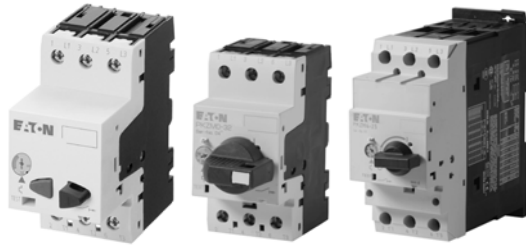


Manual Motor Protectors



Manual Motor Protectors

Product Description

Eaton's new **XT** family of manual motor protectors (MMPs) features a pushbutton or rotary ON/OFF manual disconnect, Class 10 adjustable bimetallic overload relay and fixed magnetic short-circuit trip capability in one compact unit. Two frame sizes are available: Frame B (45 mm) for motors with FLA ratings up to 32A and Frame D (55 mm) covers motor FLA ratings up to 65A.

Application Description

The XTPB and XTPR MMPs can be used in the following applications.

Motor Protective Circuit Breaker

In many countries outside of the United States and Canada, especially Europe, the MMPs are tested and classified as thermal-magnetic circuit breakers for use in motor branch circuits. This can be an important consideration for all companies who export their equipment and machines internationally. Both the XTPB and XTPR conform to IEC/EN 60947 and have the CE Mark.

Manual Motor Protectors

The XTPB and XTPR MMPs are UL listed under UL 508 as manual motor protectors. They provide an economical solution for applications requiring simple manual starting and stopping of motors. When used as a manual starter, they are typically installed in an enclosure. Many enclosures are offered as accessories for the MMPs. Separate short-circuit protective devices, such as circuit breakers or fuses, are wired ahead of the MMPs. The short-circuit protective device should be sized per the NEC and should not exceed 400% of the maximum FLA dial setting of the MMP.

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Group Motor Installations

A group motor installation can be defined as more than one motor circuit protected by a single set of fuses or circuit breaker on a motor branch circuit. This eliminates the need for individual fuses or circuit breakers for each motor circuit. Substantial component cost savings, panel space savings and reduced wiring installation time can be achieved in group motor installations.

The MMPs are tested and listed for group installation. If remote operation is required, a magnetic contactor can be wired in series with the MMP.

Article 430.53 of the NEC contains the rules and requirements for group motor installations. Refer to application note AP03402001E for NEC requirement for group motor installation.

Individual Branch Motor Applications

A UL 508 Type E self-protected manual combination starter/motor controller consists of a single device possessing four essential elements: disconnect, short circuit protection, motor controller, and motor overload protection. Some MMPs require use of a lineside adapter for this type of approval. When tested as an official combination by UL, this device takes the place of a fuse-starter or breaker-starter, **XT** Type E MMPs are self-protected, meaning they do not need additional short circuit protection of a fuse or breaker. Type E devices can also be used with a contactor or other types of UL approved controllers. If tested with a contactor, the combination motor controller becomes a Type F device. See **Page V5-T1-197** for XTFC Type F devices.

Features and Benefits

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Class 10 overload protection
- Phase loss sensitivity
- Ambient temperature compensation to IEC/EN 60947, VDE 0660
- Fixed short-circuit trip—14 times maximum setting of overload FLA dial
- Type 2 coordination per IEC 947
- Identification markers standard on starter faceplate
- Motor applications from 0.1A to 65A
- Built-in heater and magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLA
- DIN rail mount
- Terminal types available:
 - Screw terminals
 - Screw (line) and spring cage (load) terminals
 - Spring cage terminals
- Accessories include:
 - Front and side auxiliary contacts
 - Trip indicating contacts
 - Tamperproof cover for OLR dial
 - Undervoltage release
 - Shunt trip
 - Through-the-door operators
 - Enclosures
 - Three-phase line side connecting links

