

Combination Starters — Fusible and Non-fusible

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

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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**.

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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.

Catalog Number Selection

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

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

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

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	

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 START/STOP Pushbuttons with Red RUN Pilot Light with Red RUN/Green OFF Lights	A B C D	C400GK0 C400GK1 C400GK12 ② C400GK16 ②
HAND/OFF/AUTO Selector Switch with Red RUN Pilot Light with Red RUN/Green OFF Lights	H J K	C400GK3 C400GK32 ② C400GK36 ②
Red RUN Pilot Light Green OFF Red RUN/Green OFF Pilot Lights	P Q R	C400GK42 ② C400GK41 ② C400GK46 ②

Reversing

No Cover Mounted Pilot Devices FOR/REV/STOP Pushbuttons with 2 Red Pilot Lights	A B C	C400GK0 C400GR1 C400GR14 ②
UP/STOP/DOWN Pushbuttons with 2 Red Pilot Lights	E F	C400GR2 C400GR24 ②
Two Red Pilot Lights One Green Pilot Light	P Q	C400GK44 ② 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: C400T9B.

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 START/STOP Pushbuttons with Red RUN Pilot Light with Red RUN/Green OFF Lights	A B C D	— C400T1 — —
ON/OFF Pushbuttons with Red RUN Pilot Light with Red RUN/Green OFF Lights	E F G	C400T2 — —
HAND/OFF/AUTO Selector Switch with Red RUN Pilot Light with Red RUN/Green OFF Lights	H J K	C400T12 — —
START Pushbutton ON Pushbutton OFF Pushbutton Red RUN Pilot Light Green OFF Red RUN/Green OFF Pilot Lights	L M N P Q R	C400T3 C400T4 C400T5 C400T9 ④ C400T10 ④ C400T11 ④
START/STOP Selector Switch with Red RUN Pilot Light with Red RUN/Green OFF Lights	S T U	C400T13 — —
ON/OFF Selector Switch with Red RUN Pilot Light with Red RUN/Green OFF Lights	V W X	C400T14 — —

Reversing

No Cover Mounted Pilot Devices FOR/REV/STOP Pushbuttons with 2 Red Pilot Lights with 2 Red/1 Green Pilot Lights	A B C D	— C400T6 — —
UP/STOP/DOWN Pushbuttons with 2 Red Pilot Lights	E F	— —
FOR/OFF/REV Selector Switch with 2 Red Pilot Lights with 2 Red/1 Green Pilot Lights	H J K	C400T15 — —
Two Red Pilot Lights One Green Pilot Light Two Red/One Green Pilot Lights OPEN/OFF/CLOSE Selector Switch with 2 Red Pilot Lights with 2 Red/1 Green Pilot Lights	P Q R V W X	⑤ C400T10 ④ — C400T16 — —

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: C400T9B.

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.

Contactors

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E22 Selector Switch

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

Description	Factory Installed ①	Field Installation Kits
	Position 9 Cover Control Code	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: ECN16A4ADA-**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				