40.7	42.8	11001
37.6	41.2	40.8	44.8	47.0	11010
41.3	45.0	44.9	45.0	51.6	11011

③ All settings not shown are equivalent to 00000.

Overload Trip Current Settings (Continued)

Table 18-32. Size 3 Current Range

Column A Service Factor 1.15 to 1.25		Column B Service Factor 1.0		Trip Rating Amperes	DIP Switch Setting ① (Positions) (54321)
Min.	Max.	Min.	Max.		
9.9 –	10.8	10.8 –	11.7	12.4	00000
10.9 –	11.9	11.8 –	12.9	13.6	00001
12.0 –	13.1	13.0 –	14.2	15.0	00010
13.2 –	14.4	14.3 –	15.6	16.5	00011
14.5 –	15.8	15.7 –	17.2	18.1	00100
15.9 –	17.3	17.3 –	18.9	19.9	00101
17.5 –	19.2	19.0 –	20.9	21.9	00110
19.3 –	21.1	21.0 –	22.9	24.1	00111
21.2 –	23.2	23.0 –	25.2	26.5	01000
23.3 –	25.6	25.3 –	27.8	29.1	01001
25.7 –	28.1	27.9 –	30.6	32.1	01010
28.2 –	30.9	30.7 –	33.6	35.3	01011
31.0 –	34.1	33.7 –	37.0	38.8	01100
34.2 –	37.5	37.1 –	40.8	42.7	01101
37.6 –	41.3	40.9 –	44.9	47.0	01110
41.4 –	45.4	45.0 –	49.4	51.7	01111
45.5 –	50.0	49.5 –	54.3	56.9	10000
50.1 –	54.9	54.4 –	59.7	62.6	10001
55.0 –	60.5	59.8 –	65.7	68.8	10010
60.6 –	66.5	65.8 –	72.3	75.7	10011
66.6 –	73.2	72.4 –	79.6	83.3	10100
73.3 –	80.7	79.7 –	87.7	91.6	10101
80.8 –	88.7	87.8 –	90.0	101.0	10110
88.8 –	90.0	—	—	111.0	10111

① All settings not shown are equivalent to 00000.

Table 18-33. Size 4 Current Range

Column A Service Factor 1.15 to 1.25		Column B Service Factor 1.0		Trip Rating Amperes	DIP Switch Setting ② (Positions) (54321)
Min.	Max.	Min.	Max.		
9.9 –	10.8	10.8 –	11.7	12.4	00000
10.9 –	11.9	11.8 –	12.9	13.6	00001
12.0 –	13.1	13.0 –	14.2	15.0	00010
13.2 –	14.4	14.3 –	15.6	16.5	00011
14.5 –	15.8	15.7 –	17.2	18.1	00100
15.9 –	17.4	17.3 –	18.9	19.9	00101
17.5 –	19.2	19.0 –	20.9	21.9	00110
19.3 –	21.1	21.0 –	22.9	24.1	00111
21.2 –	23.2	23.0 –	25.2	26.5	01000
23.3 –	25.6	25.3 –	27.8	29.1	01001
25.7 –	28.1	27.9 –	30.6	32.1	01010
28.2 –	30.9	30.7 –	33.6	35.3	01011
31.0 –	34.1	33.7 –	37.0	38.8	01100
34.2 –	37.5	37.1 –	40.8	42.7	01101
37.6 –	41.3	40.9 –	44.9	47.0	01110
41.4 –	45.4	45.0 –	49.4	51.7	01111
45.5 –	50.0	49.5 –	54.3	56.9	10000
50.1 –	54.9	54.4 –	59.7	62.6	10001
55.0 –	60.5	59.8 –	65.7	68.8	10010
60.6 –	66.5	65.8 –	72.3	75.7	10011
66.6 –	73.2	72.4 –	79.6	83.3	10100
73.3 –	80.7	79.7 –	87.7	91.6	10101
80.8 –	88.7	87.8 –	96.4	101	10110
88.8 –	97.5	96.5 –	105	111	10111
97.6 –	106	106 –	116	122	11000
107 –	117	117 –	127	134	11001
118 –	129	128 –	133	147	11010
130 –	133	—	—	162	11011

② All settings not shown are equivalent to 00000.

Table 18-34. Size 5 Current Range

Column A Service Factor 1.15 to 1.25		Column B Service Factor 1.0		Trip Rating Amperes	DIP Switch Setting ③ (Positions) (54321)
Min.	Max.	Min.	Max.		
38.3 –	41.9	41.7 –	45.6	47.9	00000
42.0 –	46.1	45.7 –	50.1	52.5	00001
46.2 –	51.0	50.2 –	55.5	57.7	00010
51.1 –	55.9	55.6 –	60.8	63.9	00011
56.0 –	61.7	60.9 –	67.1	70.0	00100
61.8 –	67.5	67.2 –	73.4	77.3	00101
67.6 –	74.9	73.5 –	81.4	84.5	00110
75.0 –	82.3	81.5 –	89.5	93.7	00111
82.4 –	90.3	89.6 –	98.2	103	01000
90.4 –	99.9	98.3 –	108	113	01001
100 –	109	109 –	118	125	01010
110 –	120	119 –	130	137	01011
121 –	132	131 –	143	151	01100
133 –	145	144 –	157	166	01101
146 –	159	158 –	173	182	01110
160 –	175	174 –	190	200	01111
176 –	193	191 –	209	220	10000
194 –	213	210 –	231	242	10001
214 –	233	232 –	254	267	10010
234 –	257	255 –	270	293	10011
258 –	270	—	—	322	10100

③ All settings not shown are equivalent to 00000.

Table 18-35. Size 6 Current Range

Column A Service Factor 1.15 to 1.25		Column B Service Factor 1.0		Trip Rating Amperes	DIP Switch Setting ④ (Positions) (54321)
Min.	Max.	Min.	Max.		
38.3 –	41.9	41.7 –	45.6	47.9	00000
42.0 –	46.1	45.7 –	50.1	52.5	00001
46.2 –	51.0	50.2 –	55.5	57.7	00010
51.1 –	55.9	55.6 –	60.8	63.9	00011
56.0 –	61.7	60.9 –	67.1	70.0	00100
61.8 –	67.5	67.2 –	73.4	77.3	00101
67.6 –	74.9	73.5 –	81.4	84.5	00110
75.0 –	82.3	81.5 –	89.5	93.7	00111
82.4 –	90.3	89.6 –	98.2	103	01000
90.4 –	99.9	98.3 –	108	113	01001
100 –	109	109 –	118	125	01010
110 –	120	119 –	130	137	01011
121 –	132	131 –	143	151	01100
133 –	145	144 –	157	166	01101
146 –	159	158 –	173	182	01110
160 –	175	174 –	190	200	01111
176 –	193	191 –	209	220	10000
194 –	213	210 –	231	242	10001
214 –	233	232 –	254	267	10010
234 –	257	255 –	279	293	10011
258 –	282	280 –	307	322	10100
283 –	311	308 –	338	354	10101
312 –	342	339 –	372	390	10110
343 –	376	373 –	409	429	10111
377 –	414	410 –	450	471	11000
415 –	456	451 –	496	519	11001
457 –	501	497 –	540	571	11010
502 –	540	—	—	628	11011

④ All settings not shown are equivalent to 00000.

Short Circuit Ratings

Table 18-36. Short-Circuit Ratings

Short-Circuit Protective Device (SCPD)	Max. Rating (SCPD)	Circuit Breaker Interrupting Rating	Short-Circuit Withstand Rating		Typical Disconnect Device
			Current	Voltage	
Size 1					
Class H Fuse	60A	—	5,000A	600V	30A DS Sw.
Class J, R or T Fuse	60A	—	100,000A 50,000A	480V 600V	30A DS Sw.
			65,000A	600V	100A FD-K Molded Case Sw.
Magnetic Only ① Type CB ②	3A	—	100,000A 25,000A	480V 600V	HMCP HMCPS
	7A	—	100,000A 25,000A	480V 600V	HMCPS
	15A	—	100,000A 25,000A	480V 600V	HMCP
	30A	—	100,000A 25,000A	480V 600V	HMCP
Thermal Magnetic Type CB ③	50A	65,000A 25,000A	65,000A 25,000A	480V 600V	HFD
		100,000A 35,000A	100,000A 35,000A	480V 600V	FDC
Magnetic Only Type CB plus CL ④	30A	—	100,000A	600V	HMCP plus CL
Thermal/Mag. Type CB plus CL ⑤	50A	150,000A	100,000A	600V	HFD plus CL
Size 2					
Class H Fuse	100A	—	5,000A	600V	60A DS Sw.
Class J, R or T Fuse	100A	—	100,000A 50,000A	480V 600V	60A DS Sw.
			65,000A	600V	100A FD-K Molded Case Sw.
Magnetic Only ① Type CB ②	50A	—	100,000A 25,000A	480V 600V	HMCP
Thermal Magnetic Type CB ③	90A	65,000A 25,000A	65,000A 25,000A	480V 600V	HFD
		100,000A 35,000A	100,000A 35,000A	480V 600V	FDC
Magnetic Only Type CB plus CL ④	50A	—	100,000A	600V	HMCP plus CL
Thermal/Mag. Type CB plus CL ⑤	90A	150,000A	100,000A	600V	HFD plus CL
Size 3					
Class H Fuse	350A	—	5,000A	600V	100A DS Sw.
Class R Fuse	200A	—	100,000A 65,000A	480V 600V	100A FD-K Molded Case Sw.
Class J or T Fuse	200A	—	100,000A 65,000A	480V 600V	100A FD-K Molded Case Sw.
Magnetic Only ① Type CB ②	200A	—	100,000A 25,000A	480V 600V	HMCP
Thermal Magnetic	150A	65,000A 25,000A	65,000A 25,000A	480V 600V	HFD
		100,000A 35,000A	100,000A 35,000A	480V 600V	FDC
Magnetic Only Type CB plus CL ④	100A	—	100,000A	600V	HMCP plus CL
Thermal/Mag. Type CB plus CL ⑤	150A	150,000A	100,000A	600V	HFD plus CL

Short-Circuit Protective Device (SCPD)	Max. Rating (SCPD)	Circuit Breaker Interrupting Rating	Short-Circuit Withstand Rating		Typical Disconnect Device
			Current	Voltage	
Size 4					
Class H Fuse	500A	—	10,000A	600V	200A DS Sw.
Class J Fuse	400A	—	100,000A 65,000A	480V 600V	250A JD-K Molded Case Sw.
Class R or Class T Fuse	400A	—	100,000A 65,000A	480V 600V	250A JD-K Molded Case Sw.
Magnetic Only ① Type CB ②	150A	—	100,000A 50,000A	480V 600V	HMCP
Thermal Magnetic Type CB ③	250A	100,000A 35,000A	100,000A 50,000A	480V 600V	JDC
		65,000A 25,000A	65,000A 25,000A	480V 600V	HJD
Magnetic Only Type CB plus CL ④	150A	—	100,000A	600V	HMCP plus CL
Size 5					
Class H Fuse	600A	—	10,000A	600V	400A KD-K Molded Case Sw.
Class J, R or T Fuse	600A	—	100,000A	600V	
Magnetic Only ① Type CB ②	250A	—	100,000A 25,000A	480V 600V	HMCP
	400A	—	100,000A 25,000A	480V 600V	
Thermal Magnetic Type CB ③	400A	65,000A 50,000A 35,000A	65,000A 100,000A 25,000A	480V 600V 600V	HFD KDC HKD
Size 6					
Class J, R or T Fuse	600A	—	100,000A 65,000A	480V 600V	600A LD-K Molded Case Sw.
Class L Fuse	800A	—	100,000A 65,000A	480V 600V	600A LD-K Molded Case Sw.
Magnetic Only ① Type CB ②	600A	—	100,000A 25,000A	480V 600V	HMCP
	800A	—	65,000A 25,000A	480V 600V	Magnetic Only HMCP
Thermal Magnetic Type CB ③	600A	65,000A 25,000A	65,000A 35,000A	480V 600V	HLD
	800A	50,000A 25,000A	65,000A 25,000A	480V 600V	Thermal Magnetic HMC
Thermal/Mag. with CL ⑤	800A	200,000A	100,000A	600V	NB Tri-Pac

① Instantaneous adjustable trip.
② Circuit breaker.
③ Inverse time circuit breaker.
④ Instantaneous adjustable trip with current limiting attachment.
⑤ Inverse time with built-in current limiting attachment.