Standards and Certifications

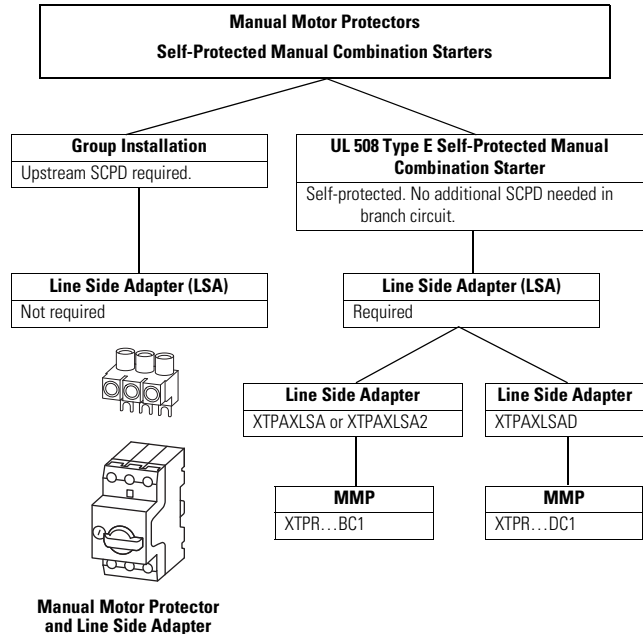
- ATEX
- CE approved
- UL listed File No. E36332
- UL listed File No. E123500
- UL 508 group motor and Type E compliant
- IEC/EN 60947
- CSA File 229767, Class 3211-05
- DIN VDE 0660 Part 100, Part 101 and Part 102



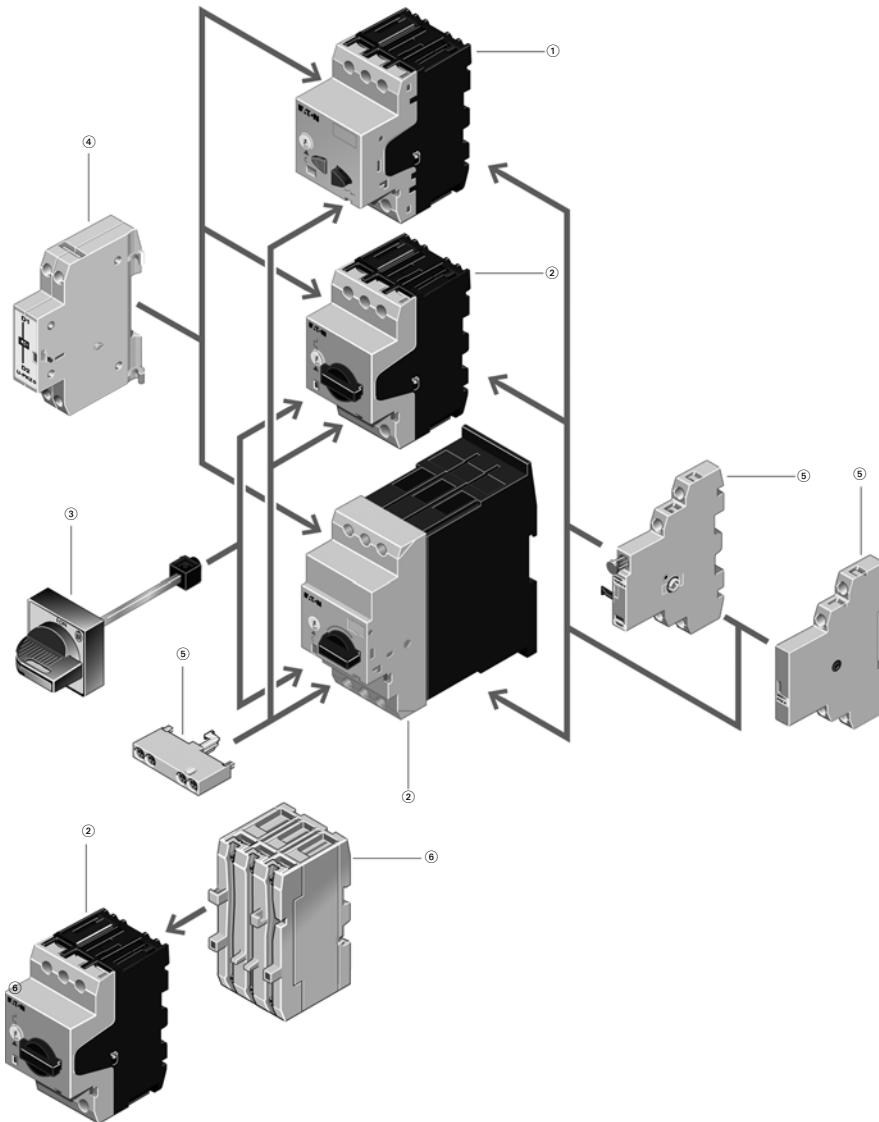
Note: For Type 2 Coordination of MMCs, see **Page V5-T1-235**.

