

# Motor Control

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# Higher Power, More Options



*Powering Business Worldwide*

- Smallest and most rugged definite purpose contactors in the market
- Mount using any other manufacturer's mounting plate or on a DIN-Rail
- Compact contactors are globally certified for superior operating performance and life
- A wide variety of accessories is key to solving all your application needs

#### Contactors Product Overview

			
Description	C25 DP Contactors	XT IEC Miniature Contactors	XT IEC Contactors
Page	Page 74	Page 78	Page 80
Type	Definite Purpose	IEC	IEC
Standards and Certifications	UL Recognized, CSA, CE, ARI, RoHS	UL, IEC EN 60947, CE, CSA, RoHS	UL, IEC EN 60947, CE, CSA, RoHS
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

# Motor Control

## Contactors

### CATALOG SELECTION

#### Definite Purpose Contactors — Catalog Numbering System

**C 25 D N A 2 15 A A**

Model
<b>C</b> = Contactor
<b>A</b> = Three-Phase Starter
<b>B</b> = Single-Phase Starter

Type
<b>25</b> = Non-Reversing Contactors
<b>27</b> = Non-Reversing Starters
<b>29</b> = Non-Reversing Starters
<b>65</b> = Reversing Contactors

Contactor Frame Size
<b>A</b> = Compact 1-Pole
<b>B</b> = Compact 2-Pole
<b>C</b> = Compact 1-Pole w/Shunt
<b>D</b> = 15 – 50A, 2- and 3-Pole
<b>E</b> = 25 – 40A, 4-Pole
<b>F</b> = 60 – 75A, 2- and 3-Pole
<b>G</b> = 90A, 2- and 3-Pole
<b>H</b> = 120A, 2- and 3-Pole
<b>K</b> = 200 and 300A, 3-Pole
<b>L</b> = 360A, 3-Pole

For Starters Only
<b>C</b> = Common Control Wiring
<b>S</b> = Separate Control Wiring

Enclosure Type
<b>N</b> = Open with Metal Mounting Plate
<b>R</b> = Open with DIN-Rail Mounting Adapter (2- and 3-Pole, 15 – 50A Contactors Only)
<b>G</b> = NEMA Type 1 Enclosed

Auxiliary Contacts (Side Mount)
<b>A</b> = 1NO Pressure Plate
<b>B</b> = 1NC Pressure Plate
<b>C</b> = 1NO-1NC Pressure Plate
<b>L</b> = 1NO-1NC Snap Switch QC Only
<b>M</b> = 2NO-2NC Snap Switch QC Only

Coil Selection	
<b>A</b> = 110 – 120V ac, 50/60 Hz	<b>R</b> = 12V ac, 50/60 Hz
<b>B</b> = 208 – 240V ac, 50/60 Hz	<b>T</b> = 24V ac, 50/60 Hz
<b>C</b> = 440 – 480V ac, 50/60 Hz	<b>1R</b> = 12V dc
<b>D</b> = 550 – 600V ac, 50/50 Hz	<b>1T</b> = 24V dc
<b>H</b> = 277V ac, 60 Hz	<b>1W</b> = 48V dc
<b>J</b> = 220 – 240 V ac, 50/60 Hz	<b>1A</b> = 120V dc
<b>L</b> = 380 – 415V ac, 50 Hz	

Current Rating	
<b>15</b> = 15A	<b>75</b> = 75A
<b>25</b> = 25A	<b>90</b> = 90A
<b>30</b> = 30A	<b>120</b> = 120A
<b>40</b> = 40A	<b>200</b> = 200A
<b>50</b> = 50A	<b>300</b> = 300A
<b>60</b> = 60A	<b>360</b> = 360A

No. of Poles
<b>1</b> = 1-Pole
<b>2</b> = 2-Pole
<b>3</b> = 3-Pole
<b>4</b> = 4-Pole