Sample Specification

Furnish as indicated Eaton Class ECX combination starters manufactured by Eaton's electrical business or approved equal. All starters shall be UL listed and conform to the latest IEC Standards and the National Electric Code.

Table 18-37. Non-reversing

Description	Catalog Number
Disconnect Switch	**ECX19**
Circuit Breaker (HMCP)	**ECX25**

Table 18-38. 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 trouble-shooting 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 120V AC. 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 inch 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 480V AC.

Technical Data

Instructional Leaflets

Table 18-39. Instructional Leaflets

Publication Number	Description
Pub51210	7 – 15A, B Frame XTCE, XTCEC and XTCF 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

Table 18-40. Coil Data — Frame B – D

	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
Voltage Tolerance										
Pick-Up (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
Drop-Out (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										
Pick-Up VA	24	24	24	24	52	52	52	149	149	149
Pick-Up 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										
Pick-Up VA	30	30	30	30	67	67	67	178	178	178
Pick-Up 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										
Pick-Up VA	27	27	27	27	62	62	62	168	168	168
	25	25	25	25	58	58	58	154	154	154
Pick-Up 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										
Pick-Up 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									

① 0.7 – 1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

② Coil Suffix TD: U_{min} 24V DC/U_{max} 27V DC.
Coil Suffix WD: U_{min} 48V DC/U_{max} 60V DC.
Coil Suffix AD: U_{min} 110V DC/U_{max} 130V DC.
Coil Suffix BD: U_{min} 200V DC/U_{max} 240V DC.
Example:
U_C = 0.7 x U_{min} — 1.2 x U_{max}
U_C = 0.7 x 24V — 1.2 x 27V DC

18

Frame F – G

Table 18-41. Coil Data — Frame F – G

	XTCE80F	XTCE95F	XTCE115G	XTCE150G
Voltage Tolerance				
Pick-Up (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
Drop-Out (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				
Pick-Up VA	310	310	180	180
Pick-Up 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				
Pick-Up VA	345	345	170	170
Pick-Up 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				
Pick-Up VA	372	328	170	170
Pick-Up 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				
Pick-Up 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			

① At 24V: 0.7 – 1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

Frame L – R

Table 18-42. Coil Data — Frame L – R

Description	XTCE185L	XTCE225L, XTCE250L	XTCE300M, XTCE400M	XTCE500M
Voltage Tolerance				
Pick-Up (x U_c) XTCE185L – XTCEC20R XTCS185L – XTCS500M Drop-Out (x U_c) XTCE185L – XTCEC20R XTCS185L – XTCS500M	0.7 x U_{cmin} — 1.15 x U_{cmax} 0.85 x U_{cmin} — 1.1 x U_{cmax} 0.2 x U_{cmin} — 0.6 x U_{cmax} 0.2 x U_{cmin} — 0.4 x U_{cmax}			
Power Consumption of the coil at cold state and 1.0 x U_C				
XTCE185L – XTCEC20R Pick-Up VA Pick-Up W Sealing VA Sealing W	 250 ① 200 4.3 3.3	 250 ① 200 4.3 3.3	 450 ① 350 4.3 3.3	 450 ① 350 4.3 3.3
XTCS185L – XTCS500M Pick-Up VA Pick-Up W Sealing VA Sealing W	 360 325 4.3 3.3	 360 325 4.3 3.3	 715 645 4.3 3.3	 715 645 4.3 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) XTCS185L – XTCS500M Closing delay (mS) Opening delay (mS)	 <100 <80 <50 <40	 <100 <80 <50 <40	 <80 <80 <50 <40	 <80 <80 <50 <40
Reaction in Threshold and Sealing State Transition Range (XTCE185L – XTCEC20R)				
Voltage interruptions (0 – 0.2 x U_{cmin}) ≤ 10ms (0 – 0.2 x U_{cmin}) > 10ms	Time is bridged successfully Drop-out of the contactor			
Voltage Dips (0.2 – 0.6 x U_{cmin}) ≤ 12ms (0.2 – 0.6 x U_{cmin}) > 12ms (0.6 – 0.7 x U_{cmin})	Time is bridged successfully Drop-out of the contactor Contactor remains switched on			
Excess Voltage (1.15 – 1.3 x U_{cmax}) (>1.3 x U_{cmax}) ≤ 3s (>1.3 x U_{cmax}) > 3s	Contactor remains switched on Contactor remains switched on Drop-out of the contactor			
Pick – Up phase (0 – 0.7 x U_{cmin}) (0.7 x U_{cmin} –1.15 x U_{cmax}) (>1.15 x U_{cmax})	Contactor does not switch on Contactor switches on with certainty Contactor switches on with certainty			
Permissible contact resistance (of the external command device with actuation of A11), Ω	≤ 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 Low	 15V 5V	 15V 5V	 15V 5V	 15V 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.			

① Control transformer with U_k ≤6%.

Table 18-42. Coil Data — Frame L – R (Continued)

Description	XTCE580N	XTCE750N, XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
Voltage Tolerance					
Pick-Up (x U_c)					
XTCE185L – XTCEC20R	0.7 x U_{cmin} — 1.15 x U_{cmax}				
XTCS185L – XTCS500M	0.85 x U_{cmin} — 1.1 x U_{cmax}				
Drop-Out (x U_c)					
XTCE185L – XTCEC20R	0.2 x U_{cmin} — 0.6 x U_{cmax}				
XTCS185L – XTCS500M	0.2 x U_{cmin} — 0.4 x U_{cmax}				
Power Consumption of the coil at cold state and 1.0 x U_C					
XTCE185L – XTCEC20R					
Pick-Up VA	800 ①	800 ①	800 ①	800 ①	1600 ①
Pick-Up W	700	700	700	700	1400
Sealing VA	7.5	7.5	7.5	7.5	15
Sealing W	6.5	6.5	6.5	6.5	13
XTCS185L — XTCS500M					
Pick-Up VA	—	—	—	—	—
Pick-Up 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	<40	<40
XTCS185L – XTCS500M					
Closing delay (mS)	—	—	—	—	—
Opening delay (mS)	—	—	—	—	—
Reaction in Threshold and Sealing State Transition Range (XTCE185L – XTCEC20R)					
Voltage interruptions					
(0 – 0.2 x U_{cmin}) ≤ 10ms	Time is bridged successfully				
(0 – 0.2 x U_{cmin}) > 10ms	Drop-out of the contactor				
Voltage Dips					
(0.2 – 0.6 x U_{cmin}) ≤ 12ms	Time is bridged successfully				
(0.2 – 0.6 x U_{cmin}) > 12ms	Drop-out of the contactor				
(0.6 – 0.7 x U_{cmin})	Contactor remains switched on				
Excess Voltage					
(1.15 – 1.3 x U_{cmax})	Contactor remains switched on				
(>1.3 x U_{cmax}) ≤ 3s	Contactor remains switched on				
(>1.3 x U_{cmax}) > 3s	Drop-out of the contactor				
Pick – Up phase					
(0 – 0.7 x U_{cmin})	Contactor does not switch on				
(0.7 x U_{cmin} –1.15 x U_{cmax})	Contactor switches on with certainty				
(>1.15 x U_{cmax})	Contactor switches on with certainty				
Permissible contact resistance (of the external command device with actuation of A11), Ω	≤ 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.				

① Control transformer with U_k ≤7%.

Contactor 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.

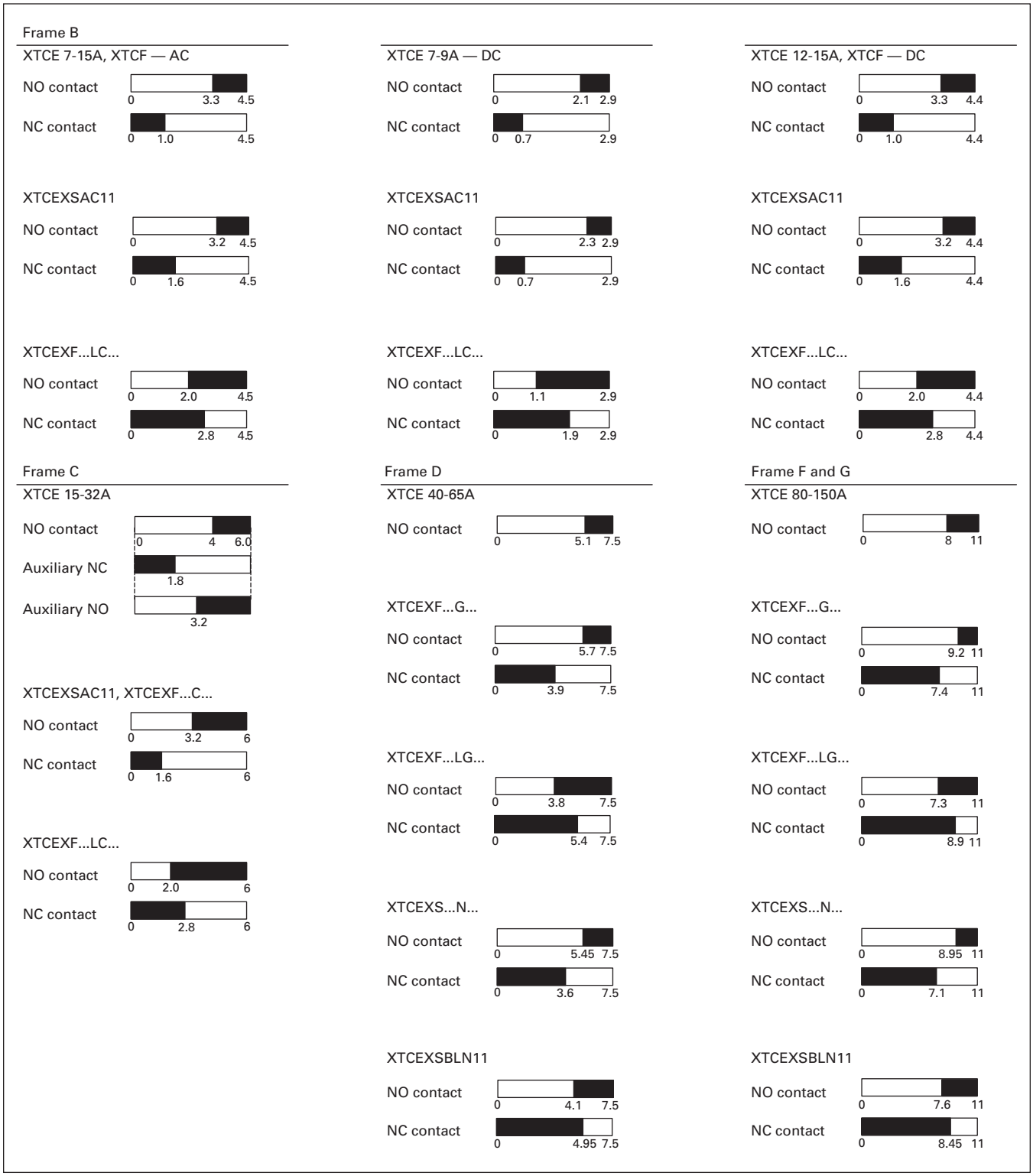


Figure 18-10. Contactor Contact Travel Diagrams

Auxiliary Contacts

Table 18-43. Auxiliary Contacts Technical Data and Specifications

Description	XTCE007B…– XTCE032C	XTCEXFAC… XTCEXFATC...	XTCEXFCC… XTCEXSCC...	XTCEXFAG…	XTCEXSBLN… XTCEXSBN… XTCEXSBNC... 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}) V AC	6000	6000	6000	6000	6000
Overvoltage category / pollution degree	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage, (U_i) V AC	690	690	690	690	690
Rated operational voltage, (U_e) V AC	500	500	500	500	500
Safe isolation to VDE 0106 Part 101 and Part 101(A) in V AC					
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 ③	10A	10A
Control circuit reliability (at U_e = 24 V DC, 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 ② Maximum fuse, gG/gL	10A	10A	10A	16A	16A

① Making and breaking conditions to DC-13, time L/R contact as stated.
② See fuses overlay for time/current characteristic (on request).
③ Conventional thermal current (I_{th}) of XTCEXSCC_ is 10A.

