

**Contactors**



**Motor Protection and Monitoring Relays**



**Manual Motor Protectors and Controllers**



**Soft Starters**



**Drives**



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#### Product Overview

#### Contactors Selection Guide

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**Definite Purpose Contactors**

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**X7IEC Miniature Contactors**

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**X7IEC Contactors**

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| Description                   | Definite Purpose Contactors                                  | X7IEC Miniature Contactors      | X7IEC Contactors                |
|-------------------------------|--|---------------------------------|---------------------------------|
|                               | Page 65  | Page 69                         | Page 71                         |
| Type                          | Definite purpose   | IEC                             | IEC                             |
| Approvals                     | UL <sup>®</sup> Recognized, CSA <sup>®</sup> , CE, ARI, RoHS | UL, IEC EN 60947, CE, CSA, RoHS | UL, IEC EN 60947, CE, CSA, RoHS |
| Technical Data                |  |                                 |                                 |
| Pole configurations           | 1P, 2P, 3P, 4P   | 3P, 4P                          | 3P, 4P                          |
| Inductive Amp ratings         | To 360A  | To 8.8A (AC-3)                  | To 1600A (AC-3)                 |
| Resistive Amp ratings         | To 360A  | To 20A (AC-1)                   | To 2450A (AC-1)                 |
| Typical electrical operations | To 300,000   | To 750,000                      | To 1,400,000                    |

For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E.

Compact Definite Purpose Contactors



Features

- Insulation voltage: 690V
- Current rated and hp/kW rated
- Magnet coil: Class F, 155°C
- Contact arc covers are standard on all contactors

Product Selection

Compact Definite Purpose Contactors—Open Type

Ampere Ratings <sup>①</sup>

| Inductive Full Load           | Resistive | Locked Rotor<br>240–277V | Catalog Number <sup>②</sup> |
|-------------------------------|-----------|--------------------------|-----------------------------|
| <b>Single-Pole</b>            |           |                          |                             |
| 30                            | 40        | 150                      | C25ANB130_                  |
| 40                            | 50        | 240                      | C25ANB140_                  |
| <b>Single-Pole with Shunt</b> |           |                          |                             |
| 30                            | 40        | 150                      | C25CNB130_                  |
| 40                            | 50        | 240                      | C25CNB140_                  |
| <b>Two-Pole</b>               |           |                          |                             |
| 25                            | 35        | 150                      | C25BNB225_                  |
| 30                            | 40        | 150                      | C25BNB230_                  |
| 40                            | 50        | 240                      | C25BNB240_                  |

Magnet Coil Selection

| AC Coil Voltage<br>50/60 Hz | Coil Suffix |
|-----------------------------|-------------|
| 24                          | T           |
| 110–120                     | A           |
| 208–240                     | B           |

Notes

- ① Rating per pole.
- ② Replace underscore ( \_ ) in catalog number with coil suffix letter from table at left.

# 59.1

## Motor Control and Protection

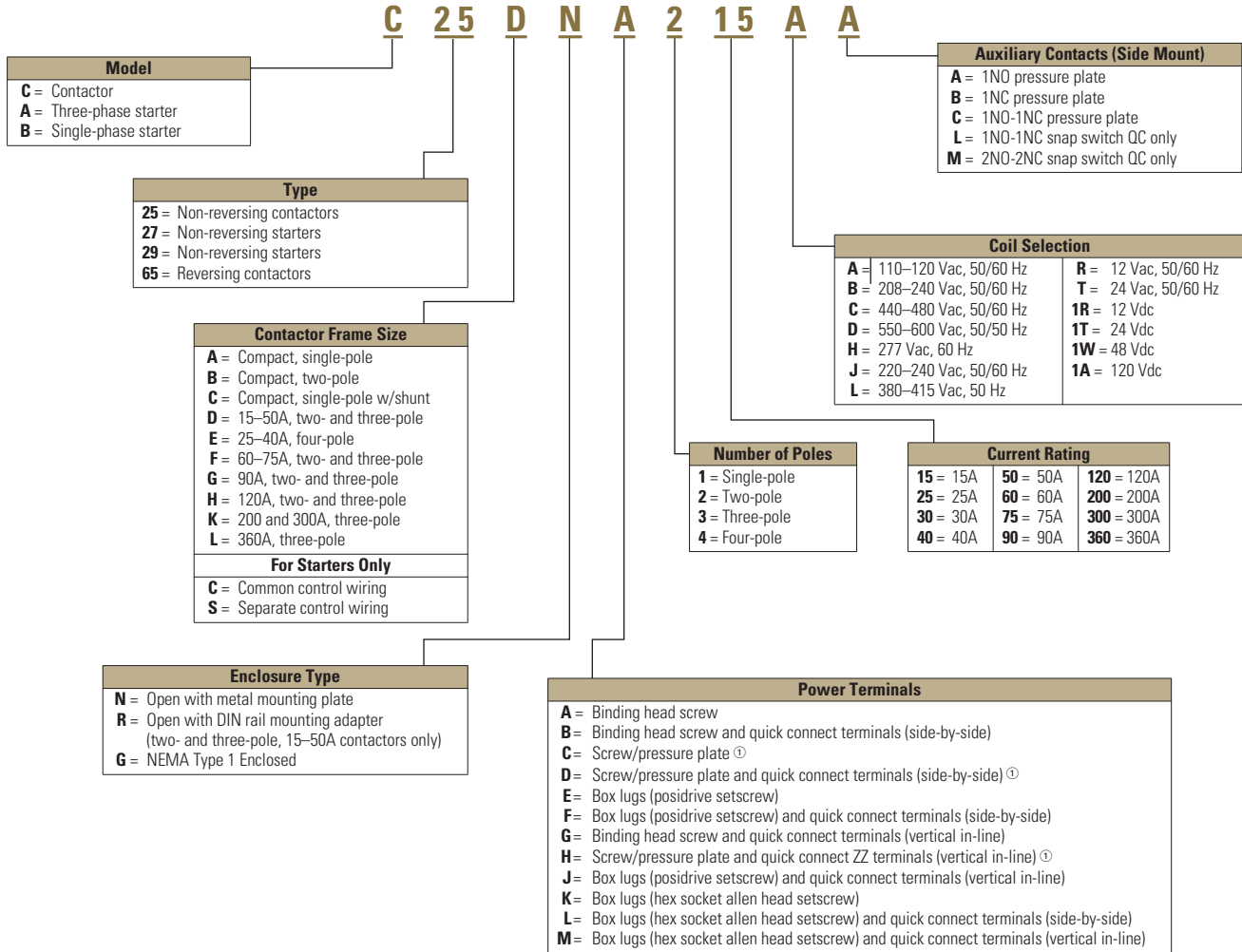
### Contactors

#### Catalog Number Selection

#### Definite Purpose Contactors

#### Definite Purpose Contactors

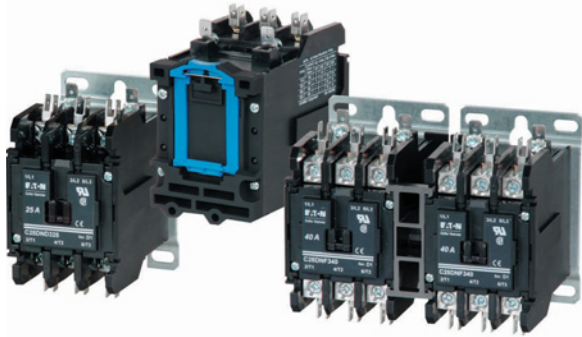
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**Note**

① Not available on 50A devices.

50 mm C25 Definite Purpose Contactors



Features

- Contactors are dual-rated with inductive and resistive ratings, as well as horsepower and kilowatt ratings
- Contactors rated 15–50A are available with DIN rail mount as a factory installed option
- Magnet coil: Class B (C25E, F, G, H and K), 130°C
- Ambient temperature: 150°F (65°C) maximum

Product Selection

50 mm C25 Definite Purpose Contactors

C25 Contactors—Open Type

| Rating, Amperes<br>Inductive Full Load | Resistive<br>per Pole | Line Voltage | Locked Rotor | Maximum Motor Horsepower |             | Open Type with<br>Metal Mounting Plate<br>Catalog Number <sup>①②</sup> | Open Type with<br>DIN Rail Adapter<br>Catalog Number <sup>①②</sup> |
|--|-----------------------|--------------|--------------|--------------------------|-------------|--|--|
|  |                       |              |              | Single-Phase             | Three-Phase |  |  |
| 15                                     | 20                    | 230          | 90           | 2                        | 3           | C25DND315_   | C25DRD315_   |
|  |                       | 460          | 75           | —                        | 5           |  |  |
|  |                       | 575          | 60           | —                        | 5           |  |  |
| 25                                     | 35                    | 230          | 150          | 3                        | 7-1/2       | C25DND325_   | C25DRD325_   |
|  |                       | 460          | 125          | —                        | 10          | C25END425_   |  |
|  |                       | 575          | 100          | —                        | 10          |  |  |
| 30                                     | 40                    | 230          | 180          | 5                        | 10          | C25DND330_   | C25DRD330_   |
|  |                       | 460          | 150          | —                        | 15          | C25END430_   |  |
|  |                       | 575          | 120          | —                        | 15          |  |  |
| 40                                     | 50                    | 230          | 240          | 7-1/2                    | 10          | C25DNF340_   | C25DRF340_   |
|  |                       | 460          | 200          | —                        | 20          | C25ENF440_   |  |
|  |                       | 575          | 160          | —                        | 20          |  |  |
| 50                                     | 65                    | 230          | 300          | 10                       | 15          | C25DNJ350_   | C25DRJ350_   |
|  |                       | 460          | 250          | —                        | 30          |  |  |
|  |                       | 575          | 200          | —                        | 30          |  |  |
| 60                                     | 75                    | 230          | 360          | 10                       | 20          | C25FNF360_   | —  |
|  |                       | 460          | 300          | —                        | 40          |  |  |
|  |                       | 575          | 240          | —                        | 40          |  |  |
| 75                                     | 90                    | 230          | 450          | 15                       | 20          | C25FNF375_   | —  |
|  |                       | 460          | 375          | —                        | 50          |  |  |
|  |                       | 575          | 300          | —                        | 50          |  |  |

Magnet Coil Selection

| Voltage<br>60 Hz       | 50 Hz                | Coil<br>Suffix |
|------------------------|----------------------|----------------|
| <b>AC</b> <sup>③</sup> |                      |                |
| 24 <sup>④</sup>        | 24                   | <b>T</b>       |
| 110–120 <sup>⑤</sup>   | 110–120 <sup>⑤</sup> | <b>A</b>       |
| 208–240 <sup>⑤</sup>   | 208–240              | <b>B</b>       |
| <b>DC</b> <sup>⑥</sup> |                      |                |
| 24                     |                      | <b>1T</b>      |

Notes

- ① Replace underscore ( \_ ) in catalog number with magnet coil suffix from table at left.
- ② Carton quantities including 20 individually packaged units are available for two- and three-pole units through 60A inductive.
- ③ Class H AC coils available as option for 15–50A contactor. Add 2 before AC coil suffix letter.
- ④ Available through 120A.
- ⑤ 104–120V 50/60 Hz for 60A, 75A and all four-pole contactors (25–40A).
- ⑥ Contactors with DC coils (only available up to 75A) include an early break NC auxiliary contact, C320KGD1.

## Reversing and Two-Speed Contactors—Open Type—Unwired, Mechanically Interlocked Only

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| Rating, Amperes<br>Inductive Full Load | Resistive<br>per Pole | Line<br>Voltage | Locked<br>Rotor | Maximum Motor Horsepower |             | Open Type with<br>Metal Mounting Plate<br>Catalog Number <sup>①</sup> |
|--|-----------------------|-----------------|-----------------|--------------------------|-------------|---|
|  |                       |                 |                 | Single-Phase             | Three-Phase |   |
| 15                                     | 20                    | 230             | 90              | 2                        | 3           | <b>C65DND315_</b>   |
|  |                       | 460             | 75              | —                        | 5           |   |
|  |                       | 575             | 60              | —                        | 5           |   |
| 25                                     | 35                    | 230             | 150             | 3                        | 7-1/2       | <b>C65DND325_</b>   |
|  |                       | 460             | 125             | —                        | 10          |   |
|  |                       | 575             | 100             | —                        | 10          |   |
| 30                                     | 40                    | 230             | 180             | 5                        | 10          | <b>C65DND330_</b>   |
|  |                       | 460             | 150             | —                        | 15          |   |
|  |                       | 575             | 120             | —                        | 15          |   |
| 40                                     | 50                    | 230             | 240             | 7-1/2                    | 10          | <b>C65DNF340_</b>   |
|  |                       | 460             | 200             | —                        | 20          |   |
|  |                       | 575             | 160             | —                        | 20          |   |
| 50                                     | 65                    | 230             | 300             | 10                       | 15          | <b>C65DNJ350_</b>   |
|  |                       | 460             | 250             | —                        | 30          |   |
|  |                       | 575             | 200             | —                        | 30          |   |

## Magnet Coil Selection

| Voltage<br>60 Hz     | 50 Hz                | Coil<br>Suffix <sup>②</sup> |
|----------------------|----------------------|-----------------------------|
| 24                   | 24                   | <b>T</b>                    |
| 110–120 <sup>③</sup> | 110–120 <sup>③</sup> | <b>A</b>                    |
| 208–240 <sup>④</sup> | 208–240              | <b>B</b>                    |

## Notes

- ① Replace underscore ( \_ ) with magnet coil suffix from table at left.
- ② Class H AC coils available as option for 15–50A contactor. Add Z before AC coil suffix letter.
- ③ 104–120V 50/60 Hz for 60A, 75A.
- ④ Available through 50A.

**XT IEC Miniature Contactors**



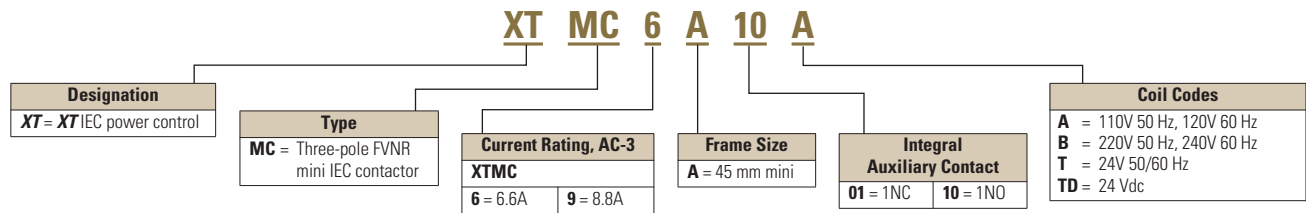
**Features**

- Reversing or non-reversing
- Three- and four-pole configurations
  - Three-pole XTMC
  - Four-pole XTMF
- Panel or DIN rail mounting
- IP20 finger and back-of-hand proof
- Direct mount with XTOM miniature overload relays

**Catalog Number Selection**

**XT IEC Miniature Contactors**

**Miniature Contactors**



**Product Selection**

**Full Voltage Non-Reversing Miniature Contactors**

| Operational Current AC-3 Amp Rating 380/400V | Conventional Free Air Thermal Current AC-1 at 50°C | Maximum kW Ratings AC-3 Three-Phase Motors, 50–60 Hz |          |      |          | Maximum Three-Phase Motor Ratings Single-Phase hp Ratings |      |       |       | Maximum Three-Phase Motor Ratings Three-Phase hp Ratings |      |      |   | Number of Power Poles | Auxiliary Contacts | Catalog Number—Screw Terminals ① |
|--|--|--|----------|------|----------|---|------|-------|-------|--|------|------|---|-----------------------|--------------------|----------------------------------|
|  |  | 220–240V   | 380–400V | 550V | 660/690V | 115V  | 200V | 230V  | 200V  | 230V   | 460V | 575V |   |                       |                    |                                  |
| 6.6  | 20   | 1.5  | 3        | 3    | 3        | 1/4   | 3/4  | 1     | 1-1/2 | 2  | 3    | 3    | 3 | 1NO                   | XTMC6A10_          |                                  |
| 6.6  | 20   | 1.5  | 3        | 3    | 3        | 1/4   | 3/4  | 1     | 1-1/2 | 2  | 3    | 3    | 3 | 1NC                   | XTMC6A01_          |                                  |
| 8.8  | 20   | 2.2  | 4        | 4    | 4        | 1/2   | 1    | 1-1/2 | 2     | 3  | 5    | 5    | 3 | 1NO                   | XTMC9A10_          |                                  |
| 8.8  | 20   | 2.2  | 4        | 4    | 4        | 1/2   | 1    | 1-1/2 | 2     | 3  | 5    | 5    | 3 | 1NC                   | XTMC9A01_          |                                  |
| 8.8  | 20   | 2.2  | 4        | 4    | 4        | 1/2   | 1    | 1-1/2 | 2     | 3  | 5    | 5    | 4 | —                     | XTMF9A00_          |                                  |

**Magnet Coil Suffix**

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| 110V 50 Hz, 120V 60 Hz | A           |
| 220V 50 Hz, 240V 60 Hz | B           |
| 24V 50/60 Hz           | T           |
| 24 Vdc                 | TD ②        |
| 415V 50 Hz, 480V 60 Hz | C           |
| 550V 50 Hz, 600V 60 Hz | D           |
| 208V 60 Hz             | E           |

**IEC Utilization Categories**

- AC-1: Non-inductive or slightly inductive loads.
- AC-3: Squirrel cage motors—starting, switching of motors during running.
- AC-4: Squirrel cage motors—starting, plugging, inching.


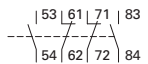
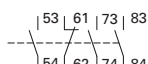
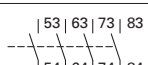
**Notes**

- ① Underscore ( \_ ) indicates magnet coil suffix required. See table at left.
- ② With DC operation: Integrated diode resistor combination, coil rating 2.6W.

## Accessories

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Front Mount Auxiliary Contacts <sup>①</sup>

| Conventional Free Air Thermal Current, $I_{th} = I_p$ , AC-1 in Amps | Contact Configuration | Contact Sequence  | Package Qty. | Catalog Number—Screw Terminals |
|--|-----------------------|---|--------------|--------------------------------|
| 10   | 1NO-1NC               |  | 5            | <b>XTMCXFA11</b>               |
| 10   | 2NO-2NC               |  | 5            | <b>XTMCXFA22</b>               |
| 10   | 3NO-1NC               |  | 5            | <b>XTMCXFA31</b>               |
| 10   | 4NO                   |  | 5            | <b>XTMCXFA40</b>               |

## XT IEC Miniature Contactors

| Description   | Package Qty. | Catalog Number              |
|---|--------------|-----------------------------|
| Mechanical interlock  | 5            | <b>XTMCXML</b>              |
| Reversing link kit—main current wiring for reversing contactors and starters      | 1            | <b>XTMCXRL</b> <sup>②</sup> |
| Connector—for mechanically arranging contactors and timing relays in combinations | 50           | <b>XTMCXCN</b> <sup>③</sup> |

**Notes**

<sup>①</sup> For two contactors with AC or DC operated magnet system that are horizontally or vertically mounted, the distance between contactors is 0 mm, and the mechanical lifespan is  $2.5 \times 10^6$  operations. The following control cables are integrated as part of the electrical interlock:  
K1M: A1—K2M: 21; K1M: 21—K2M: A1.

<sup>②</sup> Reversing link kit does not include mechanical interlock.

<sup>③</sup> 0 mm distance between contactors.



### XT IEC Contactors



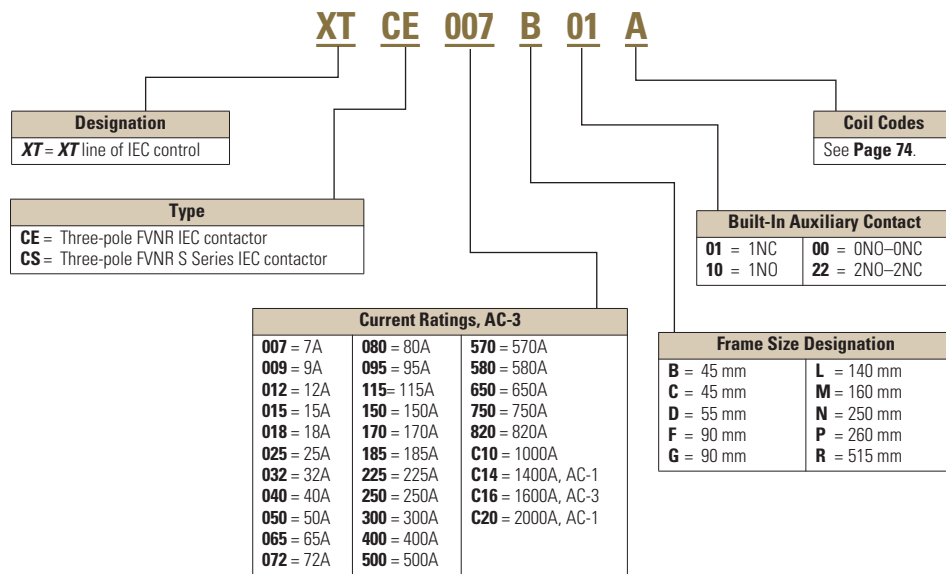
### Features

- Reversing or non-reversing contactors
- AC-3 contactor ratings to 1600A and AC-1 contactor ratings to 2000A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Built-in NO or NC auxiliary contacts to 32A
- Built-in surge suppression on DC coils XTCE Frame B-G and AC or DC coils on XTCE Frame L-R
- Can be used with **XT** or C396 overload relays
- Can be used with XTPR MMPs for manual motor controllers or UL508 Type F combination motor controllers

### Catalog Number Selection

#### XT IEC Contactors

#### Contactors



#### Product Selection

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#### Full Voltage Non-Reversing Three-Pole Contactors, Frames B–G

| UL/CSA Ratings<br>UL General Purpose Amp Rating | UL/CSA Ratings          |       |       |                        |    |                 |       | IEC Ratings             |  | Maximum kW Ratings AC-3 Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary Contacts | Catalog Number—Screw Terminals <sup>①②</sup> |
|---|-------------------------|-------|-------|------------------------|----|-----------------|-------|-------------------------|--|---|----------|------|----------|--------------------|--|
|   | Single-Phase hp Ratings |       |       | Three-Phase hp Ratings |    |                 |       | AC-3 I <sub>e</sub> (A) | AC-1 (40°C) I <sub>e</sub> = I <sub>th</sub> (A) | 220/230V  | 380/400V | 415V | 660/690V |                    |  |
| <b>Frame B</b>                                  |                         |       |       |                        |    |                 |       |                         |  |   |          |      |          |                    |  |
| 20  | 1/4                     | 3/4   | 1     | 1-1/2                  | 2  | 3               | 5     | 7                       | 20   | 2.2   | 3        | 4    | 3.5      | 1NO                | XTCE007B10_                                  |
| 20  | 1/4                     | 3/4   | 1     | 1-1/2                  | 2  | 3               | 5     | 7                       | 20   | 2.2   | 3        | 4    | 3.5      | 1NC                | XTCE007B01_                                  |
| 20  | 1/2                     | 1     | 1-1/2 | 3                      | 3  | 5               | 7-1/2 | 9                       | 20   | 2.5   | 4        | 5.5  | 4.5      | 1NO                | XTCE009B10_                                  |
| 20  | 1/2                     | 1     | 1-1/2 | 3                      | 3  | 5               | 7-1/2 | 9                       | 20   | 2.5   | 4        | 5.5  | 4.5      | 1NC                | XTCE009B01_                                  |
| 20  | 1                       | 2     | 2     | 3                      | 3  | 10 <sup>③</sup> | 10    | 12                      | 20   | 3.5   | 5.5      | 7    | 6.5      | 1NO                | XTCE012B10_                                  |
| 20  | 1                       | 2     | 2     | 3                      | 3  | 10 <sup>③</sup> | 10    | 12                      | 20   | 3.5   | 5.5      | 7    | 6.5      | 1NC                | XTCE012B01_                                  |
| 20  | 1                       | 2     | 3     | 5                      | 5  | 10 <sup>③</sup> | 10    | 15.5                    | 20   | 4   | 7.5      | 8    | 7        | 1NO                | XTCE015B10_                                  |
| 20  | 1                       | 2     | 3     | 5                      | 5  | 10 <sup>③</sup> | 10    | 15.5                    | 20   | 4   | 7.5      | 8    | 7        | 1NC                | XTCE015B01_                                  |
| <b>Frame C</b>                                  |                         |       |       |                        |    |                 |       |                         |  |   |          |      |          |                    |  |
| 40  | 2                       | 2     | 3     | 5                      | 5  | 10 <sup>③</sup> | 15    | 18                      | 35   | 5   | 7.5      | 10   | 11       | 1NO                | XTCE018C10_                                  |
| 40  | 2                       | 2     | 3     | 5                      | 5  | 10 <sup>③</sup> | 15    | 18                      | 35   | 5   | 7.5      | 10   | 11       | 1NC                | XTCE018C01_                                  |
| 40  | 2                       | 3     | 5     | 7-1/2                  | 10 | 15              | 20    | 25                      | 40   | 7.5   | 11       | 14.5 | 14       | 1NO                | XTCE025C10_                                  |
| 40  | 2                       | 3     | 5     | 7-1/2                  | 10 | 15              | 20    | 25                      | 40   | 7.5   | 11       | 14.5 | 14       | 1NC                | XTCE025C01_                                  |
| 40  | 3                       | 5     | 5     | 10                     | 10 | 20              | 25    | 32                      | 40   | 10  | 15       | 18   | 17       | 1NO                | XTCE032C10_                                  |
| 40  | 3                       | 5     | 5     | 10                     | 10 | 20              | 25    | 32                      | 40   | 10  | 15       | 18   | 17       | 1NC                | XTCE032C01_                                  |
| <b>Frame D</b>                                  |                         |       |       |                        |    |                 |       |                         |  |   |          |      |          |                    |  |
| 63  | 3                       | 5     | 7-1/2 | 10                     | 15 | 30              | 40    | 40                      | 50   | 12.5  | 18.5     | 24   | 23       | —                  | XTCE040D00_                                  |
| 80  | 3                       | 7-1/2 | 10    | 15                     | 20 | 40              | 50    | 50                      | 65   | 15.5  | 22       | 30   | 30       | —                  | XTCE050D00_                                  |
| 88  | 5                       | 10    | 15    | 20                     | 25 | 50              | 60    | 65                      | 80   | 20  | 30       | 39   | 35       | —                  | XTCE065D00_                                  |
| 88  | 5                       | 10    | 15    | 20                     | 25 | 50              | 60    | 72                      | 80   | 22  | 37       | 41   | 35       | —                  | XTCE072D00_                                  |
| <b>Frame F</b>                                  |                         |       |       |                        |    |                 |       |                         |  |   |          |      |          |                    |  |
| 125   | 7-1/2                   | 15    | 15    | 25                     | 30 | 60              | 75    | 80                      | 90   | 25  | 37       | 48   | 63       | —                  | XTCE080F00_                                  |
| 125   | 7-1/2                   | 15    | 15    | 25                     | 40 | 75              | 75    | 95                      | 110  | 30  | 45       | 57   | 75       | —                  | XTCE095F00_                                  |
| <b>Frame G</b>                                  |                         |       |       |                        |    |                 |       |                         |  |   |          |      |          |                    |  |
| 160   | 10                      | 25    | 25    | 40                     | 50 | 100             | 100   | 115                     | 130  | 37  | 55       | 70   | 90       | —                  | XTCE115G00_                                  |
| 180   | 10                      | 25    | 30    | 40                     | 60 | 125             | 125   | 150                     | 160  | 48  | 75       | 91   | 96       | —                  | XTCE150G00_                                  |
| 225 <sup>④</sup>                                | 10                      | 25    | 30    | 40                     | 60 | 125             | 125   | 170                     | 275 <sup>⑤</sup>                                 | 52  | 90       | 100  | 96       | —                  | XTCE170G00_                                  |

#### 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. Six auxiliary contacts are possible with a combination of side mounted and front mount auxiliary contacts.

DC operated contactors (Frames B–G, 7–150A) have a built-in suppressor circuit.

Frames B–C contactors with 1NC built-in auxiliary are mirror contacts (XTCE...B01\_–XTCE...C01\_).

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page 74**.