Power Terminals
<b>A</b> = Binding Head Screw
<b>B</b> = Binding Head Screw and Quick Connect Terminals (side by side)
<b>C</b> = Screw/Pressure Plate ①
<b>D</b> = Screw/Pressure Plate and Quick Connect Terminals (side by side) ①
<b>E</b> = Box Lugs (Posidrive Setscrew)
<b>F</b> = Box Lugs (Posidrive Setscrew) and Quick Connect Terminals (side by side)
<b>G</b> = Binding Head Screw and Quick Connect Terminals (vertical in-line)
<b>H</b> = Screw/Pressure Plate and Quick Connect ZZ Terminals (vertical in-line) ①
<b>J</b> = Box Lugs (Posidrive Setscrew) and Quick Connect Terminals (vertical in-line)
<b>K</b> = Box Lugs (Hex Socket Allen Head Setscrew)
<b>L</b> = Box Lugs (Hex Socket Allen Head Setscrew) and Quick Connect Terminals (side by side)
<b>M</b> = Box Lugs (Hex Socket Allen Head Setscrew) and Quick Connect Terminals (vertical in-line)

① Not available on 50A devices.

#### Compact Definite Purpose Contactors

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



#### Compact Contactors — Open Type

Ampere Ratings ①					Catalog Number ②
Inductive Full Load	Resistive	Locked Rotor			
		240 – 277V	480V	600V	

##### Single-Pole

30	40	150	75	50	C25ANB130_
40	50	240	200	160	C25ANB140_

##### Single-Pole with Shunt

30	40	150	75	50	C25CNB130_
40	50	240	200	160	C25CNB140_

##### Double-Pole

25	35	150	125	100	C25BNB225_
30	40	150	125	100	C25BNB230_
40	50	240	200	160	C25BNB240_

① Rating per pole.

② Replace underscore ( \_ ) in catalog number with coil suffix letter from table below.

#### Magnet Coil Selection

AC Coil Voltage 50/60 Hz	Coil Suffix
24	T
110 – 120	A
208 – 240	B

# Motor Control

## Contactors

### PRODUCT SELECTION

#### 50 mm C25 Definite Purpose Contactors

- 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



#### C25 Contactors — Open Type

Rating, Amperes				Maximum Motor Horsepower		Open Type with Metal Mounting Plate	Open Type with DIN-Rail Adapter
Inductive Full Load	Resistive per Pole	Line Voltage	Locked Rotor	1-Phase	3-Phase	Catalog Number ①②	Catalog Number ①②
15	20	230	90	2	3	C25DND315_	C25DRD315_
		460	75	—	5		
		575	60	—	5		
25	35	230	150	3	7-1/2	C25DND325_ C25END425_	C25DRD325_
		460	125	—	10		
		575	100	—	10		
30	40	230	180	5	10	C25DND330_ C25END430_	C25DRD330_
		460	150	—	15		
		575	120	—	15		
40	50	230	240	7-1/2	10	C25DNF340_ C25ENF440_	C25DRF3340_
		460	200	—	20		
		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		

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

#### Magnet Coil Selection

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

### 50 mm C25 Definite Purpose Contactors

#### Reversing and 2-Speed Contactors — Open Type — Unwired, Mechanically Interlocked Only

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

① Replace underscore (\_) with magnet coil suffix from table below.

#### Magnet Coil Selection

Volts		Coil Suffix ①
60 Hz	50 Hz	
24	24	<b>T</b>
110 – 120 ②	110 – 120 ②	<b>A</b>
208 – 240 ③	208 – 240	<b>B</b>

① Class H AC coils available as option for 15A – 50A contactor. Add 2 before AC coil suffix letter.

② 104 – 120V 50/60 Hz for 60A, 75A.