Table 18-44. 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					
3-Pole (I_{th}) A	50	100	180	400	—
4-Pole (I_{th}) A	60	—	—	—	—

Table 18-45. 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 MCM) 2 x (6 – 300 MCM)	1 x (1/0 – 600 MCM) 2 x (1/0 – 500 MCM)	—	—	—
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

Table 18-46. AC Ratings

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
AC-1 Operation							
Conventional Free Air Thermal Current, 3-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, 1-Pole (I_{th})							
Open	50A	50A	50A	50A	85A	85A	85A
Enclosed	45A	45A	45A	45A	80A	80A	80A
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) 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	—	—	—	—	—	—	—
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) 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	10	13	15
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	—	—	—	—	—	—	—
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is $I_{eAC-3} = X / 6 * I_e$ Transformer where X is the inrush current of the transformer and I_e Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes Up to 525V 690V	See *XT* Starters in **CA08102001E** for Capacitor Ratings						
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	—	—	—	—	—	—	—
Maximum Operating Frequency (ops/hr)	—	—	—	—	—	—	—

① At maximum permissible ambient temperature.

② 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 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

Table 18-46. AC Ratings (Continued)

Description	XTCE040D	XTCE050D	XTCE065D	XTCE080F	XTCE095F	XTCE115G	XTCE150G
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
Open							
at 40°C (I_{th})	60A	80A	98A	110A	130A	160A	190A
at 50°C (I_{th})	57A	71A	88A	98A	125A	142A	180A
at 55°C (I_{th})	55A	68A	83A	94A	115A	135A	170A
at 60°C (I_{th})	50A	65A	80A	90A	110A	130A	160A
Enclosed	45A	58A	72A	80A	100A	115A	144A
Conventional Free Air Thermal Current, 1-Pole (I_{th})							
Open	125A	162A	200A	225A	275A	325A	400A
Enclosed	112A	145A	180A	200A	250A	285A	360A
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	40	50	65	80	95	115	150
240V	40	50	65	80	95	115	150
380/400V	40	50	65	80	95	115	150
415V	40	50	65	80	95	115	150
440V	40	50	65	80	95	115	150
500V	40	50	65	80	95	115	150
660/690V	25	32	37	65	80	93	100
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	12.5	15.5	20	25	30	37	48
240V	13.5	17	22	27.5	34	40	52
380/400V	18.5	22	30	37	45	55	75
415V	24	30	39	43	57	70	91
440V	25	32	41	51	60	75	95
500V	28	36	47	58	70	85	110
660/690V	23	30	35	63	75	90	96
1000V	—	—	—	—	—	—	—
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	18	21	25	40	50	55	65
240V	18	21	25	40	50	55	65
380/400V	18	21	25	40	50	55	65
415V	18	21	25	40	50	55	65
440V	18	21	25	40	50	55	65
500V	18	21	25	40	50	55	65
660/690V	14	17	20	40	50	45	50
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	5	6	7	12	16	17	20
240V	5.5	6.5	7.5	13	17	19	22
380/400V	9	10	12	20	26	28	33
415V	9.5	11	13	24	30	33	39
440V	10	12	14	25	32	35	41
500V	11	13	16	29	36	40	47
660/690V	12	14	17	26	35	43	48
1000V	—	—	—	—	—	—	—
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is I_{eAC-3} = X / 6 * Ie Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes Up to 525V 690V	See *XT* Starters in **CA08102001E** for Capacitor Ratings						
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	—	—	—	—	—	—	—
Maximum Operating Frequency (ops/hr)	—	—	—	—	—	—	—

① At maximum permissible ambient temperature.

② 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 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

Table 18-46. AC Ratings (Continued)

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE580N
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
at 40°C (I_{th})	337	386	429	490	612	857	980
at 50°C (I_{th})	301	345	383	438	548	767	876
at 55°C (I_{th})	287	329	366	418	522	731	836
at 60°C (I_{th})	275	315	350	400	500	700	800
Conventional Free Air Thermal Current, 1-Pole (I_{th})	685	785	875	1000	1250	1750	2000
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	185	225	250	300	400	500	580
240V	185	225	250	300	400	500	580
380/400V	185	225	250	300	400	500	580
415V	185	225	250	300	400	500	580
440V	185	225	250	300	400	500	580
500V	185	225	250	300	400	500	580
660/690V	185	225	250	300	400	500	580
1000V	76	76	76	95	95	95	435
Rated power (P) in kilowatts							
220/230V	55	70	75	90	125	155	185
240V	62	75	85	100	132	170	200
380/400V	90	110	132	160	200	250	315
415V	110	132	148	180	240	300	348
440V	115	142	157	190	255	345	370
500V	132	160	180	215	290	360	420
660/690V	175	215	240	286	344	344	560
1000V	108	108	108	132	132	132	600
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	136	164	200	240	296	360	456
240V	136	164	200	240	296	360	456
380/400V	136	164	200	240	296	360	456
415V	136	164	200	240	296	360	456
440V	136	164	200	240	296	360	456
500V	136	164	200	240	296	360	456
660/690V	136	164	200	240	296	296	456
1000V	76	76	76	95	95	95	348
Rated power (P) in kilowatts							
220/230V	41	51	62	75	92	112	143
240V	45	54	68	82	101	122	156
380/400V	75	90	110	132	160	200	250
415V	80	96	117	142	176	216	274
440V	85	102	125	151	186	229	290
500V	96	116	143	172	214	260	330
660/690V	127	155	189	229	283	344	440
1000V	108	108	108	132	132	132	509
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is I_{eAC-3} = X / 6 * Ie Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes							
Up to 525V	220	220	220	307	307	307	463
690V	133	133	133	177	177	177	265
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	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

① At maximum permissible ambient temperature.

② 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 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

18

Table 18-46. AC Ratings (Continued)

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
AC-1 Operation						
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz						
at 40°C (I_{th})	1041	1102	1225	1225	1714	2450
at 50°C (I_{th})	931	986	1095	1095	1533	2190
at 55°C (I_{th})	888	940	1044	1044	1462	2089
at 60°C (I_{th})	850	900	1000	1000	1400	2000
Conventional Free Air Thermal Current, 1-Pole (I_{th})	2125	2250	2500	2500	3500	5000
AC-3 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes						
220/230V	650	750	820	1000	—	—
240V	650	750	820	1000	—	—
380/400V	650	750	820	1000	—	—
415V	650	750	820	1000	—	—
440V	650	750	820	1000	—	—
500V	650	750	820	1000	—	—
660/690V	650	750	820	1000	—	—
1000V	435	580	580	700	—	—
Rated power (P) in kilowatts						
220/230V	205	240	260	315	—	—
240V	225	260	285	340	—	—
380/400V	355	400	450	560	—	—
415V	390	455	500	610	—	—
440V	420	480	525	650	—	—
500V	470	550	600	730	—	—
660/690V	630	720	750	1000	—	—
1000V	600	800	800	1000	—	—
AC-4 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes						
220/230V	512	576	656	800	—	—
240V	512	576	656	800	—	—
380/400V	512	576	656	800	—	—
415V	512	576	656	800	—	—
440V	512	576	656	800	—	—
500V	512	576	656	800	—	—
660/690V	512	576	656	800	—	—
1000V	348	464	464	700	—	—
Rated power (P) in kilowatts						
220/230V	161	181	209	260	—	—
240V	176	200	228	280	—	—
380/400V	280	315	355	450	—	—
415V	307	346	394	490	—	—
440V	326	367	418	520	—	—
500V	370	417	474	590	—	—
660/690V	494	556	633	780	—	—
1000V	509	678	678	1000	—	—
AC-6A Operation						
Transformer Loads	Values are application specific. Calculation is I_{eAC-3} = X / 6 * Ie Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②					
AC-6B Operation						
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes						
Up to 525V	463	463	463	463	—	—
690V	265	265	265	265	—	—
Maximum inrush current peak (x I_e)	30	30	30	30	—	—
Component Lifesaving (Operations)	100,000	100,000	100,000	100,000	—	—
Maximum Operating Frequency (ops/hr)	200	200	200	200	—	—

① At maximum permissible ambient temperature.

② 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 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

DC Ratings

Table 18-47. DC Ratings — DC-1

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	40	40
110V	20	20	20	20	35	40	40
220V	15	15	15	15	35	40	40
440V	1	1.3	1.3	1.3	2.9	2.9	2.9
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	110	110	160	160
110V	50	50	72	110	110	160	160
220V	45	45	65	70	70	90	90
440V	2.9	2.9	2.9	4.5	4.5	4.5	4.5
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	11	11	11	11	11	11	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Table 18-48. DC Ratings — DC-3

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	35	40
110V	20	20	20	20	35	35	40
220V	1.5	1.5	1.5	1.5	10	10	25
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	110	110	160	160
110V	50	50	72	110	110	160	160
220V	25	25	35	35	35	40	40
440V	0.6	0.6	0.6	1	1	1	1
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Table 18-49. DC Ratings — DC-5

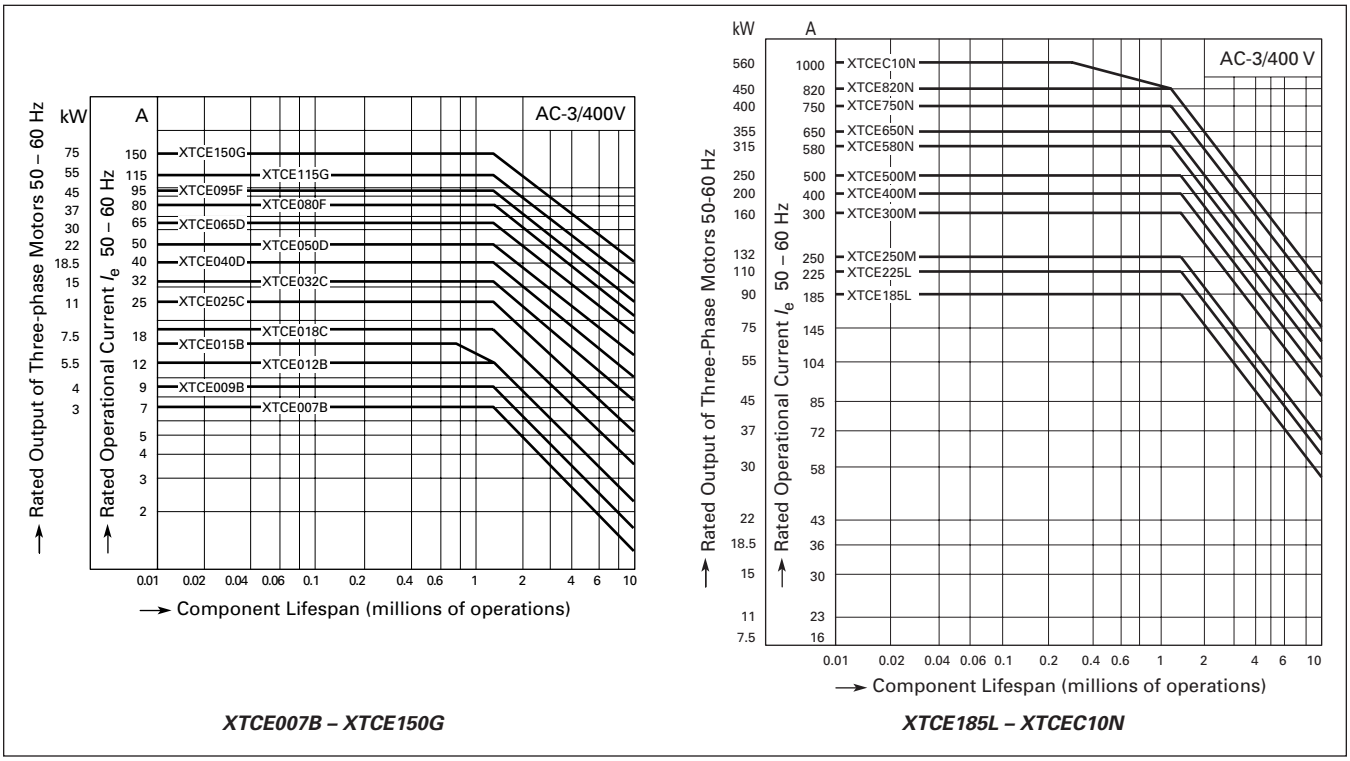
Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	35	40
110V	20	20	20	20	35	35	40
220V	1.5	1.5	1.5	1.5	10	10	25
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	110	110	160	160
110V	50	50	72	110	110	160	160
220V	25	25	35	35	35	40	40
440V	0.6	0.6	0.6	1	1	1	1
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Heat Loss