② For spring cage terminals, insert C after the fourth digit of the catalog number. Example: XTCE C 007B10A.

For 7–12A XTCEC contactors, the power, auxiliary and coil terminals are spring cage.

For 18–32A XTCEC contactors, the auxiliary and coil terminals are spring cage.

For 40–150A XTCEC contactors, the coil terminals only are spring cage.

③ For electrical life contactor application data, see Volume 5—Motor Control and Protection, CA08100006E, Tab 27.

④ For 180–225A, use 2 x 3/0 AWG wire.

⑤ For 225–275A, use 2 x 70 mm<sup>2</sup> wire.

Full Voltage Non-Reversing Three-Pole Contactors, Frames L-R

| UL/CSA Ratings   |                        |     |      | IEC Ratings             |  |          | Maximum kW Ratings AC-3 Three-Phase Motors 50-60 Hz |      |                       |                    |      |         | Auxiliary Contacts       | Catalog Number <sup>②</sup> |
|--|------------------------|-----|------|-------------------------|--|----------|---|------|-----------------------|--------------------|------|---------|--------------------------|-----------------------------|
| UL General Purpose Amp Rating                                  | Three-Phase hp Ratings |     |      | AC-3 I <sub>e</sub> (A) | AC-1 (40°C) I <sub>e</sub> = I <sub>th</sub> (A) | 220/230V | 380/400V  | 415V | 660/690V <sup>①</sup> | 1000V <sup>①</sup> |      |         |                          |                             |
| <b>Frame L—Standard Coil (110/120V, 230/240 Vac Coil Only)</b> |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 225  | 50                     | 60  | 125  | 150                     | 185  | 337      | 55  | 90   | 110                   | 175                | 108  | 2NO-2NC | XTCS185L22_              |                             |
| 250  | 60                     | 75  | 150  | 200                     | 225  | 386      | 70  | 110  | 132                   | 215                | 108  | 2NO-2NC | XTCS225L22_              |                             |
| 300  | 75                     | 100 | 200  | 250                     | 250  | 429      | 75  | 132  | 148                   | 240                | 108  | 2NO-2NC | XTCS250L22_              |                             |
| <b>Frame L—Electronic Coil</b>                                 |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 225  | 50                     | 60  | 125  | 150                     | 185  | 337      | 55  | 90   | 110                   | 175                | 108  | 2NO-2NC | XTCE185L22_              |                             |
| 250  | 60                     | 75  | 150  | 200                     | 225  | 386      | 70  | 110  | 132                   | 215                | 108  | 2NO-2NC | XTCE225L22_              |                             |
| 300  | 75                     | 100 | 200  | 250                     | 250  | 429      | 75  | 132  | 148                   | 240                | 108  | 2NO-2NC | XTCE250L22_              |                             |
| <b>Frame M—Standard Coil (110/120V, 230/240 Vac Coil Only)</b> |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 350  | 100                    | 125 | 250  | 300                     | 300  | 490      | 90  | 160  | 180                   | 286                | 132  | 2NO-2NC | XTCS300M22_              |                             |
| 450  | 125                    | 150 | 300  | 400                     | 400  | 612      | 125   | 200  | 240                   | 344                | 132  | 2NO-2NC | XTCS400M22_              |                             |
| 550  | 150                    | 200 | 400  | 500                     | 500  | 857      | 155   | 250  | 300                   | 344                | 132  | 2NO-2NC | XTCS500M22_              |                             |
| 550  | 150                    | 200 | 400  | 500                     | 580  | 980      | 155   | 315  | —                     | 344                | 132  | 2NO-2NC | XTCS570M22_              |                             |
| <b>Frame M—Electronic Coil</b>                                 |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 350  | 100                    | 125 | 250  | 300                     | 300  | 490      | 90  | 160  | 180                   | 286                | 132  | 2NO-2NC | XTCE300M22_              |                             |
| 450  | 125                    | 150 | 300  | 400                     | 400  | 612      | 125   | 200  | 240                   | 344                | 132  | 2NO-2NC | XTCE400M22_              |                             |
| 550  | 150                    | 200 | 400  | 500                     | 500  | 857      | 155   | 250  | 300                   | 344                | 132  | 2NO-2NC | XTCE500M22_              |                             |
| 550  | 150                    | 200 | 400  | 500                     | 580  | 980      | 155   | 315  | 350                   | 344                | 132  | 2NO-2NC | XTCE570M22_              |                             |
| <b>Frame N—Electronic Coil</b>                                 |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 630  | 200                    | 200 | 400  | 600                     | 580  | 980      | 185   | 315  | 348                   | 560                | 600  | 2NO-2NC | XTCE580N22_ <sup>③</sup> |                             |
| 700  | 200                    | 250 | 500  | 600                     | 650  | 1041     | 205   | 355  | 390                   | 630                | 600  | 2NO-2NC | XTCE650N22_ <sup>③</sup> |                             |
| 800  | 250                    | 300 | 600  | 700                     | 750  | 1102     | 240   | 400  | 455                   | 720                | 800  | 2NO-2NC | XTCE750N22_ <sup>③</sup> |                             |
| 850  | 290                    | 350 | 700  | 860                     | 820  | 1225     | 260   | 450  | 500                   | 750                | 800  | 2NO-2NC | XTCE820N22_ <sup>③</sup> |                             |
| 1100   | 350                    | 420 | 850  | 980                     | 1000   | 1225     | 315   | 560  | 610                   | 1000               | 1000 | 2NO-2NC | XTCEC10N22_ <sup>③</sup> |                             |
| <b>Frame P—Electronic Coil</b>                                 |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 1400   | —                      | —   | —    | —                       | —  | 1714     | —   | —    | —                     | —                  | —    | 2NO-2NC | XTCEC14P22_ <sup>③</sup> |                             |
| <b>Frame R—Electronic Coil</b>                                 |                        |     |      |                         |  |          |   |      |                       |                    |      |         |                          |                             |
| 1600   | 560                    | 640 | 1200 | 1300                    | 1600   | 2200     | 500   | 900  | 900                   | 1600               | 1700 | 2NO-2NC | XTCEC16R22_ <sup>③</sup> |                             |
| 2000   | —                      | —   | —    | —                       | —  | 2450     | —   | —    | —                     | —                  | —    | 2NO-2NC | XTCEC20R22_ <sup>③</sup> |                             |

Contactor Application Data

| Catalog Prefix | Electrical Life (Operations) for 10 hp, 480V (14.2A) Applications |
|----------------|---|
| XTCE012B       | 1 million   |
| XTCE015B       | 1.2 million   |
| XTCE018C       | 2 million   |

Notes

AC and DC operated contactors have a built-in suppressor circuit (Frames L-R, 185-2000A).

- ① For 185-500A contactors at 660/690V or 1000V: Do not reverse directly.
- ② Underscore ( \_ ) indicates magnet coil suffix required. See **Page 74**.
- ③ When operating the 580-2000A XTCE contactors with frequency inverters, the suppressor on the load side must be removed. The load side suppressor must also be removed when performing a high-voltage test—see Pub51204, Pub51209.

Full Voltage Non-Reversing Three-Pole Contactors—Contact Sequence (Circuit Symbols), Standard Offering

| Contactor Frame | Auxiliary Contacts | Contact Sequence |
|-----------------|--------------------|------------------|
| B-C             | 1NO                |                  |
| B-C             | 1NC                |                  |
| D-G             | —                  |                  |
| L-R             | 2NO-2NC            |                  |

#### Magnet Coil Suffix

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames B–F</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24 Vdc                 | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 550V 50 Hz, 600V 60 Hz | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| <b>Frame G</b>         |             |
| 100–120V 50/60 Hz      | <b>A</b>    |
| 190–240V 50/60 Hz      | <b>B</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24–27 Vdc              | <b>TD</b>   |
| 480–500V 50/60 Hz      | <b>C</b>    |

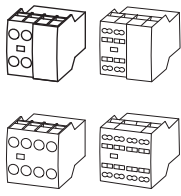




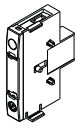

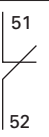
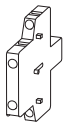

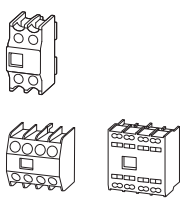




| Coil Voltage                | Suffix Code |
|-----------------------------|-------------|
| <b>Frames L–N</b>           |             |
| 110–250V 40–60 Hz/DC        | <b>A</b>    |
| 250–500V 40–60 Hz           | <b>C</b>    |
| 24–48 Vdc                   | <b>TD</b>   |
| <b>Frames L–M, S-Series</b> |             |
| 110–120V 50/60 Hz           | <b>A</b>    |
| 220–240V 50/60 Hz           | <b>B</b>    |
| <b>Frames P–R</b>           |             |
| 220–250V 50–60 Hz/DC        | <b>B</b>    |

#### XTCR Reversing Contactor Components

| Qty. | Frame                | B                  | C                  | D                  | F                  | G                  |
|------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 2    | Contactors           | <b>XTCE...B01_</b> | <b>XTCE...B01_</b> | <b>XTCE...D00_</b> | <b>XTCE...F00_</b> | <b>XTCE...G00_</b> |
| 2    | Auxiliary contact    | <b>XTCEXFAC20</b>  | <b>XTCEXFAC20</b>  | <b>XTCEXFBG11</b>  | <b>XTCEXFBG11</b>  | <b>XTCEXFBG11</b>  |
| 1    | Mechanical interlock | <b>XTCEXMLB</b>    | <b>XTCEXMLC</b>    | <b>XTCEXMLD</b>    | <b>XTCEXMLG</b>    | <b>XTCEXMLG</b>    |
| 1    | Reversing link kit   | <b>XTCEXRLB</b>    | <b>XTCEXRLC</b>    | <b>XTCEXRLD</b>    | <b>XTCEXRLG</b>    | <b>XTCEXRLG</b>    |

Accessories

Auxiliary Contacts—Frames B–G

|   |    | Conventional Thermal Current, Open at 60°C<br>$I_{th} = I_e$ , AC-1 in Amps | Poles   | Contact Configuration   | Circuit Symbol | Pkg. Qty.            | Catalog Number—Screw Terminals |
|---|----|---|---------|---|----------------|----------------------|--------------------------------|
| <b>Frames B–C</b>   |    | <b>Frames B–C—Front (Top) Mount</b> ①                                       |         |   |                |                      |                                |
|    | 16 | 2   | 2NO     |    | 5              | <b>XTCEXFAC20</b>    |                                |
|   | 16 | 2   | 1NO-1NC |    | 5              | <b>XTCEXFAC11</b>    |                                |
|   | 16 | 4   | 4NO     |    | 5              | <b>XTCEXFAC40</b>    |                                |
|   | 16 | 4   | 2NO-2NC |    | 5              | <b>XTCEXFAC22</b>    |                                |
| <b>Frame B</b>  |    | <b>Frame B—Side Mount</b> ①②  |         |   |                |                      |                                |
|    | 16 | 1   | 1NO     |    | 1              | <b>XTCEXSAB10</b>    |                                |
|   | 16 | 1   | 1NC     |   | 1              | <b>XTCEXSAB01</b>    |                                |
| <b>Frame C</b>  |    | <b>Frame C—Side Mount</b> ①   |         |   |                |                      |                                |
|  | 10 | 2   | 1NO-1NC |  | 1              | <b>XTCEXSACC11</b> ① |                                |
| <b>Frames D–G</b>   |    | <b>Frames D–G</b> ③   |         |   |                |                      |                                |
|  | 16 | 2   | 2NO     |  | 5              | <b>XTCEXFBG20</b>    |                                |
|   | 16 | 2   | 1NO-1NC |  | 5              | <b>XTCEXFBG11</b>    |                                |
|   | 16 | 4   | 4NO-0NC |  | 5              | <b>XTCEXFBG40</b>    |                                |
|   | 16 | 4   | 2NO-2NC |  | 5              | <b>XTCEXFBG22</b>    |                                |

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 XTCE007\_–XTCE032\_ 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.

① Frames B–C cannot use both a side AND a top mount auxiliary contact at the same time.

② Can be mounted to the left side of contactor only.

Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

③ For Frame D, six auxiliary contacts maximum (can be a combination of side and top mount units).

#### Side Mount Auxiliary Contacts—Frames D–R, 40–2000A

##### Conventional Free Air

Thermal Current,  
 $I_{th} = I_e$ , AC-1 in Amps

Poles


Contact  
Configuration

Circuit Symbol

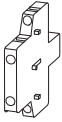
Pkg. Qty.

Catalog Number—  
Screw Terminals

##### Frame D–R <sup>①②</sup>

|    |   |         |   |   |                   |
|----|---|---------|---|---|-------------------|
| 10 | 2 | 1NO-1NC |  | 1 | <b>XTCEXSBN11</b> |
|----|---|---------|---|---|-------------------|

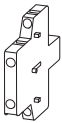
##### Frames D–R



##### Frames L–R (Screw Mount) <sup>②</sup>

|    |   |         |   |   |                   |
|----|---|---------|---|---|-------------------|
| 10 | 2 | 1NO-1NC |  | 1 | <b>XTCEXSBR11</b> |
|----|---|---------|---|---|-------------------|

##### Frames L–R



#### Mechanical Interlock <sup>③</sup>

##### For Use with ...

##### Package Qty.

##### Catalog Number

##### XTCEXMLB

XTCE007B–XTCE015B, XTCE020B

5

**XTCEXMLB**



##### XTCEMLC

XTCE018C–XTCE032C

1

**XTCEMLC**

XTCE032C–XTCE045C

XTCE040D–XTCE072D

XTCE063D–XTCE080D

1

**XTCEMLD**

XTCE080F–XTCE170G

1

**XTCEMLG <sup>④</sup>**

XTCE125G–XTCE200G



##### XTCEMLM

XTCE185L–XTCE570M

1

**XTCEMLM**

XTCE580N–XTCEC10N

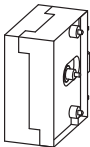
1

**XTCEMLN <sup>④</sup>**

XTCE500M–XTCE570M with XTCE500N–XTCEC10N

1

**XTCEMLNM <sup>④</sup>**



#### Reversing Link Kits

#### Reversing Link Kits

##### For Use with ...

##### Package Qty.

##### Catalog Number

XTCE007B–XTCE015B

1

**XTCEXRLB <sup>⑤</sup>**

XTCE018C–XTCE032C

1

**XTCEXRLC**

XTCE040D–XTCE065D

1

**XTCEXRLD**

XTCE080F–XTCE150G

1

**XTCEXRLG**

XTCE185L–XTCE250L

1

**XTCEXRLN**

XTCE300M–XTCE400M

1

**XTCEXRLM400**



#### Notes

- ① For Frame D, six auxiliary contacts maximum (can be a combination of side and top mount units).
- ② For Frames F–R, eight auxiliary contacts maximum (can be a combination of side and top mount units).
- ③ For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B–G frames, mechanical lifespan is 2.5 x 10<sup>6</sup> operations and the distance between contactors is 0 mm. For L–N frames, mechanical lifespan is 5 x 10<sup>6</sup> operations and no auxiliary contact can be mounted between the mechanical interlock and the contactor—the distance between contactors is 15 mm.
- ④ XTCEXMLG, XTCEXMLN and XTCEXMLNM consist of an interlock element and mounting plate.
- ⑤ Also includes interlocking bridge (XTCEXLB). The following control cables are integrated for electrical interlock:  
K1M: A1–K2M: 21; K1M: 21–K2M: A1; K1M: A2–K2M: A2.

**Product Overview**

**Monitoring Relays Selection Guide**



| Description            | D65 Series  | D65C Series   |
|------------------------|---|---|
|                        | Page 79   | Page 81   |
| <b>Approvals</b>       | cULus, CE   | RoHS, cURus, cULus, CE  |
| <b>Features</b>        | Various combinations of protection available<br>Compact cases for easy mounting<br>LED indicators for quick troubleshooting | Monitors AC single-phase currents from 0.1–10 A<br>External CT can be used to extend ranges<br>LED indicates output relay status<br>Choice of fixed or user-adjustable settings |
| <b>Contact Data</b>    |   |   |
| Configuration          | SPDT or DPDT  | —   |
| Maximum allowable load | 10A   | Less than 5 VA  |
| Material               | —   | —   |
| Resistance             | —   | —   |
| Dielectric strength    | 2000V   | —   |
| <b>Coil Data</b>       |   |   |
| AC                     | 24–480 Vac  | —   |
| DC                     | 24–120 Vdc  | —   |
| Power                  |   |   |
| VA (Vac)               | 5 VA  | —   |
| Watts (Vdc)            | —   | —   |
| <b>General Data</b>    |   |   |
| Ambient temperature    |   |   |
| Operational            | –4° to 149°F (–20° to 65°C)   | –20° to 131°F (–28° to 55°C)  |
| Maximum pick-up        | <= 500 milliseconds   | Overcurrent: Adjustable throughout current range monitored<br>Undercurrent: Fixed at 5% above adjustable drop-out setting   |
| Maximum release        | <= 500 milliseconds   | Overcurrent: Fixed at 95% of pick-up setting for D65CE; adjustable from 50–95% of pick-up setting for D65CEK<br>Undercurrent: Adjustable throughout current range monitored     |
| Life                   |   |   |
| Mechanical operations  | 10 million  | 10 million  |
| Electrical operations  | 100,000   | 100,000   |

For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E.

## Overload Relays Selection Guide


**XTIEC Miniature Overload Relays**

**XTOB, XTOT Thermal Overload Relays**

**XT Electronic Overload Relays**

**Motor Insight Overload and Monitoring Relays**

| Description                            | Page 84                     | Page 85                     | Page 88  | Page 94                              |
|--|-----------------------------|-----------------------------|--|--------------------------------------|
| Relay type                             | Thermal bi-metal            | Thermal bi-metal            | Electronic   | Electronic                           |
| FLA range                              | 0.1–12A                     | 0.1–630A                    | 0.1–1500A  | 1–540A                               |
| FLA max.:min. ratio                    | Approx. 1.5:1               | Approx. 1.5:1               | 5:1  | 18:1 and 9:1                         |
| Trip class                             | 10                          | 10                          | Selectable 10A/10/20/30  | 5–30, stepped by 1's                 |
| Reset type                             | Selectable manual/automatic | Selectable manual/automatic | Selectable manual/automatic/remote   | Selectable manual/automatic/remote   |
| Direct connect to <b>XT</b> contactor  | Yes, XTMC                   | Yes, XTCE                   | Yes, XTCE  | —                                    |
| Direct connect to DP contactor         | —                           | —                           | Yes  | —                                    |
| Standalone mounting                    | —                           | Panel or DIN                | Panel or DIN   | Panel                                |
| Thermal overload protection            | Yes                         | Yes                         | Yes  | Yes, programmable                    |
| Jam                                    | —                           | —                           | —  | Yes, programmable                    |
| Current unbalance protection           | —                           | —                           | Yes, selectable  | Yes, programmable                    |
| Single-phasing                         | —                           | —                           | Yes, fixed level   | Yes, fixed on or off                 |
| Ground fault                           | —                           | —                           | Yes, fixed   | Yes, programmable                    |
| Phase reversal                         | —                           | —                           | —  | Yes, programmable                    |
| Undercurrent                           | —                           | —                           | —  | Yes, programmable                    |
| Overcurrent                            | —                           | —                           | —  | —                                    |
| Low power/high power                   | —                           | —                           | —  | Yes, programmable                    |
| Overvoltage/undervoltage               | —                           | —                           | —  | Yes, programmable                    |
| Voltage unbalance                      | —                           | —                           | —  | Yes, programmable                    |
| Current per phase and average rms      | —                           | —                           | —  | Yes                                  |
| Current unbalance percent              | —                           | —                           | Yes  | Yes                                  |
| Ground fault current                   | —                           | —                           | Yes  | Yes                                  |
| Voltage per phase and average rms      | —                           | —                           | —  | Yes                                  |
| Voltage unbalance percent              | —                           | —                           | —  | Yes                                  |
| Power/power factor                     | —                           | —                           | —  | Yes                                  |
| Thermal capacity                       | —                           | —                           | Yes  | Yes                                  |
| Frequency                              | —                           | —                           | Yes  | Yes                                  |
| Motor run hours                        | —                           | —                           | —  | Yes                                  |
| Motor starts count                     | —                           | —                           | —  | Yes                                  |
| Time to restart after fault            | —                           | —                           | —  | Yes                                  |
| Overload status                        | —                           | —                           | Yes  | Yes                                  |
| Programmable reset timers/attempts     | —                           | —                           | —  | Yes                                  |
| Programmable trip delays               | —                           | —                           | —  | Yes                                  |
| Programmable auxiliary contact         | —                           | —                           | —  | —                                    |
| Communications with I/O                | —                           | —                           | Yes<br>(Modbus <sup>®</sup> , DeviceNet <sup>™</sup> , PROFIBUS <sup>®</sup> ) | Yes<br>(Modbus, DeviceNet, PROFIBUS) |
| Remote display                         | —                           | —                           | —  | Yes (NEMA 1, 12, and 3R)             |
| Lockable user interface or tamperproof | —                           | —                           | Yes  | Yes                                  |
| Alarm no-trip mode                     | —                           | —                           | —  | Yes, for GF and line faults          |
| Diagnostics                            | —                           | —                           | —  | Yes, 10 fault queue                  |

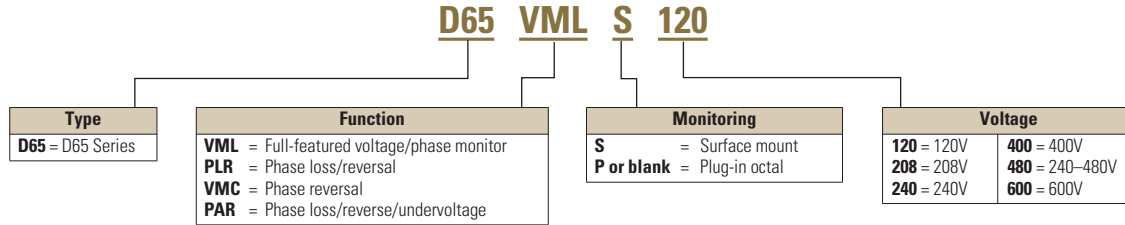
For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E.



### Catalog Number Selection

#### D65 Series Monitoring Relays

##### D65 Series



#### D65 Series Full-Featured Voltage/Phase Monitor

##### Features

- Full-featured voltage/phase monitoring relays
- Undervoltage, overvoltage, phase imbalance, phase loss (single-phasing), phase reversal
- Universal voltage range of 208–480V provides the flexibility to cover a variety of applications; 120V and 600V units also available
- Automatic or manual reset after the fault condition is corrected
- User-adjustable settings include nominal voltage, percent phase imbalance, undervoltage drop-out, time delay on undervoltage and time delay on restart after fault

##### Product Selection

D65VML\_

#### D65VML Series



| Style                             | Operating Voltage, 50/60 Hz | Catalog Number |
|-----------------------------------|-----------------------------|----------------|
| Surface-mount (DIN rail or panel) | 120V                        | D65VMLS120     |
|                                   | 208–480V                    | D65VMLS480     |
|                                   | 600V                        | D65VMLS600     |
| Plug-in (DIN rail)                | 120V                        | D65VMLP120     |
|                                   | 208–480V                    | D65VMLP480 ①   |
| 8-pin socket                      | —                           | D3PA2 ②        |
| 8-pin IP20 rated socket           | —                           | D3PA6          |

#### D65 Series Phase Reversal Monitoring Relays

##### Features

- Protects against phase reversal
- One version works on 208–480V three-phase systems
- 10A SPDT output contacts

##### Product Selection

D65VMC\_

#### D65VMC Series



| Style   | Nominal Voltage, 50/60 Hz | Catalog Number |
|---------|---------------------------|----------------|
| Plug-in | 120V                      | D65VMC120      |
|         | 208–480V                  | D65VMC480 ①    |

##### Notes

- ① Requires a 600V rated socket when used on system voltages greater than 300V.
- ② The D3PA2 socket is rated 10A, 600V.

**D65 Series Phase Loss and Reversal Monitoring Relays****Features**

- Protects against phase loss and phase reversal
- LED indicates both normal and fault conditions
- 10A SPDT output contacts

**Product Selection****D65PLR\_****D65PLR Series**

| Style   | Nominal Voltage, 50/60 Hz | Catalog Number     |
|---------|---------------------------|--------------------|
| Plug-in | 120V                      | <b>D65PLR120</b>   |
|         | 208V                      | <b>D65PLR208</b>   |
|         | 240V                      | <b>D65PLR240</b>   |
|         | 400V                      | <b>D65PLR400</b> ① |
|         | 480V                      | <b>D65PLR480</b> ① |

**D65 Series Phase Loss, Reversal and Undervoltage****Features**

- Protects against phase loss, phase reversal and undervoltage
- Undervoltage setting is adjustable from 75–95% of nominal
- LED indicates both normal and fault conditions
- 10A SPDT output contacts

**Product Selection****D65PAR\_****D65PAR Series**

| Style   | Nominal Voltage, 60 Hz | Undervoltage Range | Catalog Number     |
|---------|------------------------|--------------------|--------------------|
| Plug-in | 120V                   | 90–115V            | <b>D65PAR120</b>   |
|         | 208V                   | 156–198V           | <b>D65PAR208</b>   |
|         | 240V                   | 180–230V           | <b>D65PAR240</b>   |
|         | 400V                   | 300–380V           | <b>D65PAR400</b> ① |
|         | 480V                   | 360–460V           | <b>D65PAR480</b> ① |

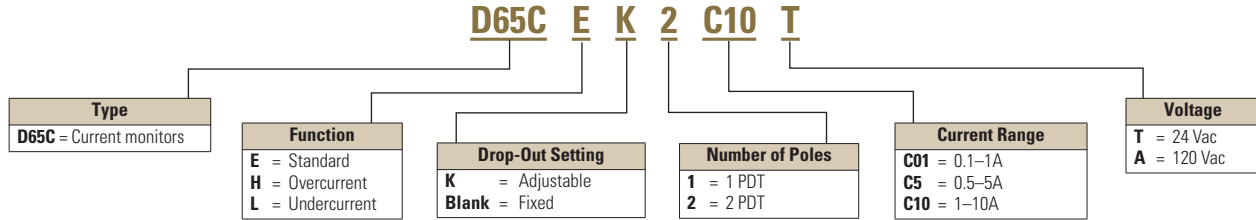
**Note**

- ① Requires a 600V rated socket when used on system voltages greater than 300V.