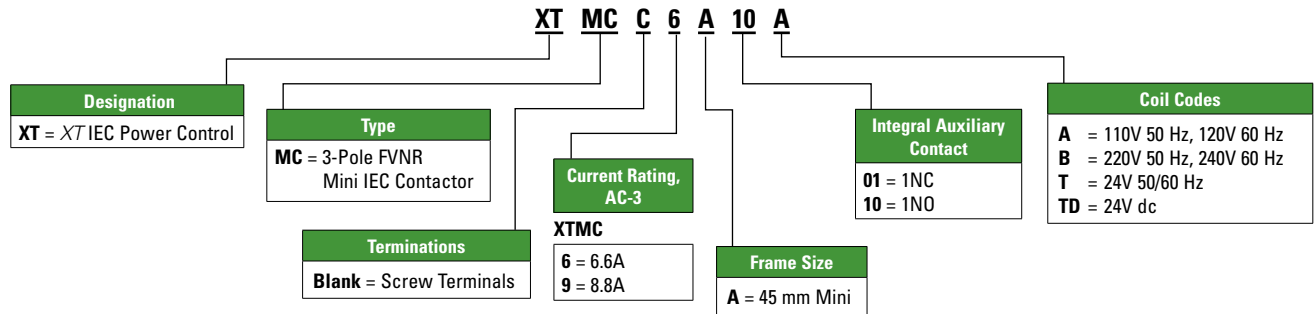
③ Available through 50A.

# Motor Control

## Contactors

### CATALOG SELECTION / PRODUCT SELECTION

#### XT IEC Miniature Contactors — Catalog Numbering System



#### XT IEC Miniature Contactors

- Reversing or non-reversing
- 3- and 4-pole configurations
  - 3-pole XTMC
  - 4-pole XTMF
- Panel or DIN-Rail mounting
- IP20 finger and back-of-hand proof
- Direct mount with XTOM Miniature Overload Relays



#### 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				Maximum 3-Phase Motor Rating							No. of Power Poles	Aux. Contacts	Catalog Number — Screw Terminals ①	
		3-Phase Motors 50 – 60 Hz				1-Phase Horsepower Ratings			3-Phase Horsepower Ratings							
		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	3	1NO	XTMC6A10_
6.6	20	1.5	3	3	3	1/4	3/4	1	1-1/2	2	3	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_	

① Underscore ( ) indicates magnet coil suffix required. See table below.

#### 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
24V dc	TD ①
415V 50 Hz, 480V 60 Hz	C
550V 50 Hz, 600V 60 Hz	D
208V 60 Hz	E





① With DC Operation: Integrated diode resistor combination, coil rating 2.6W.

#### Note: 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.

#### XT IEC Miniature Contactors

##### Front Mount Auxiliary Contacts

Conventional Free Air Thermal Current, $I_{th} = I_e$ , 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>

##### Accessories

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> ②
Connector — For mechanically arranging contactors and timing relays in combinations	50	<b>XTMCXCN</b> ①

① 0 mm distance between contactors.

② Reversing Link Kit does not include mechanical interlock.

**Note:** 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.

# Motor Control

## Contactors

### CATALOG SELECTION

#### XT IEC Contactors — Catalog Numbering System

**XT CE 007 B 01 A**

**Designation**  
**XT** = XT Line of IEC Control

**Type**  
**CE** = 3-Pole FVNR IEC Contactor  
**CS** = 3-Pole FVNR S Series IEC Contactor

Current Ratings, AC-3	
<b>007</b> = 7A	<b>185</b> = 185A
<b>009</b> = 9A	<b>225</b> = 225A
<b>012</b> = 12A	<b>250</b> = 250A
<b>015</b> = 15A	<b>300</b> = 300A
<b>018</b> = 18A	<b>400</b> = 400A
<b>025</b> = 25A	<b>500</b> = 500A
<b>032</b> = 32A	<b>570</b> = 580A
<b>040</b> = 40A	<b>580</b> = 580A
<b>050</b> = 50A	<b>650</b> = 650A
<b>065</b> = 65A	<b>750</b> = 750A
<b>072</b> = 72A	<b>820</b> = 820A
<b>080</b> = 80A	<b>C10</b> = 1000A
<b>095</b> = 95A	<b>C14</b> = 1400A, AC-1
<b>115</b> = 115A	<b>C16</b> = 1600A, AC-3
<b>150</b> = 150A	<b>C20</b> = 2000A, AC-1
<b>170</b> = 170A	

Frame Size Designation	
<b>B</b> = 45 mm	<b>L</b> = 140 mm
<b>C</b> = 45 mm	<b>M</b> = 160 mm
<b>D</b> = 55 mm	<b>N</b> = 250 mm
<b>F</b> = 90 mm	<b>P</b> = 260 mm
<b>G</b> = 90 mm	<b>R</b> = 515 mm