Table 18-50. Current heat loss (3-Pole) in watts

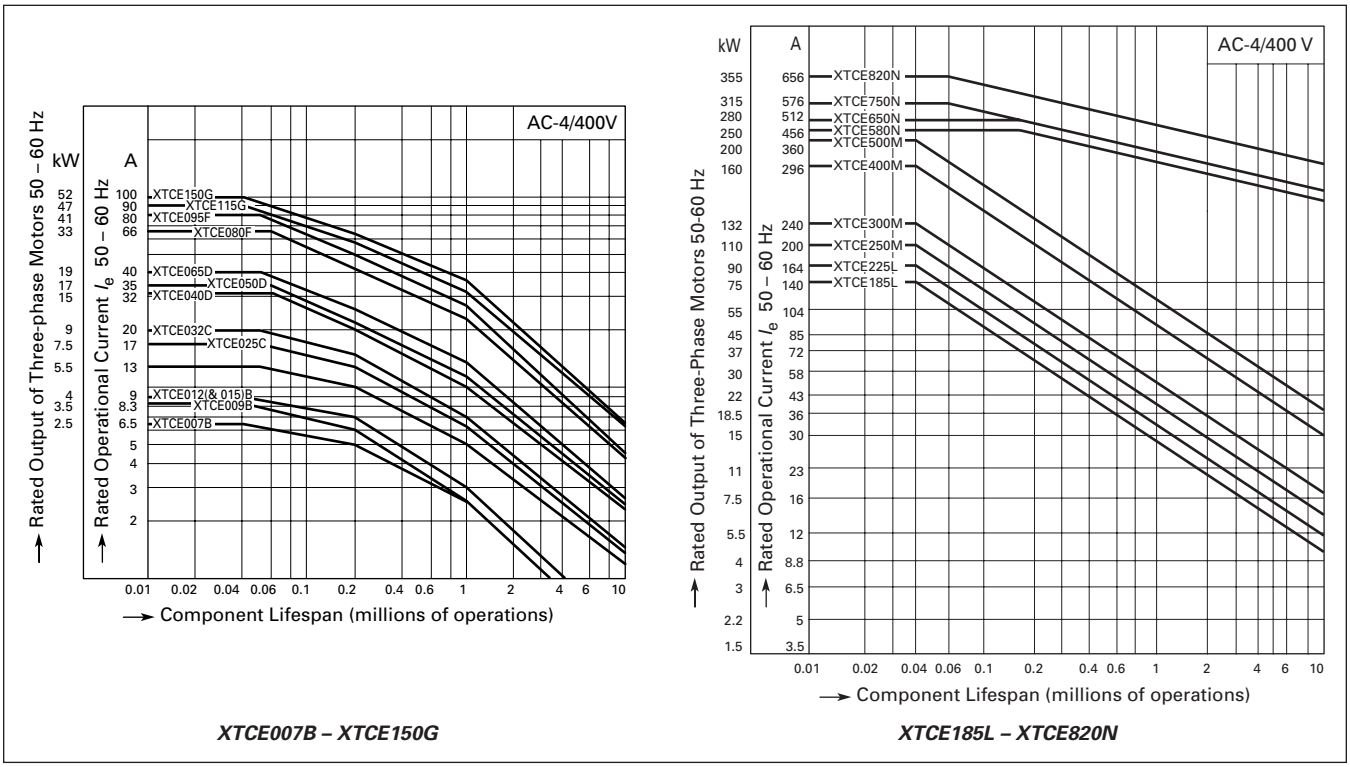
Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Current heat loss (3-Pole) in watts							
at I_{th}	3	3	3	3	7.3	9.6	12.1
at I_e to AC-3/400V	0.37	0.6	1.1	1.8	1.9	3.8	6.1
Impedance per pole, mΩ	2.5	2.5	2.5	2.5	2	2	2
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
Current heat loss (3-Pole) in watts							
at I_{th}	11.3	19	28.8	14.6	21.8	30.4	46.1
at I_e to AC-3/400V	7.2	11.3	19	11.5	16.2	23.8	40.5
Impedance per pole, mΩ	1.5	1.5	1.5	0.6	0.6	0.6	0.6
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
Current heat loss (3-Pole) in watts							
at I_{th}	79	108	95	123	188	236	227
at I_e to AC-3/400V	36	55	48	69	120	120	120
Impedance per pole, mΩ	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
Current heat loss (3-Pole) in watts							
at I_{th}	257	288	355	355	697	711	—
at I_e to AC-3/400V	150	200	239	355	—	—	—
Impedance per pole, mΩ	—	—	—	—	—	—	—

Life Curves



XTCE007B – XTCE150G ***XTCE185L – XTCEC10N***

Figure 18-11. Normal Switching Duty



XTCE007B – XTCE150G ***XTCE185L – XTCE820N***

Figure 18-12. Extreme Switching Duty

18

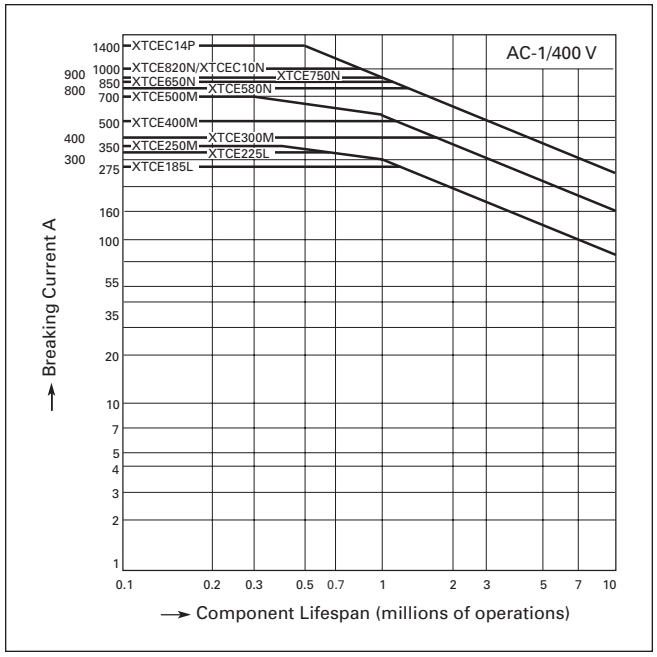


Figure 18-13. Switching Duty for Non-motor loads, 3-pole, 4-pole — XTCE185L – XTCEC14P

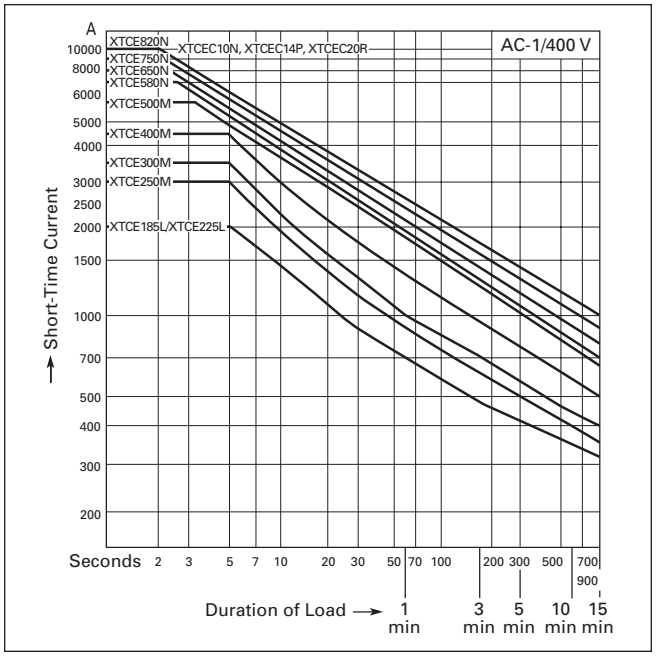
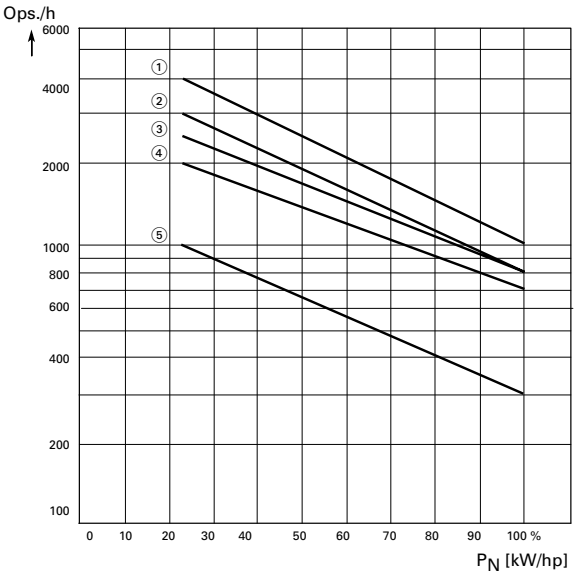


Figure 18-14. Short-Time Loading, 3-pole — XTCE185L – XTCEC20R

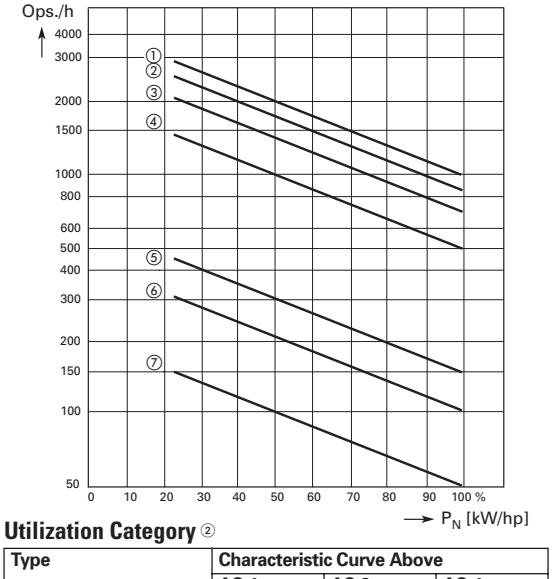


Utilization Category ①

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

① P_N = max. motor rating (kW/hp) of the relevant contactor. ops./h = max. number of operations per hour.

7 to 150 hp



Utilization Category ②

Type	Characteristic Curve Above		
	AC-1	AC-3	AC-4
XTCE185L	2	1	6
XTCE225L	2	1	6
XTCE250L	2	1	6
XTCE300M	3	2	7
XTCE400M	3	2	7
XTCE500M	3	2	7
XTCE580N	3	4	5
XTCE650N	3	4	5
XTCE750N	3	4	5
XTCE820N	3	4	5

② P_N = max. motor rating (kW/hp) of the relevant contactor. ops./h = max. number of operations per hour.