### Catalog Number Selection

#### D65C Series Monitoring Relays

#### D65C Series



#### D65CE Standard Current Monitoring Relays

##### Features

- Monitors AC single-phase currents
- Three separate current monitoring ranges covering 0.1–10 amperes
- External CT can be used to extend ranges
- Fixed 100 ms pick-up and drop-out time delay

##### Product Selection

#### D65CE\_ D65CE Series



| Pick-Up Setting                | Drop-Out Setting          | Input Voltage             | Current Range Monitored | Catalog Number     |
|--------------------------------|---------------------------|---------------------------|-------------------------|--------------------|
| <b>SPDT—8-Pin Plug-In</b>      |                           |                           |                         |                    |
| Adjustable                     | Fixed (at 95% of pick-up) | 24 Vac                    | 0.1–1A                  | <b>D65CE1C01T</b>  |
|                                |                           |                           | 0.5–5A                  | <b>D65CE1C5T</b>   |
|                                |                           |                           | 1–10A                   | <b>D65CE1C10T</b>  |
|                                | 120 Vac                   | Fixed (at 95% of pick-up) | 0.1–1A                  | <b>D65CE1C01A</b>  |
|                                |                           |                           | 0.5–5A                  | <b>D65CE1C5A</b>   |
|                                |                           |                           | 1–10A                   | <b>D65CE1C10A</b>  |
| Adjustable (50–95% of pick-up) | 24 Vac                    | 24 Vac                    | 0.1–1A                  | <b>D65CEK1C01T</b> |
|                                |                           |                           | 0.5–5A                  | <b>D65CEK1C5T</b>  |
|                                |                           |                           | 1–10A                   | <b>D65CEK1C10T</b> |
|                                | 120 Vac                   | Fixed (at 95% of pick-up) | 0.1–1A                  | <b>D65CEK1C01A</b> |
|                                |                           |                           | 0.5–5A                  | <b>D65CEK1C5A</b>  |
|                                |                           |                           | 1–10A                   | <b>D65CEK1C10A</b> |
| <b>DPDT—11-Pin Plug-In</b>     |                           |                           |                         |                    |
| Adjustable                     | Fixed (at 95% of pick-up) | 24 Vac                    | 0.1–1A                  | <b>D65CE2C01T</b>  |
|                                |                           |                           | 0.5–5A                  | <b>D65CE2C5T</b>   |
|                                |                           |                           | 1–10A                   | <b>D65CE2C10T</b>  |
|                                | 120 Vac                   | Fixed (at 95% of pick-up) | 0.1–1A                  | <b>D65CE2C01A</b>  |
|                                |                           |                           | 0.5–5A                  | <b>D65CE2C5A</b>   |
|                                |                           |                           | 1–10A                   | <b>D65CE2C10A</b>  |
| Adjustable (50–95% of pick-up) | 24 Vac                    | 24 Vac                    | 0.1–1A                  | <b>D65CEK2C01T</b> |
|                                |                           |                           | 0.5–5A                  | <b>D65CEK2C5T</b>  |
|                                |                           |                           | 1–10A                   | <b>D65CEK2C10T</b> |
|                                | 120 Vac                   | Fixed (at 95% of pick-up) | 0.1–1A                  | <b>D65CEK2C01A</b> |
|                                |                           |                           | 0.5–5A                  | <b>D65CEK2C5A</b>  |
|                                |                           |                           | 1–10A                   | <b>D65CEK2C10A</b> |

#### D65CH Series, Overcurrent Monitors

#### Features

- Monitors AC single-phase currents for overcurrent conditions
- Three separate current monitoring ranges covering 0.1–10 amperes
- External CT can be used to extend ranges
- Adjustable pick-up setting with either fixed or adjustable drop-out setting
- Adjustable time delay of 0.1–10 seconds on pick-up
- Fixed 100 ms time delay on drop-out
- LED indicates output

#### Product Selection

D65CH\_

#### D65CH Series



| Pick-Up Setting            | Drop-Out Setting                  | Input Voltage | Current Range Monitored | Catalog Number     |                    |
|----------------------------|-----------------------------------|---------------|-------------------------|--------------------|--------------------|
| <b>SPDT—8-Pin Plug-In</b>  |                                   |               |                         |                    |                    |
| Adjustable                 | Fixed<br>(at 95% of pick-up)      | 24 Vac        | 0.1–1A                  | <b>D65CH1C1T</b>   |                    |
|                            |                                   |               | 0.5–5A                  | <b>D65CH1C5T</b>   |                    |
|                            |                                   |               | 1–10A                   | <b>D65CH1C10T</b>  |                    |
|                            | 120 Vac                           |               | 0.1–1A                  | <b>D65CH1C1A</b>   |                    |
|                            |                                   |               | 0.5–5A                  | <b>D65CH1C5A</b>   |                    |
|                            |                                   |               | 1–10A                   | <b>D65CH1C10A</b>  |                    |
|                            | Adjustable<br>(50–95% of pick-up) | 24 Vac        |                         | 0.1–1A             | <b>D65CHK1C1T</b>  |
|                            |                                   |               |                         | 0.5–5A             | <b>D65CHK1C5T</b>  |
|                            |                                   |               |                         | 1–10A              | <b>D65CHK1C10T</b> |
| 120 Vac                    |                                   |               | 0.1–1A                  | <b>D65CHK1C1A</b>  |                    |
|                            |                                   |               | 0.5–5A                  | <b>D65CHK1C5A</b>  |                    |
|                            |                                   |               | 1–10A                   | <b>D65CHK1C10A</b> |                    |
| <b>DPDT—11-Pin Plug-In</b> |                                   |               |                         |                    |                    |
| Adjustable                 | Fixed<br>(at 95% of pick-up)      | 24 Vac        | 0.1–1A                  | <b>D65CH2C1T</b>   |                    |
|                            |                                   |               | 0.5–5A                  | <b>D65CH2C5T</b>   |                    |
|                            |                                   |               | 1–10A                   | <b>D65CH2C10T</b>  |                    |
|                            | 120 Vac                           |               |                         | 0.1–1A             | <b>D65CH2C1A</b>   |
|                            |                                   |               |                         | 0.5–5A             | <b>D65CH2C5A</b>   |
|                            |                                   |               |                         | 1–10A              | <b>D65CH2C10A</b>  |
|                            | Adjustable<br>(50–95% of pick-up) | 24 Vac        |                         | 0.1–1A             | <b>D65CHK2C1T</b>  |
|                            |                                   |               |                         | 0.5–5A             | <b>D65CHK2C5T</b>  |
|                            |                                   |               |                         | 1–10A              | <b>D65CHK2C10T</b> |
|                            | 120 Vac                           |               |                         | 0.1–1A             | <b>D65CHK2C1A</b>  |
|                            |                                   |               |                         | 0.5–5A             | <b>D65CHK2C5A</b>  |
|                            |                                   |               |                         | 1–10A              | <b>D65CHK2C10A</b> |

### D65CL Series, Undercurrent Monitoring Relays

#### Features

- Monitors AC single-phase currents for undercurrent conditions
- Three separate current monitoring ranges covering 0.1–10 amperes
- External CT can be used to extend ranges
- Adjustable drop-out setting with fixed pick-up setting
- Adjustable time delay of 0.1–10 seconds on drop-out
- Fixed 100 ms time delay on pick-up

#### Product Selection

D65CL\_

#### D65CL Series



| Pick-Up Setting            | Drop-Out Setting             | Input Voltage | Current Range Monitored | Catalog Number    |
|----------------------------|------------------------------|---------------|-------------------------|-------------------|
| <b>SPDT—8-Pin Plug-In</b>  |                              |               |                         |                   |
| Adjustable                 | Fixed<br>(at 5% of drop-out) | 24 Vac        | 0.1–1A                  | <b>D65CL1C1T</b>  |
|                            |                              |               | 0.5–5A                  | <b>D65CL1C5T</b>  |
|                            |                              |               | 1–10A                   | <b>D65CL1C10T</b> |
|                            |                              | 120 Vac       | 0.1–1A                  | <b>D65CL1C1A</b>  |
|                            |                              |               | 0.5–5A                  | <b>D65CL1C5A</b>  |
|                            |                              |               | 1–10A                   | <b>D65CL1C10A</b> |
| <b>SPDT—11-Pin Plug-In</b> |                              |               |                         |                   |
| Adjustable                 | Fixed<br>(at 5% of drop-out) | 24 Vac        | 0.1–1A                  | <b>D65CL2C1T</b>  |
|                            |                              |               | 0.5–5A                  | <b>D65CL2C5T</b>  |
|                            |                              |               | 1–10A                   | <b>D65CL210T</b>  |
|                            |                              | 120 Vac       | 0.1–1A                  | <b>D65CL2C1A</b>  |
|                            |                              |               | 0.5–5A                  | <b>D65CL2C5A</b>  |
|                            |                              |               | 1–10A                   | <b>D65CL2C10A</b> |

**XTIEC Miniature Overload Relays**



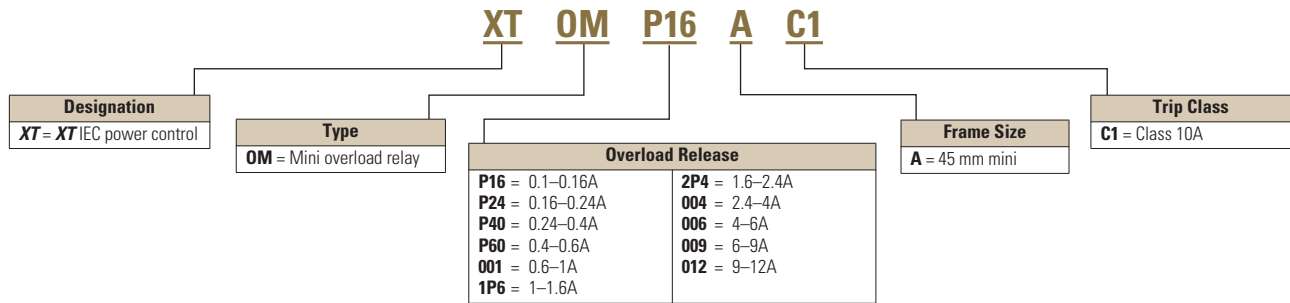
**Features**

- Trip class 10A
- Ambient temperature compensated  $-5^{\circ}$  to  $50^{\circ}\text{C}$  ( $23^{\circ}$  to  $122^{\circ}\text{F}$ )
- Selectable manual/automatic reset
- 1NO-1NC auxiliary contact as standard
- Direct mount with XTMC contactors

**Catalog Number Selection**

**XTIEC Miniature Overload Relays**

**Miniature Overload Relays**



**Product Selection**

**Miniature Overload Relays** ①②

| Overload Release It | Trip Class | Contact Sequence | Contact Configuration | Short Circuit Protection (A) |                            | Circuit Breaker | CEC/NEC Fuse | Catalog Number    |
|---------------------|------------|------------------|-----------------------|------------------------------|----------------------------|-----------------|--------------|-------------------|
|                     |            |                  |                       | Type 1 Coordination, gG/gL   | Type 2 Coordination, gG/gL |                 |              |                   |
| 0.1–0.16A           | 10A        | 97 95            | 1NO-1NC               | 20                           | 0.5                        | 15              | —            | <b>XTOMP16AC1</b> |
| 0.16–0.24A          |            |                  |                       | 20                           | 1                          | 15              | —            | <b>XTOMP24AC1</b> |
| 0.24–0.4A           |            | 2 4 6 98 96      |                       | 20                           | 2                          | 15              | —            | <b>XTOMP40AC1</b> |
| 0.4–0.6A            |            |                  |                       | 20                           | 2                          | 15              | —            | <b>XTOMP60AC1</b> |
| 0.6–1A              |            |                  |                       | 20                           | 4                          | 15              | 3            | <b>XTOM001AC1</b> |
| 1–1.6A              |            |                  |                       | 20                           | 6                          | 15              | 6            | <b>XTOM1P6AC1</b> |
| 1.6–2.4A            |            |                  |                       | 20                           | 6                          | 15              | 6            | <b>XTOM2P4AC1</b> |
| 2.4–4A              |            |                  |                       | 20                           | 10                         | 15              | 15           | <b>XTOM004AC1</b> |
| 4–6A                |            |                  |                       | 20                           | 10                         | 15              | 20           | <b>XTOM006AC1</b> |
| 6–9A                |            |                  |                       | 20                           | 10                         | 15              | 35           | <b>XTOM009AC1</b> |
| 9–12A               |            |                  |                       | —                            | —                          | —               | 45           | <b>XTOM012AC1</b> |

**Notes**

- ① Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402002E for more information.
- ② When fitted directly to the contactor, a clearance of at least 5 mm is required between the overload relays.

**XTOB, XTOT Thermal Overload Relays**



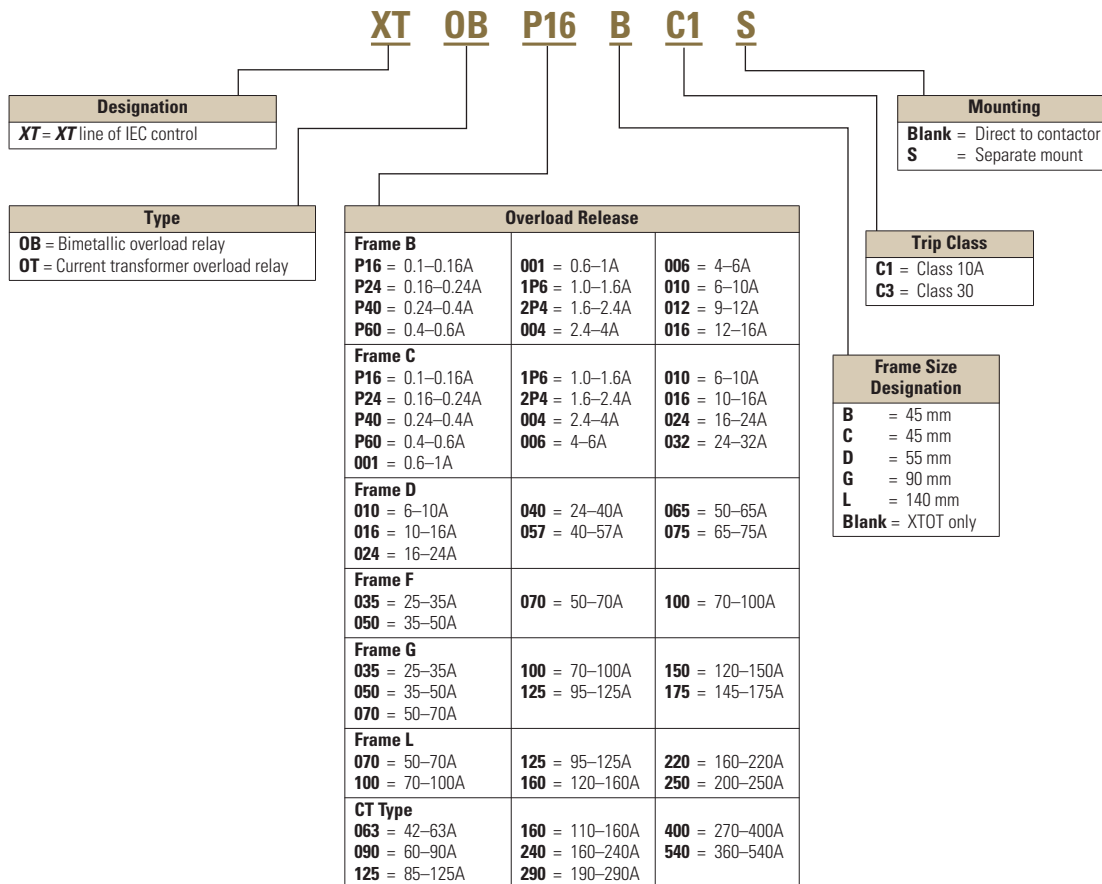
**Features**

- Direct mount to **XT** contactors or separate mount
- Class 10A
- Up to 630A

**Catalog Number Selection**

**XTOB, XTOT Thermal Overload Relays**

**Thermal Overload Relays**



#### Product Selection

59

#### XTOB, XTOT Thermal Overload Relays

| Overload Releases, I <sub>r</sub>                                | Contact Sequence | Contact Configuration | For Use with Contactor Ampere Range | Short-Circuit Protection (A) |              | Catalog Number |
|--|------------------|-----------------------|-------------------------------------|------------------------------|--------------|----------------|
|  |                  |                       |                                     | Maximum Circuit Breaker      | CEC/NEC Fuse |                |
| <b>Frame B—Direct Mount to XTCE...B Contactor</b>                |                  |                       |                                     |                              |              |                |
| 0.1–0.165  |                  | 1NO-1NC               | 7–15A                               | 25                           | 3            | XTOBP16BC1     |
| 0.16–0.24  |                  |                       | 7–15A                               | 25                           | 3            | XTOBP24BC1     |
| 0.24–0.4   |                  |                       | 7–15A                               | 25                           | 3            | XTOBP40BC1     |
| 0.4–0.6  |                  |                       | 7–15A                               | 25                           | 3            | XTOBP60BC1     |
| 0.6–1  |                  |                       | 7–15A                               | 25                           | 3            | XTOB001BC1     |
| 1–1.6  |                  |                       | 7–15A                               | 25                           | 6            | XTOB1P6BC1     |
| 1.6–2.4  |                  |                       | 7–15A                               | 25                           | 6            | XTOB2P4BC1     |
| 2.4–4  |                  |                       | 7–15A                               | 25                           | 15           | XTOB004BC1     |
| 4–6  |                  |                       | 7–15A                               | 25                           | 20           | XTOB006BC1     |
| 6–10   |                  |                       | 7–15A                               | 25                           | 35           | XTOB010BC1     |
| 9–12   |                  |                       | 9–15A                               | 25                           | 45           | XTOB012BC1     |
| 12–16  |                  |                       | 12–15A                              | 30                           | 45           | XTOB016BC1     |
| <b>Frame C—Direct Mount to XTCE...C Contactor</b>                |                  |                       |                                     |                              |              |                |
| 0.6–1  |                  | 1NO-1NC               | 18–32A                              | 25                           | 3            | XTOB001CC1     |
| 1–1.6  |                  |                       | 18–32A                              | 25                           | 6            | XTOB1P6CC1     |
| 1.6–2.4  |                  |                       | 18–32A                              | 25                           | 6            | XTOB2P4CC1     |
| 2.4–4  |                  |                       | 18–32A                              | 25                           | 15           | XTOB004CC1     |
| 4–6  |                  |                       | 18–32A                              | 25                           | 20           | XTOB006CC1     |
| 6–10   |                  |                       | 18–32A                              | 25                           | 25           | XTOB010CC1     |
| 10–16  |                  |                       | 18–32A                              | 30                           | 25           | XTOB016CC1     |
| 16–24  |                  |                       | 18–32A                              | 30                           | 25           | XTOB024CC1     |
| 24–32  |                  |                       | 25–32A                              | 30                           | 25           | XTOB032CC1     |
| <b>Frame D—Direct Mount to XTCE...D Contactor</b>                |                  |                       |                                     |                              |              |                |
| 6–10   |                  | 1NO-1NC               | 40–72A                              | 25                           | 25           | XTOB010DC1     |
| 10–16  |                  |                       | 40–72A                              | 25                           | 25           | XTOB016DC1     |
| 16–24  |                  |                       | 40–72A                              | 30                           | 25           | XTOB024DC1     |
| 24–40  |                  |                       | 40–72A                              | 125                          | 125          | XTOB040DC1     |
| 40–57  |                  |                       | 50–72A                              | 150                          | 150          | XTOB057DC1     |
| 50–65  |                  |                       | 65–72A                              | 150                          | 200          | XTOB065DC1     |
| 65–75  |                  |                       | 72A                                 | 150                          | 200          | XTOB075DC1     |
| <b>Frames F–G—Direct Mount to XTCE...F or XTCE...G Contactor</b> |                  |                       |                                     |                              |              |                |
| 35–50  |                  | 1NO-1NC               | 80–170A                             | 150                          | 200          | XTOB050GC1     |
| 50–70  |                  |                       | 80–170A                             | 150                          | 200          | XTOB070GC1     |
| 70–100   |                  |                       | 80–170A                             | 400                          | 400          | XTOB100GC1     |
| 95–125   |                  |                       | 80–170A                             | 500                          | 400          | XTOB125GC1     |
| 120–150  |                  |                       | 80–170A                             | 600                          | 600          | XTOB150GC1     |
| 145–175  |                  |                       | 150–170A                            | 600                          | 600          | XTOB175GC1     |

#### Notes

Short circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402001E for more information on overload relays for Frames B–G.

Trip Class: 10A

Suitable for protection of EEx e-motors. EC prototype test certificate available upon request.

Observe manuals MN03402001E and MN03407001E. See documentation—manuals for overload monitoring of EEx e-motors.



### XTOB, XTOT Thermal Overload Relays, continued

| Overload Releases, I <sub>r</sub>                                 | Contact Sequence | Contact Configuration | For Use with Contactor Ampere Range | Short-Circuit Protection (A) |              | Catalog Number     |
|---|------------------|-----------------------|-------------------------------------|------------------------------|--------------|--------------------|
|   |                  |                       |                                     | Maximum Circuit Breaker      | CEC/NEC Fuse |                    |
| <b>Frames F–G—Separate Mount</b>                                  |                  |                       |                                     |                              |              |                    |
| 35–50   |                  | 1NO-1NC               | 80–170A                             | 150                          | 200          | <b>XTOB050GC1S</b> |
| 50–70   |                  |                       | 80–170A                             | 150                          | 200          | <b>XTOB070GC1S</b> |
| 70–100  |                  |                       | 80–170A                             | 400                          | 400          | <b>XTOB100GC1S</b> |
| 95–125  |                  |                       | 80–170A                             | 500                          | 400          | <b>XTOB125GC1S</b> |
| 120–150   |                  |                       | 80–170A                             | 600                          | 600          | <b>XTOB150GC1S</b> |
| 145–175   |                  |                       | 150–170A                            | 600                          | 600          | <b>XTOB175GC1S</b> |
| <b>Frame L—Direct Mount to XTC (E or S)...L or Separate Mount</b> |                  |                       |                                     |                              |              |                    |
| 50–70   |                  | 1NO-1NC               | 185–250A                            | 150                          | 200          | <b>XTOB070LC1</b>  |
| 70–100  |                  |                       | 185–250A                            | 400                          | 400          | <b>XTOB100LC1</b>  |
| 95–125  |                  |                       | 185–250A                            | 500                          | 400          | <b>XTOB125LC1</b>  |
| 120–160   |                  |                       | 185–250A                            | 600                          | 600          | <b>XTOB160LC1</b>  |
| 160–220   |                  |                       | 185–250A                            | 800                          | 800          | <b>XTOB220LC1</b>  |
| 200–250   |                  |                       | 225–250A                            | 600                          | 700          | <b>XTOB250LC1</b>  |

### Current Transformer Operated Overload Relay

| Overload Releases, I <sub>r</sub> | Contact Sequence | Contact Configuration | For Use with Contactor Ampere Range | Short-Circuit Protection (A) |              | Catalog Number    |
|-----------------------------------|------------------|-----------------------|-------------------------------------|------------------------------|--------------|-------------------|
|                                   |                  |                       |                                     | Maximum Circuit Breaker      | CEC/NEC Fuse |                   |
| <b>Frames M–N—Separate Mount</b>  |                  |                       |                                     |                              |              |                   |
| 160–240                           |                  | 1NO-1NC               | 300–500A                            | 600                          | 700          | <b>XTOT240C3S</b> |
| 190–290                           |                  |                       | 300–500A                            | 600                          | 700          | <b>XTOT290C3S</b> |
| 270–400                           |                  |                       | 300–500A                            | 1000                         | 1000         | <b>XTOT400C3S</b> |
| 360–540                           |                  |                       | 500A                                | 600                          | 1000         | <b>XTOT540C3S</b> |
| 420–630                           |                  |                       | 630A                                | 600                          | 1000         | <b>XTOT630C3S</b> |

### Accessories

#### Adapter



#### DIN-Rail or Panel-Mount Adapter, Frames C–D ①

| For Use With... | Package Qty. | Catalog Number   |
|-----------------|--------------|------------------|
| XTOB...CC1      | 5            | <b>XTOBXDINC</b> |
| XTOB...DC1      | 2            | <b>XTOBXDIND</b> |

#### Terminal Lug Kit—Set of Three Lugs

| Description                     | For Use With... | Package Qty. | Catalog Number  |
|---------------------------------|-----------------|--------------|-----------------|
| Set of three lugs #6 AWG-350MCM | XTOB...LC1      | 1            | <b>XTOBXTLL</b> |

#### Notes

Short circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402001E for more information on overload relays for Frames B–G.

Trip Class: 10A

Suitable for protection of EEx e-motors. EC prototype test certificate available upon request.

Observe manuals MN03402001E and MN03407001E. See documentation—manuals for overload monitoring of EEx e-motors

① Can be snap fitted on a top hat rail (DIN rail) or can be screw fitted.

**XT Electronic Overload Relays**



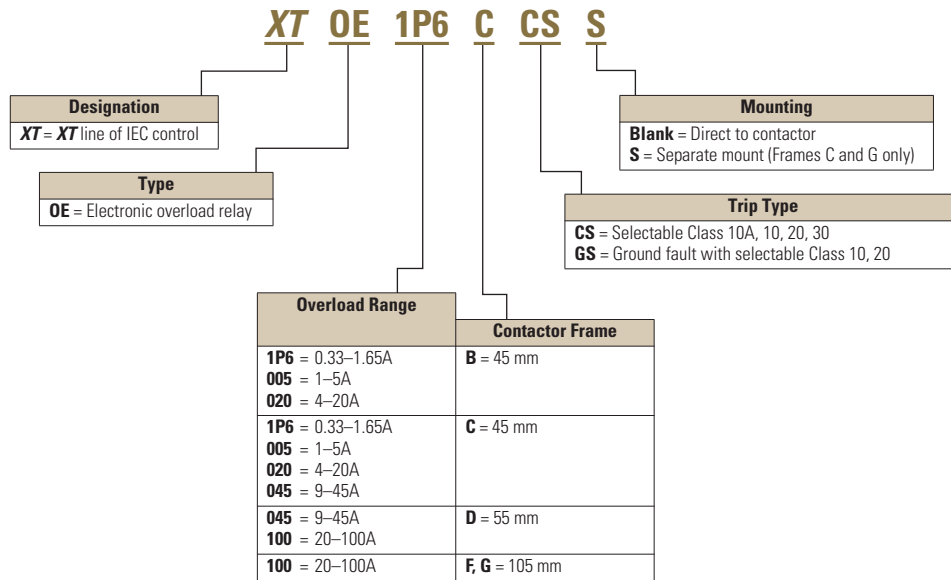
**Features**

- Direct mount to **XT** contactors or separate mount
- Standard version: selectable trip class (10A, 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
- Electrically isolated 1NO-1NC contacts (push-to-test)
- FLA range of 0.1–1500A

**Catalog Number Selection**

**XT Electronic Overload Relays**

**XT Electronic Overload Relay—IEC ①**



**Note**

① See Page 89 for Product Selection.