Built-In Auxiliary Contact	
<b>01</b> = 1NC	<b>00</b> = 0NO-0NC
<b>10</b> = 1NO	<b>22</b> = 2NO-2NC

**Coil Codes**  
 See Page 83.

#### XT IEC Contactors

- 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



#### Full Voltage Non-Reversing 3-Pole Contactors, Frame B – Frame G

UL/CSA Ratings								IEC Ratings							Aux. Contacts	Catalog Number — Screw Terminals ①②
UL General Purpose Amp Rating	1-Phase hp Ratings			3-Phase hp Ratings				AC-3 I <sub>e</sub> (A)	AC-1 (40°C) I <sub>e</sub> = I <sub>th</sub> (A)	Maximum kW Ratings AC-3 3-Phase Motors 50 – 60 Hz						
	115V	200V	230V	200V	230V	460V	575V			220/230V	380/400V	415V	660/690V			

#### Frame 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 ③	10	12	20	3.5	5.5	7	6.5	1NO	XTCE012B10_
20	1	2	2	3	3	10 ③	10	12	20	3.5	5.5	7	6.5	1NC	XTCE012B01_
20	1	2	3	5	5	10 ③	10	15.5	20	4	7.5	8	7	1NO	XTCE015B10_
20	1	2	3	5	5	10 ③	10	15.5	20	4	7.5	8	7	1NC	XTCE015B01_

#### Frame C

40	2	2	3	5	5	10 ③	15	18	35	5	7.5	10	11	1NO	XTCE018C10_
40	2	2	3	5	5	10 ③	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_

#### Frame D

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_

#### Frame F

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	110	95	110	30	45	57	75	—	XTCE095F00_

#### Frame G

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 ⑤	10	25	30	40	60	125	125	170	275 ④	52	90	100	96	—	XTCE170G00_

① Underscore (\_) indicates magnet coil suffix required. See Page 83.

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 Tab 34 of the Control Products Catalog (CA08102001E).

④ For 225 – 275A, use 2 x 70 mm<sup>2</sup> wire.

⑤ For 180 – 225A, use 2 x 3/0 AWG wire.

**Note:** 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. 6 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. Frame B – C contactors with 1NC built-in auxiliary are mirror contacts (XTCE...B01\_ – XTCE...C01\_).

# Motor Control

## Contactors

### PRODUCT SELECTION

#### XT IEC Contactors

#### Full Voltage Non-Reversing 3-Pole Contactors, Frame L – Frame R

UL/CSA Ratings					IEC Ratings							Aux. Contacts	Catalog Number ①
UL General Purpose Amp Rating	3-Phase hp Ratings				AC-3 I <sub>e</sub> (A)	AC-1 (40°C) I <sub>e</sub> = I <sub>th</sub> (A)	Maximum kW Ratings AC-3						
	200V	230V	460V	575V			3-Phase Motors 50 – 60 Hz						
							220/230V	380/400V	415V	660/690V ②	1000V ②		

#### Frame L — Standard Coil (110/120V, 230/240V ac Coil Only)

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_

#### Frame L — Electronic Coil

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_

#### Frame M — Standard Coil (110/120V, 230/240V ac Coil Only)

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_

#### Frame M — Electronic Coil

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_

#### Frame N — Electronic Coil

630	200	200	400	600	580	980	185	315	348	560	600	2NO-2NC	XTCE580N22_ ③
700	200	250	500	600	650	1041	205	355	390	630	600	2NO-2NC	XTCE650N22_ ③
800	250	300	600	700	750	1102	240	400	455	720	800	2NO-2NC	XTCE750N22_ ③
850	290	350	700	860	820	1225	260	450	500	750	800	2NO-2NC	XTCE820N22_ ③
1100	350	420	850	980	1000	1225	315	560	610	1000	1000	2NO-2NC	XTCE10N22_ ③

#### Frame P — Electronic Coil

1400	—	—	—	—	—	1714	—	—	—	—	—	2NO-2NC	XTCEC14P22_ ③
------	---	---	---	---	---	------	---	---	---	---	---	---------	---------------

#### Frame R — Electronic Coil

1600	560	640	1200	1300	1600	2200	500	900	900	1600	1700	2NO-2NC	XTCEC16R22_ ③
2000	—	—	—	—	—	2450	—	—	—	—	—	2NO-2NC	XTCEC20R22_ ③

① Underscore ( ) indicates magnet coil suffix required. See Page 83.