Line Side Adapters—When to Use Them

Note: Line side adapters are not required for non-US applications. Most countries outside of the US classify the MMP as a thermal magnetic circuit breaker.



Product Identification



Notes

Basic Units

- ① XTPB pushbutton manual motor protectors (see [Page V5-T1-161](#))
 - Rated operational current up to 25A
 - Switching capacity 50 kA/415V
 - Short-circuit release, adjustable $0.6-1 \times I_u$
 - Single-phasing sensitive
- ② XTPR rotary manual motor protectors (see [Page V5-T1-162](#))
 - Rated operational current up to 32A, 65A
 - Switching capacity 150/50 kA/415V
 - Short-circuit release, fixed setting to $14 \times I_u$
 - Overload release, adjustable $0.6-1 \times I_u$
 - Single-phasing sensitive
 - With screws or spring-loaded terminals

Mounting Accessories

- ③ Rotary handle mechanism (see [Page V5-T1-167](#))
 - ON/OFF/tripped switch position indication
 - Lockable door/cover interlock
 - Extendable y plug fit extension shaft
 - Handle latched in switch positions
 - Optionally also without locking and door interlock function
- Insulated enclosures (see [Page V5-T1-170](#))
 - Surface mounting, enclosures, IP40, IP55 and IP40 and IP55 front flush mounting enclosure
- Mounting/wiring (see [Page V5-T1-167](#))
 - Component adapter for busbar mounting
 - Three-phase commoning link for side-by-side-mounting
 - Mounting kits for rapid mounting of direct-on-line, reversing and star-delta starters