### Product Selection

#### XT Electronic Overload Relays

45 mm XT for Direct Mount



#### XT Electronic Overload Relays for Direct Mount to XT Contactors

| For Use with XT Contactor Frame | For Use with Contactor | Overload Range (Amps) | Contact Sequence | Frame Size | Auxiliary Contact Configuration | Type       | Catalog Number    |
|---------------------------------|------------------------|-----------------------|------------------|------------|---------------------------------|------------|-------------------|
| B                               | XTCE007B_              | 0.33–1.65             | 97 95            | 45 mm      | NO-NC                           | ZEB12-1.65 | <b>XTOE1P6BCS</b> |
|                                 | XTCE009B_              | 1–5                   |                  |            |                                 | ZEB12-5    | <b>XTOE005BCS</b> |
|                                 | XTCE012B_              | 4–20                  | 2 4 6 98 96      |            |                                 | ZEB12-20   | <b>XTOE020BCS</b> |
| C                               | XTCE018C_              | 0.33–1.65             | 97 95            | 45 mm      | NO-NC                           | ZEB32-1.65 | <b>XTOE1P6CCS</b> |
|                                 | XTCE025C_              | 1–5                   |                  |            |                                 | ZEB32-5    | <b>XTOE005CCS</b> |
|                                 | XTCE032C_              | 4–20                  | 2 4 6 98 96      |            |                                 | ZEB32-20   | <b>XTOE020CCS</b> |
|                                 |                        | 9–45                  |                  |            |                                 | ZEB32-45   | <b>XTOE045CCS</b> |
| D                               | XTCE040D_              | 9–45                  | 97 95            | 45 mm      | NO-NC                           | ZEB65-45   | <b>XTOE045DCS</b> |
|                                 | XTCE050D_              | 20–100                |                  | 55 mm      |                                 | ZEB65-100  | <b>XTOE100DCS</b> |
| F, G                            | XTCE065D_              |                       | 2 4 6 98 96      |            |                                 |            |                   |
|                                 | XTCE072D_              |                       |                  |            |                                 |            |                   |
|                                 | XTCE080F_              | 20–100                | 97 95            | 55 mm      | NO-NC                           | ZEB150-100 | <b>XTOE100GCS</b> |
|                                 | XTCE095F_              |                       |                  |            |                                 |            |                   |
|                                 | XTCE115G_              |                       | 2 4 6 98 96      |            |                                 |            |                   |
| XTCE150G_                       |                        |                       |                  |            |                                 |            |                   |
| XTCE170G_                       |                        |                       |                  |            |                                 |            |                   |

45 mm XT for Direct Mount with Ground Fault



#### XT Electronic Overload Relays with Ground Fault for Direct Mount to XT Contactors

| For Use with XT Contactor Frame | For Use with Contactor | Overload Range (Amps) | Contact Sequence | Frame Size | Auxiliary Contact Configuration | Type          | Catalog Number    |
|---------------------------------|------------------------|-----------------------|------------------|------------|---------------------------------|---------------|-------------------|
| B                               | XTCE007B_              | 0.33–1.65             | 97 95            | 45 mm      | NO-NC                           | ZEB12-1.65-GF | <b>XTOE1P6BGS</b> |
|                                 | XTCE009B_              | 1–5                   |                  |            |                                 | ZEB12-5-GF    | <b>XTOE005BGS</b> |
|                                 | XTCE012B_              | 4–20                  | 2 4 6 98 96      |            |                                 | ZEB12-20-GF   | <b>XTOE020BGS</b> |
| C                               | XTCE018C_              | 0.33–1.65             | 97 95            | 45 mm      | NO-NC                           | ZEB32-1.65-GF | <b>XTOE1P6CGS</b> |
|                                 | XTCE025C_              | 1–5                   |                  |            |                                 | ZEB32-5-GF    | <b>XTOE005CGS</b> |
|                                 | XTCE032C_              | 4–20                  | 2 4 6 98 96      |            |                                 | ZEB32-20-GF   | <b>XTOE020CGS</b> |
|                                 |                        | 9–45                  |                  |            |                                 | ZEB32-45-GF   | <b>XTOE045CGS</b> |
| D                               | XTCE040D_              | 9–45                  | 97 95            | 45 mm      | NO-NC                           | ZEB65-45-GF   | <b>XTOE045DGS</b> |
|                                 | XTCE050D_              | 20–100                |                  | 55 mm      |                                 | ZEB65-100-GF  | <b>XTOE100DGS</b> |
| F, G                            | XTCE065D_              |                       | 2 4 6 98 96      |            |                                 |               |                   |
|                                 | XTCE072D_              |                       |                  |            |                                 |               |                   |
|                                 | XTCE080F_              | 20–100                | 97 95            | 55 mm      | NO-NC                           | ZEB150-100-GF | <b>XTOE100GGS</b> |
|                                 | XTCE095F_              |                       |                  |            |                                 |               |                   |
|                                 | XTCE115G_              |                       | 2 4 6 98 96      |            |                                 |               |                   |
| XTCE150G_                       |                        |                       |                  |            |                                 |               |                   |
| XTCE170G_                       |                        |                       |                  |            |                                 |               |                   |

1-5A OL with CTs



#### XT Electronic Overload Relays for use with Large Frame XT Contactors (L-R)

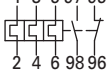
Use CTs and 1-5A **XT** overload relay. CT kit does not include overload relay (order separately).

| XT Contactor Frame | For Use with IEC Contactor Amp Range (AC-3) | CT Range (Amps) | Description  | CT Kit Catalog Number | Terminal Size                           | Overload Relay Catalog Number | Overload Relay with Ground Fault Catalog Number |
|--------------------|---|-----------------|--|-----------------------|---|-------------------------------|---|
| L, M               | 185-500A                                    | 60-300          | 300: 5 panel-mount CT kit with integrated lugs                 | ZEB-XCT300            | 750 kcmil<br>(2) 250 kcmil<br>3/0 Cu/Al | XTOE005CCSS                   | XTOE005CGSS                                     |
| M, N               | 300-820A                                    | 120-600         | 600: 5 panel-mount CT kit with integrated, pass through holes  | ZEB-XCT600            | (2) 750 kcmil<br>3/0 Cu/Al              | XTOE005CCSS                   | XTOE005CGSS                                     |
| N                  | 580-1000A                                   | 200-1000        | 1000: 5 panel-mount CT kit with integrated, pass through holes | ZEB-XCT1000           | (3) 750 kcmil<br>3/0 Cu/Al              | XTOE005CCSS                   | XTOE005CGSS                                     |
| R                  | 1600A                                       | 300-1500        | 1500: 5 panel-mount CT kit with integrated, pass through holes | ZEB-XCT1500           | (4) 750 kcmil<br>1/0 Cu/Al              | XTOE005CCSS                   | XTOE005CGSS                                     |

45 mm XT for Separate Mount






#### XT Electronic Overload Relays for Separate Mount

| Overload Range (Amps) | Frame Size | Contact Sequence  | Type          | Overload Relay Catalog Number | Overload Relay with Ground Fault Catalog Number |
|-----------------------|------------|---|---------------|-------------------------------|---|
| <b>Overload Relay</b> |            |   |               |                               |   |
| 0.33-1.65             | 45 mm      | 1 3 5 97 95   | ZEB32-1.65/KK | XTOE1P6CCSS                   | XTOE1P6CGSS                                     |
| 1-5                   |            |  | ZEB32-5/KK    | XTOE005CCSS                   | XTOE005CGSS                                     |
| 4-20                  |            |   | ZEB32-20/KK   | XTOE020CCSS                   | XTOE020CGSS                                     |
| 9-45                  |            |   | ZEB32-45/KK   | XTOE045CCSS                   | XTOE045CGSS                                     |
| 20-100                | 55 mm      |   | ZEB150-100/KK | XTOE100CCSS                   | XTOE100GGSS                                     |

### Accessories

#### CT Kits

#### Accessories

|  | Description  | Catalog Number  |
|--|--|---|
| <b>Safety Cover</b><br> | <b>Safety Cover</b><br>Clear Lexan cover that mounts on top of the FLA dial and DIP switches when closed.                  | <b>ZEB-XSC</b>  |
| <b>Reset Bar</b><br>    | <b>Reset Bar</b><br>Assembles to the top of the overload to provide a larger target area for door mounted reset operators. | <b>ZEB-XRB</b>  |
| <b>Remote Reset</b><br> | <b>Remote Reset</b><br>Remote reset module (24 Vdc) ①<br>Remote reset module (120 Vac) ①<br>Remote reset module (24 Vac) ① | <b>C440-XCOM</b><br><b>ZEB-XRR-120</b><br><b>ZEB-XRR-24</b> |

### Communication

The C440 is provided with two levels of communication capability.

#### Basic Communication via Expansion Module—Monitoring Only

Basic communication on the C440 is accomplished using an expansion module. The expansion module plugs into the expansion bay on the C440 overload relay, enabling communications with the overload via their Modbus RTU (RS-485) network. No additional parts are required. See figure below.



**Basic Communication—Modbus**

#### Advanced Communication—Monitoring and Control

C440 also has the ability to communicate on industrial protocols such as DeviceNet, PROFIBUS, Modbus RTU and Modbus TCP, and Ethernet (planned) while providing control capability using I/O.

An expansion module (mentioned earlier) combined with a communication adapter and a communication module allows easy integration onto the customer's network. See figure below.



**Advanced Communication—Communication Adapter with Communication Module**

#### Advanced Communication—Communication Module

The communication adapter comes standard with four inputs and two outputs (24 Vdc or 120 Vac) while providing the customer with flexible mounting options (DIN rail or panel).

#### Note

① Customer can wire remote mounted button to reset module (i.e., 22 mm pushbutton, catalog number M22-D-B-GB14-K10).

# 59.2

## Motor Control and Protection



### Motor Protection and Monitoring Relays

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The following information can be viewed using the communication option:

- Motor status—running, stopped, tripped or resetting
- Individual rms phase currents (A, B, C)
- Average of three-phase rms current
- Percent thermal capacity
- Fault codes (only available prior to reset)
- Percent phase imbalance
- Ground fault current and percent
- Overload relay settings—trip class, DIP switch selections, reset selections
- Modbus address (can be set over the network)

#### Communication Accessories

|  | Description  | Catalog Number      |
|--|--|---------------------|
| <b>Expansion Module</b><br>       | Expansion module (Remote Reset/Modbus RTU, RS-485 Communication)                                   | <b>C440-XCOM</b>    |
| <b>Communication Adapter</b><br> | Communication adapter kit (DIN C Panel mounted adapter, required for advance communication option) | <b>C440-COM-ADP</b> |
|  | DeviceNet communication module kit—120V I/O (consists of C440-XCOM + C441K + C440-COM-ADP)         | <b>C440-DN-120</b>  |
|  | DeviceNet communication module kit—24 Vdc I/O (consists of C440-XCOM + C441L + C440-COM-ADP)       | <b>C440-DN-24</b>   |
|  | PROFIBUS communication module kit—120V I/O (consists of C440-XCOM + C441S + C440-COM-ADP)          | <b>C440-DP-120</b>  |
|  | PROFIBUS communication module kit—24V I/O (consists of C440-XCOM + C441Q + C440-COM-ADP)           | <b>C440-DP-24</b>   |
|  | Modbus communication module kit—120V I/O (consists of C440-XCOM + C441N + C440-COM-ADP)            | <b>C440-MOD-120</b> |
|  | Modbus communication module kit—24 Vdc I/O (consists of C440-XCOM + C441P + C440-COM-ADP)          | <b>C440-MOD-24</b>  |
|  | Ethernet IP communication module kit—120V I/O (consists of C440-XCOM + C441R + C440-COM-ADP)       | <b>C440-EIP-120</b> |

### Short Circuit Ratings (North America CSA, cUL)

Changes to UL 508A and NEC in recent years have brought a focus to control panel safety with regard to short-circuit current ratings (SCCR). Eaton's C440 electronic overload relays combined with **XT** series IEC and Freedom Series NEMA contactors provide a wide variety of SCCR solutions needed for a variety of applications. The SCCR data in this document reflects the latest information as of April 2010.

### C440/XT Standalone Overload Relays (XT, C440)

| Overload<br>FLA Range | Maximum<br>Operating<br>Voltage | Standard-Fault Short Circuit Data |                                   |                                | High-Fault Short Circuit Data<br>Fuses (RK5, J, CC) |           |                      | Thermal-Magnetic Circuit Breakers |           |                         |
|-----------------------|---------------------------------|-----------------------------------|-----------------------------------|--------------------------------|---|-----------|----------------------|-----------------------------------|-----------|-------------------------|
|                       |                                 | 600V (kA)                         | Maximum<br>Fuse Size (A)<br>(RK5) | Maximum<br>Breaker<br>Size (A) | 480V (kA)   | 600V (kA) | Maximum<br>Fuse Size | 480V (kA)                         | 600V (kA) | Maximum<br>Breaker Size |
| 0.33–1.65A            | 600 Vac                         | 1                                 | 6                                 | 15                             | —   | —         | —                    | —                                 | —         | —                       |
| 1–5A                  | 600 Vac                         | 5                                 | 20                                | 20                             | 100   | 100       | 30                   | 100                               | 35        | 20                      |
| 4–20A                 | 600 Vac                         | 5                                 | 80                                | 80                             | 100   | 100       | 100                  | 100                               | 35        | 80                      |
| 9–45A                 | 600 Vac                         | 5                                 | 175                               | 175                            | 100   | 100       | 100                  | 100                               | 35        | 100/175 (480/600)       |
| 20–100A               | 600 Vac                         | 10                                | 400                               | 400                            | 100   | 100       | 200                  | 150                               | 35        | 250/400 (480/600)       |

### IEC XT Starters with XT Electronic Overload Relays

| Contactor<br>Frame Size | Maximum<br>Operating<br>Voltage | High-Fault Short Circuit Data<br>Fuses (RK5, J, CC) |      | Maximum<br>Fuse Size | Thermal-Magnetic Circuit Breakers |      |                         |
|-------------------------|---------------------------------|---|------|----------------------|-----------------------------------|------|-------------------------|
|                         |                                 | 480V  | 600V |                      | 480V                              | 600V | Maximum<br>Breaker Size |
| B                       | 1–5A                            | 100   | 100  | 30                   | —                                 | —    | —                       |
|                         | 4–20A                           | 100   | 100  | 30                   | —                                 | —    | —                       |
| C                       | 1–5A                            | 100   | 100  | 60                   | —                                 | —    | —                       |
|                         | 4–20A                           | 100   | 100  | 60                   | —                                 | —    | —                       |
|                         | 9–45A                           | 100   | 100  | 60                   | —                                 | —    | —                       |
| D                       | 9–45A                           | 100   | 100  | 200                  | 65                                | 35   | 175                     |
|                         | 20–100A                         | 100   | 100  | 200                  | 65                                | 35   | 175                     |
| F                       | 20–100A                         | 100   | 100  | 200                  | 65                                | 65   | 350                     |
| G                       | 20–100A                         | 100   | 100  | 200                  | 65                                | 65   | 350                     |

**Motor Insight Overload and Monitoring Relays**



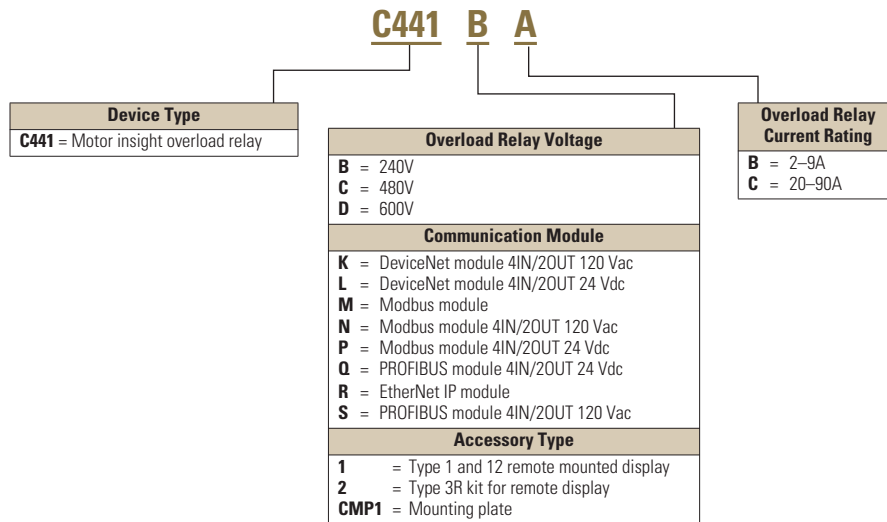
**Features**

- Power, voltage and current monitoring, ground fault, flexible communications, motor and line protection in a single package
- Monitor energy consumption at individual loads to avoid peak demand charges
- Protect pumps from dead-head or starved conditions
- 0–660V, 1–540A with two relays
- Remote display allows for configuration without opening the panel, providing additional operator safety

**Catalog Number Selection**

**Motor Insight Overload and Monitoring Relays**

**Overload and Monitoring Relays**



**Product Selection**

**Motor Insight**

| Power Source      | Monitoring Range | Current Range | Catalog Number      |
|-------------------|------------------|---------------|---------------------|
| 240 Vac (170–264) | 170–264 Vac      | 1–9A          | <b>C441BA</b>       |
|                   |                  | 5–90A         | <b>C441BB</b>       |
| 480 Vac (323–528) | 323–528 Vac      | 1–9A          | <b>C441CA</b>       |
|                   |                  | 5–90A         | <b>C441CB</b>       |
| 600 Vac (489–660) | 489–660 Vac      | 1–9A          | <b>C441DA</b>       |
|                   |                  | 5–90A         | <b>C441DB</b>       |
| 120 Vac (102–132) | 170–660 Vac      | 1–9A          | <b>C4410109NOUI</b> |
|                   |                  | 5–90A         | <b>C4410590NOUI</b> |



### Motor Insight CT Multiplier and Wire Wrap Schedule

| Motor FLA                   | Number of Loops | Number of Conductors Through CT Primary | CT Multiplier Setting | Catalog Number <sup>①</sup> |
|-----------------------------|-----------------|---|-----------------------|-----------------------------|
| <b>Current Range: 5–90A</b> |                 |   |                       |                             |
| 5–22.5                      | 3               | 4                                       | 4                     | <b>C441_B</b>               |
| 6.67–30                     | 2               | 3                                       | 3                     |                             |
| 10–45                       | 1               | 2                                       | 2                     |                             |
| 20–90                       | 0               | 1                                       | 1                     |                             |
| <b>Current Range: 1–9A</b>  |                 |   |                       |                             |
| 1–5                         | 1               | 2                                       | 2                     | <b>C441_A</b>               |
| 2–9                         | 0               | 1                                       | 1                     |                             |
| 60–135                      | 0               | 1                                       | 150–(150:5)           |                             |
| 120–270                     | 0               | 1                                       | 300–(300:5)           |                             |
| 240–540                     | 0               | 1                                       | 600–(600:5)           |                             |

### Modbus Communication Module



| Description                          | I/O     | Catalog Number |
|--------------------------------------|---------|----------------|
| Modbus communication module          | None    | <b>C441M</b>   |
| Modbus communication module 4IN/2OUT | 120 Vac | <b>C441N</b>   |
| Modbus communication module 4IN/2OUT | 240 Vdc | <b>C441P</b>   |

### DeviceNet Modules

| Description                    | I/O     | Catalog Number |
|--------------------------------|---------|----------------|
| DeviceNet communication module | 120 Vac | <b>C441K</b>   |
| DeviceNet communication module | 24 Vdc  | <b>C441L</b>   |

## Accessories

### Motor Insight

| Description  | Catalog Number   |
|--|--|
| <b>Remote Display</b><br>         | Remote display Type 1<br><b>C4411</b>  |
| <b>Kit for Remote display</b><br> | Type 3R kit for remote display (remote display not included)<br><b>C4413</b> |
| Adaptive mounting plate  | <b>C441CMP1</b>  |

**Note**

① Underscore indicates operating voltage code required.

#### Operating Voltage Codes

| Code | Voltage |
|------|---------|
| B    | 240 Vac |
| C    | 480 Vac |
| D    | 600 Vac |

#### Product Overview

#### Manual Motor Protectors and Controllers Selection Guide

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| Description                    | <b>XTPB Pushbutton Manual Motor Protectors</b><br>Page 97 | <b>XTPR Rotary Manual Motor Protectors</b><br>Page 97 | <b>XTSC Manual Motor Controllers</b><br>Page 101 | <b>XTFC Combination Motor Controllers</b><br>Page 101            |
|--------------------------------|---|---|--|--|
| Operator style                 | Pushbutton  | Rotary  | Rotary   | Rotary   |
| Components                     | Manual motor protector                                    | Manual motor protector                                | Manual motor protector contactor connector kit   | Manual motor protector contactor connector kit line side adapter |
| UL 508 Type E                  | —   | Yes, with line side adapter                           | —  | —  |
| UL 508 Type F                  | —   | —   | —  | Yes  |
| Branch motor circuit functions | Disconnect  | Disconnect  | Disconnect                                       | Disconnect   |
|                                | Controller (manual)                                       | Controller (manual)                                   | Controller (manual and remote)                   | Controller (manual and remote)                                   |
|                                | Short circuit protection                                  | Short circuit protection                              | Short circuit protection                         | Short circuit protection   |
|                                | Motor overload protection                                 | Motor overload protection                             | Motor overload protection                        | Motor overload protection  |
| FLA range                      | 0.1–25A   | 0.1–65A   | 0.1–65A  | 0.1–65A  |

### XT IEC Manual Motor Protectors



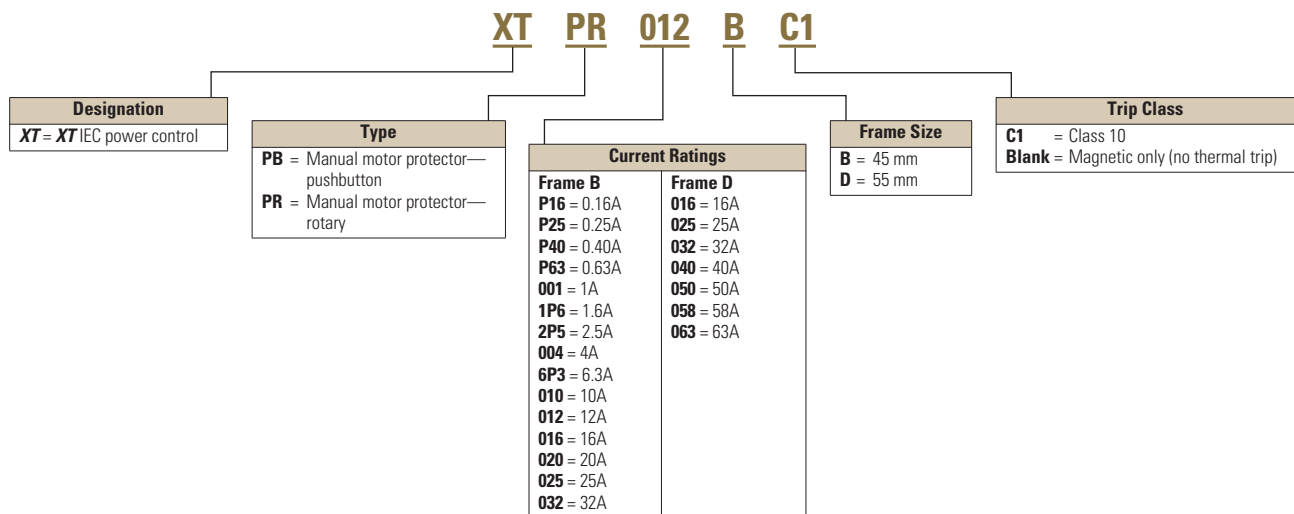
### Features

- ON/OFF rotary handle with lockout provision
- Class 10 overload protection
- Motor applications from 0.1–63A
- Built-in heater and magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLA
- XTPR Rotary MMP with a lineside adapter is rated for UL 508 Type E

### Catalog Number Selection

#### XT IEC Manual Motor Protectors

#### Manual Motor Protectors



## Product Selection

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## XTPB Pushbutton Manual Motor Protectors—Global and North American Ratings

Motor Protective Device with Thermal and Magnetic Trip

**Note:** Service Factor (SF)—Setting  $I_r$  of current scale in dependence of load factor:SF = 1.15 →  $I_r = 1 \times I_n$  motSF = 1 →  $I_r = 0.9 \times I_n$  mot

| Rated<br>Uninterrupted<br>Current—<br>$I_u = I_e$ (Amps) | FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (A) | Short Circuit<br>Release—<br>$I_{rm}$ (A) | Maximum Motor Ratings ①                      |          |      |   |          | Maximum hp Rating—P (hp)<br>UL 508/CSA C 22.2 No. 14<br>Three-Phase |       |       |       | Screw Terminals—<br>Catalog Number |
|--|--|---|--|----------|------|---|----------|---|-------|-------|-------|------------------------------------|
|  |  |   | Maximum kW Rating<br>AC-3—P (kW) Three-Phase |          |      | Maximum hp Rating—P (hp)<br>UL 508/CSA C 22.2 No. 14<br>Three-Phase |          | 200V  | 240V  | 480V  | 600V  |                                    |
|  |  |   | 220–240V                                     | 380–415V | 440V | 500V  | 660–690V | 200V  | 240V  | 480V  | 600V  |                                    |
| <b>Frame B</b>   |  |   |  |          |      |   |          |   |       |       |       |                                    |
| 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     | 1/2   | 1/2   | XTPB001BC1                         |
| 1.6  | 1–1.6  | 22  | 0.25   | 0.55     | 0.55 | 0.75  | 1.1      | ②   | ②     | 3/4   | 1     | 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        | 1   | 1     | 2     | 3     | XTPB004BC1                         |
| 6.3  | 4–6.3  | 88  | 1.1  | 2.2      | 3    | 3   | 4        | 1-1/2   | 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   | 5     | 10    | 15    | XTPB020BC1                         |
| 25   | 20–25  | 350                                       | 5.5  | 12.5     | 12.5 | 15  | 22       | 5   | 7-1/2 | 15    | 20    | XTPB025BC1                         |

**Notes**

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).

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

Motor Protective Device with Thermal and Magnetic Trip

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

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

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

| Rated<br>Uninterrupted<br>Current—<br>$I_u = I_e$ (Amps) | FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (A) | Short Circuit<br>Release—<br>$I_{rm}$ (A) | Maximum Motor Ratings ①                      |          |      |      |          | Maximum hp Rating—P (hp)<br>UL 508/CSA C 22.2 No. 14<br>Three-Phase |       |       |       | Screw Terminals—<br>Catalog Number ③ |
|--|--|---|--|----------|------|------|----------|---|-------|-------|-------|--------------------------------------|
|  |  |   | Maximum kW Rating<br>AC-3—P (kW) Three-Phase |          |      |      |          | 200V  | 240V  | 480V  | 600V  |                                      |
|  |  |   | 220–240V                                     | 380–415V | 440V | 500V | 660–690V |   |       |       |       |                                      |
| <b>Frame B</b>   |  |   |  |          |      |      |          |   |       |       |       |                                      |
| 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     | 1/2   | 1/2   | XTPR001BC1                           |
| 1.6  | 1–1.6  | 22  | 0.25   | 0.55     | 0.55 | 0.75 | 1.1      | ②   | ②     | 3/4   | 1     | 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        | 1   | 1     | 2     | 3     | XTPR004BC1                           |
| 6.3  | 4–6.3  | 88  | 1.1  | 2.2      | 3    | 3    | 4        | 1-1/2   | 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   | 5     | 10    | 15    | XTPR020BC1                           |
| 25   | 20–25  | 350                                       | 5.5  | 12.5     | 12.5 | 15   | 22       | 5   | 7-1/2 | 15    | 20    | XTPR025BC1                           |
| 32   | 25–32  | 448                                       | 7.5  | 15       | 15   | 22   | 30       | 7-1/2   | 10    | 25    | 30    | XTPR032BC1                           |
| <b>Frame D</b>   |  |   |  |          |      |      |          |   |       |       |       |                                      |
| 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 | 20    | 25    | XTPR025DC1                           |
| 32   | 25–32  | 448                                       | 7.5  | 15       | 17.5 | 22   | 22       | 10  | 10    | 25    | 30    | XTPR032DC1                           |
| 40   | 32–40  | 560                                       | 11   | 20       | 22   | 24   | 30       | 10  | 15    | 30    | 40    | XTPR040DC1                           |
| 50   | 40–50  | 700                                       | 14   | 25       | 30   | 30   | 45       | 10  | 15    | 30    | 40    | XTPR050DC1                           |
| 58   | 50–58  | 812                                       | 17   | 30       | 37   | 37   | 55       | —   | —     | 40    | —     | XTPR058DC1                           |
| 65   | 55–65  | 882                                       | 18.5   | 34       | 37   | 45   | 55       | —   | —     | —     | —     | XTPR063DC1                           |

**Notes**

- 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).
- ③ Catalog number shown comes with screw terminals. For Frame B devices up to 16A, spring cage terminals are available. For spring cage terminals on line and load sides, insert a "C" into the catalog number in the 5th position—Example: XTPRC \_BC1. For spring cage terminals on the load side only, insert an "SC" into the catalog number in the 5th and 6th positions—Example: XTPRSC \_BC1.

