

Combination Motor Controllers



Combination Motor Controllers

Product Description

Eaton's **XT** IEC open non-reversing and reversing manual motor controllers combine a manual motor protector with an IEC contactor(s) to provide a complete motor protection solution by combining motor disconnect function, thermal overload protection, magnetic short-circuit protection and remote control operation in one compact, assembled unit. These assembled manual motor controllers cover motors with FLA ratings from 0.10A to 65A.

The UL 508 Type F or Type E labeled combination motor controller (CMC) includes a line side adapter (LSA). These assembled combination motor controllers cover motors with FLA ratings from 0.10A to 65A.


Application Description

The **XT** IEC non-reversing and reversing manual and combination motor controllers can be used in the following applications:

Group Motor Control

Manual motor controllers (MMCs) are ideal for group motor applications where an upstream breaker or fuse provides protection for two or more motors. **XT** manual motor controllers (MMC) combine a manual motor protector, a wiring connector link and IEC contactor.

Contents

Description	Page
Relays and Timers	V5-T1-3
Miniature Controls	V5-T1-18
Contactors and Starters	V5-T1-35
XTSE Contactors	V5-T1-126
Thermal Overload Relays	V5-T1-128
C440/ XT Electronic Overload Relay	V5-T1-141
Manual Motor Protectors	V5-T1-157
Combination Motor Controllers	
Features	V5-T1-192
Catalog Number Selection	V5-T1-193
Product Selection	V5-T1-193
Accessories	V5-T1-203
Technical Data and Specifications	V5-T1-205
Dimensions	V5-T1-212
 An Eaton Green Solution	
XT Electronic Manual Motor Protector	V5-T1-217
EMS—Electronic Motor Starter	V5-T1-230
XT DC Contactors	V5-T1-232
Reference Data	V5-T1-234

Individual Branch Circuit for Motor Loads

Combination motor controller (CMC), consisting of a line side adapter, manual motor protector, wiring connector link and IEC contactor, provide an efficient means to build an entire branch circuit. The **XT** CMC is UL 508 Type F and Type E approved, meaning it is "self-protected" and doesn't require the use of an additional fuse or breaker for short circuit protection. This approval means CMC's can be used in place of a traditional fuse-starter and breaker-starter motor circuit.

Based around two key functional components (MMP and contactor), the CMC is a very cost effective means to build a branch circuit. Fuses and breakers must be oversized to prevent tripping during motor start up, and thus these oversized devices can no longer protect the motor. To compensate for this, a motor overload relay is necessary to protect the motor.

The manual motor protector was invented in Germany by Moeller to correct this inefficiency. The MMP operates similarly to a circuit breaker, except the inrush (magnetic) protection is set to 14 times the running current, thus accounting for motor start-up current without the necessity to oversize. A overcurrent dial was added to the face of the MMP to serve as the motor overload protection. This "motor protective circuit breaker", as it is referred to in Europe, now accomplishes all four key functions of a motor branch circuit: disconnect, short circuit, motor controller and motor overload protection. With the addition of a contactor, users have the ability to remotely control the starter device.

Whether a single motor application or a multiple motor application, CMC's are an ideal solution for machinery OEMs and panel builders.

1

Features

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Test trip function
- Motor applications from 0.10A to 65A
- 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 and Type E CMC high fault short-circuit ratings
- 1NO-1NC auxiliary contact as standard on manual motor controller and combination motor controller

Standards and Certifications

UL 508 Type F combination motor controller

- IEC Type 2 Approved per IEC 60947-4-1
- UL Listed File No. E245398
- CE Mark



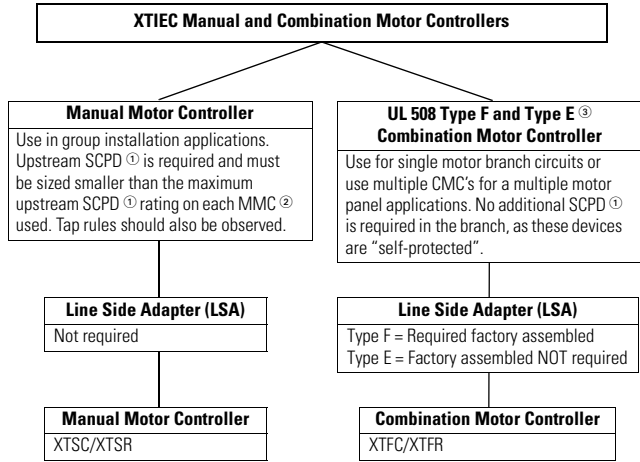
Note: For Type 2 Coordination of MMCs, see **Page V5-T1-235**. Protection in different controller types

UL 508 Type E self-protected combination motor controller

- UL Listed File No. E123500



MMC and CMC Applications



Notes

Technical Paper AP03402001E.