185 to 820 hp

Figure 18-15. Maximum Operating Frequency — Related to Rating and Utilization Category (400V)

Overload Relays

Table 18-51. 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°C to +55°C [-13°F to 131°F]	-25°C to +55°C [-13°F to 131°F]	-25°C to +55°C [-13°F to 131°F]	-25°C to +50°C [-13°F to 22°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 (Ui) V AC	690	690	690	1000
Overvoltage Category / Pollution Degree	III/3	III/3	III/3	III/3
Impulse Withstand Voltage (Uimp) V AC	6000	6000	6000	8000
Operational Voltage (Ue) V AC	690	690	690	1000
Safe Isolation to VDE 0106 Part 101 and part 101/A1 Between auxiliary contacts and main contacts (V AC) Between main contacts (V AC)	 440 440	 440 440	 440 440	 440 440
Overload Release Setting Range	0.1 – 32A	6 – 75A	25 – 150A	50 – 250A
Short Circuit Protection Maximum Fuse			④	
Temperature Compensation Residual Error > 40°C	<0.25	<0.25	<0.25	<0.25
Current Heat Loss (3 Conductors) Lower value of setting range, W Upper value of setting range	 2.5 6	 3 7.5	 16 28	 16 28
Terminal Capacity Solid, mm^2 Flexible with ferrule, mm^2 Flexible with cable lug, mm^2 Stranded with cable lug, mm^2	 2 x (1 – 6) 2 x (1 – 4) 2 x (1 – 6) ② — —	 2 x (1 – 16) 1 x 25 2 x (1 – 10) ③ — —	 2 x (4 – 16) 1 x (4 – 70) 2 x (4 – 50) — —	 — — — 95 120
Solid or Stranded, AWG	14 - 8	14 - 2	2 / 0	250MCM
Flat Conductor (number of segments x width x thickness, mm^2	—	—	—	6 x 16 x 18
Busbar — Width (mm)	—	—	—	20 x 3
Terminal Screw Tightening Torque Nm Lb-in	M4 1.8 16	M6 3.5 31	M10 10 88.5	M8 x 25 24 221.3
Tools Pozidriv screwdriver Standard screwdriver Hexagon socket head spanner (SW)	 Size 2 1 x 6 —	 Size 2 1 x 6 —	 — — 5 mm	 — — 13 mm
Auxiliary and Control Circuit Connections				
Impulse Withstand Voltage (Uimp) V AC	6000	6000	6000	6000
Overvoltage Category/Pollution Degree	III/3	III/3	III/3	III/3
Terminal Capacity Solid, mm^2 Flexible with ferrule, mm^2 Solid or Stranded (AWG)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)
Terminal Screw Tightening Torque Nm Lb-in	M3.5 0.8 – 1.2 7 – 10.6	M3.5 0.8 – 1.2 7 – 10.6	M3.5 0.8 – 1.2 7 – 10.6	M3.5 0.8 – 1.2 7 – 10.6
Tools Pozidriv screwdriver Standard screwdriver	 Size 2 1 x 6	 Size 2 1 x 6	 Size 2 1 x 6	 Size 2 1 x 6
Rated Insulated Voltage (Ui) V AC	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	—

① Ambient Temperature Operating Range to IEC/EN 60947, PTB: -5°C to +50°C.
② 6 mm^2 flexible with ferrules to DIN 46228.
③ Main contact terminal capacity, solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section.
④ Consult factory.

Table 18-51. 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 (Continued)				
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

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.

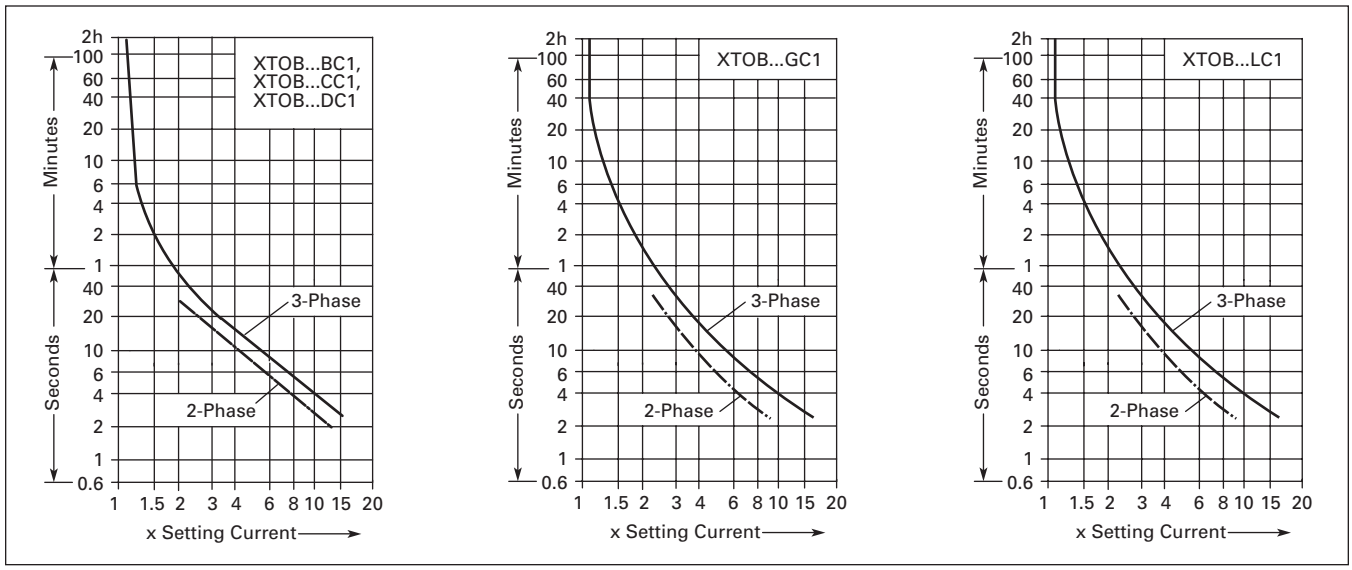


Figure 18-16. Tripping Characteristics

Instructional Leaflets

Table 18-52. Instructional Leaflets

Publication Number	Description
Pub51221	XTOB, D Frame Overload Relays (Inside of Packaging)
Pub51222	XTOB, B – C Frame Overload Relays (Inside of Packaging)

Lighting Contactors

C30CN Lighting Contactors

Main Power Poles

Table 18-53. Maximum AC Voltage and Amp Ratings

Load Type	Amps Continuous	Poles	
		1-Phase	3-Phase
Ballast	30	347V AC	600V AC
General Use	30	600V AC	600V AC
Tungsten	20	277V AC	480V AC
AC Resistive	30	600V AC	600V AC

Table 18-54. Maximum Horsepower Rating

Normal Starting Duty	
1 Pole, Single-Phase	
Volts	**Horsepower**
110 – 120V	1
220 – 240V	2
3 Poles, Three-Phase	
Volts	**Horsepower**
200 – 208V	3
220 – 240V	5
440 – 480V	10
550 – 600V	15

Control Circuit Characteristics

Table 18-55. Coil

Description	VA
Inrush	248 VA
Sealed	28 VA

Table 18-56. Control Module

Input Voltage	Steady State Current @ Rated Voltage (mA)	Maximum VA
12 – 24V DC	42	2
24V AC	80	5
115 – 120V AC	83	12
200 – 277V AC	91	30

Table 18-57. Other Control Module Characteristics

Description	Specification
Minimum pulse duration (3-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

Auxiliary Contacts Rating:

A600, 24V DC, 24 VA

Ambient Temperature:

-13 to 104°F (-25 to 40°C)

Mounting Position:

Vertical 3-point mounting only.

Wire Size

Table 18-58. 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

① 8 AWG stranded only.

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: 480V AC
  - Line-to-neutral: 277V AC

18

Sample Specification

S752 Combination Soft Starters

Furnish as indicated Cutler-Hammer® Class ECS combination starters manufactured by Eaton's electrical business or approved equal. All starters shall be UL listed and conform to the latest IEC and NEMA Standards and the National Electric Code.

Table 18-59. S752

Description	Catalog Number
Disconnect Switch	**ECS91**
Circuit Breaker (HMCPE/HMCP)	**ECS92**

General

- All motor starters shall be fully rated SCR devices up to 50 amperes, with adjustable ramp time from 0.5 to 30 seconds, an initial torque adjustable from 0 – 95%, and a soft stop adjustable up to 30 seconds.
- Overload relays shall be inherent to the soft starter, 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 Auto/Manual. Trip reset to be selectable. Digital Fault/Status display inherent to overload.
- 24V DC power supplies are supplied as standard and are available with primary ratings from 480 – 120V AC and have ratings available from 10 – 160 Watts. Power supplies are equipped with 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 120V AC. 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.
- Communication modules to snap-on to soft starter to enable control network connectivity.

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 inch 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 480V AC.

Technical Data

Table 18-60. S752 Open Soft Starters

Soft Starter (Partial Catalog Number)	S752 L01	S752 L02	S752 L04	S752 L09	S752 L16	S752 L27	S752 L50
In-Line Current Capacity	0.8	1.9	4.4	9.0	16	27	50
Inside-the-Delta Current Capacity	1.3	3.2	7.6	15	27	46	78
Dimensions							
Width in Inches (mm)	2.14 (54)	2.14 (54)	2.14 (54)	2.14 (54)	2.14 (54)	2.14 (54)	2.14 (54)
Height in Inches (mm)	7.78 (198)	7.78 (198)	7.78 (198)	7.78 (198)	7.78 (198)	7.78 (198)	7.78 (198)
Depth in Inches (mm)	5.13 (130)	5.13 (130)	5.13 (130)	5.13 (130)	5.13 (130)	5.13 (130)	5.13 (130)
Weight in lbs. (kg)	3.5 (1.6)	3.5 (1.6)	3.5 (1.6)	3.5 (1.6)	3.5 (1.6)	3.5 (1.6)	3.5 (1.6)
Drawing	See **Tab 15**.						
Electrical Characteristics							
Line Voltage (V AC)	200 – 600	200 – 600	200 – 600	200 – 600	200 – 600	200 – 600	200 – 600
Operating Frequency (Hz)	47 – 63	47 – 63	47 – 63	47 – 63	47 – 63	47 – 63	47 – 63
Leakage Current	15 mA AC max.						
Min. Operating Current	100 mA						
Control Voltage (24V DC ±10%)	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4
Response Time Max.	100 mS	100 mS	100 mS	100 mS	100 mS	100 mS	100 mS
Control Steady State Current	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Inrush Current (During Bypass)	3.6A @ 50 mS	3.6A @ 50 mS	3.6A @ 50 mS	3.6A @ 50 mS	3.6A @ 50 mS	3.6A @ 50 mS	3.6A @ 50 mS
Control Wiring							
(+ and -) 1 Wire per Terminal	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)	14 – 12 AWG (1.5 – 2.5 mm^2)
(+ and -) 2 Wires per Terminal	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)	14 AWG (1.5 mm^2)
(P,F,1,2,3) 1 Wire per Terminal	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)	22 – 12 AWG (0.5 – 2.5 mm^2)
(P,F,1,2,3) 2 Wires per Terminal	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)	18 – 14 AWG (0.75 – 1.5 mm^2)
Torque (max.)	4.5 lb-in (0.5 Nm)	4.5 lb-in (0.5 Nm)	4.5 lb-in (0.5 Nm)	4.5 lb-in (0.5 Nm)	4.5 lb-in (0.5 Nm)	4.5 lb-in (0.5 Nm)	4.5 lb-in (0.5 Nm)
Driver	0.13 (3.5 mm) Flat	0.13 (3.5 mm) Flat	0.13 (3.5 mm) Flat	0.13 (3.5 mm) Flat	0.13 (3.5 mm) Flat	0.13 (3.5 mm) Flat	0.13 (3.5 mm) Flat
Terminals L1, L2, L3/T1, T2, T3 — Use Class B 75°C copper wire only							
1 Wire per Terminal	14 – 4 AWG (1.5 – 16 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)	14 – 4 AWG (1.5 – 16 mm^2)
2 Wires per Terminal	14 – 6 AWG (1.5 – 12 mm^2)	14 – 6 AWG (1.5 – 12 mm^2)	14 – 6 AWG (1.5 – 12 mm^2)	14 – 6 AWG (1.5 – 12 mm^2)	14 – 6 AWG (1.5 – 12 mm^2)	14 – 6 AWG (1.5 – 12 mm^2)	14 – 6 AWG (1.5 – 12 mm^2)
Torque (max.) 14 – 10 AWG (1.5 – 6 mm^2) 8 AWG (10 mm^2) 6 – 4 AWG (6 – 4 mm^2)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)	 35 lb-in (4 Nm) 40 lb-in (4.5 Nm) 45 lb-in (5 Nm)
Connector Type	Box Lug	Box Lug	Box Lug	Box Lug	Box Lug	Box Lug	Box Lug
Driver	3 mm Hex Key	3 mm Hex Key	3 mm Hex Key	3 mm Hex Key	3 mm Hex Key	3 mm Hex Key	3 mm Hex Key
Environmental Characteristics							
Temperature — Operating (no derating)	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C
Temperature — Derate >50°C (max. 65°C)	-1% per °C	-1% per °C	-1% per °C	-1% per °C	-1% per °C	-1% per °C	-1% per °C
Temperature — Storage	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C
Altitude (Meters) — No Derating	2000	2000	2000	2000	2000	2000	2000
Altitude > 2000M	1% per 100m	1% per 100m	1% per 100m	1% per 100m	1% per 100m	1% per 100m	1% per 100m
Humidity	95% Non-condensing						
Operating Position	Vertical ± 30°						
Impulse Withstand Voltage IEC 947-4-1	4000V	4000V	4000V	4000V	4000V	4000V	4000V
Rated Insulation Voltage (Ui)	660V						
Installation Category	III						
Vibration	IEC 68-2-6 3g 10 – 150 Hz						
Shock	15g	15g	15g	15g	15g	15g	15g
Degree of Protection	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Agency Approvals	UL, CSA, CE						