**XTPR Manual Self-Protected Motor Starters—North American Ratings, UL 508 Type E** ②

Motor Protective Device with Thermal and Magnetic Trip

**Note:** 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 (e.g., XTPAXLSA). 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.

| Rated Uninterrupted Current—<br>$I_u = I_e$ (Amps) | FLA Adjustment Range/Overload Release— $I_r$ (A) | Short Circuit Release—<br>$I_{rm}$ (A) | Maximum Motor Ratings ①                 |       |          |          | Rated Short Circuit Breaking Capacity (kA) |          |          | Line Side Adapter—<br>Catalog Number ② | Manual Motor Protector Screw Terminals—<br>Catalog Number |
|--|--|--|---|-------|----------|----------|--|----------|----------|--|---|
|  |  |  | Maximum hp Rating—P (hp)<br>Three-Phase |       |          |          | 240V                                       | 480–277V | 600–247V |  |   |
|  |  |  | 220V                                    | 240V  | 480–277V | 600–247V | 240V                                       | 480–277V | 600–247V |  |   |
| <b>Frame B</b>                                     |  |  |   |       |          |          |  |          |          |  |   |
| 0.16   | 0.1–0.16   | 2.2                                    | ③                                       | ③     | 1/2      | 1/2      | 50   | 50       | 50       | XTPAXLSA                               | XTPRP16BC1  |
| 0.25   | 0.16–0.25  | 3.4                                    | ③                                       | ③     | 1/2      | 1/2      | 50   | 50       | 50       | XTPAXLSA                               | XTPRP25BC1  |
| 0.4  | 0.25–0.4   | 5.6                                    | ③                                       | ③     | 1/2      | 1/2      | 50   | 50       | 50       | XTPAXLSA                               | XTPRP40BC1  |
| 0.63   | 0.4–0.63   | 8.8                                    | ③                                       | ③     | 1/2      | 1/2      | 50   | 50       | 50       | XTPAXLSA                               | XTPRP63BC1  |
| 1  | 0.63–1   | 14                                     | ③                                       | ③     | 1/2      | 1/2      | 50   | 50       | 50       | XTPAXLSA                               | XTPR001BC1  |
| 1.6  | 1–1.6  | 22                                     | ③                                       | ③     | 3/4      | 3/4      | 50   | 50       | 50       | XTPAXLSA                               | XTPR1P6BC1  |
| 2.5  | 1.6–2.5  | 35                                     | 1/2                                     | 1/2   | 1        | 1-1/2    | 50   | 50       | 50       | XTPAXLSA                               | XTPR2P5BC1  |
| 4  | 2.5–4  | 56                                     | 3/4                                     | 1     | 2        | 3        | 50   | 50       | 50       | XTPAXLSA                               | XTPR004BC1  |
| 6.3  | 4–6.3  | 88                                     | 1                                       | 1-1/2 | 3        | 5        | 50   | 50       | 50       | XTPAXLSA                               | XTPR6P3BC1  |
| 10   | 6.3–11   | 140                                    | 3                                       | 3     | 7-1/2    | 10       | 50   | 50       | 50       | XTPAXLSA                               | XTPR010BC1  |
| 12   | 8–12   | 168                                    | 3                                       | 3     | 7-1/2    | —        | 42   | 42       | —        | XTPAXLSA                               | —   |
| 16   | 10–16  | 224                                    | 3                                       | 5     | 10       | —        | 42   | 42       | —        | XTPAXLSA                               | XTPR016BC1  |
| 20   | 16–20  | 280                                    | 5                                       | 5     | —        | —        | 42   | 42       | —        | XTPAXLSA                               | XTPR020BC1  |
| 25   | 20–25  | 350                                    | 5                                       | 7-1/2 | 15       | —        | 18   | 18       | —        | XTPAXLSA                               | XTPR025BC1  |
| 32   | 25–32  | 448                                    | 7-1/2                                   | 10    | 25       | —        | 18   | 18       | —        | XTPAXLSA                               | XTPR032BC1  |
| <b>Frame D</b>                                     |  |  |   |       |          |          |  |          |          |  |   |
| 16   | 10–16  | 224                                    | 3                                       | 5     | 10       | 10       | 50   | 50       | 50       | XTPAXLSAD                              | XTPR016DC1  |
| 25   | 16–25  | 350                                    | 7-1/2                                   | 7-1/2 | 20       | 25       | 50   | 50       | 50       | XTPAXLSAD                              | XTPR025DC1  |
| 32   | 25–32  | 448                                    | 10                                      | 10    | 25       | 30       | 50   | 50       | 50       | XTPAXLSAD                              | XTPR032DC1  |
| 40   | 32–40  | 560                                    | 10                                      | 10    | 30       | 40       | 50   | 50       | 50       | XTPAXLSAD                              | XTPR040DC1  |
| 50   | 40–50  | 700                                    | 10                                      | 15    | 30       | —        | 65   | 65       | —        | XTPAXLSAD                              | XTPR050DC1  |
| 58   | 50–58  | 812                                    | 15                                      | 15    | 40       | —        | 65   | 65       | —        | XTPAXLSAD                              | XTPR058DC1  |
| 65   | 55–65  | 882                                    | 15                                      | 15    | 40       | —        | 65   | 65       | —        | XTPAXLSAD                              | XTPR063DC1  |

**Notes**

- ① Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.  
 ② UL 508 Type E starters are assembled from a standard XTPR and a special incoming terminal line side adapter (XTPAXLSA or XTPAXLSAD).  
 ③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

XT IEC Manual and Combination Motor Controllers



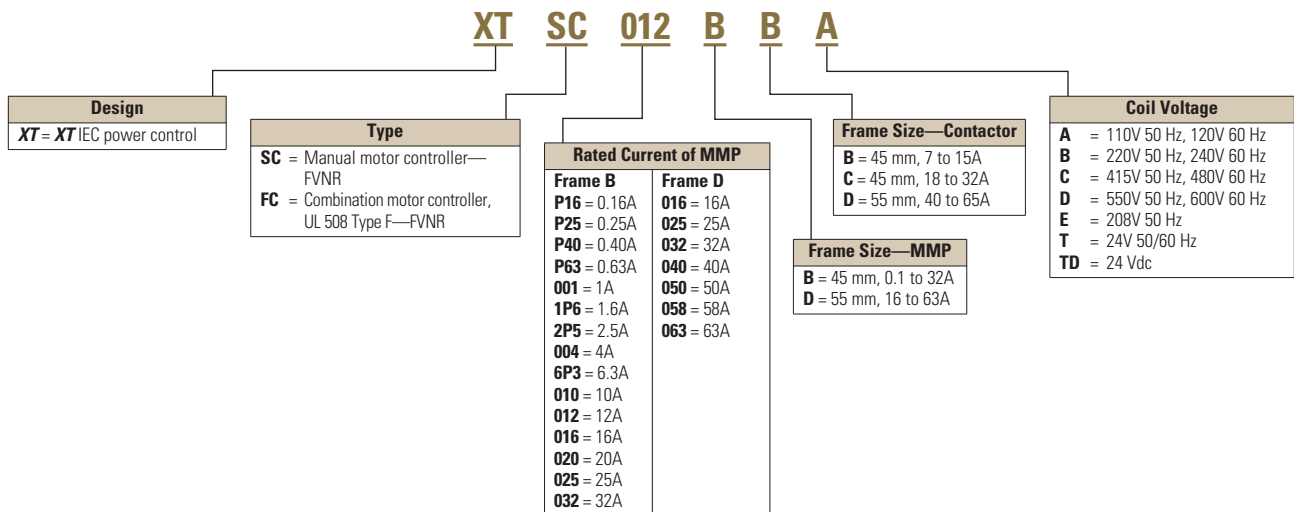
### Features

- ON/OFF rotary handle with lockout provision
- Class 10 overload protection
- Adjustment dial for setting motor FLA
- Built-in surge suppression on DC coils as standard
- Assembled manual motor controllers consist of manual motor protector, contactor, connector kit and 1NO-1NC auxiliary contact for MMP
- Assembled combination motor controllers consist of manual motor protector, contactor, connector kit, 1NO-1NC auxiliary contact for MMP and line side adapter
- Combination motor controllers are UL 508 Type F rated, and provide the following functions in a single device
  - Disconnect, short circuit protection, motor overload protection, motor controller

### Catalog Number Selection

#### XT IEC Manual and Combination Motor Controllers

#### Manual and Combination Motor Controllers



#### Product Selection

59

#### XTSC Manual Motor Controllers (MMC)/Starter Combinations

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor

**Note:** The assembled Manual Motor Controller (MMC) consists of an XTPR Manual Motor Protector (MMP) and an XTCE contactor. For Frame B MMP + Frame B Contactor assemblies, the XTSC can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB). For 16A and above, the assembly is mounted via a DIN rail adapter plate (XTPAXTPCPC, XTPAXTPCPD) and the electrical connection is made with electrical contact modules (XTPAXECMC, XTPAXECMD), both included in XTPAXTPCC and XTPAXTPCD.

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

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

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

| FLA Adjustment Range (A) ①             | Short Circuit Release—<br>$I_{rm}$ (A) | Maximum Motor Ratings—P ②                 |          |      |                                      |       |       |       |       | Assembled Manual Motor Controller ③<br>Non-Reversing—<br>Catalog Number |
|--|--|---|----------|------|--------------------------------------|-------|-------|-------|-------|---|
|  |  | Maximum kW Rating AC-3—P (kW) Three-Phase |          |      | Maximum hp Rating—P (hp) Three-Phase |       |       |       |       |   |
|  |  | 220–240V                                  | 380–415V | 500V | 660–690V                             | 200V  | 240V  | 480V  | 600V  |   |
| <b>Frame B MMP + Frame B Contactor</b> |  |   |          |      |                                      |       |       |       |       |   |
| 0.1–0.16                               | 3.2                                    | —   | —        | —    | 0.06                                 | ④     | ④     | 1/2   | 1/2   | XTSCP16BB_  |
| 0.16–0.25                              | 3.5                                    | —   | 0.06     | 0.06 | 0.12                                 | ④     | ④     | 1/2   | 1/2   | XTSCP25BB_  |
| 0.25–0.4                               | 5.6                                    | 0.06                                      | 0.09     | 0.12 | 0.18                                 | ④     | ④     | 1/2   | 1/2   | XTSCP40BB_  |
| 0.4–0.63                               | 8.82                                   | 0.09                                      | 0.18     | 0.25 | 0.25                                 | ④     | ④     | 1/2   | 1/2   | XTSCP63BB_  |
| 0.63–1                                 | 14                                     | 0.12                                      | 0.25     | 0.37 | 0.55                                 | ④     | ④     | 1/2   | 1/2   | XTSC001BB_  |
| 1–1.6                                  | 22.4                                   | 0.25                                      | 0.55     | 0.75 | 1.1                                  | ④     | ④     | 3/4   | 1     | XTSC1P6BB_  |
| 1.6–2.5                                | 35                                     | 0.37                                      | 0.75     | 1.1  | 1.5                                  | 1/2   | 1/2   | 1     | 1-1/2 | XTSC2P5BB_  |
| 2.5–4                                  | 56                                     | 0.75                                      | 1.5      | 2.2  | 3                                    | 1     | 1     | 2     | 3     | XTSC004BB_  |
| 4–6.3                                  | 88.2                                   | 1.1                                       | 2.2      | 3    | 4                                    | 1-1/2 | 1-1/2 | 3     | 5     | XTSC6P3BB_  |
| 6.3–10                                 | 140                                    | 2.2                                       | 4        | 4    | 7.5                                  | 3     | 3     | 7-1/2 | 10    | XTSC010BB_  |
| 8–12                                   | 168                                    | 3   | 5.5      | 5.5  | 11                                   | 3     | 3     | 7-1/2 | 10    | XTSC012BB_  |
| 10–16                                  | 224                                    | 4   | 7.5      | 9    | 12.5                                 | 3     | 3     | 10    | 10    | XTSC016BB_  |
| <b>Frame B MMP + Frame C Contactor</b> |  |   |          |      |                                      |       |       |       |       |   |
| 10–16                                  | 224                                    | 4   | 7.5      | 9    | 12.5                                 | 3     | 3     | 10    | 10    | XTSC016BC_  |
| 16–20                                  | 280                                    | 5.5                                       | 9        | 12.5 | 15                                   | 5     | 5     | 10    | 15    | XTSC020BC_  |
| 20–25                                  | 350                                    | 5.5                                       | 11       | 15   | 22                                   | 5     | 7-1/2 | 15    | 20    | XTSC025BC_  |
| 25–32                                  | 448                                    | 7.5                                       | 15       | 22   | 30                                   | 7-1/2 | 10    | 20    | 25    | XTSC032BC_  |
| <b>Frame D MMP + Frame C Contactor</b> |  |   |          |      |                                      |       |       |       |       |   |
| 10–16                                  | 224                                    | 4   | 7.5      | 9    | 12.5                                 | 3     | 5     | 10    | 15    | XTSC016DC_  |
| 16–25                                  | 350                                    | 5.5                                       | 12.5     | 12.5 | 22                                   | 7-1/2 | 7-1/2 | 20    | 25    | XTSC025DC_  |
| 25–32                                  | 448                                    | 7.5                                       | 15       | 17.5 | 22                                   | 10    | 10    | 25    | 30    | XTSC032DC_  |
| <b>Frame D MMP + Frame D Contactor</b> |  |   |          |      |                                      |       |       |       |       |   |
| 32–40                                  | 560                                    | 11  | 20       | 22   | 30                                   | 10    | —     | 30    | 30    | XTSC040DD_  |
| 40–50                                  | 700                                    | 14  | 25       | 30   | 45                                   | 15    | 15    | 30    | 40    | XTSC050DD_  |
| 50–58                                  | 812                                    | 17  | 30       | 37   | 55                                   | —     | —     | 40    | —     | XTSC058DD_  |
| 55–65                                  | 882                                    | 18.5                                      | 34       | 37   | 55                                   | —     | —     | 40    | —     | XTSC063DD_  |

#### Notes

- ① Overload release— $I_r$ .
- ② Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
- ③ Underscore ( \_ ) indicates magnet coil suffix required. See **Page 103**.
- ④ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).



**XTFC Combination Motor Controllers (CMC), UL 508 Type F**

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor + Required Line Side Adapter

**Note:** The assembled Combination Motor Controller (CMC) consists of an XTPR Manual Motor Protector (MMP) and an XTCE contactor and a required Line Side Adapter. For Frame B MMP + Frame B Contactor assemblies, the XTFC and XTFR can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB, XTPAXRPCRB). For 16A and above, the assembly is mounted via a DIN rail adapter plate (XTPAXTPCPC, XTPAXTPCPD) and the electrical connection is made with electrical contact modules (XTPAXECMC, XTPAXECMD), both included in XTPAXTPCC and XTPAXTPCD.

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

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

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

| FLA Adjustment Range (A) ①             | Short Circuit Release— $I_m$ (A) | Maximum Motor Ratings—P ②                 |          |      |                                      |       |       |       |       | Assembled Manual Motor Controller ③ Non-Reversing—Catalog Number |
|--|----------------------------------|---|----------|------|--------------------------------------|-------|-------|-------|-------|--|
|  |                                  | Maximum kW Rating AC-3—P (kW) Three-Phase |          |      | Maximum hp Rating—P (hp) Three-Phase |       |       |       |       |  |
|  |                                  | 220–240V                                  | 380–415V | 500V | 660–690V                             | 200V  | 240V  | 480V  | 600V  |  |
| <b>Frame B MMP + Frame B Contactor</b> |                                  |   |          |      |                                      |       |       |       |       |  |
| 0.1–0.16                               | 2.2                              | —   | —        | —    | 0.06                                 | ④     | ④     | 1/2   | 1/2   | XTFCP16BB_   |
| 0.16–0.25                              | 3.5                              | —   | 0.06     | 0.06 | 0.12                                 | ④     | ④     | 1/2   | 1/2   | XTFCP25BB_   |
| 0.25–0.4                               | 5.6                              | 0.06                                      | 0.09     | 0.12 | 0.18                                 | ④     | ④     | 1/2   | 1/2   | XTFCP40BB_   |
| 0.4–0.63                               | 8.82                             | 0.09                                      | 0.18     | 0.25 | 0.25                                 | ④     | ④     | 1/2   | 1/2   | XTFCP63BB_   |
| 0.63–1                                 | 14                               | 0.12                                      | 0.25     | 0.37 | 0.55                                 | ④     | ④     | 1/2   | 1/2   | XTFC001BB_   |
| 1–1.6                                  | 22.4                             | 0.25                                      | 0.55     | 0.75 | 1.1                                  | ④     | ④     | 3/4   | 1     | XTFC1P6BB_   |
| 1.6–2.5                                | 35                               | 0.37                                      | 0.75     | 1.1  | 1.5                                  | 1/2   | 1/2   | 1     | 1-1/2 | XTFC2P5BB_   |
| 2.5–4                                  | 56                               | 0.75                                      | 1.5      | 2.2  | 3                                    | 1     | 1     | 2     | 3     | XTFC004BB_   |
| 4–6.3                                  | 88.2                             | 1.1                                       | 2.2      | 3    | 4                                    | 1-1/2 | 1-1/2 | 3     | 5     | XTFC6P3BB_   |
| 6.3–10                                 | 140                              | 2.2                                       | 4        | 4    | 7.5                                  | 3     | 3     | 7-1/2 | 10    | XTFC010BB_   |
| 8–12                                   | 168                              | 3   | 5.5      | 5.5  | 11                                   | 3     | 3     | 7-1/2 | —     | XTFC012BB_   |
| 10–16                                  | 224                              | 4   | 7.5      | 9    | 12.5                                 | 3     | 5     | 10    | —     | XTFC016BB_   |
| <b>Frame B MMP + Frame C Contactor</b> |                                  |   |          |      |                                      |       |       |       |       |  |
| 10–16                                  | 224                              | 4   | 7.5      | 9    | 12.5                                 | 3     | 5     | 10    | —     | XTFC016BC_   |
| 16–20                                  | 280                              | 5.5                                       | 9        | 12.5 | 15                                   | 5     | 5     | —     | —     | XTFC020BC_   |
| 20–25                                  | 350                              | 5.5                                       | 11       | 15   | 22                                   | 5     | 7-1/2 | 15    | —     | XTFC025BC_   |
| 25–32                                  | 448                              | 7.5                                       | 15       | 22   | 30                                   | 7-1/2 | 10    | 20    | —     | XTFC032BC_   |
| <b>Frame D MMP + Frame C Contactor</b> |                                  |   |          |      |                                      |       |       |       |       |  |
| 10–16                                  | 224                              | 4   | 7.5      | 9    | 12.5                                 | 3     | 5     | 10    | 10    | XTFC016DC_   |
| 16–25                                  | 350                              | 5.5                                       | 12.5     | 12.5 | 22                                   | 7-1/2 | 7-1/2 | 20    | 25    | XTFC025DC_   |
| 25–32                                  | 448                              | 7.5                                       | 15       | 17.5 | 22                                   | 10    | 10    | 25    | 30    | XTFC032DC_   |
| <b>Frame D MMP + Frame D Contactor</b> |                                  |   |          |      |                                      |       |       |       |       |  |
| 32–40                                  | 560                              | 11  | 20       | 22   | 30                                   | 10    | 10    | 30    | 40    | XTFC040DD_   |
| 40–50                                  | 700                              | 14  | 25       | 30   | 45                                   | 10    | 15    | 30    | —     | XTFC050DD_   |
| 50–58                                  | 812                              | 17  | 30       | 37   | 55                                   | 15    | 15    | 40    | —     | XTFC058DD_   |
| 55–65                                  | 882                              | 18.5                                      | 34       | 37   | 55                                   | 15    | 15    | 40    | —     | XTFC063DD_   |

**Magnet Coil Suffix**

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24 Vdc                 | <b>TD</b> ⑤ |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 550V 50 Hz, 600V 60 Hz | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |

**Notes**

- ① Overload release— $I_r$ .
- ② Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
- ③ Underscore ( \_ ) indicates magnet coil suffix required. See table at left.
- ④ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).
- ⑤ With DC operation: Integrated diode-resistor combination, coil rating 2.6W.

#### Accessories

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#### Auxiliary Contacts

| Contact Configuration | Contact Sequence | Screw Terminals<br>Pkg. Qty. | Catalog Number   |
|-----------------------|------------------|------------------------------|------------------|
| <b>Side-Mount</b>     |                  |                              |                  |
| 1NO-1NC               |                  | 5                            | <b>XTPAXSA11</b> |
| <b>Front-Mount</b>    |                  |                              |                  |
| 1NO-1NC               |                  | 5                            | <b>XTPAXFA11</b> |

#### Rotary Handle Mechanism



#### IP65 Rotary Handle Mechanism ①②③

| Description  | Pkg. Qty. | Catalog Number     |
|--|-----------|--------------------|
| <b>Complete Kits—Includes Handle, Shaft and Required Hardware</b>  |           |                    |
| Rotary handle mechanism IP65 black—for use on main switches to IEC/EN 60204.   | 1         | <b>XTPAXRHMB</b>   |
| Rotary handle mechanism IP65 red/yellow—for use on main switch with emergency-stop function to IEC/EN 60204.   | 1         | <b>XTPAXRHMR</b>   |
| Rotary handle mechanism IP65 black—for use on main switches to IEC/EN 60204 where XTPR is mounted 90° from vertical.                                 | 1         | <b>XTPAXRHM90B</b> |
| Rotary handle mechanism IP65 red/yellow—for use on main switch with emergency-stop function to IEC/EN 60204 where XTPR is mounted 90° from vertical. | 1         | <b>XTPAXRHM90R</b> |

#### Shunt Release



#### Shunt Release

| Pkg. Qty. | Screw Terminals—<br>Catalog Number |
|-----------|------------------------------------|
| 2         | <b>XTPAXSR120V60H</b>              |
| 2         | <b>XTPAXSR240V60H</b>              |
| 2         | <b>XTPAXSR480V60H</b>              |
| 2         | <b>XTPAXSR24VDC</b>                |

#### Undervoltage Release



#### Undervoltage Release

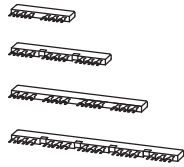
| Pkg. Qty. | Screw Terminals—<br>Catalog Number |
|-----------|------------------------------------|
| 2         | <b>XTPAXUVR120V60H</b>             |
| 2         | <b>XTPAXUVR240V60H</b>             |
| 2         | <b>XTPAXUVR480V60H</b>             |

#### Notes

- ① With ON/OFF switch position and “+” (tripped), lockable with three padlocks, 4–8 mm hasp. Can be locked in the OFF position, if required.
- ② Rotary handle mechanisms ship with door interlock disabled. See instruction publication with product for how to enable door interlock.
- ③ Not for use with XTPAXFAEM20 early-make front-mount auxiliary contact.

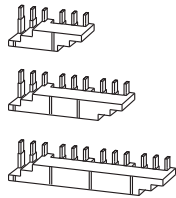
**Three-Phase Commoning Links** ①

**MMP—Frame B**



| For Use With...  | Qty MMP | Length of Link (mm) | Unit Width (mm) | Pkg. Qty. | Catalog Number    |
|--|---------|---------------------|-----------------|-----------|-------------------|
| <b>Frame B</b>   |         |                     |                 |           |                   |
| MMP with no side-mounted auxiliaries or voltage releases | 2       | 90                  | 45              | 10        | <b>XTPAXCLKA2</b> |
|  | 3       | 135                 | 45              | 10        | <b>XTPAXCLKA3</b> |
|  | 4       | 180                 | 45              | 10        | <b>XTPAXCLKA4</b> |
|  | 5       | 225                 | 45              | 10        | <b>XTPAXCLKA5</b> |

**MMP—Frame D**



| For Use With...  | Qty MMP | Length of Link (mm) | Unit Width (mm) | Pkg. Qty. | Catalog Number     |
|--|---------|---------------------|-----------------|-----------|--------------------|
| <b>Frame D</b>   |         |                     |                 |           |                    |
| MMP with no side-mounted auxiliaries or voltage releases | 2       | 110                 | 55              | 1         | <b>XTPAXCLKA2D</b> |
|  | 3       | 165                 | 55              | 1         | <b>XTPAXCLKA3D</b> |
|  | 4       | 220                 | 55              | 1         | <b>XTPAXCLKA4D</b> |

**Incoming Terminal**



**Incoming Terminal for Three-Phase Commoning Link** ②

| For Use With...    | Pkg. Qty. | Catalog Number |
|--------------------|-----------|----------------|
| B Frame XTPR, XTPB | 5         | <b>XTPAXIT</b> |

**Line-Side Adapter**



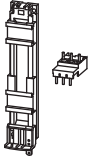
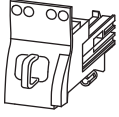
**Line-Side Adapter** ③

| For Use With...   | Pkg. Qty. | Catalog Number     |
|---|-----------|--------------------|
| B Frame XTPR to create a UL 508 type E/F manual combination starter | 5         | <b>XTPAXLSA</b>    |
| D Frame XTPR to create a UL 508 type E/F manual combination starter | 1         | <b>XTPAXLSAD</b> ④ |

**Notes**

- ① Protected against accidental contact. B Frame short circuit proof  $U_e = 690V$ ,  $I_u = 63A$ ; D Frame short circuit proof  $U_e = 690V$ ,  $I_u = 128A$ . Frame B links can be combined by rotating mounting. Frame D links cannot be combined.
- ② For three-phase commoning link, protected against accidental contact,  $U_e = 690V$ ,  $I_u = 63A$ ; for conductor cross-sections: 2.5–25 mm<sup>2</sup> stranded; 2.5–16 mm<sup>2</sup> flexible with ferrules, AWG 14-6.
- ③ XTPAXLSA is for three-phase commoning link, finger- and back-of-hand proof,  $U_e = 690V$ ,  $I_u = 60A$ ; for conductor cross sections: 2.5–25 mm<sup>2</sup> stranded, 2.5–16 mm<sup>2</sup> flexible with ferrule, AWG 14-6.
- ④ XTPAXLSAD cannot be combined with three-phase commoning links.