Line side adapters are not required for non-U.S. applications. Most countries outside of the U.S. classify the MMP as a motor-protective circuit breaker.

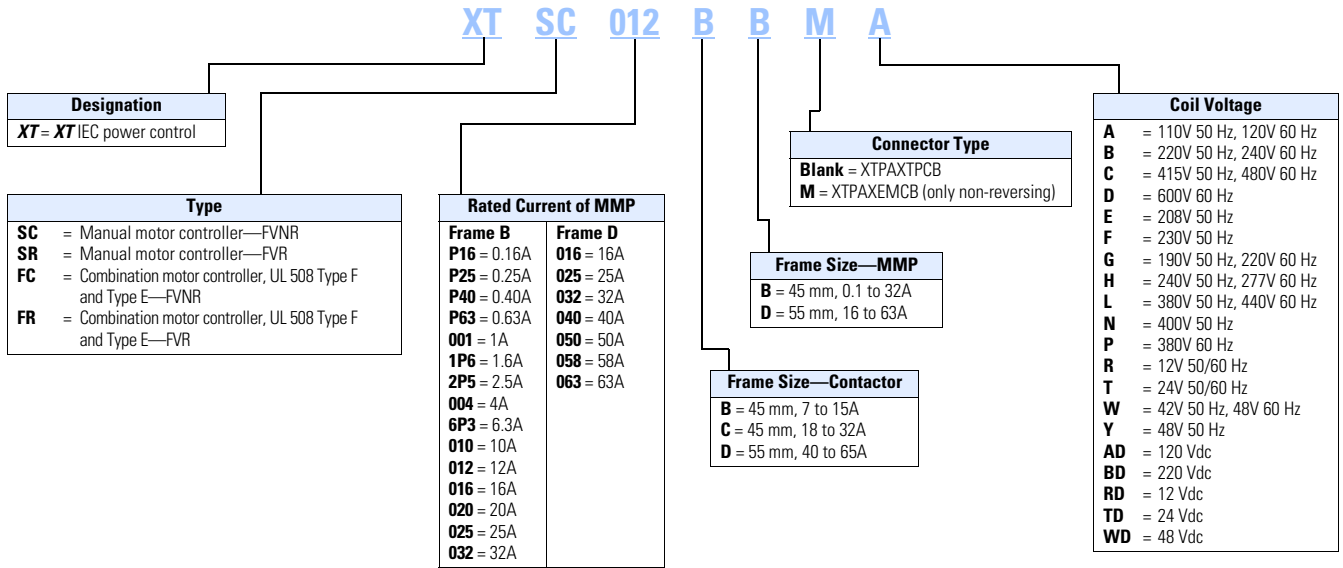
^① SCPD = Short-circuit protective device (circuit breaker, fuses).

^② MMC = Manual motor controller

^③ Type E self-protected combination controller is the combination of a Type E self-protected device with a contactor.

Catalog Number Selection

Combination Motor Controllers



Product Selection

XTSC and XTSR Manual Motor Controllers (MMC)/Starter Combinations

Frame B MMP +
Frame B Contactor

Factory-Assembled Manual Motor Controller—Frame B MMP + Frame B Contactor—
Maximum UL Ratings ①



FLA Adjustment
Range/Overload
Release— I_r
(Amps)



FLA Adjustment Range/Overload Release— I_r (Amps)	Short-Circuit Release— I_m (Amps)	Maximum hp Rating—P (hp) UL 508/CSA C22.2 No. 14 Three-Phase				Assembled Manual Motor Controller ②	
		200V	240V	480V	600V	Non-Reversing Catalog Number ③	Reversing Catalog Number
0.1–0.16	3.2	—	—	—	0.06	XTSCP16BB_	XTSRP16BB_
0.16–0.25	3.5	—	0.06	0.06	0.12	XTSCP25BB_	XTSRP25BB_
0.25–0.4	5.6	0.06	0.09	0.12	0.18	XTSCP40BB_	XTSRP40BB_
0.4–0.63	8.82	0.09	0.18	0.25	0.25	XTSCP63BB_	XTSRP63BB_
0.63–1	14	0.12	0.25	0.37	0.55	XTSC001BB_	XTSR001BB_
1–1.6	22.4	0.25	0.55	0.75	1.1	XTSC1P6BB_	XTSR1P6BB_
1.6–2.5	35	0.37	0.75	1.1	1.5	XTSC2P5BB_	XTSR2P5BB_
2.5–4	56	0.75	1.5	2.2	3	XTSC004BB_	XTSR004BB_
4–6.3	88.2	1.1	2.2	3	4	XTSC6P3BB_	XTSR6P3BB_
6.3–10	140	2.2	4	4	7.5	XTSC010BB_	XTSR010BB_
8–12	168	3	5.5	5.5	11	XTSC012BB_	XTSR012BB_
10–16	224	4	7.5	9	12.5	XTSC016BB_	—