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 contactor(s) close after ramp time.

- Adjustable initial torque 0 – 95% of locked rotor torque.
- Adjustable ramp time .5 – 30 seconds.

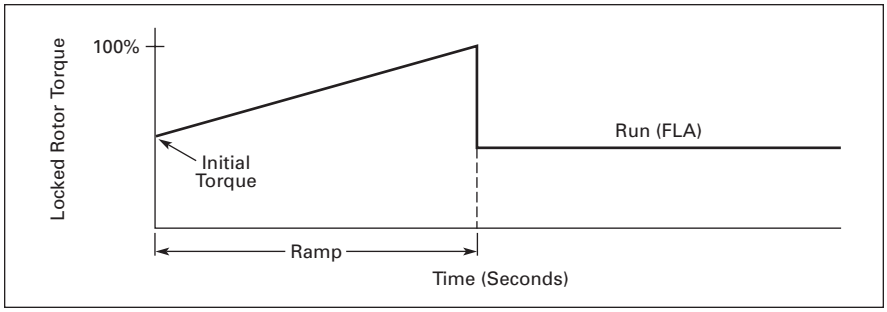


Figure 18-17. Starting Characteristics — Ramp Start

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 product damage.

- Stop time = 0 – 30 seconds.

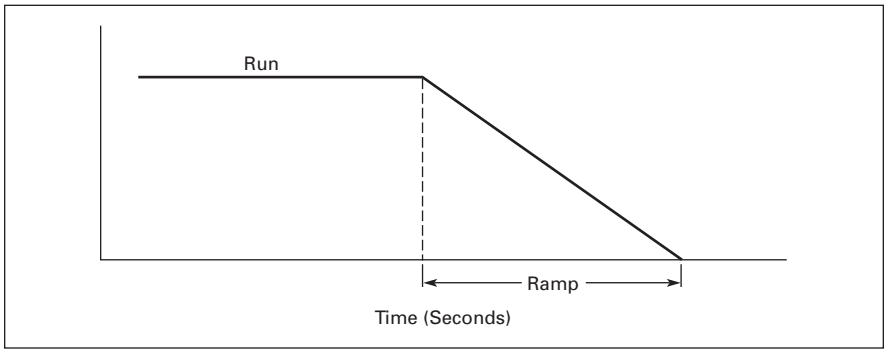


Figure 18-18. Starting Characteristics — Soft Stop

18

Sample Specification

S801 and S811 Combination Soft Starters

Furnish as indicated Cutler-Hammer® Class ECS combination starters manufactured by Eaton's electrical business or approved equal. All starters shall be UL listed and conform to the latest IEC and NEMA Standards and the National Electric Code.

Table 18-61. S801 Soft Starter

Description	Catalog Number
Disconnect Switch	**ECS91**
Circuit Breaker (HMCPE/HMCP)	**ECS92**

Table 18-62. S811 Soft Starter

Description	Catalog Number
Disconnect Switch	**ECS94**
Circuit Breaker (HMCPE/HMCP)	**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.
- 24V DC power supplies are supplied as standard and are available with primary ratings from 480 – 120V AC 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 120V AC. 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.
- S811 shall have built-in communication port to enable control network connectivity. S801 shall permit communications via smart I/O module enabling 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 inch 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 480V AC.

Technical Data

Table 18-63. Specifications— *IT.* Soft Starter

Soft Starter (Partial Catalog Number)	S801/ S811 N37	S801/ S811 N66	S801/ S811 R10	S801/ S811 R13	S801/ S811 T18	S801/ S811 T24	S801/ S811 T30	S801/ S811 U36	S801/ S811 U42	S801/ S811 U50 ①	S801/ S811 V36	S801/ S811 V42	S801/ S811 V50	S801/ S811 V65	S801/ S811 V72	S801/ S811 V85	S801/ S811 V10 ②
Max. Current Capacity	37	66	105	135	180	240	304	360	420	500	360	420	500	650	720	850	1000
Dimensions																	
Width in Inches (mm)	2.60 (66.0)		4.37 (111.0)		7.65 (194.4)			7.73 (196.3)			11.03 (280.2)						
Height in Inches (mm)	7.38 (187.4)		7.92 (201.1)		12.71 (322.9)			12.72 (323.1)			16.57 (420.8)						
Depth in Inches (mm)	6.63 (168.4)		7.03 (178.6)		6.69 (169.8)			7.08 (179.9)			7.23 (183.7)						
Weight in lbs. (kg)	5.8 (2.6)		10.5 (4.8)		48 (21.8) w/Lugs 41 (18.6) w/o Lugs			48 (21.8) w/Lugs 41 (18.6) w/o Lugs			103 (46.8) w/Lugs 91 (41.4) w/o Lugs						
General Information																	
Bypass Mechanical Lifespan	10M																
Insulating Voltage Ui	660V																
Ramp Time Range	.5 – 180 Seconds (.5 – 360 Seconds Extended Ramp)																
Resistance to Vibration	3g																
Resistance to Shock	15g																
Electrical Information																	
Operating Voltage	200 – 600V																
Operating Frequency	47 – 63 Hz																
Overload Setting	30 – 100%																
Trip Class	5, 10, 20, & 30																
Cabling Capacity (IEC 947)																	
Number of Conductors	1		1		1 or 2			1 or 2			2, 4 or 6						
Wire Sizes	14 – 2		14 – 4/0		4 AWG to 500 MCM			4 AWG to 500 MCM			2/0 to 500 MCM						
Type of Connectors	Box Lug				Add-On Lug Kit												
Control Wiring (12-Pin)																	
Wire Sizes in AWG	22 – 14																
Number of Conductors (Stranded)	2 (or one AWG 12)																
Torque Requirements in lb-in	3.5																
Solid, Stranded or Flexible Max. Size in mm^2	3.31																
Control Power Requirements																	
Voltage Range (24V ± 10%)	21.6 – 26.4																
Steady State Current Amps	1.0		1.0		1.0			1.0			1.4						
Inrush Current Amps	10		10		10			10			10						
Ripple	1%																
Relays (1) Class A and C																	
Voltage AC — maximum	240																
Voltage DC — maximum	120																
Amps — maximum	3																
Environment																	
Temperature — Operating	-30 – 50°C (No derating) Consult factory for operation > 50° C																
Temperature — Storage	-50 – 70°C																
Altitude	<2000 Meters — Consult factory for operation > 2000m																
Humidity	<95% Non-condensing																
Operating Position	Any																
Pollution degree IEC947-1	3																
Impulse withstand Voltage IEC947-4-1	6000V																

① U-Frame 500 Amp unit does not have IEC Certification.
② UR Recognized Product.

Operation

Starting and Stopping Modes

The S801/S811 have 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).

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).

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

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.

