

3.1

IEC Contactors and Starters

XT IEC Power Control

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IEC Non-Metallic Enclosure—Contactors and Starters



Non-Metallic Enclosure—Contactors and Starters

Product Description

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

Reliable Protection

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

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

Clever, Convenient Design to 25 hp

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

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

Additional Reference

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

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Features and Benefits

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

Standards and Certifications

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

- UL Listed/CSA/IEC

Product Configuration Overview

Starter sizes (mm)

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

Phases

- Available in single- and three-phase

Contactors

- From miniature to 32 amps

Voltages

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

Pilot devices

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

Illumination options

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

IEC Metallic Enclosure—Contactors and Starters



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Metallic Enclosure—Contactors and Starters

Product Description

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

Features and Benefits

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

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

Standards and Certifications

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

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

Short-Circuit Ratings

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

Note

① cUL Listing indicates appropriate CSA standard investigation.

Additional Reference

Dimensions	Tab 14
Accessories and Modifications	Tab 15
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Catalog Number Selection

XT IEC Line Metallic Enclosed Control

EC X 25 E 5 A A A -

Design
X = XT IEC

Modification Codes
See Tab 15

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

Overload Range
See table below

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

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

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

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

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

XTOB Overload Relays for Enclosed XT

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

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

Notes

- ① See Tab 1 for enclosure type/IP rating cross-reference.
- ② Size B–E is 10–16 A.

C440 Solid-State Overload Modifications

Reliability and Improved Uptime

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

Flexibility

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

Monitoring Capabilities

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

Safety

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

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

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

Notes

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

Cover Control

Product Selection

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

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

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

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



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

Note

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

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

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

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

Type 1 Cover Control



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

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

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

Notes

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

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

Product Selection

Non-Combination Starters

Class ECX09—Non-Combination Non-Reversing Starter

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

Notes

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