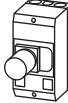
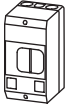
#### Non-Reversing Starters



#### Combination Connection Kits for Connection of XTPR MMP with XTCE Contactor

| For Use With...                            | Description   | Std. Pack | Catalog Number                       |
|--|---|-----------|--------------------------------------|
| <b>Non-Reversing Starters</b>              |   |           |                                      |
| XTPR...B + XTCE...B                        | Comprised of:<br>Mechanical connection element for XTPR...B and contactor<br>Main current wiring between XTPR...B and contactor in tool-less plug connection<br>Cable guidance<br>Use contactor auxiliary switch XTCEXFAT_<br>Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter. | 1         | <b>XTPAXTPCB</b>                     |
| XTPR...B + XTCE...C<br>XTPR...D + XTCE...D | Comprised of:<br>DIN rail adapter plate<br>Main current wiring between XTPR and contactor   | 1         | <b>XTPAXTPCC</b><br><b>XTPAXTPCD</b> |

#### Insulated Enclosures



#### Insulated Enclosures for Surface Mounting

| Degree of Protection   | For Use With...  | Description  | Catalog Number        |
|--|--|--|-----------------------|
| <b>XTPB Pushbutton Manual Motor Protectors—North American Usage</b> <sup>①②</sup>              |  |  |                       |
| IP65<br>NEMA<br>3R, 4X, 12, 13   | XTPB MMP only or with: XTPAXFA_, XTPBXFAEM20,<br>XTPAXSA_, XTPAXUVR_, XTPAXSR_, XTPAXCL                        | With actuating diaphragm   | <b>XTPBXENAS65</b>    |
| IP65<br>NEMA<br>3R, 4X, 12, 13   | XTPB MMP only or with: XTPAXFA_, XTPBXFAEM20,<br>XTPAXUVR_, XTPAXSR_, XTPAXCL                                  | With emergency-stop (E-stop) pushbutton actuator, red/yellow                     | <b>XTPBXENASES65</b>  |
| <b>B Frame (0.1–32A) XTPR Rotary Manual Motor Protectors—North American Usage</b> <sup>③</sup> |  |  |                       |
| IP55<br>NEMA<br>1, 12, 3R  | B Frame XTPR Only or with: XTPAXSA_ and XTPAXFA_,<br>XTPAXUVR_ and XTPAXFA_, XTPAXSR_ and XTPAXFA_,<br>XTPAXCL | With red/yellow rotary handle for use as emergency-stop switch to VDE 0113       | <b>XTPAXENAS55RY</b>  |
| <b>D Frame (10–65A) XTPR Rotary Manual Motor Protectors</b> <sup>④⑤</sup>                      |  |  |                       |
| IP65<br>NEMA<br>1, 12, 3R, 4X  | D Frame XTPR only or with: XTPAXFA_, XTPAXFAEM20,<br>XTPAXSA_, XTPAXSATR_, XTPAXUVR_, XTPAXSR_,<br>XTPAXCL     | With red/yellow rotary handle for use as emergency-stop switches to IEC/EN 60204 | <b>XTPAXENCSD65RY</b> |

#### Notes

- ① Built-in terminal for PE(N).
- ② North American enclosures come with conduit adapters for use with 1/2 NPT.
- ③ Built-in N and PE terminal, lower part without knockouts.
- ④ Integrated terminal for PE(N) connection.
- ⑤ % Metric knockouts:  
Top ÷ bottom: M25/M32  
In backplate: M25/M32  
Control cable entry: M20

**Product Overview**

**Soft Starters Selection Guide**



| Description                     | S701<br>Page 108                       | DS6<br>Page 110                    | S801<br>Page 111                                       | S811<br>Page 117   |
|---------------------------------|--|------------------------------------|--|--|
| <b>Power</b>                    |  |                                    |  |  |
| Current range (A)               | Up to 25 and up to 30 with bypass      | 41–200                             | 37–1000  | 37–1000  |
| Phases                          | Two-phase control                      | Two-phase control                  | 3  | 3  |
| Input voltage (line voltage)    | Up to 600V                             | Up to 460V                         | 0–600V; 690V on V and T Frame                          | 0–600V; 690V on V and T Frame                            |
| Horsepower range                | Up to 25 hp                            | 230V: 10–60 hp;<br>460V: 30–150 hp | 230V: 10–400 hp;<br>20–800 hp<br>460V: 575V:30–1000 hp | 230V: 10–400 hp;<br>20–800 hp<br>460V: 575V:30–1000 hp   |
| Internal run-bypass             | Can have bypass with auxiliary contact | Yes                                | Yes  | Yes  |
| Inside-the-delta control        | —                                      | —                                  | Yes  | Yes  |
| <b>Control</b>                  |  |                                    |  |  |
| User interface                  | Non-digital interface                  | Rotary dials                       | DIP switches and rotary dials                          | LCD and keypad   |
| Control voltage                 | 24–300 AC/DC                           | 24 Vdc                             | 24 Vdc   | 24 Vdc   |
| Communications                  | —                                      | —                                  | —  | EtherNet/IP; Ethernet Modbus; Serial Modbus; PROFIBUS DP |
| Program relays                  | —                                      | —                                  | —  | Yes  |
| <b>Soft Start</b>               |  |                                    |  |  |
| Voltage ramp initial current    | 5–85% LRT                              | 5–85% LRT                          | 5–85% LRT  | 5–85% LRT  |
| Voltage ramp time               | 0.5–20 sec.                            | 1–30 sec.                          | 0.5–180 sec.   | 0.5–180 sec.   |
| Current limit                   | —                                      | —                                  | 5–85% LRT  | 5–85% LRT  |
| Current limit time              | —                                      | —                                  | 0.5–180 sec.   | 0.5–180 sec.   |
| Kick start current              | 0–85% LRT                              | —                                  | 5–85% LRT  | 5–85% LRT  |
| Kick start time                 | 0–200 ms                               | —                                  | 0–2 sec.   | 0–2 sec.   |
| Jog                             | —                                      | —                                  | Yes  | Yes  |
| <b>Soft Stop</b>                |  |                                    |  |  |
| Stop ramp time                  | 0–20 sec.                              | 0–30 sec.                          | 0–60 sec.  | 0–60 sec.  |
| Electronic DC injection braking | Yes                                    | —                                  | —  | —  |
| Preset slow speed               | —                                      | —                                  | —  | —  |
| Pump control                    | —                                      | —                                  | Optional   | Optional   |
| <b>Environmental</b>            |  |                                    |  |  |
| Operating temperature           | –30° to 40°C                           | 0° to 40°C                         | –30° to 50°C   | –30° to 50°C   |
| Humidity                        | 0–95% non-condensing                   | 0–95% non-condensing               | 0–95% non-condensing                                   | 0–95% non-condensing                                     |
| Altitude                        | <2000M                                 | <2000M                             | <2000M   | <2000M   |

# 59.4

## Motor Control and Protection

### Soft Starters

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**S701 Soft Start Controller**



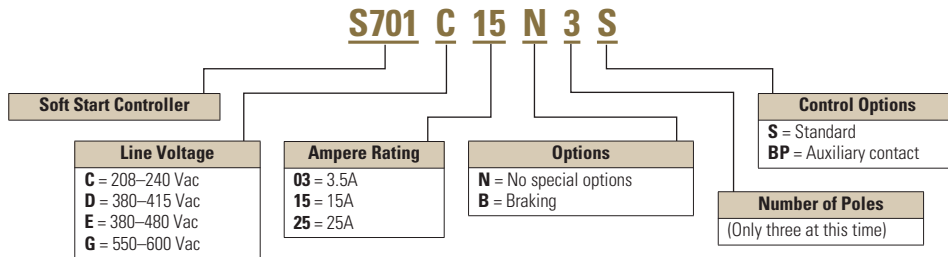
### Features

- Rated operational voltage up to 600 Vac
- Control voltage range from 24–480 Vac/Vdc, 24–300 Vac/Vdc with auxiliary contact or brake
- Adjustable ramp times
- Adjustable initial torque control (0–85%)
- Kick start feature

### Catalog Number Selection

#### S701 Soft Start Controller

#### Soft Start Controller



### Product Selection

#### Soft Start Controllers

| Maximum Current | Line Voltage | Control Voltage (Vac/Vdc) | Three-Phase Motor kW Rating (50 Hertz) |          |      | Horsepower Rating (60 Hertz) |         |             |         |             |         |             |         | Catalog Number    |
|-----------------|--------------|---------------------------|--|----------|------|------------------------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------------|
|                 |              |                           | 230V                                   | 380–400V | 440V | 200V 1.0 SF                  | 1.15 SF | 230V 1.0 SF | 1.15 SF | 460V 1.0 SF | 1.15 SF | 575V 1.0 SF | 1.15 SF |                   |
| 3.5             | 208–240      | 24–240                    | 7.5                                    | N/A      | N/A  | 1                            | 1       | 1           | 1       | N/A         | N/A     | N/A         | N/A     | <b>S701C03N3S</b> |
| 3.5             | 380–415      | 24–300                    | N/A                                    | 1.1      | N/A  | N/A                          | N/A     | N/A         | N/A     | 1-1/2       | 1-1/2   | N/A         | N/A     | <b>S701D03N3S</b> |
| 3.5             | 440–480      | 24–300                    | N/A                                    | N/A      | 1.5  | N/A                          | N/A     | N/A         | N/A     | 2           | 2       | N/A         | N/A     | <b>S701E03N3S</b> |
| 3.5             | 500–600      | 24–300                    | N/A                                    | N/A      | N/A  | N/A                          | N/A     | N/A         | N/A     | N/A         | N/A     | 2           | 2       | <b>S701G03N3S</b> |
| 15              | 208–240      | 24–240                    | 4                                      | N/A      | N/A  | 3                            | 3       | 3           | 3       | N/A         | N/A     | N/A         | N/A     | <b>S701C15N3S</b> |
| 15              | 380–480      | 24–300                    | N/A                                    | 5.5      | 7.5  | N/A                          | N/A     | N/A         | N/A     | 10          | 7-1/2   | N/A         | N/A     | <b>S701E15N3S</b> |
| 15              | 500–600      | 24–300                    | N/A                                    | N/A      | N/A  | N/A                          | N/A     | N/A         | N/A     | N/A         | N/A     | 10          | 10      | <b>S701G15N3S</b> |
| 25              | 208–240      | 24–240                    | 7.5                                    | N/A      | N/A  | 5                            | 5       | 7-1/2       | 5       | N/A         | N/A     | N/A         | N/A     | <b>S701C25N3S</b> |
| 25              | 380–480      | 24–300                    | N/A                                    | 11       | 12.5 | N/A                          | N/A     | N/A         | N/A     | 15          | 15      | N/A         | N/A     | <b>S701E25N3S</b> |
| 25              | 500–600      | 24–300                    | N/A                                    | N/A      | N/A  | N/A                          | N/A     | N/A         | N/A     | N/A         | N/A     | 20          | 20      | <b>S701G25N3S</b> |

**S701—Soft Start Controller with Auxiliary Contact**

| Maximum Current               | Line Voltage | Control Voltage (Vac/Vdc) | Three-Phase Motor kW Rating (50 Hertz) |          |      | Horsepower Rating |         |             |         |             |         |             |         | Catalog Number     |
|-------------------------------|--------------|---------------------------|--|----------|------|-------------------|---------|-------------|---------|-------------|---------|-------------|---------|--------------------|
|                               |              |                           | 230V                                   | 380–400V | 440V | 200V 1.0 SF       | 1.15 SF | 230V 1.0 SF | 1.15 SF | 460V 1.0 SF | 1.15 SF | 575V 1.0 SF | 1.15 SF |                    |
| <b>Ratings without Bypass</b> |              |                           |  |          |      |                   |         |             |         |             |         |             |         |                    |
| 25                            | 208–240      | 24–240                    | 5.5                                    | N/A      | N/A  | 5                 | 5       | 7-1/2       | 5       | N/A         | N/A     | N/A         | N/A     | <b>S701C25N3BP</b> |
| 25                            | 380–480      | 24–300                    | N/A                                    | 12.5     | 12.5 | N/A               | N/A     | N/A         | N/A     | 15          | 15      | N/A         | N/A     | <b>S701E25N3BP</b> |
| 25                            | 500–600      | 24–300                    | N/A                                    | N/A      | N/A  | N/A               | N/A     | N/A         | N/A     | N/A         | N/A     | 20          | 20      | <b>S701G25N3BP</b> |
| <b>Ratings with Bypass</b>    |              |                           |  |          |      |                   |         |             |         |             |         |             |         |                    |
| 30                            | 208–240      | 24–240                    | 7.5                                    | N/A      | N/A  | 7-1/2             | 7-1/2   | 10          | 7-1/2   | N/A         | N/A     | N/A         | N/A     | <b>S701C25N3BP</b> |
| 30                            | 380–480      | 24–300                    | N/A                                    | 15       | 15   | N/A               | N/A     | N/A         | N/A     | 20          | 15      | N/A         | N/A     | <b>S701E25N3BP</b> |
| 30                            | 500–600      | 24–300                    | N/A                                    | N/A      | N/A  | N/A               | N/A     | N/A         | N/A     | N/A         | N/A     | 25          | 20      | <b>S701G25N3BP</b> |

**S701—Soft Start Controller with Brake**

| Maximum Current | Line Voltage | Control Voltage (Vac/Vdc) | Three-Phase Motor kW Rating (50 Hertz) |          |      | Horsepower Rating |         |             |         |             |         |             |         | Catalog Number    |
|-----------------|--------------|---------------------------|--|----------|------|-------------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------------|
|                 |              |                           | 230V                                   | 380–400V | 440V | 200V 1.0 SF       | 1.15 SF | 230V 1.0 SF | 1.15 SF | 460V 1.0 SF | 1.15 SF | 575V 1.0 SF | 1.15 SF |                   |
| 25              | 208–240      | 24–240                    | 5.5                                    | N/A      | N/A  | 5                 | 5       | 7-1/2       | 5       | N/A         | N/A     | N/A         | N/A     | <b>S701C25B3S</b> |
| 25              | 380–480      | 24–300                    | N/A                                    | 12.5     | 12.5 | N/A               | N/A     | N/A         | N/A     | 15          | 15      | N/A         | N/A     | <b>S701E25B3S</b> |

DS6 Soft Start Controller



### Features

- Run bypass mode greatly reduces internal heating created by the power dissipation across the SCRs. The bypass contactor directly connects the motor to the line and improves system efficiency by reducing internal power losses
- Less heat minimizes enclosure size and cooling requirements, and maximizes the life of all devices in the enclosure
- LED displays device status and provides fault indication
- Variable ramp times and voltage control (torque control) settings provide unlimited starting configurations, allowing for maximum application flexibility
- Minimizes the peak inrush current's stress on the power system
- Minimizes peak starting torque to diminish mechanical system wear and damage

### Product Selection

#### DS6 Soft Start Controller

For 400% ramp, see Volume 6—Solid-State Motor Control, CA08100007E, Tab 35.

#### DS6 Soft Start Controller—Horsepower Rating, 10-Second Ramp, One Start per Hour, 300% Current Limit at 40°C

| Rated Current (A) | Motor Power (hp) |      |      | Maximum Allowable Breaker Size a | Maximum Allowable Fuse Size ① | Recommended XT0B Overload | Recommended C396 Overload | Catalog Number          |
|-------------------|------------------|------|------|----------------------------------|-------------------------------|---------------------------|---------------------------|-------------------------|
|                   | 200V             | 230V | 460V |                                  |                               |                           |                           |                         |
| 40                | 10               | 10   | 30   | HFD3150L                         | 150A Class RK5                | XT0B040DC1 ②              | C396A2A045SELAX           | <b>DS6-34DSX041N0-N</b> |
| 52                | 15               | 20   | 40   | HFD3200L                         | 200A Class RK5                | XT0B057DC1 ②              | C396B2A075SELAX           | <b>DS6-34DSX055N0-N</b> |
| 65                | 20               | 25   | 50   | HJD3250                          | 200A Class RK5                | XT0B065DC1 ②              | C396B2A075SELAX           | <b>DS6-34DSX068N0-N</b> |
| 77                | 25               | 30   | 60   | HKD3300                          | 300A Class RK5                | XT0B100GC1S               | C396B2A110SELAX           | <b>DS6-34DSX081N0-N</b> |
| 96                | 30               | 30   | 75   | HKD3350                          | 350A Class RK5                | XT0B100GC1S               | C396B2A110SELAX           | <b>DS6-34DSX099N0-N</b> |
| 124               | 40               | 50   | 100  | HKD3400                          | 500A Class RK5                | XT0B125GC1S               | C396C2A150SELAX           | <b>DS6-34DSX134N0-N</b> |
| 156               | 50               | 60   | 125  | HLD3450                          | 500A Class RK5                | XT0B160LC1 ③              | C396A2A005SELAX ④         | <b>DS6-34DSX161N0-N</b> |
| 180               | 60               | 75   | 150  | HLD3500                          | 500A Class RK5                | XT0B220LC1 ③              | C396A2A005SELAX ④         | <b>DS6-34DSX196N0-N</b> |

### Power Supply Selection

| Description                         | Catalog Number  |
|-------------------------------------|-----------------|
| 85–264V input and 24V output        | <b>ELC-PS01</b> |
| 380–480V input and 24V output       | <b>PSS25F</b>   |
| 100–240 Vac input and 24 Vdc output | <b>PSG60E</b>   |
| 380–480 Vac input and 24 Vdc output | <b>PSG60F</b>   |

#### Notes

- ① Maximum values may be higher than allowed per NEC 430.52 and UL 508A 31.1.
- ② XT0BXDIND panel mounting adaptor must be used with this overload.
- ③ XT0BXTLL line and load lugs must be used with this overload.
- ④ C396CTK300 current transformer must be used with this overload.



S801 Soft Starter



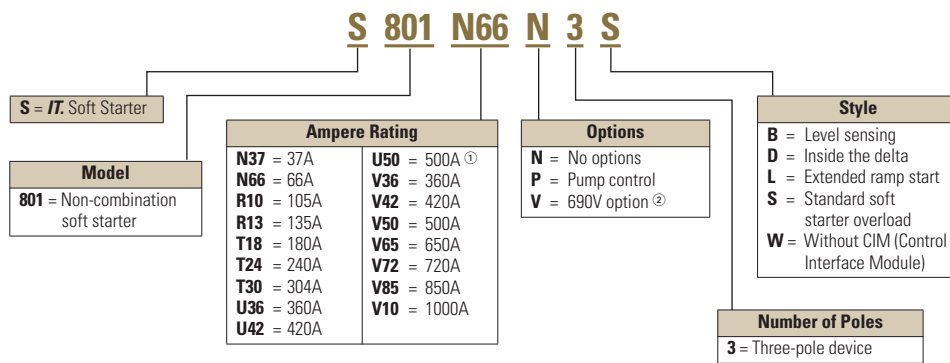
**Features**

- Built-in overload protection
- Built-in run bypass contactor
- Adjustable torque control
- Physically fits in place of most NEMA and IEC starters
- Optional pump control

**Catalog Number Selection**

**S801 Soft Starter**

**Soft Starter**



**Notes**

- <sup>①</sup> U Frame 500A unit does not have IEC certification.
- <sup>②</sup> Not available on U Frames.

## Product Selection

### Standard Duty Ratings

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**Note:** Motor applications and customer needs come in many different varieties. With the standard and severe duty rating tables, we have attempted to provide guidelines on what the **IT** Soft Starter is capable of. If the application falls under these categories, you can use these charts.

| Starting Method  | Ramp Current % of FLA | Ramp Time Seconds | Starts per Hour | Ambient Temperature |
|------------------|-----------------------|-------------------|-----------------|---------------------|
| vs. Soft Start   | 300%                  | 30 sec.           | 3               | 50°C                |
| vs. Full Voltage | 500%                  | 10 sec.           | 3               | 50°C                |
| vs. Wye-Delta    | 350%                  | 20 sec.           | 3               | 50°C                |
| vs. 80% RVAT     | 480%                  | 20 sec.           | 2               | 50°C                |
| vs. 65% RVAT     | 390%                  | 20 sec.           | 3               | 50°C                |
| vs. 50% RVAT     | 300%                  | 20 sec.           | 4               | 50°C                |

### Standard Duty Rated Open Soft Starters

| Maximum Current     | Three-Phase Motor<br>kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        |               |        |               |        | Catalog Number ① |               |                      |
|---------------------|---|----------|------|----------------------|--------|---------------|--------|---------------|--------|------------------|---------------|----------------------|
|                     | 230V                                      | 380–400V | 440V | 200V<br>1.0SF        | 1.15SF | 230V<br>1.0SF | 1.15SF | 460V<br>1.0SF | 1.15SF |                  | 575V<br>1.0SF | 1.15SF               |
| <b>Frame Size N</b> |   |          |      |                      |        |               |        |               |        |                  |               |                      |
| 37                  | 10  | 18.5     | 18.5 | 10                   | 10     | 10            | 10     | 25            | 20     | 30               | 30            | <b>S801N37N3S</b>    |
| 66                  | 18.5                                      | 30       | 37   | 20                   | 15     | 20            | 20     | 50            | 40     | 60               | 50            | <b>S801N66N3S</b>    |
| <b>Frame Size R</b> |   |          |      |                      |        |               |        |               |        |                  |               |                      |
| 105                 | 30  | 55       | 59   | 30                   | 25     | 40            | 30     | 75            | 60     | 100              | 75            | <b>S801R10N3S</b>    |
| 135                 | 40  | 63       | 80   | 40                   | 30     | 50            | 40     | 100           | 75     | 125              | 100           | <b>S801R13N3S</b>    |
| <b>Frame Size T</b> |   |          |      |                      |        |               |        |               |        |                  |               |                      |
| 180                 | 51  | 90       | 110  | 60                   | 50     | 60            | 60     | 150           | 125    | 150              | 150           | <b>S801T18N3S</b>    |
| 240                 | 75  | 110      | 147  | 75                   | 60     | 75            | 75     | 200           | 150    | 200              | 200           | <b>S801T24N3S</b>    |
| 304                 | 90  | 160      | 185  | 100                  | 75     | 100           | 100    | 250           | 200    | 300              | 250           | <b>S801T30N3S</b>    |
| <b>Frame Size U</b> |   |          |      |                      |        |               |        |               |        |                  |               |                      |
| 360                 | 110                                       | 185      | 220  | 125                  | 100    | 150           | 125    | 300           | 250    | 350              | 300           | <b>S801U36N3S</b>    |
| 420                 | 129                                       | 220      | 257  | 150                  | 125    | 175           | 150    | 350           | 300    | 450              | 350           | <b>S801U42N3S</b>    |
| 500                 | 150                                       | 257      | 300  | 150                  | 150    | 200           | 150    | 400           | 350    | 500              | 450           | <b>S801U50N3S</b> ②③ |
| <b>Frame Size V</b> |   |          |      |                      |        |               |        |               |        |                  |               |                      |
| 360                 | 110                                       | 185      | 220  | 125                  | 100    | 150           | 125    | 300           | 250    | 350              | 300           | <b>S801V36N3S</b>    |
| 420                 | 129                                       | 220      | 257  | 150                  | 125    | 175           | 150    | 350           | 300    | 450              | 350           | <b>S801V42N3S</b>    |
| 500                 | 150                                       | 257      | 300  | 150                  | 150    | 200           | 150    | 400           | 350    | 500              | 450           | <b>S801V50N3S</b>    |
| 650                 | 200                                       | 355      | 425  | 250                  | 200    | 250           | 200    | 500           | 450    | 600              | 500           | <b>S801V65N3S</b>    |
| 720                 | 220                                       | 400      | 450  | —                    | —      | 300           | 250    | 600           | 500    | 700              | 600           | <b>S801V72N3S</b>    |
| 850                 | 257                                       | 475      | 500  | —                    | —      | 350           | 300    | 700           | 600    | 900              | 700           | <b>S801V85N3S</b>    |
| 1000                | 315                                       | 560      | 600  | —                    | —      | 400           | 350    | 800           | 700    | 1000             | 800           | <b>S801V10N3S</b> ④  |

#### Notes

- ① For two-wire (level sensing) control, change the last digit from S to 2.
- ② 15 sec. start, 300% inrush, 40°C, one start every 15 minutes. If these start parameters are exceeded, please refer to 290 mm V Frame, 500A starter.
- ③ U Frame 500A does not have IEC certification.
- ④ For more information on optimum performance of the 1000A Frame Size V S801, see Appendix C of MNO3902008E.

**Severe Duty Ratings**

**Note:** Severe duty ratings are defined as any combination of parameters that exceed the standard duty ratings where the ramp time is over 30 seconds, the number of starts per hour exceeds four, or the current limit set is over 300%. Example: 35-second ramp, five starts per hour, 350% current limit at 40°C ambient.

| Starting Method  | Ramp Current % of FLA | Ramp Time Seconds | Starts per Hour | Ambient Temperature |
|------------------|-----------------------|-------------------|-----------------|---------------------|
| vs. Soft Start   | 450%                  | 30 sec.           | 4               | 50°C                |
| vs. Full Voltage | 500%                  | 10 sec.           | 10              | 50°C                |
| vs. Wye-Delta    | 350%                  | 65 sec.           | 3               | 50°C                |
| vs. 80% RVAT     | 480%                  | 25 sec.           | 4               | 50°C                |
| vs. 65% RVAT     | 390%                  | 40 sec.           | 4               | 50°C                |
| vs. 50% RVAT     | 300%                  | 60 sec.           | 4               | 50°C                |

**Severe Duty Rated Open Soft Starters**

| Maximum Current     | Three-Phase Motor kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        | 230V  |        | 460V  |        | 575V  |        | Catalog Number ① |
|---------------------|--|----------|------|----------------------|--------|-------|--------|-------|--------|-------|--------|------------------|
|                     | 230V                                   | 380-400V | 440V | 200V 1.0SF           | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF |                  |
| <b>Frame Size N</b> |  |          |      |                      |        |       |        |       |        |       |        |                  |
| 22                  | 5.5                                    | 10       | 11   | 5                    | 5      | 7-1/2 | 5      | 15    | 10     | 20    | 15     | S801N37N3S       |
| 42                  | 11                                     | 18.5     | 22   | 10                   | 10     | 15    | 10     | 30    | 25     | 40    | 30     | S801N66N3S       |
| <b>Frame Size R</b> |  |          |      |                      |        |       |        |       |        |       |        |                  |
| 65                  | 15                                     | 30       | 33   | 15                   | 15     | 20    | 15     | 50    | 40     | 50    | 50     | S801R10N3S       |
| 80                  | 22                                     | 40       | 45   | 25                   | 20     | 30    | 25     | 60    | 50     | 75    | 60     | S801R13N3S       |
| <b>Frame Size T</b> |  |          |      |                      |        |       |        |       |        |       |        |                  |
| 115                 | 33                                     | 59       | 63   | 30                   | 30     | 40    | 30     | 75    | 75     | 100   | 100    | S801T18N3S       |
| 150                 | 45                                     | 80       | 90   | 50                   | 40     | 50    | 50     | 100   | 100    | 150   | 125    | S801T24N3S       |
| 192                 | 55                                     | 100      | 110  | 60                   | 50     | 75    | 60     | 150   | 125    | 200   | 150    | S801T30N3S       |
| <b>Frame Size U</b> |  |          |      |                      |        |       |        |       |        |       |        |                  |
| 240                 | 75                                     | 110      | 147  | 75                   | 60     | 75    | 75     | 200   | 150    | 200   | 200    | S801U36N3S       |
| 305                 | 90                                     | 160      | 185  | 100                  | 75     | 100   | 100    | 250   | 200    | 300   | 250    | S801U42N3S       |
| 365                 | 110                                    | 185      | 220  | 125                  | 100    | 150   | 125    | 300   | 250    | 350   | 300    | S801U50N3S ②     |
| <b>Frame Size V</b> |  |          |      |                      |        |       |        |       |        |       |        |                  |
| 240                 | 75                                     | 110      | 147  | 75                   | 60     | 75    | 75     | 200   | 150    | 200   | 200    | S801V36N3S       |
| 305                 | 90                                     | 160      | 185  | 100                  | 75     | 100   | 100    | 250   | 200    | 300   | 250    | S801V42N3S       |
| 365                 | 110                                    | 185      | 220  | 125                  | 100    | 150   | 125    | 300   | 250    | 350   | 300    | S801V50N3S       |
| 420                 | 129                                    | 220      | 257  | 150                  | 125    | 150   | 150    | 350   | 300    | 450   | 350    | S801V65N3S       |
| 480                 | 147                                    | 257      | 295  | 150                  | 150    | 200   | 150    | 400   | 350    | 500   | 450    | S801V72N3S       |
| 525                 | 160                                    | 280      | 335  | 150                  | 150    | 200   | 150    | 450   | 350    | 500   | 450    | S801V85N3S       |
| 600                 | 185                                    | 315      | 375  | 200                  | 150    | 250   | 200    | 500   | 450    | 600   | 500    | S801V10N3S ③     |

**Notes**

- ① For two-wire (level sensing) control, change the last digit from S to 2.
- ② U Frame 500A unit does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S801, see Appendix C of MN03902008E.

## 15-Second Ramp, Four Starts per Hour, 300% Current Limit at 40°C Ambient, Inside-the-Delta Ratings

| Maximum Continuous Motor Line Current | Three-Phase Motor kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        |               |        |               |        |               |        | Catalog Number       |
|---------------------------------------|--|----------|------|----------------------|--------|---------------|--------|---------------|--------|---------------|--------|----------------------|
|                                       | 230V                                   | 380–400V | 440V | 200V<br>1.0SF        | 1.15SF | 230V<br>1.0SF | 1.15SF | 460V<br>1.0SF | 1.15SF | 575V<br>1.0SF | 1.15SF |                      |
| <b>Frame Size N</b>                   |  |          |      |                      |        |               |        |               |        |               |        |                      |
| 65                                    | 10                                     | 18.5     | 18.5 | 15                   | 15     | 15            | 15     | 40            | 30     | 50            | 50     | <b>S801N37N3D</b>    |
| 114                                   | 18.5                                   | 30       | 37   | 30                   | 25     | 30            | 30     | 75            | 60     | 100           | 75     | <b>S801N66N3D</b>    |
| <b>Frame Size R</b>                   |  |          |      |                      |        |               |        |               |        |               |        |                      |
| 182                                   | 30                                     | 55       | 59   | 50                   | 40     | 60            | 50     | 125           | 100    | 150           | 125    | <b>S801R10N3D</b>    |
| 234                                   | 40                                     | 63       | 80   | 60                   | 50     | 75            | 60     | 150           | 125    | 200           | 150    | <b>S801R13N3D</b>    |
| <b>Frame Size T</b>                   |  |          |      |                      |        |               |        |               |        |               |        |                      |
| 311                                   | 51                                     | 90       | 110  | 100                  | 75     | 100           | 100    | 250           | 200    | 250           | 250    | <b>S801T18N3D</b>    |
| 415                                   | 75                                     | 110      | 147  | 125                  | 100    | 125           | 125    | 300           | 250    | 300           | 300    | <b>S801T24N3D</b>    |
| 526                                   | 90                                     | 160      | 185  | 150                  | 125    | 150           | 150    | 400           | 300    | 400           | 400    | <b>S801T30N3D</b>    |
| <b>Frame Size U</b>                   |  |          |      |                      |        |               |        |               |        |               |        |                      |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250           | 200    | 450           | 400    | 550           | 450    | <b>S801U36N3D</b>    |
| 727                                   | 129                                    | 220      | 257  | 250                  | 200    | 300           | 250    | 550           | 450    | 700           | 550    | <b>S801U42N3D</b>    |
| 865                                   | 150                                    | 257      | 300  | 250                  | 250    | 300           | 250    | 600           | 550    | 750           | 700    | <b>S801U50N3D</b> ①② |
| <b>Frame Size V</b>                   |  |          |      |                      |        |               |        |               |        |               |        |                      |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250           | 200    | 450           | 400    | 550           | 450    | <b>S801V36N3D</b>    |
| 727                                   | 129                                    | 220      | 257  | 250                  | 200    | 300           | 250    | 550           | 450    | 700           | 550    | <b>S801V42N3D</b>    |
| 865                                   | 150                                    | 257      | 300  | 250                  | 250    | 300           | 250    | 600           | 550    | 750           | 700    | <b>S801V50N3D</b>    |
| 1125                                  | 200                                    | 355      | 425  | 400                  | 300    | 400           | 300    | 750           | 700    | 900           | 750    | <b>S801V65N3D</b>    |
| 1246                                  | —                                      | —        | —    | —                    | —      | —             | —      | —             | —      | —             | —      | <b>S801V72N3D</b>    |
| 1471                                  | —                                      | —        | —    | —                    | —      | —             | —      | —             | —      | —             | —      | <b>S801V85N3D</b>    |
| —                                     | —                                      | —        | —    | —                    | —      | —             | —      | —             | —      | —             | —      | <b>S801V10N3D</b> ③  |

**Notes**

- ① 15-sec. start, 300% inrush, 40°C, one start every 15 minutes. If these start parameters are exceeded, please refer to 290 mm V Frame, 865A inside-the-delta starter.
- ② U Frame 500A unit does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V inside-the-delta S801, see Appendix C of MN03902009E.