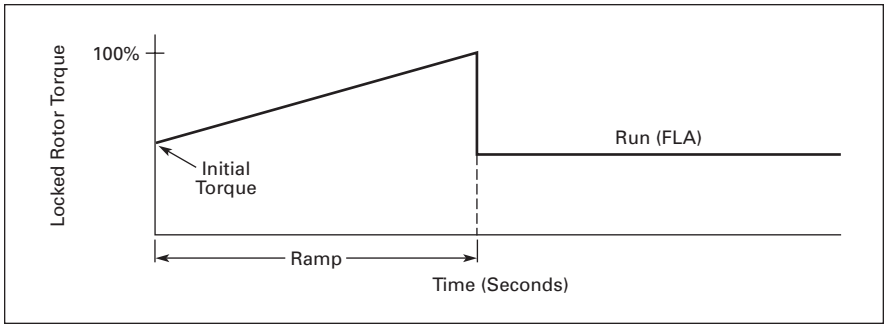


Figure 18-19. Starting Characteristics — Ramp Start

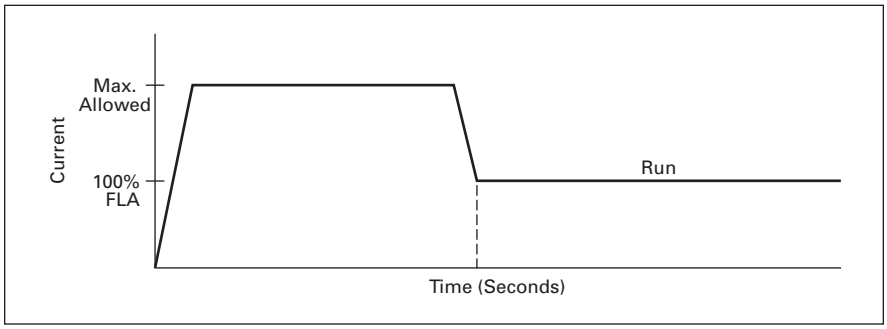


Figure 18-20. Starting Characteristics — Current Limit Start

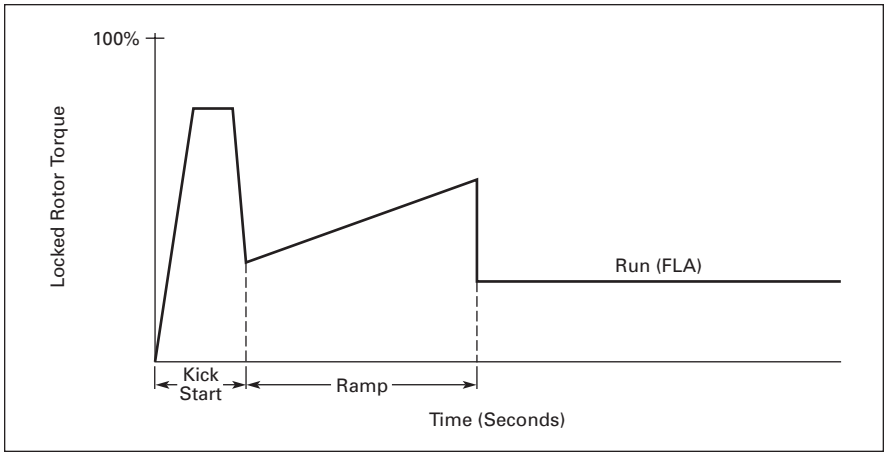


Figure 18-21. Starting Characteristics — Kick Start

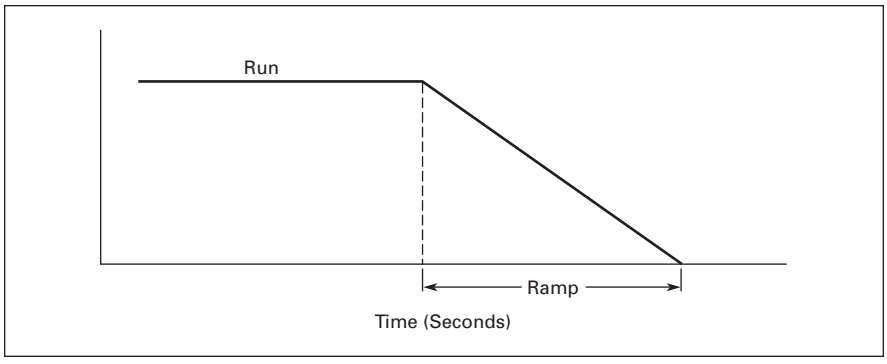


Figure 18-22. Starting Characteristics — Soft Stop

18

Sample Specification

MVX9000 Microdrives

Furnish as indicated Cutler-Hammer® Class ECS combination motor controllers manufactured by Eaton's electrical business or approved equal. All motor controllers shall be UL listed and conform to the latest Standards and the National Electric Code.

Table 18-64. MVX9000 Microdrives

Description	Catalog Number
Disconnect Switch	**ECS81**
Circuit Breaker (HMCPE/HMCP)	**ECS82**

General

- All motor controllers shall utilize IGBT technology with ratings up to 7-1/2 hp at 240V AC and 10 hp at 480V AC.
- Overload relays shall be inherent to the drive and allow for keypad selection of full load amperage settings.
- Control circuit transformers, where specified, shall be encapsulated. Primary and secondary fusing shall be provided. Unless otherwise specified, the secondary shall be 120V AC. 50 VA is minimum.
- Pilot devices, where specified, shall be oiltight and mounted in the door. Pilot lights shall be transformer type for longer lamp life. Pilot device legend plates shall be engraved aluminum.
- Keypad for drive control shall be mounted through the door. Option shall be available for an external enclosure for additional keypad protection. Option shall also be available for keypad mounted directly onto drive.

Enclosure

- Enclosures shall be Type 1, 3R, 4, 4X or 12, as scheduled.
- The operating mechanism shall be mounted through the door and shall have positive, non-teasing ON/OFF action.
- 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 inch 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 480V AC.

Technical Data

Output Ratings

- Horsepower;
  - 90V – 132V, 1/4 – 1 hp
  - 200 – 240V: 1/2 – 7-1/2 hp
  - 380 – 480V: 1 – 10 hp
- Frequency Range: 0.1 – 400 Hz
- Overload Rating: 150% for 60 seconds
- Frequency Resolution:
  - Digital: 0.1 Hz
  - Analog: Max. (Set Frequency/1000) Hz
- Frequency Accuracy
  - Digital: ± 0.01% of max. frequency
  - Analog: ± 0.2% of max. frequency
- Undervoltage Carryover Limit: 0.3 to 25 seconds

Motor Performance

- Motor Control: Sensorless Vector
- Constant and Variable Torque: Standard
- Speed Regulation: 0.5% of base speed

Input Power

- Voltage at 50/60 Hz ± 3 Hz
  - 100V – 120V, -10% +10% / 1-phase
  - 200V – 240V, -10% +5% / 1-phase
  - 200V – 240V, -10% +5% / 3-phase
  - 380V – 480V, -10% +10% / 3-phase
- Displacement Power Factor: Better than 0.95
- Efficiency: Typically greater than 95%

Design Type

- Microprocessor: 32-Bit
- Converter Type: Diode
- Inverter Type: Insulated Gate Bipolar Transistor
- Waveform: Sensorless Vector

Environment

- Operating Temperature:
  - -10°C to +50°C
  - -10°C to +40°C (above 7-1/2 hp)
- Humidity: 20 to 90% non-condensing
- Maximum Elevation: 1000 meters (3300 ft.)

Protective Features

- Ground Fault: Standard
- Overload Protection: Standard
- Overcurrent: Standard
- Overvoltage: Standard
- Undervoltage: Standard
- Overtemperature: Standard
- Overload Limit: Standard

Set Up Adjustments, Performance Features, Operator Control and External Interface

Keypad

- Alphanumeric Display: Standard, 1 x 4 character
- Digital Indications: Frequency (Hz), Motor Current (amps), User-Defined RUN/STOP, FORWARD/REVERSE and Parameters
- Diagnostics: Last 3 trips with cause
- LED Status Indicators: 8 (RUN/STOP, FORWARD/REVERSE, Hz, Amps, User Defined, and Input Speed)
- Operator Functions: START/STOP, Speed control (digital or potentiometer), RESET, SETUP Keys and ENTER.

I/O Terminal Block

- Analog Inputs:
  - 2 Inputs: 0 – 10V DC, 4 – 20 mA
  - Potentiometer: 1K ohm to 2K ohm
  - Analog Voltage: Nominal 10V DC (10K ohm input impedance)
  - Analog Current: Nominal 4 – 20 mA (250 ohm)
- Digital Inputs: 6 Programmable Inputs
- Digital Outputs: 1 Programmable Open collector and 1 Form C Relay contact
- Analog Monitor Output:
  - Analog meter – frequency or output current
- Dynamic Brake Chopper

Programmable Parameters

- Out of the Box: Factory settings loaded for quick start-up.
- Accel. and Decel.: 2 separately adjustable Linear or S Curve times: 0.1 – 3000 seconds
- Auto Restart: Overcurrent, overvoltage and undervoltage with 4 selectable retry restart modes
- DC Injection Braking
- External Fault: Terminal input
- Jog: Terminal input
- Fault Reset: STOP/RESET or terminal input
- I/O: NO/NC Selectable
- Jump Frequencies: 3 (with adjustable width)
- Parameter Security: Programmable software lock
- Preset Speeds: 7 preset speeds
- PID Controller: PID process control
- Reversing: Keypad or terminal
- Speed Setting: Keypad, terminal or pot
- START/STOP Control: Keypad or terminal
- Stop Modes: Decel, coast or DC injection

Reliability

- Pretested Components: Standard
- Surface Mount Technology: Standard (PCBs)
- Computerized Testing: Standard
- Final Test with Full Load: Standard
- Eaton's Cutler-Hammer Engineering Systems and Service: National network of AF drive specialists

Table 18-65. Watts Loss

Horsepower	Catalog Number	Volts	Watts Loss
			9 kHz
1/4	**MVXF25A0-1**	115V	20W
1/2	**MVXF50A0-1**	AC	20W
1	**MVX001A0-1**		38W
1/2	**MVXF50A0-2**	240V	20W
1	**MVX001A0-2**	AC	38W
2	**MVX002A0-2**		75W
3	**MVX003A0-2**		110W
5	**MVX005A0-2**		185W
7-1/2	**MVX007A0-2**		275W
1	**MVX001A0-4**	480V	38W
2	**MVX002A0-4**	AC	75W
3	**MVX003A0-4**		110W
5	**MVX005A0-4**		185W
7-1/2	**MVX007A0-4**		275W
10	**MVX010A0-4**		375W

Table 18-66. Dynamic Breaking Resistor Sizing

Dynamic Braking Resistors, Open Units		Catalog Number	Resistor (Min. Ohms)	Watts	Braking Torque	Duty Cycle
Horsepower	Volts					
1/4	115V	**K13-000034-0821**	100	80W	220%	10%
1/2	Series	**K13-000034-0821**	100	80W	220%	10%
1		**K13-000034-0821**	80	80W	125%	10%
1/2	230V	**K13-000034-0821**	100	80W	220%	10%
1	Series	**K13-000034-0821**	80	80W	125%	10%
2		**K13-000034-0824**	55	300W	125%	10%
3		**K13-000034-0824**	35	300W	125%	10%
5		**K13-000034-0825**	25	400W	125%	10%
7-1/2		**K13-000034-0826** ①	16	500W	125%	10%
1	460V	**K13-000034-0841**	260	80W	125%	10%
2	Series	**K13-000034-0843**	190	300W	125%	10%
3		**K13-000034-0843**	145	300W	125%	10%
5		**K13-000034-0844**	95	400W	125%	10%
7-1/2		**K13-000034-0845** ①	60	500W	125%	10%
10		**K13-000034-0846** ②	45	700W	125%	10%

① Braking resister kit includes two resistors to be connected in parallel.
② Braking resister kit includes three resistors to be connected in parallel.

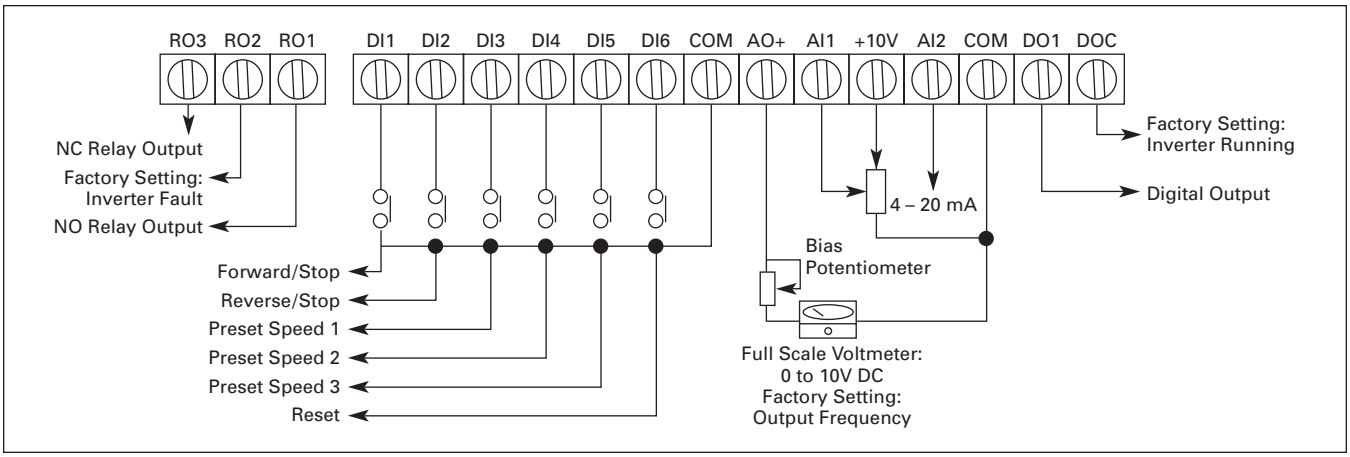


Figure 18-23. Control Terminal Wiring (Factory Settings)

18

Table 18-67. Specifications

Description	NEMA			Special Purpose			
	Size 4	Size 5	Size 6	160A	320A	540A	610A
	V201K4_	V201K5_	V201K6_	V201KR_	V201KT_	V201KV_	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 Second	1600A RMS	3000A RMS	6000A RMS	1600A RMS	3000A RMS	6000A RMS	6000A RMS
Dielectric Strength	2200V AC	5375V AC	5375V AC	2200V AC	5375V AC	5375V AC	5375V AC
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
3-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) ①							
Single-Phase, 2-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, 3-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

① For transformers having inrush currents of not more than 20 times the rated full load current.