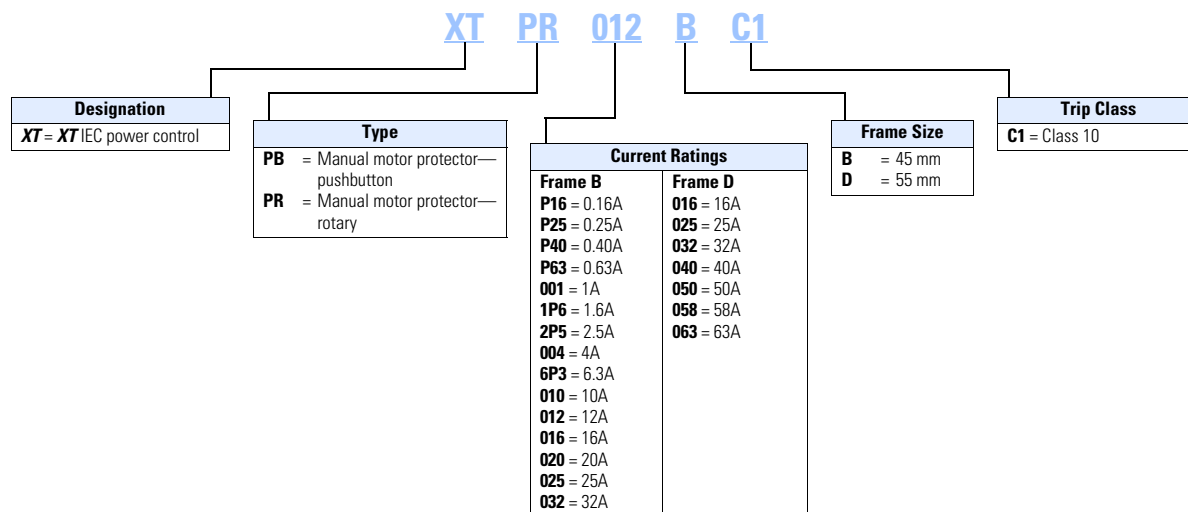
Add-On Functions

- ④ Voltage releases (see [Page V5-T1-166](#))
 - Undervoltage release
 - Shunt releases
 - With screws or spring-loaded terminals
- ⑤ Standard auxiliary contacts (see [Page V5-T1-164](#))
 - ON/OFF indication
 - Differential fault indication overload/short-circuit release
 - ON/OFF for (high capacity) contact module
 - ON/OFF for starter combination
 - With early-make contacts
 - With screws or spring-loaded terminals
- ⑥ Current limiter (see [Page V5-T1-166](#))
 - Increases the switching capacity of the 10–25A manual motor protectors to 100 kA/440V
 - Can be used for individual group protection

1

Catalog Number Selection

XT Manual Motor Protectors



Product Selection

Product Selection for Manual Motor Starter Applications

When ordering, specify catalog numbers according to the following stipulations:

XT manual motor protectors are selected based on the overload current range required for a given motor. This current range is determined from the motor full load ampere rating and motor service factor usually found on the motor nameplate.

For motors with service factors less than 1.15, multiply the motor FLA by 0.90 to select appropriate MMP.

Example: For motor having FLA of 6.4A and service factor of 1.0 ($6.4A \times 0.90 = 5.76A$) select catalog number XTPB6P3B01.

See Application Note—
AP03402001E.

For motor with service factor of 1.15 or greater, use motor nameplate full load amperes to select the appropriate MMP.

Example: For motor having FLA of 11A and service factor of 1.15, select catalog number XTPR012BC1.

Frame B



XTPB Pushbutton Manual Motor Protectors—Global and North American Ratings—Frame B
Type 1 and Type 2 Coordination Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current— $I_u = I_o$ (Amps)	FLA Adjustment Range/ Overload Release— I_r (Amps)	Short Circuit Release— I_m (Amps)	Maximum Motor Ratings ^①							Maximum hp Rating—P (hp) UL 508/CSA C22.2 No. 14				Screw Terminal Catalog Number
			Maximum kW Rating AC-3—P (kW)							Three-Phase				
			Three-Phase							Three-Phase				
			220– 240V	380– 415V	440V	500V	660– 690V	200V	240V	480V	600V			
0.16	0.1–0.16	2.2	—	—	—	—	0.06	②	②	②	②	XTPBP16BC1		
0.25	0.16–0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	XTPBP25BC1		
0.4	0.25–0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	XTPBP40BC1		
0.63	0.4–0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	XTPBP63BC1		
1	0.63–1	14	0.12	0.25	0.25	0.37	0.55	②	②	2	1/2	XTPB001BC1		
1.6	1–1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	3/4	XTPB1P6BC1		
2.5	1.6–2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	XTPB2P5BC1		
4	2.5–4	56	0.75	1.5	1.5	2.2	3	3/4	3/4	2	3	XTPB004BC1		
6.3	4–6.3	88	1.1	2.2	3	3	4	1	1-1/2	3	5	XTPB6P3BC1		
10	6.3–10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	XTPB010BC1		
12	8–12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	XTPB012BC1		
16	10–16	224	4	7.5	9	9	12.5	3	5	10	10	XTPB016BC1		
20	16–20	280	5.5	9	11	12.5	15	5	—	—	15	XTPB020BC1		
25	20–25	350	5.5	12.5	12.5	15	22	—	7-1/2	15	20	XTPB025BC1		

Notes

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.

Service Factor (SF)—Setting I_r of current scale in dependence of load factor:

$$SF = 1.15 \rightarrow I_r = 1 \times I_{n \text{ mot}}$$

$$SF = 1 \rightarrow I_r = 0.9 \times I_{n \text{ mot}}$$

For manual motor protective circuit breaker switching capacity, see **Page V5-T1-179**.

① Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

Frame B



XTPR Rotary Manual Motor Protectors with Screw Terminals— Global Ratings and North American Ratings—Frame B

Type 1 and Type 2 Coordination Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current— $I_u = I_e$ (Amps)	FLA Adjustment Range/ Overload Release— I_r (Amps)	Short Circuit Release— I_{rm} (Amps)	Maximum Motor Ratings ①							Maximum hp Rating—P (hp) UL 508/CSA C22.2 No. 14				Screw Terminal Catalog Number
			Maximum kW Rating AC-3—P (kW)						Three-Phase					
			220– 240V	380– 415V	440V	500V	660– 690V	200V	240V	480V	600V			
0.16	0.1–0.16	2.2	—	—	—	—	0.06	②	②	②	②	XTPRP16BC1		
0.25	0.16–0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	XTPRP25BC1		
0.4	0.25–0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	XTPRP40BC1		
0.63	0.4–0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	XTPRP63BC1		
1	0.63–1	14	0.12	0.25	0.25	0.37	0.55	②	②	②	②	XTPR001BC1		
1.6	1–1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	3/4	XTPR1P6BC1		
2.5	1.6–2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	XTPR2P5BC1		
4	2.5–4	56	0.75	1.5	1.5	2.2	3	3/4	3/4	2	3	XTPR004BC1		
6.3	4–6.3	88	1.1	2.2	3	3	4	1	1-1/2	3	5	XTPR6P3BC1		
10	6.3–10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	XTPR010BC1		
12	8–12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	XTPR012BC1		
16	10–16	224	4	7.5	9	9	12.5	3	5	10	10	XTPR016BC1		
20	16–20	280	5.5	9	11	12.5	15	5	—	—	15	XTPR020BC1		
25	20–25	350	5.5	12.5	12.5	15	22	—	7-1/2	15	20	XTPR025BC1		
32	25–32	448	7.5	15	15	22	30	7-1/2	10	20	25	XTPR032BC1		

Frame D



XTPR Rotary Manual Motor Protectors with Screw Terminals— Global Ratings and North American Ratings—Frame D

Type 1 and Type 2 Coordination Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current— $I_u = I_o$ (Amps)	FLA Adjustment Range/ Overload Release— I_r (Amps)	Short Circuit Release— I_{rm} (Amps)	Maximum Motor Ratings ①									
			Maximum kW Rating AC-3—P (kW)					Maximum hp Rating—P (hp) UL 508/CSA C22.2 No. 14				
			Three-Phase					Three-Phase				
			220— 240V	380— 415V	440V	500V	660— 690V	200V	240V	480V	600V	Screw Terminal Catalog Number
16	10–16	224	4	7.5	9	9	12.5	3	5	10	15	XTPR016DC1
25	16–25	350	5.5	12.5	12.5	15	22	7-1/2	7-1/2	15	20	XTPR025DC1
32	25–32	448	7.5	15	17.5	22	22	10	10	20	30	XTPR032DC1
40	32–40	560	11	20	22	24	30	10	15	30	30	XTPR040DC1
50	40–50	700	14	25	30	30	45	10	15	30	40	XTPR050DC1
58	50–58	812	17	30	37	37	55	15	15	40	50	XTPR058DC1
65	55–65	882	18.5	34	37	45	55	15	15	40	50	XTPR063DC1

Notes

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.

Service Factor (SF)—Setting I_r of current scale in dependence of load factor:

$$SF = 1.15 \rightarrow I_r = 1 \times I_n \text{ mot}$$

$$SF = 1 \rightarrow I_r = 0.9 \times I_n \text{ mot}$$

For manual motor protective circuit breaker switching capacity, see **Page V5-T1-179**.

① Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

Frame B



XTPR Manual Self-Protected Motor Starters—North American Ratings, UL 508 Type E—Frame B^①

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current— I_u (Amps)	FLA Adjustment Range/ Overload Release— I_r (Amps)	Short Circuit Release— I_{rm} (Amps)	Maximum Motor Ratings ^② Maximum hp Rating—P (hp) Three-Phase				Rated Short-Circuit Breaking Capacity (kA)			Line Side Adapter ^① Catalog Number	Manual Motor Protector— Screw Terminal Catalog Number
			200V	240V	480V/ 277V	600V/ 247V	480/ 277V	600/ 347V			
0.16	0.1–0.16	2.2	③	③	1/2	1/2	50	50		XTPAXLSA	XTPRP16BC1
0.25	0.16–0.25	3.4	③	③	1/2	1/2	50	50		XTPAXLSA	XTPRP25BC1
0.4	0.25–0.4	5.6	③	③	1/2	1/2	50	50		XTPAXLSA	XTPRP40BC1
0.63	0.4–0.63	8.8	③	③	1/2	1/2	50	50		XTPAXLSA	XTPRP63BC1
1	0.63–1	14	③	③	1/2	1/2	50	50		XTPAXLSA	XTPR001BC1
1.6	1–1.6	22	③	③	3/4	3/4	50	50		XTPAXLSA	XTPR1P6BC1
2.5	1.6–2.5	35	1/2	1/2	1	1-1/2	50	50		XTPAXLSA	XTPR2P5BC1
4	2.5–4	56	3/4	1	2	3	50	50		XTPAXLSA	XTPR004BC1
6.3	4–6.3	88	1	1-1/2	3	5	65	50		XTPAXLSA	XTPR6P3BC1
10	6.3–11	140	3	3	7-1/2	10	65	50		XTPAXLSA	XTPR010BC1
12	8–12	168	3	3	7-1/2	—	65	—		XTPAXLSA	XTPR012BC1
16	10–16	224	3	5	10	—	42	—		XTPAXLSA	XTPR016BC1
20	16–20	280	5	5	—	—	18	—		XTPAXLSA	XTPR020BC1
25	20–25	350	5	7-1/2	15	—	18	—		XTPAXLSA	XTPR025BC1
32	25–32	448	7-1/2	10	25	—	18	—		XTPAXLSA	XTPR032BC1

Frame D



XTPR Circuit Breaker According to UL 489—Frame D

Rated Uninterrupted Current— I_u (Amps)	FLA Adjustment Range/ Overload Release— I_r (Amps)	Short Circuit Release— I_{rm} (Amps)	Maximum Motor Ratings ^② Maximum hp Rating—P (hp) Three-Phase				Rated Short-Circuit Breaking Capacity (kA)			Manual Motor Protector— Screw Terminal Catalog Number
			200V	240V	480V/ 277V	600V/ 247V	240V	480/ 277V	600/ 347V	
16	10–16	224	3	5	10	10	65	65	25	XTPR016DCB
25	16–25	350	7-1/2	7-1/2	20	25	65	65	25	XTPR025DCB
32	24–32	448	10	10	25	30	65	65	25	XTPR032DCB

Frame D



XTPR Manual Self-Protected Motor Starters—North American Ratings, UL 508 Type E—Frame D^①

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current— I_u (Amps)	FLA Adjustment Range/ Overload Release— I_r (Amps)	Short Circuit Release— I_{rm} (Amps)	Maximum Motor Ratings ^② Maximum hp Rating—P (hp) Three-Phase				Rated Short-Circuit Breaking Capacity (kA)			Line Side Adapter ^① Catalog Number	Manual Motor Protector— Screw Terminal Catalog Number
			200V	240V	480V/ 277V	600V/ 247V	240V	480/ 277V	600/ 347V		
16	10–16	224	3	5	10	10	65	65	25	XTPAXLSAD	XTPR016DC1
25	16–25	350	7-1/2	7-1/2	20	25	65	65	25	XTPAXLSAD	XTPR025DC1
32	25–32	448	10	10	25	30	65	65	25	XTPAXLSAD	XTPR032DC1
40	32–40	560	10	—	30	30	65	65	25	XTPAXLSAD	XTPR040DC1
50	40–50	700	—	15	30	—	65	65	—	XTPAXLSAD	XTPR050DC1
58	50–58	812	—	—	40	—	65	65	—	XTPAXLSAD	XTPR058DC1
65	55–65	882	—	—	40	—	65	65	—	XTPAXLSAD	XTPR063DC1