Notes

- ① Select manual motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
- ② Underscore (_) indicates magnetic coil suffix required. See Page V5-T1-196.
- ③ "M" prior to (_) coil suffix will be assembled with standard connector XTPAXEMCB, non-reversing only.

1

Frame B MMP +
Frame B Contactor



Factory-Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor— Maximum IEC Ratings ^①

FLA Adjustment Range/Overload Release— I_r (Amps)	Short-Circuit Release— I_m (Amps)	Maximum Motor Ratings Maximum kW Rating AC-3—P (kW)				Assembled Manual Motor Controller ^②	
		Three-Phase				Non-Reversing Catalog Number	Reversing Catalog Number
		220– 240V	380– 415V	500V	660– 690V		
0.1–0.16	3.2	③	③	1/2	1/2	XTSCP16BB_	XTSRP16BB_
0.16–0.25	3.5	③	③	1/2	1/2	XTSCP25BB_	XTSRP25BB_
0.25–0.4	5.6	③	③	1/2	1/2	XTSCP40BB_	XTSRP40BB_
0.4–0.63	8.82	③	③	1/2	1/2	XTSCP63BB_	XTSRP63BB_
0.63–1	14	③	③	1/2	1/2	XTSC001BB_	XTSR001BB_
1–1.6	22.4	③	③	3/4	1	XTSC1P6BB_	XTSR1P6BB_
1.6–2.5	35	1/2	1/2	1	1-1/2	XTSC2P5BB_	XTSR2P5BB_
2.5–4	56	1	1	2	3	XTSC004BB_	XTSR004BB_
4–6.3	88.2	1-1/2	1-1/2	3	5	XTSC6P3BB_	XTSR6P3BB_
6.3–10	140	3	3	7-1/2	7.5	XTSC010BB_	XTSR010BB_
8–12	168	3	3	7-1/2	7.5	XTSC012BB_	XTSR012BB_
10–16	224	3	3	10	7.5	XTSC016BB_	—

Frame B MMP +
Frame C Contactor



Factory-Assembled Manual Motor Controller—Frame B MMP + Frame C Contactor— Maximum UL Ratings ^①

FLA Adjustment Range/Overload Release— I_r (Amps)	Short-Circuit Release— I_m (Amps)	Maximum hp Rating—P (hp) UL 508/CSA C22.2 No. 14				Assembled Manual Motor Controller ^②	
		Three-Phase				Non-Reversing Catalog Number	Reversing Catalog Number
		200V	240V	480V	600V		
10–16	224	3	3	10	10	XTSC016BC_	XTSR016BC_
16–20	280	5	5	10	15	XTSC020BC_	XTSR020BC_
20–25	350	5	7-1/2	15	20	XTSC025BC_	XTSR025BC_
25–32	448	7-1/2	10	20	25	XTSC032BC_	XTSR032BC_

Frame B MMP +
Frame C Contactor



Factory-Assembled Manual Motor Controller—Frame B MMP + Frame C Contactor— Maximum IEC Ratings ^①

FLA Adjustment Range/Overload Release— I_r (Amps)	Short-Circuit Release— I_m (Amps)	Maximum Motor Ratings Maximum kW Rating AC-3—P (kW)				Assembled Manual Motor Controller ^②	
		Three-Phase				Non-Reversing Catalog Number	Reversing Catalog Number
		220– 240V	380– 415V	500V	660– 690V		
10–16	224	4	7.5	9	12.5	XTSC016BC_	XTSR016BC_
16–20	280	5.5	9	12.5	15	XTSC020BC_	XTSR020BC_
20–25	350	5.5	11	15	22	XTSC025BC_	XTSR025BC_
25–32	448	7.5	15	22	30	XTSC032BC_	XTSR032BC_

Notes

- ① Select manual motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
- ② Underscore (_) indicates magnetic coil suffix required. See **Page V5-T1-196**.
- ③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).