Severe Duty Inside-the-Delta Ratings

| Maximum Continuous Motor Line Current | Three-Phase Motor kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        | 230V  |        | 460V  |        | 575V  |        | Catalog Number          |
|---------------------------------------|--|----------|------|----------------------|--------|-------|--------|-------|--------|-------|--------|-------------------------|
|                                       | 230V                                   | 380-400V | 440V | 200V 1.0SF           | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF |                         |
| <b>Frame Size N</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                         |
| 39                                    | 5.5                                    | 10       | 11   | 7-1/2                | 7-1/2  | 10    | 7-1/2  | 25    | 15     | 30    | 25     | S801N37N3D              |
| 73                                    | 11                                     | 18.5     | 22   | 15                   | 15     | 25    | 15     | 50    | 40     | 60    | 50     | S801N66N3D              |
| <b>Frame Size R</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                         |
| 111                                   | 15                                     | 30       | 33   | 25                   | 25     | 30    | 25     | 75    | 60     | 75    | 75     | S801R10N3D              |
| 138                                   | 22                                     | 40       | 45   | 40                   | 30     | 50    | 40     | 100   | 75     | 120   | 100    | S801R13N3D              |
| <b>Frame Size T</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                         |
| 199                                   | 33                                     | 59       | 63   | 50                   | 50     | 60    | 50     | 125   | 125    | 150   | 150    | S801T18N3D              |
| 257                                   | 45                                     | 80       | 90   | 75                   | 60     | 75    | 75     | 150   | 150    | 250   | 200    | S801T24N3D              |
| 324                                   | 55                                     | 100      | 110  | 100                  | 75     | 100   | 100    | 250   | 200    | 300   | 250    | S801T30N3D              |
| <b>Frame Size U</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                         |
| 415                                   | 75                                     | 110      | 147  | 125                  | 100    | 125   | 125    | 300   | 250    | 300   | 300    | S801U36N3D              |
| 526                                   | 90                                     | 160      | 185  | 150                  | 120    | 150   | 150    | 400   | 300    | 450   | 400    | S801U42N3D              |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250   | 200    | 450   | 400    | 550   | 450    | S801U50N3D <sup>①</sup> |
| <b>Frame Size V</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                         |
| 415                                   | 75                                     | 110      | 147  | 125                  | 100    | 125   | 125    | 300   | 250    | 300   | 300    | S801V36N3D              |
| 526                                   | 90                                     | 160      | 185  | 150                  | 120    | 150   | 150    | 400   | 300    | 450   | 400    | S801V42N3D              |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250   | 200    | 450   | 400    | 550   | 450    | S801V50N3D              |
| 727                                   | 129                                    | 220      | 257  | 250                  | 200    | 250   | 250    | 550   | 450    | 700   | 550    | S801V65N3D              |
| 816                                   | 147                                    | 257      | 295  | 250                  | 250    | 300   | 250    | 600   | 550    | 750   | 700    | S801V72N3D              |
| 908                                   | 160                                    | 280      | 335  | 250                  | 250    | 300   | 250    | 700   | 550    | 750   | 700    | S801V85N3D              |
| —                                     | —                                      | —        | —    | —                    | —      | —     | —      | —     | —      | —     | —      | S801V10N3D <sup>②</sup> |

Notes

- ① U Frame 500A unit does not have IEC certification.
- ② For more information on optimum performance of the 1000A Frame Size V inside-the-delta S801, see Appendix C of MN03902009E.

## Accessories

## S801 Soft Starter

## Pump Control Option

| Frame Size | Maximum Current | Catalog Number    |
|------------|-----------------|-------------------|
| N          | 37              | <b>S801N37P3S</b> |
|            | 66              | <b>S801N66P3S</b> |
| R          | 105             | <b>S801R10P3S</b> |
|            | 135             | <b>S801R13P3S</b> |

| Frame Size | Maximum Current | Catalog Number                 |
|------------|-----------------|--------------------------------|
| T          | 180             | <b>S801T18P3S</b>              |
|            | 240             | <b>S801T24P3S</b>              |
|            | 304             | <b>S801T30P3S</b>              |
| U          | 360             | <b>S801U36P3S</b>              |
|            | 420             | <b>S801U42P3S</b>              |
|            | 500             | <b>S801U50P3S</b> <sup>①</sup> |

| Frame Size | Maximum Current | Catalog Number    |
|------------|-----------------|-------------------|
| V          | 360             | <b>S801V36P3S</b> |
|            | 420             | <b>S801V42P3S</b> |
|            | 500             | <b>S801V50P3S</b> |
|            | 650             | <b>S801V65P3S</b> |
|            | 720             | <b>S801V72P3S</b> |
|            | 850             | <b>S801V85P3S</b> |
|            | 1000            | <b>S801V10P3S</b> |

## Surge Suppressor

Surge Suppressors <sup>②</sup>

| Description                                       | Catalog Number |
|---|----------------|
| 600V MOV for 65 mm and 110 mm units               | <b>EMS38</b>   |
| 600V MOV for 200 mm and 290 mm units              | <b>EMS39</b>   |
| 690V MOV for 200 mm and 290 mm units <sup>③</sup> | <b>EMS41</b>   |

## Lug Kit

Lug Kits <sup>④</sup>

| Frame Size                                   | Frame Designation         | Description                                 | Catalog Number |
|--|---------------------------|---|----------------|
| 200 mm, SSRV                                 | T, U                      | Two cable connections, 4 AWG to 1/0 cable   | <b>EML22</b>   |
|  |                           | One cable connection, 4/0 to 500 MCM cable  | <b>EML23</b>   |
|  |                           | Two cable connections, 4/0 to 500 MCM cable | <b>EML24</b>   |
|  |                           | One cable connection, 2/0 to 300 MCM cable  | <b>EML25</b>   |
|  |                           | Two cable connections, 2/0 to 300 MCM cable | <b>EML26</b>   |
|  |                           | 290 mm, SSRV                                | V              |
| Four cable connections, 4/0 to 500 MCM cable | <b>EML30</b>              |   |                |
| Six cable connections, 4/0 to 500 MCM cable  | <b>EML32</b>              |   |                |
| Four cable connections, 2/0 to 300 MCM cable | <b>EML33</b> <sup>⑤</sup> |   |                |

## Power Supplies

| Description                      | Catalog Number |
|----------------------------------|----------------|
| 115 Vac input; 24 Vdc output     | <b>PSS55A</b>  |
| 230 Vac input; 24 Vdc output     | <b>PSS55B</b>  |
| 380–480 Vac input; 24 Vdc output | <b>PSS55C</b>  |

## Notes

- ① U Frame 500A unit does not have IEC certification.
- ② 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).
- ③ T Frame only.
- ④ 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.
- ⑤ The EML33 does not have a CSA Listing.

### S811 Communicating Soft Starter



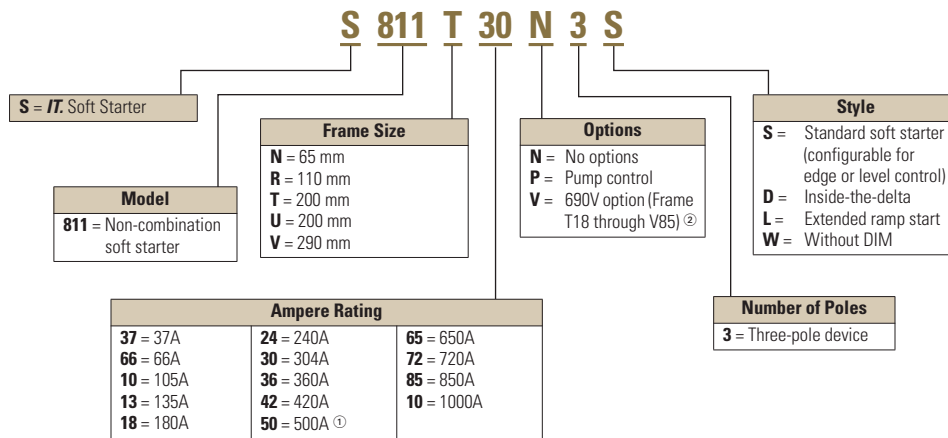
### Features

- Door or device mounted digital interface module enables users to safely configure, commission, monitor and troubleshoot the system without opening the enclosure door, eliminating the possibility of an arc flash incident
- System operating parameters can be monitored enterprise-wide through a communications network
- Run bypass mode greatly reduces internal heating created by the greater power dissipation in the SCRs
- Internal solid-state overload protection provides accurate current measurement and trip settings
- Advanced selectable protective features safeguard the motor and system against a variety of system faults
- Pump control option maximizes the life of the pump
- Smallest in industry, minimizing panel/enclosure size

### Catalog Number Selection

#### S811 Communicating Soft Starter

#### Communicating Soft Starter



#### Notes

- ① U Frame 500A unit does not have IEC certification.
- ② Not available in U Frame.

## Product Selection

## Standard Duty Ratings

59

**Note:** Motor applications and customer needs come in many different varieties. With the standard and severe duty rating tables, we have attempted to provide guidelines on what the **IT** Soft Starter is capable of. If the application falls under these categories, you can use these charts.

| Starting Method  | Ramp Current % of FLA | Ramp Time Seconds | Starts per Hour | Ambient Temperature |
|------------------|-----------------------|-------------------|-----------------|---------------------|
| vs. Soft Start   | 300%                  | 30 sec.           | 3               | 50°C                |
| vs. Full Voltage | 500%                  | 10 sec.           | 3               | 50°C                |
| vs. Wye-Delta    | 350%                  | 20 sec.           | 3               | 50°C                |
| vs. 80% RVAT     | 480%                  | 20 sec.           | 2               | 50°C                |
| vs. 65% RVAT     | 390%                  | 20 sec.           | 3               | 50°C                |
| vs. 50% RVAT     | 300%                  | 20 sec.           | 4               | 50°C                |

## 15-Second Ramp, Four Starts per Hour, 300% Current Limit at 40°C

| Maximum Current     | Three-Phase Motor<br>kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        |               |        |               |        | Catalog Number |               |                                |
|---------------------|---|----------|------|----------------------|--------|---------------|--------|---------------|--------|----------------|---------------|--------------------------------|
|                     | 230V                                      | 380–400V | 440V | 200V<br>1.0SF        | 1.15SF | 230V<br>1.0SF | 1.15SF | 460V<br>1.0SF | 1.15SF |                | 575V<br>1.0SF | 1.15SF                         |
| <b>Frame Size N</b> |   |          |      |                      |        |               |        |               |        |                |               |                                |
| 37                  | 10  | 18.5     | 18.5 | 10                   | 10     | 10            | 10     | 25            | 20     | 30             | 30            | <b>S811N37N3S</b>              |
| 66                  | 18.5                                      | 30       | 37   | 20                   | 15     | 20            | 20     | 50            | 40     | 60             | 50            | <b>S811N66N3S</b>              |
| <b>Frame Size R</b> |   |          |      |                      |        |               |        |               |        |                |               |                                |
| 105                 | 30  | 55       | 59   | 30                   | 25     | 40            | 30     | 75            | 60     | 100            | 75            | <b>S811R10N3S</b>              |
| 135                 | 40  | 63       | 80   | 40                   | 30     | 50            | 40     | 100           | 75     | 125            | 100           | <b>S811R13N3S</b>              |
| <b>Frame Size T</b> |   |          |      |                      |        |               |        |               |        |                |               |                                |
| 180                 | 51  | 90       | 110  | 60                   | 50     | 60            | 60     | 150           | 125    | 150            | 150           | <b>S811T18N3S</b>              |
| 240                 | 75  | 110      | 147  | 75                   | 60     | 75            | 75     | 200           | 150    | 200            | 200           | <b>S811T24N3S</b>              |
| 304                 | 90  | 160      | 185  | 100                  | 75     | 100           | 100    | 250           | 200    | 300            | 250           | <b>S811T30N3S</b>              |
| <b>Frame Size U</b> |   |          |      |                      |        |               |        |               |        |                |               |                                |
| 360                 | 110                                       | 185      | 220  | 125                  | 100    | 150           | 125    | 300           | 250    | 350            | 300           | <b>S811U36N3S</b>              |
| 420                 | 129                                       | 220      | 257  | 150                  | 125    | 175           | 150    | 350           | 300    | 450            | 350           | <b>S811U42N3S</b>              |
| 500                 | 150                                       | 257      | 300  | 150                  | 150    | 200           | 150    | 400           | 350    | 500            | 450           | <b>S811U50N3S</b> <sup>①</sup> |
| <b>Frame Size V</b> |   |          |      |                      |        |               |        |               |        |                |               |                                |
| 360                 | 110                                       | 185      | 220  | 125                  | 100    | 150           | 125    | 300           | 250    | 350            | 300           | <b>S811V36N3S</b>              |
| 420                 | 129                                       | 220      | 257  | 150                  | 125    | 175           | 150    | 350           | 300    | 450            | 350           | <b>S811V42N3S</b>              |
| 500                 | 150                                       | 257      | 300  | 150                  | 150    | 200           | 150    | 400           | 350    | 500            | 450           | <b>S811V50N3S</b>              |
| 650                 | 200                                       | 355      | 425  | 250                  | 200    | 250           | 200    | 500           | 450    | 600            | 500           | <b>S811V65N3S</b>              |
| 720                 | 220                                       | 400      | 450  | —                    | —      | 300           | 250    | 600           | 500    | 700            | 600           | <b>S811V72N3S</b>              |
| 850                 | 257                                       | 475      | 500  | —                    | —      | 350           | 300    | 700           | 600    | 900            | 700           | <b>S811V85N3S</b>              |
| 1000                | 277                                       | 525      | 500  | —                    | —      | 400           | 350    | 800           | 700    | 900            | 800           | <b>S811V10N3S</b> <sup>②</sup> |

## Notes

- ① 500A rating does not have IEC certification.  
 ② For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.



**Severe Duty Ratings**

**Note:** Severe duty ratings are defined as any combination of parameters that exceed the standard duty ratings where the ramp time is over 30 seconds, the number of starts per hour exceeds four, or the current limit set is over 300%. Example: 35-second ramp, five starts per hour, 350% current limit at 40°C ambient.

| Starting Method  | Ramp Current % of FLA | Ramp Time Seconds | Starts per Hour | Ambient Temperature |
|------------------|-----------------------|-------------------|-----------------|---------------------|
| vs. Soft Start   | 450%                  | 30 sec.           | 4               | 50°C                |
| vs. Full Voltage | 500%                  | 10 sec.           | 10              | 50°C                |
| vs. Wye-Delta    | 350%                  | 65 sec.           | 3               | 50°C                |
| vs. 80% RVAT     | 480%                  | 25 sec.           | 4               | 50°C                |
| vs. 65% RVAT     | 390%                  | 40 sec.           | 4               | 50°C                |
| vs. 50% RVAT     | 300%                  | 60 sec.           | 4               | 50°C                |

**>30-Second Ramp, >Four Starts per Hour or >300% Current Limit** ①

| Maximum Current     | Three-Phase Motor kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        | 230V  |        | 460V  |        | 575V  |        | Catalog Number |
|---------------------|--|----------|------|----------------------|--------|-------|--------|-------|--------|-------|--------|----------------|
|                     | 230V                                   | 380-400V | 440V | 200V 1.0SF           | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF |                |
| <b>Frame Size N</b> |  |          |      |                      |        |       |        |       |        |       |        |                |
| 22                  | 5.5                                    | 10       | 11   | 5                    | 5      | 7-1/2 | 5      | 15    | 10     | 20    | 15     | S811N37N3S     |
| 42                  | 11                                     | 18.5     | 22   | 10                   | 10     | 15    | 10     | 30    | 25     | 40    | 30     | S811N66N3S     |
| <b>Frame Size R</b> |  |          |      |                      |        |       |        |       |        |       |        |                |
| 65                  | 15                                     | 30       | 33   | 15                   | 15     | 20    | 15     | 50    | 40     | 50    | 50     | S811R10N3S     |
| 80                  | 22                                     | 40       | 45   | 25                   | 20     | 30    | 25     | 60    | 50     | 75    | 60     | S811R13N3S     |
| <b>Frame Size T</b> |  |          |      |                      |        |       |        |       |        |       |        |                |
| 115                 | 33                                     | 59       | 63   | 30                   | 30     | 40    | 30     | 75    | 75     | 100   | 100    | S811T18N3S     |
| 150                 | 45                                     | 80       | 90   | 50                   | 40     | 50    | 50     | 100   | 100    | 150   | 125    | S811T24N3S     |
| 192                 | 55                                     | 100      | 110  | 60                   | 50     | 75    | 60     | 150   | 125    | 200   | 150    | S811T30N3S     |
| <b>Frame Size U</b> |  |          |      |                      |        |       |        |       |        |       |        |                |
| 240                 | 75                                     | 110      | 147  | 75                   | 60     | 75    | 75     | 200   | 150    | 200   | 200    | S811U36N3S     |
| 305                 | 90                                     | 160      | 185  | 100                  | 75     | 100   | 100    | 250   | 200    | 300   | 250    | S811U42N3S     |
| <b>Frame Size V</b> |  |          |      |                      |        |       |        |       |        |       |        |                |
| 240                 | 75                                     | 110      | 147  | 75                   | 60     | 75    | 75     | 200   | 150    | 200   | 200    | S811V36N3S     |
| 305                 | 90                                     | 160      | 185  | 100                  | 75     | 100   | 100    | 250   | 200    | 300   | 250    | S811V42N3S     |
| 365                 | 110                                    | 185      | 220  | 125                  | 100    | 150   | 125    | 300   | 250    | 350   | 300    | S811V50N3S     |
| 420                 | 129                                    | 220      | 257  | 150                  | 125    | 150   | 150    | 350   | 300    | 450   | 350    | S811V65N3S     |
| 480                 | 147                                    | 257      | 295  | 150                  | 150    | 200   | 150    | 400   | 350    | 500   | 450    | S811V72N3S     |
| 525                 | 160                                    | 280      | 335  | 150                  | 150    | 200   | 150    | 450   | 350    | 500   | 450    | S811V85N3S     |
| 575                 | 172                                    | 303      | 370  | 200                  | 150    | 250   | 200    | 500   | 450    | 600   | 500    | S811V10N3S     |

**Note**

① For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

#### 15-Second Ramp, Four Starts per Hour, 300% Current Limit at 40°C Ambient, Inside-the-Delta Ratings

| Maximum Continuous Motor Line Current | Three-Phase Motor kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        |            |        |            |        |            |        | Catalog Number       |
|---------------------------------------|--|----------|------|----------------------|--------|------------|--------|------------|--------|------------|--------|----------------------|
|                                       | 230V                                   | 380–400V | 440V | 200V 1.0SF           | 1.15SF | 230V 1.0SF | 1.15SF | 460V 1.0SF | 1.15SF | 575V 1.0SF | 1.15SF |                      |
| <b>Frame Size N</b>                   |  |          |      |                      |        |            |        |            |        |            |        |                      |
| 65                                    | 10                                     | 18.5     | 18.5 | 15                   | 15     | 15         | 15     | 40         | 30     | 50         | 50     | <b>S811N37N3D</b>    |
| 114                                   | 18.5                                   | 30       | 37   | 30                   | 25     | 30         | 30     | 75         | 60     | 100        | 75     | <b>S811N66N3D</b>    |
| <b>Frame Size R</b>                   |  |          |      |                      |        |            |        |            |        |            |        |                      |
| 182                                   | 30                                     | 55       | 59   | 50                   | 40     | 60         | 50     | 125        | 100    | 150        | 125    | <b>S811R10N3D</b>    |
| 234                                   | 40                                     | 63       | 80   | 60                   | 50     | 75         | 60     | 150        | 125    | 200        | 150    | <b>S811R13N3D</b>    |
| <b>Frame Size T</b>                   |  |          |      |                      |        |            |        |            |        |            |        |                      |
| 311                                   | 51                                     | 90       | 110  | 100                  | 75     | 100        | 100    | 250        | 200    | 250        | 250    | <b>S811T18N3D</b>    |
| 415                                   | 75                                     | 110      | 147  | 125                  | 100    | 125        | 125    | 300        | 250    | 300        | 300    | <b>S811T24N3D</b>    |
| 526                                   | 90                                     | 160      | 185  | 150                  | 125    | 150        | 150    | 400        | 300    | 400        | 400    | <b>S811T30N3D</b>    |
| <b>Frame Size U</b>                   |  |          |      |                      |        |            |        |            |        |            |        |                      |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250        | 200    | 450        | 400    | 550        | 450    | <b>S811U36N3D</b>    |
| 727                                   | 129                                    | 220      | 257  | 250                  | 200    | 300        | 250    | 550        | 450    | 700        | 550    | <b>S811U42N3D</b>    |
| 865                                   | 150                                    | 257      | 300  | 250                  | 250    | 300        | 250    | 600        | 550    | 750        | 700    | <b>S811U50N3D</b> ①② |
| <b>Frame Size V</b>                   |  |          |      |                      |        |            |        |            |        |            |        |                      |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250        | 200    | 450        | 400    | 550        | 450    | <b>S811V36N3D</b>    |
| 727                                   | 129                                    | 220      | 257  | 250                  | 200    | 300        | 250    | 550        | 450    | 700        | 550    | <b>S811V42N3D</b>    |
| 865                                   | 150                                    | 257      | 300  | 250                  | 250    | 300        | 250    | 600        | 550    | 750        | 700    | <b>S811V50N3D</b>    |
| 1125                                  | 200                                    | 355      | 425  | 400                  | 300    | 400        | 300    | 750        | 700    | 900        | 750    | <b>S811V65N3D</b>    |
| 1246                                  | —                                      | —        | —    | —                    | —      | —          | —      | —          | —      | —          | —      | <b>S811V72N3D</b>    |
| 1471                                  | —                                      | —        | —    | —                    | —      | —          | —      | —          | —      | —          | —      | <b>S811V85N3D</b>    |
| —                                     | —                                      | —        | —    | —                    | —      | —          | —      | —          | —      | —          | —      | <b>S811V10N3D</b> ③  |

**Notes**

- ① 15 sec. start, 300% inrush, 40°C, one start every 15 minutes. If these start parameters are exceeded, please refer to 290 mm V Frame, 865A inside-the-delta starter.
- ② U Frame 500A unit does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

Inside-the-Delta Severe Duty Ratings

| Maximum Continuous Motor Line Current | Three-Phase Motor kW Rating (50 Hertz) |          |      | hp Rating (60 Hertz) |        | 230V  |        | 460V  |        | 575V  |        | Catalog Number |
|---------------------------------------|--|----------|------|----------------------|--------|-------|--------|-------|--------|-------|--------|----------------|
|                                       | 230V                                   | 380-400V | 440V | 200V 1.0SF           | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF | 1.0SF | 1.15SF |                |
| <b>Frame Size N</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                |
| 39                                    | 5.5                                    | 10       | 11   | 7-1/2                | 7-1/2  | 10    | 7-1/2  | 25    | 15     | 30    | 25     | S811N37N3D     |
| 73                                    | 11                                     | 18.5     | 22   | 15                   | 15     | 25    | 15     | 50    | 40     | 60    | 50     | S811N66N3D     |
| <b>Frame Size R</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                |
| 111                                   | 15                                     | 30       | 33   | 25                   | 25     | 30    | 25     | 75    | 60     | 75    | 75     | S811R10N3D     |
| 138                                   | 22                                     | 40       | 45   | 40                   | 30     | 50    | 40     | 100   | 75     | 120   | 100    | S811R13N3D     |
| <b>Frame Size T</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                |
| 199                                   | 33                                     | 59       | 63   | 50                   | 50     | 60    | 50     | 125   | 125    | 150   | 150    | S811T18N3D     |
| 257                                   | 45                                     | 80       | 90   | 75                   | 60     | 75    | 75     | 150   | 150    | 250   | 200    | S811T24N3D     |
| 324                                   | 55                                     | 100      | 110  | 100                  | 75     | 100   | 100    | 250   | 200    | 300   | 250    | S811T30N3D     |
| <b>Frame Size U</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                |
| 415                                   | 75                                     | 110      | 147  | 125                  | 100    | 125   | 125    | 300   | 250    | 300   | 300    | S811U36N3D     |
| 526                                   | 90                                     | 160      | 185  | 150                  | 120    | 150   | 150    | 400   | 300    | 450   | 400    | S811U42N3D     |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250   | 200    | 450   | 400    | 550   | 450    | S811U50N3D ①   |
| <b>Frame Size V</b>                   |  |          |      |                      |        |       |        |       |        |       |        |                |
| 415                                   | 75                                     | 110      | 147  | 125                  | 100    | 125   | 125    | 300   | 250    | 300   | 300    | S811V36N3D     |
| 526                                   | 90                                     | 160      | 185  | 150                  | 120    | 150   | 150    | 400   | 300    | 450   | 400    | S811V42N3D     |
| 623                                   | 110                                    | 185      | 220  | 200                  | 150    | 250   | 200    | 450   | 400    | 550   | 450    | S811V50N3D     |
| 727                                   | 129                                    | 220      | 257  | 250                  | 200    | 250   | 250    | 550   | 450    | 700   | 550    | S811V65N3D     |
| 816                                   | 147                                    | 257      | 295  | 250                  | 250    | 300   | 250    | 600   | 550    | 750   | 700    | S811V72N3D     |
| 908                                   | 160                                    | 280      | 335  | 250                  | 250    | 300   | 250    | 700   | 550    | 750   | 700    | S811V85N3D     |
| —                                     | —                                      | —        | —    | —                    | —      | —     | —      | —     | —      | —     | —      | S811V10N3D ②   |

Notes

- ① U Frame 500A unit does not have IEC certification.
- ② For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

## Accessories

## S811 Communicating Soft Starter

## Pump Control Option

| Frame Size | Maximum Current | Catalog Number    | Frame Size | Maximum Current | Catalog Number                 | Frame Size | Maximum Current | Catalog Number    |
|------------|-----------------|-------------------|------------|-----------------|--------------------------------|------------|-----------------|-------------------|
| N          | 37              | <b>S811N37P3S</b> | T          | 180             | <b>S811T18P3S</b>              | V          | 360             | <b>S811V36P3S</b> |
|            | 66              | <b>S811N66P3S</b> |            | 240             | <b>S811T24P3S</b>              |            | 420             | <b>S811V42P3S</b> |
| R          | 105             | <b>S811R10P3S</b> | U          | 304             | <b>S811T30P3S</b>              |            | 500             | <b>S811V50P3S</b> |
|            | 135             | <b>S811R13P3S</b> |            | 360             | <b>S811U36P3S</b>              |            | 650             | <b>S811V65P3S</b> |
|            |                 |                   |            | 420             | <b>S811U42P3S</b>              |            | 720             | <b>S811V72P3S</b> |
|            |                 |                   |            | 180             | <b>S811T18P3S</b>              |            | 850             | <b>S811V85P3S</b> |
|            |                 |                   |            | 500             | <b>S811U50P3S</b> <sup>①</sup> |            | 1000            | <b>S811V10P3S</b> |

## Surge Suppressor

Surge Suppressors <sup>②</sup>

| Description                          | Catalog Number |
|--------------------------------------|----------------|
| 600V MOV for 200 mm and 290 mm units | <b>EMS39</b>   |
| 690V MOV for 200 mm <sup>③</sup>     | <b>EMS41</b>   |

## Lug Kit

Lug Kits <sup>④</sup>

| Frame Size                                   | Frame Designation         | Description                                 | Catalog Number |
|--|---------------------------|---|----------------|
| 200 mm, SSRV                                 | T, U                      | Two cable connections, 4 AWG to 1/0 cable   | <b>EML22</b>   |
|  |                           | One cable connection, 4/0 to 500 MCM cable  | <b>EML23</b>   |
|  |                           | Two cable connections, 4/0 to 500 MCM cable | <b>EML24</b>   |
|  |                           | One cable connection, 2/0 to 300 MCM cable  | <b>EML25</b>   |
|  |                           | Two cable connections, 2/0 to 300 MCM cable | <b>EML26</b>   |
|  |                           | 290 mm, SSRV                                | V              |
| Four cable connections, 4/0 to 500 MCM cable | <b>EML30</b>              |   |                |
| Six cable connections, 4/0 to 500 MCM cable  | <b>EML32</b>              |   |                |
| Four cable connections, 2/0 to 300 MCM cable | <b>EML33</b> <sup>⑤</sup> |   |                |

## Power Supplies

| Description                      | Catalog Number |
|----------------------------------|----------------|
| 115 Vac input; 24 Vdc output     | <b>PSS55A</b>  |
| 230 Vac input; 24 Vdc output     | <b>PSS55B</b>  |
| 380–480 Vac input; 24 Vdc output | <b>PSS55C</b>  |

Digital Interface Module <sup>⑥</sup>

| Description          | Catalog Number |
|----------------------|----------------|
| Blank cover (filler) | <b>EMA68</b>   |
| DIM                  | <b>EMA91</b>   |
| Panel mounting kit—  |                |
| 3 ft cable           | <b>EMA69A</b>  |
| 5 ft cable           | <b>EMA69B</b>  |
| 8 ft cable           | <b>EMA69C</b>  |
| 10 ft cable          | <b>EMA69D</b>  |

## Notes

- ① U Frame 500A unit does not have IEC certification.
- ② 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).
- ③ T Frame only.
- ④ 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.
- ⑤ The EML33 does not have a CSA Listing.
- ⑥ The Digital Interface Module (DIM) is available as a replacement part. 24 Vdc power supply can be used with the S811 SSRV or as a standalone device.