Notes

A UL 508 Type E self-protected manual combination starter (XTPR) consists of a manual motor protector (XTPR) and a UL Listed line side adapter (for example, XTPAXLSA or XTPAXLSA2). The Type E self-protected manual combination starter alone is a legitimate short-circuit protective device and disconnect means for the downstream motor, while the contactor has been added to provide remote operation of the motor circuit. Conductor size for XTPAXLSA is 14–6 AWG, XTPAXLSAD is 8 AWG–1/0.

① UL 508 Type E starters are assembled from a standard XTPR and a special incoming terminal line side adapter (XTPAXLSA or XTPAXLSAD).

② Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

UL 508/CSA C22.2 No. 14—XTPR—Frame B (all Screw and Spring Cage Terminal Options), Manual Motor Protector with Thermal and Magnetic Trip

Catalog Number	Rated Uninterrupted Current— I_u (Amps)	FLA Adjustment Range/Overload Release— I_r (Amps)	Short Circuit Release— I_m (Amps)	Maximum Protective Device for UL/CSA Group Protection					
				Maximum rms Sym Current— 480V (kA)	w/Current Limiter— XTPAXCL	Maximum Fuse Rating (A)	w/Current Limiter— XTPAXCL	Circuit Breaker Maximum (A)	w/Current Limiter— XTPAXCL
XTPRP16BC1	0.16	0.1–0.16	2.2	50	—	600	—	600	—
XTPRP25BC1	0.25	0.16–0.25	3.5	50	—	600	—	600	—
XTPRP40BC1	0.4	0.25–0.4	5.6	50	—	600	—	600	—
XTPRP63BC1	0.63	0.4–0.63	8.8	50	—	600	—	600	—
XTPR001BC1	1	0.63–1	14	50	—	600	—	600	—
XTPR1P6BC1	1.6	1–1.6	22	50	—	600	—	600	—
XTPR2P5BC1	2.5	1.6–2.5	35	50	—	600	—	600	—
XTPR004BC1	4	2.5–4	56	50	—	600	—	600	—
XTPR6P3BC1	6.3	4–6.3	88	50	—	600	—	600	—
XTPR010BC1	10	6.3–10	140	30	50	600	600	600	600
XTPR012BC1	12	8–12	168	10	50	150	600	125	600
XTPR016BC1	16	10–16	224	10	50	150	600	125 ①	600
XTPR032BC1	32	25–32	448	10	18	150	600	125	600
XTPR025BC1	25	20–25	350	10	18	150	600	125	600
XTPR032BC1	32	25–32	448	10	18	150	600	125	600

UL 508/CSA C22.2 No. 14—XTPR—Frame D, Manual Motor Protector with Thermal and Magnetic Trip

Catalog Number	Rated Uninterrupted Current— I_u (Amps)	FLA Adjustment Range/Overload Release— I_r (Amps)	Short Circuit Release— I_m (Amps)	Maximum Protective Device for UL/CSA Group Protection					
				Maximum rms Sym Current— 480V (kA)	w/Current Limiter— XTPAXCL	Maximum Fuse Rating (A)	w/Current Limiter— XTPAXCL	Circuit Breaker Maximum (A)	w/Current Limiter— XTPAXCL
XTPR016DC1	16	10–16	224	65	—	600	—	600	—
XTPR025DC1	25	16–25	350	65	—	600	—	600	—
XTPR032DC1	32	25–32	448	65	—	600	—	600	—
XTPR040DC1	40	32–40	560	65	—	600	—	600	—
XTPR050DC1	50	40–50	700	65	—	600	—	600	—
XTPR058DC1	58	50–58	812	65	—	600	—	600	—
XTPR063DC1	65	55–63	882	65	—	600	—	600	—

Note

① 22 kA 600 Vac.