Table 18-68. Electrical Characteristics — Apply to Both NEMA and Special Purpose Types

Description	Size		
	4 (160A)	5 (320A)	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
Pick-Up Volts	70% of Rated Coil Volts		
Drop-Out Volts	50% of Rated Coil Volts		
Pick-Up Time in Hz	1.5 – 2 Hz		
Drop-Out 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 Second	1600A RMS	3000A RMS	6000A RMS

Table 18-69. 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
Pick-Up Volts	70% of Rated Coil Volts		
Drop-Out Volts	50% of Rated Coil Volts		
Pick-Up Time in Hz	1.5 – 2	1.5 – 2	1.5 – 2
Drop-Out Time in Hz	6 – 7.5	6 – 6.15	6 – 6.15

18

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 18-49**.

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.

Table 18-70. 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	10141
1100	8382	12067	15477
1500	11100	16066	21032
2000	21820	24356	41100
3000	29123	32770	59997
5000	74595	111000	145000
7500	104000	162000	219000
10000	111000	166000	237000

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:

Table 18-71. Example Data

Qty.	Description	Sealed VA	Inrush VA
3	3-Pole Size 1 Contactors	60	309
2	3-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 one at left, the Transformer Selection Inrush VA is calculated at 1773 VA.

Transformer Selection VA

$$= \sqrt{(\text{VA Sealed})^2 + (\text{VA Inrush})^2}$$

$$= \sqrt{(311)^2 + (1773)^2}$$

$$= \sqrt{3{,}240{,}250}$$

$$= 1800$$

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.

Control Power Transformer Kit

Table 18-72. Component VA Table

	Inrush			Sealed		
	VAR	**Watts**	**VA**	**VAR**	**Watts**	**VA**
Relays						
Type AA (1 – 2 Pole)	18	8.5	20	8	6.6	11
Type D15	64	49	80	7.1	2.4	7.5
Type M (2 – 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
Advantage Contactors and Starters						
NEMA						
Size IL, 1 and 2	—	—	250	—	5	25
Sizes 3 and 4	—	—	500	—	10	50
Sizes 5 and 6	—	—	2600	—	10	50

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 which 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.

Table 18-73. 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	.95	.55	.48	.38	—
	1200	1.61	1.40	.81	.70	.56	—
	900	1.84	1.60	.93	.80	.64	—
1/3	1800	1.37	1.19	.69	.60	.48	—
	1200	1.83	1.59	.92	.80	.64	—
	900	2.07	1.80	1.04	.90	.72	—
1/2	1800	1.98	1.72	.99	.86	.69	—
	1200	2.47	2.15	1.24	1.08	.86	—
	900	2.74	2.38	1.38	1.19	.95	—
3/4	1800	2.83	2.46	1.42	1.23	.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	—
	900	4.95	4.30	2.60	2.15	1.72	—
1-1/2	3600	5.01	4.36	2.64	2.18	1.74	—
	1800	5.59	4.86	2.94	2.43	1.94	—
	1200	6.07	5.28	3.20	2.64	2.11	—
	900	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	—
	900	9.09	7.90	4.77	3.95	3.16	—
3	3600	9.59	8.34	5.02	4.17	3.34	—
	1800	10.8	9.40	5.70	4.70	3.76	—
	1200	11.7	10.2	6.20	5.12	4.10	—
	900	13.1	11.4	6.90	5.70	4.55	—
5	3600	15.5	13.5	8.20	6.76	5.41	—
	1800	16.6	14.4	8.74	7.21	5.78	—
	1200	18.2	15.8	9.59	7.91	6.32	—
	900	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	—
	900	26.5	23.0	13.9	11.5	9.19	—
10	3600	29.2	25.4	15.4	12.7	10.1	—
	1800	30.8	26.8	16.3	13.4	10.7	—
	1200	32.2	28.0	16.9	14.0	11.2	—
	900	35.1	30.5	18.5	15.2	12.2	—
15	3600	41.9	36.4	22.0	18.2	14.5	—
	1800	45.1	39.2	23.7	19.6	15.7	—
	1200	47.6	41.4	25.0	20.7	16.5	—
	900	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	—
	900	63.1	54.9	33.2	27.4	21.9	—

Table 18-73. Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor (Continued)

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	—
	900	77.4	67.3	40.7	33.7	27.0	—
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	—
	900	94.1	81.8	49.5	40.9	32.7	—
40	3600	111	96.4	58.2	48.2	38.5	—
	1800	116	101	61.0	50.4	40.3	—
	1200	117	102	61.2	50.6	40.4	—
	900	121	105	63.2	52.2	41.7	—
50	3600	138	120	72.9	60.1	48.2	—
	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	—
60	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	—
	900	177	154	93.1	77.0	61.5	—
75	3600	206	179	108	89.6	71.7	—
	1800	210	183	111	91.6	73.2	—
	1200	212	184	112	92.0	73.5	—
	900	222	193	117	96.5	77.5	—
100	3600	266	231	140	115	92.2	—
	1800	271	236	144	118	94.8	23.6
	1200	275	239	145	120	95.6	24.2
	900	290	252	153	126	101	24.8
125	3600	—	292	176	146	116	—
	1800	—	293	177	147	117	29.2
	1200	—	298	180	149	119	29.9
	900	—	305	186	153	122	30.9
150	3600	—	343	208	171	137	—
	1800	—	348	210	174	139	34.8
	1200	—	350	210	174	139	35.5
	900	—	365	211	183	146	37.0
200	3600	—	452	257	226	181	—
	1800	—	458	265	229	184	46.7
	1200	—	460	266	230	184	47.0
	900	—	482	279	241	193	49.4
250	3600	—	559	338	279	223	—
	1800	—	568	343	284	227	57.5
	1200	—	573	345	287	229	58.5
	900	—	600	347	300	240	60.5
300	1800	—	678	392	339	271	69.0
	1200	—	684	395	342	274	70.0
400	1800	—	896	518	448	358	91.8
500	1800	—	1110	642	555	444	116

① To convert horsepower to kW, multiply horsepower by .7457.
② 380V 50 Hz.

Table 18-74. Product Codes — By Description

Description	Code
Accessories, Advantage	AF63
Accessories, Fuse Clips and Cover Control	AF40
Accessories, ***IT.*** EM IEC	AF68
Accessories, ***IT.*** EM IEC Enclosed Control	AF68
Accessories, ***IT.*** EM NEMA Enclosed Control	AF67
C361 Flange Mounted Switch	AN20
C371 Circuit Breaker Operator	AN50
Combination Enclosed Starters, Specials	AM60
Combination Full Voltage Advantage Starter	AE63
Combination Full Voltage IEC Freedom Starter	AE62
Combination Full Voltage IEC ***IT.*** EM Starters	AE68
Combination Full Voltage NEMA Freedom Starter	AE61
Combination Full Voltage NEMA ***IT.*** EM Starters	AE67
Combination Full Voltage Type 4X & 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, Advantage	AJ66
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, Advantage	AI67
Multispeed Combination, IEC Freedom	AI66
Multispeed Combination, NEMA Freedom	AI65
Multispeed Non-combination, Freedom IEC	AI62
Multispeed, Advantage	AI63
Multispeed, IEC ***IT.*** EM	AI68
Multispeed, NEMA Freedom	AI61
Multispeed, NEMA ***IT.*** EM	AI69
Multispeed, Vacuum	AI64
Non-combination Enclosed Starters, Specials	AM50
Non-combination Full Voltage Advantage Contactor	AB63
Non-combination Full Voltage Advantage Starter	AA63
Non-combination Full Voltage IEC Freedom Contactor	AB62
Non-combination Full Voltage IEC Freedom Fixed OL Starter	AA31
Non-combination Full Voltage IEC Freedom Starter	AA62
Non-combination Full Voltage IEC ***IT.*** EM Contactors	AC68
Non-combination Full Voltage IEC ***IT.*** EM Starters	AA68
Non-combination Full Voltage NEMA Freedom Contactor	AB61
Non-combination Full Voltage NEMA Freedom Starter	AA61
Non-combination Full Voltage NEMA ***IT.*** EM Contactors	AC67
Non-combination Full Voltage NEMA ***IT.*** EM Starters	AA67
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 MVX Drives	AA80
Non-combination Reduced Voltage ***IT.*** Soft Starter	NS12

Table 18-74. Product Codes — By Description (Continued)

Description	Code
Oil Pump Panel, NEMA Freedom	AJ71
Pump Panel, Advantage	AJ63
Pump Panel, IEC Freedom	AJ62
Pump Panel, NEMA Freedom	AJ61
Pump Panel, Vacuum	AJ64
Pump Panels, ***IT.*** EM	AJ67
Reduced Voltage IEC Starter	AG62
Reduced Voltage NEMA Starter	AG61
Reduced Voltage Vacuum Starter	AG64
Reduced Voltage, IEC ***IT.***	AG68
Renewal Parts for Enclosed Control, C361, C371, C400	HD70H4

Table 18-75. Product Codes — By Code

Code	Description
AA31	Non-combination Full Voltage IEC Freedom Fixed OL Starter
AA61	Non-combination Full Voltage NEMA Freedom Starter
AA62	Non-combination Full Voltage IEC Freedom Starter
AA63	Non-combination Full Voltage Advantage 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
AA67	Non-combination Full Voltage NEMA ***IT.*** EM Starters
AA68	Non-combination Full Voltage IEC ***IT.*** EM Starters
AA80	Non-combination MVX Drives
AB61	Non-combination Full Voltage NEMA Freedom Contactor
AB62	Non-combination Full Voltage IEC Freedom Contactor
AB63	Non-combination Full Voltage Advantage 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
AC67	Non-combination Full Voltage NEMA ***IT.*** EM Contactors
AC68	Non-combination Full Voltage IEC ***IT.*** EM Contactors
AE61	Combination Full Voltage NEMA Freedom Starter
AE62	Combination Full Voltage IEC Freedom Starter
AE63	Combination Full Voltage Advantage Starter
AE64	Combination Full Voltage Vacuum Starter
AE65	Combination Full Voltage Type 4X & 7/9 NEMA Starter
AE66	Non-combination Full Voltage Type 7/9 NEMA Starter
AE67	Combination Full Voltage NEMA ***IT.*** EM Starters
AE68	Combination Full Voltage IEC ***IT.*** EM Starters
AF40	Accessories, Fuse Clips and Cover Control
AF63	Accessories, Advantage
AF67	Accessories, ***IT.*** EM NEMA Enclosed Control
AF68	Accessories, ***IT.*** EM IEC Enclosed Control
AF68	Accessories, ***IT.*** EM IEC
AG61	Reduced Voltage NEMA Starter
AG62	Reduced Voltage IEC Starter
AG64	Reduced Voltage Vacuum Starter
AG68	Reduced Voltage, IEC ***IT.***
AI61	Multispeed, NEMA Freedom
AI62	Multispeed Non-combination, Freedom IEC

Table 18-75. Product Codes — By Code (Continued)

Code	Description
AI63	Multispeed, Advantage
AI64	Multispeed, Vacuum
AI65	Multispeed Combination, NEMA Freedom
AI66	Multispeed Combination, IEC Freedom
AI67	Multispeed Combination, Advantage
AI68	Multispeed, IEC ***IT.*** EM
AI69	Multispeed, NEMA ***IT.*** EM
AJ61	Pump Panel, NEMA Freedom
AJ62	Pump Panel, IEC Freedom
AJ63	Pump Panel, Advantage
AJ64	Pump Panel, Vacuum
AJ65	Duplex Pump Panels, Freedom
AJ66	Duplex Pump Panels, Advantage
AJ67	Pump Panels, ***IT.*** EM
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
2915	Manual Starters Type MS
2916	Manual Starters Type B100

April 2008

Eaton Electrical Terms & Conditions

Contents

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 Electrical Inc. (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

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.

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 therefore." 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.

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.