**Product Overview**

**Drives Selection Guide**



| Description            | M-Max Machinery Drives  |      |       | SVX9000 Drives  |      |     |      |      |      |
|------------------------|---|------|-------|---|------|-----|------|------|------|
|                        | Page 124  |      |       | Page 126  |      |     |      |      |      |
| Frame                  |   |      |       |   |      |     |      |      |      |
|                        | FS1   | FS2  | FS3   | FR4   | FR5  | FR6 | FR7  | FR8  | FR9  |
| Dimensions (in Inches) |   |      |       |   |      |     |      |      |      |
| Height                 | 6.16  | 7.68 | 10.33 | 12.9  | 16.5 | 2.2 | 24.8 | 30.1 | 45.3 |
| Width                  | 2.58  | 3.54 | 3.94  | 5   | 5.6  | 7.6 | 9.3  | 11.5 | 18.9 |
| Depth                  | 4.02  | 4.13 | 4.41  | 7.5   | 8.4  | 9.3 | 10.1 | 13.5 | 13.4 |
| I/O                    | Six digital inputs<br>Two analog inputs (V and mA)<br>One analog output<br>One digital output<br>Two relay outputs<br>RS-485 interface (Modbus RTU) |      |       | Six digital inputs<br>Two analog inputs (V and mA)<br>Two digital outputs, form C relays<br>One digital output, open collector<br>One analog output<br>Varied communication options |      |     |      |      |      |

#### M-Max Machinery Drive



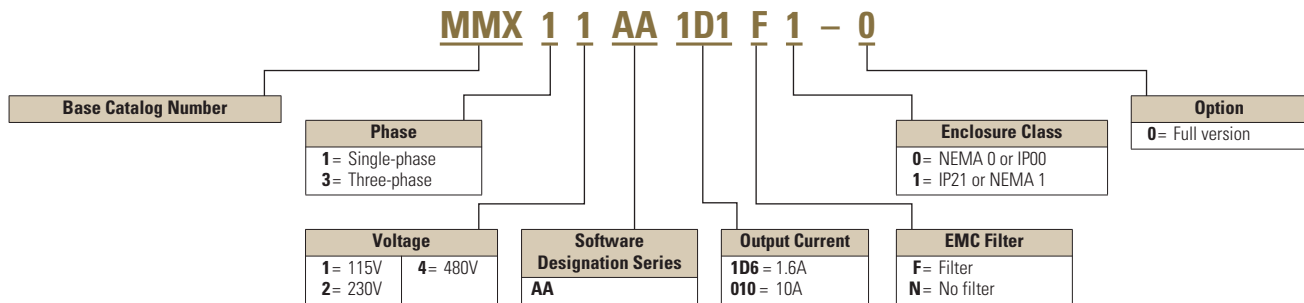
#### Features

- Ease of use—plug and play, start-up wizard, advanced diagnostic capability, copy/paste parameters without powering drive
- Compact, space-saving design
- Availability—short lead-times, stocked at multiple locations
- Aftermarket support organization with industry-leading drive specialists for pre- and post-sale support
- Rugged and reliable—50°C rating, 150% overload for one min., 200% starting current for two secs. in every 20 sec. period, conformal coated boards, two year warranty
- RoHS compliance

#### Catalog Number Selection

##### M-Max™ Machinery Drive

##### Machinery Drive



**Product Selection**

**M-Max Machinery Drive**

| P (kW)                         | P (hp) | I <sub>N</sub> (A)          | Catalog Number |
|--------------------------------|--------|-----------------------------|----------------|
| <b>Input 115V Single-Phase</b> |        | <b>Out 230V Three-Phase</b> |                |
| 0.25                           | 0.33   | 1.7                         | MMX11AA1D7N0-0 |
| 0.37                           | 0.5    | 2.4                         | MMX11AA2D4N0-0 |
| 0.55                           | 0.75   | 2.8                         | MMX11AA2D8N0-0 |
| 0.75                           | 1      | 3.7                         | MMX11AA3D7N0-0 |
| 1.1                            | 1.5    | 4.8                         | MMX11AA4D8F0-0 |
| <b>Input 230V Single-Phase</b> |        | <b>Out 230V Three-Phase</b> |                |
| 0.25                           | 0.33   | 1.7                         | MMX12AA1D7F0-0 |
| 0.37                           | 0.5    | 2.4                         | MMX12AA2D4F0-0 |
| 0.55                           | 0.75   | 2.8                         | MMX12AA2D8F0-0 |
| 0.75                           | 1      | 3.7                         | MMX12AA3D7F0-0 |
| 1.1                            | 1.5    | 4.8                         | MMX12AA4D8F0-0 |
| 1.5                            | 2      | 7                           | MMX12AA7D0F0-0 |
| 2.2                            | 3      | 9.6                         | MMX12AA9D6F0-0 |
| <b>Input 230V Three-Phase</b>  |        | <b>Out 230V Three-Phase</b> |                |
| 0.25                           | 0.33   | 1.7                         | MMX32AA1D7N0-0 |
| 0.37                           | 0.5    | 2.4                         | MMX32AA2D4N0-0 |
| 0.55                           | 0.75   | 2.8                         | MMX32AA2D8N0-0 |
| 0.75                           | 1      | 3.7                         | MMX32AA3D7N0-0 |
| 1.1                            | 1.5    | 4.8                         | MMX32AA4D8F0-0 |
| 1.5                            | 2      | 7                           | MMX32AA7D0F0-0 |
| 2.2                            | 3      | 11                          | MMX32AA011F0-0 |

| P (kW)                        | P (hp) | I <sub>N</sub> (A)          | Catalog Number |
|-------------------------------|--------|-----------------------------|----------------|
| <b>Input 480V Three-Phase</b> |        | <b>Out 480V Three-Phase</b> |                |
| 0.37                          | 0.5    | 1.3                         | MMX34AA1D3F0-0 |
| 0.55                          | 0.75   | 1.9                         | MMX34AA1D9F0-0 |
| 0.75                          | 1      | 2.4                         | MMX34AA2D4F0-0 |
| 1.1                           | 1.5    | 3.3                         | MMX34AA3D3F0-0 |
| 1.5                           | 2      | 4.3                         | MMX34AA4D3F0-0 |
| 2.2                           | 3      | 5.6                         | MMX34AA5D6F0-0 |
| 3                             | 4      | 7.6                         | MMX34AA7D6F0-0 |
| 4                             | 5.5    | 9                           | MMX34AA009F0-0 |
| 5.5                           | 7.5    | 12                          | MMX34AA012F0-0 |
| 7.5                           | 10     | 14                          | MMX34AA014F0-0 |
| <b>Input 575V Three-Phase</b> |        | <b>Out 575V Three-Phase</b> |                |
| 1                             | 1.7    | 2                           | MMX35AA1D7N0-0 |
| 2                             | 2.7    | 3.6                         | MMX35AA2D7N0-0 |
| 3                             | 3.9    | 5                           | MMX35AA3D9N0-0 |
| 5                             | 6.1    | 7.6                         | MMX35AA6D1N0-0 |
| 7.5                           | 9      | 10.4                        | MMX35AA9D0N0-0 |

**Accessories**

**Kits**

| Description                      | Catalog Number |
|----------------------------------|----------------|
| Drive to PC communication module | MMX-COM-PC     |
| Type 1 and IP21 kit for Frame 1  | MMX-IP21-FS1   |
| Type 1 and IP21 kit for Frame 2  | MMX-IP21-FS2   |
| Type 1 and IP21 kit for Frame 3  | MMX-IP21-FS3   |

**Optional Communication Modules**

| Description                                     | Catalog Number |
|---|----------------|
| Communication adapter kit                       | MMX-NET-XA     |
| CANopen network card                            | XXM-NET-CO-A   |
| PROFIBUS DP network card with serial connection | XXM-NET-PS-A   |
| PROFIBUS DP network card with sub-D connection  | XXM-NET-PD-A   |
| DeviceNet network card                          | XXM-NET-DN-A   |

#### SVX9000 Drives



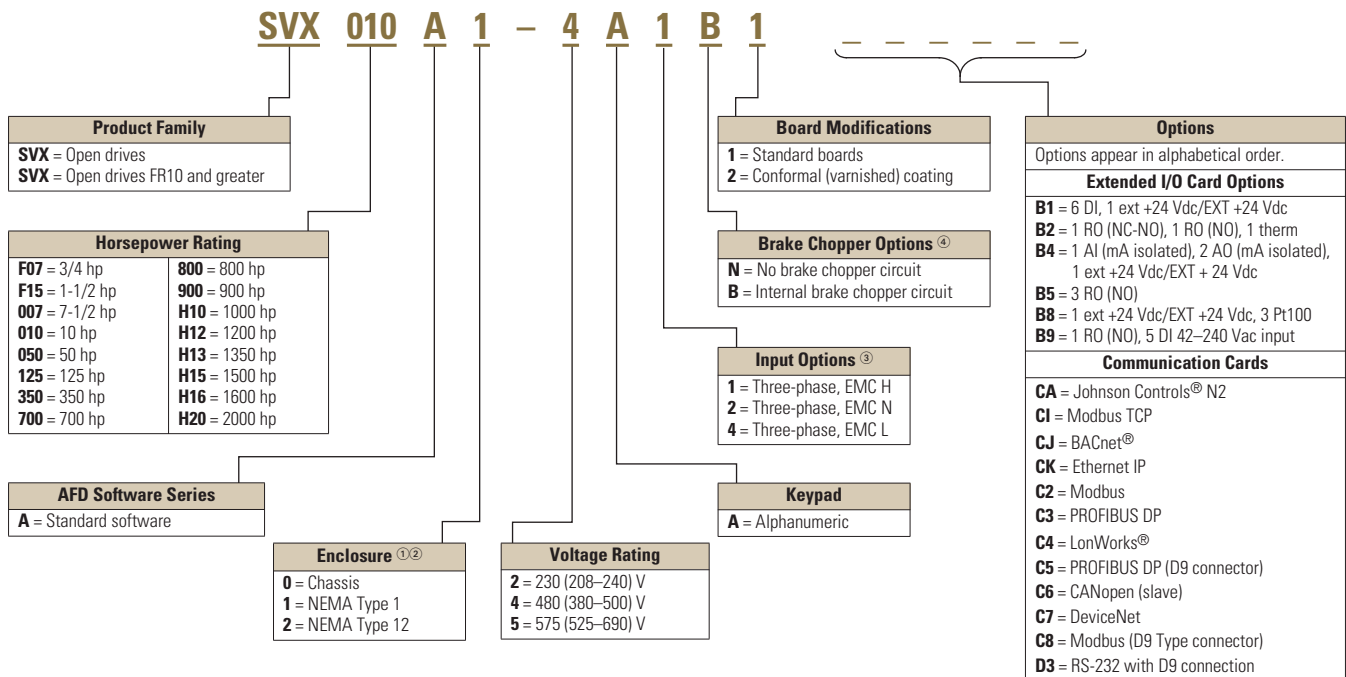
#### Features

- Integrated 3% line reactors standard on drives from FR4 through FR9
- EMI/RFI filters standard up to 200 hp I<sub>H</sub> 480V, 100 hp I<sub>H</sub> 230V
- Quick start wizard built into the programming of the drive ensures a smooth start-up
- LOCAL/REMOTE operation from keypad
- Copy/paste function allows transfer of parameter settings from one drive to the next
- Standard Type 12 keypad on all drives
- Hand-held auxiliary 240V power supply allows programming/monitoring of control module without applying full power to the drive

#### Catalog Number Selection

##### SVX9000 Drives

##### SVX9000



#### Notes

- ① 480V drives 250 hp (IH) and larger are available with enclosure style 0 (chassis); 690V drives 200 hp (IH) and larger are available with enclosure style 0 (chassis).
- ② 480V and 690V FR10 freestanding drives are available with enclosure style 1 (NEMA Type 1) and enclosure style 2 (NEMA Type 12). FR11 freestanding drives only available with enclosure style 1 (NEMA Type 1).
- ③ All 230V drives and 480V drives up to 200 hp (IH) are only available with input option 1 (EMC level H). 480V drives 250 hp (IH) or larger are available with input option 2 (EMC level N). 480V drives are available with input option 4 (EMC level L). 575V drives 200 hp (IH) or larger are only available with input option 2. 575V drives up to 150 hp (IH) are only available with input option 4 (EMC level L).
- ④ 480V drives up to 30 hp (IH) are only available with brake chopper option B. 480V drives 40 hp (IH) or larger come standard with brake chopper option N. 230V drives up to 15 hp (IH) are only available with brake chopper option B. 230V drives 20 hp or larger come standard with brake chopper option N. All 575V drives come standard without brake chopper option (N). N = No brake chopper.



**Product Selection**

**208–240V, Type 1 Drive**

| Frame Size | Delivery Code | hp (I <sub>H</sub> ) | Current (I <sub>H</sub> ) | hp (I <sub>L</sub> ) | Current (I <sub>L</sub> ) | Catalog Number |
|------------|---------------|----------------------|---------------------------|----------------------|---------------------------|----------------|
| FR4        | W             | 3/4                  | 3.7                       | 1                    | 4.8                       | SVXF07A1-2A1B1 |
|            |               | 1                    | 4.8                       | 1-1/2                | 6.6                       | SVX001A1-2A1B1 |
|            |               | 1-1/2                | 6.6                       | 2                    | 7.8                       | SVXF15A1-2A1B1 |
|            |               | 2                    | 7.8                       | 3                    | 11                        | SVX002A1-2A1B1 |
|            |               | 3                    | 11                        | —                    | 12.5                      | SVX003A1-2A1B1 |
| FR5        | W             | —                    | 12.5                      | 5                    | 17.5                      | SVX004A1-2A1B1 |
|            |               | 5                    | 17.5                      | 7-1/2                | 25                        | SVX005A1-2A1B1 |
|            |               | 7-1/2                | 25                        | 10                   | 31                        | SVX007A1-2A1B1 |
| FR6        | W             | 10                   | 31                        | 15                   | 48                        | SVX010A1-2A1B1 |
|            |               | 15                   | 48                        | 20                   | 61                        | SVX015A1-2A1B1 |
| FR7        | W             | 20                   | 61                        | 25                   | 75                        | SVX020A1-2A1N1 |
|            |               | 25                   | 75                        | 30                   | 88                        | SVX025A1-2A1N1 |
|            |               | 30                   | 88                        | 40                   | 114                       | SVX030A1-2A1N1 |
| FR8        | W             | 40                   | 114                       | 50                   | 140                       | SVX040A1-2A1N1 |
|            |               | 50                   | 140                       | 60                   | 170                       | SVX050A1-2A1N1 |
|            |               | 60                   | 170                       | 75                   | 205                       | SVX060A1-2A1N1 |
| FR9        | W             | 75                   | 205                       | 100                  | 261                       | SVX075A1-2A1N1 |
|            |               | 100                  | 261                       | —                    | —                         | SVX100A1-2A1N1 |

**525–690V, Type 1 Drive**

| Frame Size | Delivery Code | hp (I <sub>H</sub> ) | Current (I <sub>H</sub> ) | hp (I <sub>L</sub> ) | Current (I <sub>L</sub> ) | Catalog Number |
|------------|---------------|----------------------|---------------------------|----------------------|---------------------------|----------------|
| FR6        | W             | 2                    | 3.33                      | 3                    | 4.5                       | SVX002A1-5A4N1 |
|            |               | 3                    | 4.5                       | —                    | 5.5                       | SVX003A1-5A4N1 |
|            |               | —                    | 5.5                       | 5                    | 7.5                       | SVX004A1-5A4N1 |
|            |               | 5                    | 7.5                       | 7-1/2                | 10                        | SVX005A1-5A4N1 |
|            |               | 7-1/2                | 10                        | 10                   | 13.5                      | SVX007A1-5A4N1 |
|            |               | 10                   | 13.5                      | 15                   | 18                        | SVX010A1-5A4N1 |
|            |               | 15                   | 18                        | 20                   | 22                        | SVX015A1-5A4N1 |
|            |               | 20                   | 22                        | 25                   | 27                        | SVX020A1-5A4N1 |
|            |               | 25                   | 27                        | 30                   | 34                        | SVX025A1-5A4N1 |
|            |               | FR7                  | W                         | 30                   | 34                        | 40             |
| 40         | 41            |                      |                           | 50                   | 52                        | SVX040A1-5A4N1 |
| FR8        | W             | 50                   | 52                        | 60                   | 62                        | SVX050A1-5A4N1 |
|            |               | 60                   | 62                        | 75                   | 80                        | SVX060A1-5A4N1 |
|            |               | 75                   | 80                        | 100                  | 100                       | SVX075A1-5A4N1 |
| FR9        | W             | 100                  | 100                       | 125                  | 125                       | SVX100A1-5A4N1 |
|            |               | 125                  | 125                       | 150                  | 144                       | SVX125A1-5A4N1 |
|            |               | 150                  | 144                       | —                    | 170                       | SVX150A1-5A4N1 |
|            |               | —                    | 170                       | 200                  | 208                       | SVX175A1-5A4N1 |

**380–500V, Type 1 Drive**

| Frame Size | Delivery Code | hp (I <sub>H</sub> ) | Current (I <sub>H</sub> ) | hp (I <sub>L</sub> ) | Current (I <sub>L</sub> ) | Catalog Number |
|------------|---------------|----------------------|---------------------------|----------------------|---------------------------|----------------|
| FR4        | W             | 1                    | 2.2                       | 1-1/2                | 3.3                       | SVX001A1-4A1B1 |
|            |               | 1-1/2                | 3.3                       | 2                    | 4.3                       | SVXF15A1-4A1B1 |
|            |               | 2                    | 4.3                       | 3                    | 5.6                       | SVX002A1-4A1B1 |
|            |               | 3                    | 5.6                       | 5                    | 7.6                       | SVX003A1-4A1B1 |
|            |               | 5                    | 7.6                       | —                    | 9                         | SVX005A1-4A1B1 |
|            |               | —                    | 9                         | 7-1/2                | 12                        | SVX006A1-4A1B1 |
| FR5        | W             | 7-1/2                | 12                        | 10                   | 16                        | SVX007A1-4A1B1 |
|            |               | 10                   | 16                        | 15                   | 23                        | SVX010A1-4A1B1 |
|            |               | 15                   | 23                        | 20                   | 31                        | SVX015A1-4A1B1 |
| FR6        | W             | 20                   | 31                        | 25                   | 38                        | SVX020A1-4A1B1 |
|            |               | 25                   | 38                        | 30                   | 46                        | SVX025A1-4A1B1 |
|            |               | 30                   | 46                        | 40                   | 61                        | SVX030A1-4A1B1 |
| FR7        | W             | 40                   | 61                        | 50                   | 72                        | SVX040A1-4A1N1 |
|            |               | 50                   | 72                        | 60                   | 87                        | SVX050A1-4A1N1 |
|            |               | 60                   | 87                        | 75                   | 105                       | SVX060A1-4A1N1 |
| FR8        | W             | 75                   | 105                       | 100                  | 140                       | SVX075A1-4A1N1 |
|            |               | 100                  | 140                       | 125                  | 170                       | SVX100A1-4A1N1 |
|            |               | 125                  | 170                       | 150                  | 205                       | SVX125A1-4A1N1 |
| FR9        | W             | 150                  | 205                       | 200                  | 261                       | SVX150A1-4A1N1 |
|            |               | 200                  | 245                       | 250                  | 300                       | SVX200A1-4A1N1 |

## Accessories

## Option Board Kits

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| Option Kit Description <sup>①</sup>   | Allowed Slot Locations <sup>②</sup> | Field Installed Catalog Number | Factory Installed Option Designator | SVX Ready Programs Basic |
|---|-------------------------------------|--------------------------------|-------------------------------------|--------------------------|
| <b>Standard I/O Cards</b>   |                                     |                                |                                     |                          |
| 2 RO (NC/NO)  | B                                   | <b>OPTA2</b>                   | —                                   | X                        |
| 6 DI, 1 DO, 2 AI, 1AO, 1 +10 Vdc Ref, 2 Ext +24 Vdc/Ext +24 Vdc   | A                                   | <b>OPTA9</b>                   | —                                   | X                        |
| <b>Extended I/O Card Options</b>  |                                     |                                |                                     |                          |
| 2 RO, therm—SPX only  | B                                   | <b>OPTA3</b>                   | A3                                  | —                        |
| Encoder low volt +5V/15V/24V—SPX only   | C                                   | <b>OPTA4</b>                   | A4                                  | —                        |
| Encoder high volt +15V/24V—SPX only   | C                                   | <b>OPTA5</b>                   | A5                                  | —                        |
| Double encoder—SPX only   | C                                   | <b>OPTA7</b>                   | A7                                  | X                        |
| 6 DI, 1 DO, 2 AI, 1 AO—SPX only   | A                                   | <b>OPTA8</b>                   | A8                                  | —                        |
| 3 DI (encoder 10–24V), out +15V/+24V, 2 DO (pulse+direction)—SPX only   | C                                   | <b>OPTAE</b>                   | AE                                  | X                        |
| 6 DI, 1 ext +24 Vdc/Ext +24 Vdc   | B, C, <b>D</b> , E                  | <b>OPTB1</b>                   | B1                                  | —                        |
| 1 RO (NC/NO), 1 RO (NO), 1 therm  | B, C, <b>D</b> , E                  | <b>OPTB2</b>                   | B2                                  | —                        |
| 1 AI (mA isolated), 2 AO (mA isolated), 1 Ext +24 Vdc/Ext +24 Vdc   | B, C, <b>D</b> , E                  | <b>OPTB4</b>                   | B4                                  | X                        |
| 3 RO (NO)   | B, C, <b>D</b> , E                  | <b>OPTB5</b>                   | B5                                  | —                        |
| 1 Ext +24 Vdc/Ext +24 Vdc, 3 Pt100  | B, C, <b>D</b> , E                  | <b>OPTB8</b>                   | B8                                  | —                        |
| 1 RO (NO), 5 DI 42–240 Vac input  | B, C, <b>D</b> , E                  | <b>OPTB9</b>                   | B9                                  | —                        |
| <b>Communication Cards</b>  |                                     |                                |                                     |                          |
| Modbus  | D, <b>E</b>                         | <b>OPTC2</b>                   | C2                                  | X                        |
| Johnson Controls N2 <sup>③</sup>  | D, <b>E</b>                         | <b>OPTC2</b>                   | CA                                  | —                        |
| Modbus TCP  | D, <b>E</b>                         | <b>OPTCI</b>                   | CI                                  | X                        |
| BACnet  | D, <b>E</b>                         | <b>OPTCJ</b>                   | CJ                                  | X                        |
| Ethernet IP   | D, <b>E</b>                         | <b>OPTCK</b>                   | CK                                  | X                        |
| PROFIBUS DP   | D, <b>E</b>                         | <b>OPTC3</b>                   | C3                                  | X                        |
| LonWorks  | D, <b>E</b>                         | <b>OPTC4</b>                   | C4                                  | X                        |
| PROFIBUS DP (D9 connector)  | D, <b>E</b>                         | <b>OPTC5</b>                   | C5                                  | X                        |
| DeviceNet   | D, <b>E</b>                         | <b>OPTC7</b>                   | C7                                  | X                        |
| Modbus (D9 type connector)  | D, <b>E</b>                         | <b>OPTC8</b>                   | C8                                  | X                        |
| Adapter—SPX only  | D, <b>E</b>                         | <b>OPTD1</b>                   | D1                                  | X                        |
| Adapter—SPX only  | D, <b>E</b>                         | <b>OPTD2</b>                   | D2                                  | X                        |
| RS-232 with D9 connection   | D, <b>E</b>                         | <b>OPTD3</b>                   | D3                                  | X                        |
| <b>Keypad</b>   |                                     |                                |                                     |                          |
| 9000X series local/remote keypad (replacement keypad)   | —                                   | <b>KEYPAD-LOC/REM</b>          | —                                   | —                        |
| 9000X series remote mount keypad unit (keypad not included, includes 10 ft cable, keypad holder, mounting hardware) | —                                   | <b>OPTRMT-KIT-9000X</b>        | —                                   | —                        |
| 9000X Series RS-232 cable, 13 ft  | —                                   | <b>PP00104</b>                 | —                                   | —                        |

**Notes**

<sup>①</sup> AI = Analog Input; AO = Analog Output, DI = Digital Input, DO = Digital Output, RO = Relay Output.

<sup>②</sup> Option card must be installed in one of the slots listed for that card. Slot indicated in bold is the preferred location.

<sup>③</sup> OPTC2 is a multi-protocol option card.

**Miscellaneous Options**

| Description   | Catalog Number      |
|---|---------------------|
| <p><b>9000XDrive</b><br/>                     A PC-based tool for controlling and monitoring of the SVX9000. Features include: loading parameters that can be saved to a file or printed, setting references, starting and stopping the motor, monitoring signals in graphical or text form, and real-time display. To avoid damage to the drive or computer, SVDriveable must be used.</p> | <b>9000XDRIVE</b>   |
| <p><b>SVDriveable</b><br/>                     6 ft (1.8m) RS-232 cable (22 gauge) with a 7-pin connector on each end. Should be used in conjunction with the 9000XDrive option to avoid damage to the SVX9000 or computer. The same cable can be used for downloading specialized applications to the drive.</p>   | <b>SVDRIVECABLE</b> |

**NEMA Type 12 Conversion Kit**

**Note:** The NEMA Type 12 kit option is used to convert a NEMA Type 1 to a NEMA Type 12 drive. The NEMA Type 12 kit consists of a metal drive shroud, fan kit for some frames, adapter plate and plugs.

| Frame Size | Delivery Code | Approximate Dimensions in Inches (mm) |          |         | Approximate Weight in lb (kg) | Catalog Number   |
|------------|---------------|---------------------------------------|----------|---------|-------------------------------|------------------|
|            |               | Length                                | Width    | Height  |                               |                  |
| FR4        | W             | 13 (330)                              | 7 (178)  | 4 (102) | 4 (1.8)                       | <b>OPTN12FR4</b> |
| FR5        | W             | 16 (406)                              | 8 (203)  | 7 (178) | 5 (2.3)                       | <b>OPTN12FR5</b> |
| FR6        | W             | 21 (533)                              | 10 (254) | 5 (127) | 7 (3.2)                       | <b>OPTN12FR6</b> |