② For 185 – 500A contactors at 660/690V or 1000V: Do not reverse directly.

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.

#### 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

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

#### Full Voltage Non-Reversing 3-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	

#### XT IEC Contactors

##### Magnet Coil Suffix

Coil Voltage	Suffix Code
<b>Frame 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>
24V dc	<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>

##### Frame G

100 – 120V 50/60 Hz	<b>A</b>
190 – 240V 50/60 Hz	<b>B</b>
24V 50/60 Hz	<b>T</b>
24 – 27V dc	<b>TD</b>
480 – 500V 50/60 Hz	<b>C</b>

##### Magnet Coil Suffix (Continued)

Coil Voltage	Suffix Code
<b>Frame L – N</b>	
110 – 250V 40 – 60 Hz/DC	<b>A</b>
250 – 500V 40 – 60 Hz	<b>C</b>
24 – 48V dc	<b>TD</b>

##### Frame L – M, S-Series

110 – 120V 50/60 Hz	<b>A</b>
220 – 240V 50/60 Hz	<b>B</b>

##### Frame P – R

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>

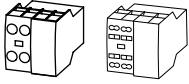


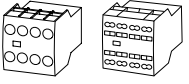


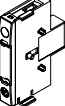


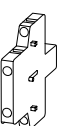




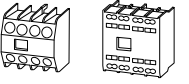


# Motor Control

## Contactors

### PRODUCT SELECTION

#### XT IEC Contactors

#### Auxiliary Contacts

	Conventional Thermal Current, Open at 60°C $I_{th} = I_{e'}$ AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Catalog Number — Screw Terminals
<b>Frame B – C — Front (Top) Mount</b>						
	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 — Side Mount ①</b>						
	16	1	1NO		1	<b>XTCEXSAB10</b>
	16	1	1NC		1	<b>XTCEXSAB01</b>
<b>Frame C — Side Mount</b>						
	10	2	1NO-1NC		1	<b>XTCEXSCC11 ①</b>
<b>Frame D — G</b>						
	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>

① Can be mounted to the left side of contactor only. Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

**Note:** 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 XTCE007B... – XTCE032C... 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.

#### XT IEC Contactors

#### Side Mount Auxiliary Contacts for Frame D – R, 40 – 2000A

Conventional Free Air Thermal Current, $I_{th} = I_c$ , AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Catalog Number — Screw Terminals
--	-------	-----------------------	----------------	-----------	----------------------------------

#### Frame D – R

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

#### Frame D – R (Screw Mount)

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

**Note:** For Frames B – C, cannot use both a side AND a top mount auxiliary contact at the same time.  
 For Frame D, 6 auxiliary contacts maximum (can be a combination of side and top mount units)  
 For Frames F – R, 8 auxiliary contacts maximum (can be a combination of side and top mount units)

#### Accessories

For Use with...	Pkg. Qty.	Catalog Number
-----------------	-----------	----------------

#### Mechanical Interlock ①

	XTCE007B – XTCE015B, XTCE020B	5	<b>XTCEXMLB</b>
	XTCE018C – XTCE032C XTCE032C – XTCE045C XTCE040D – XTCE072D	1	<b>XTCEXMLC</b>
	XTCE063D – XTCE080D	1	<b>XTCEXMLD</b>
	XTCE080F – XTCE170G XTCE125G – XTCE200G	1	<b>XTCEXMLG ②</b>
	XTCE185L – XTCE570M	1	<b>XTCEXMLM</b>
	XTCE580N – XTCEC10N	1	<b>XTCEXMLN ②</b>
	XTCE500M – XTCE570M with XTCE500N – XTCEC10N	1	<b>XTCEXMLNM ②</b>

#### Reversing Link Kits

	XTCE007B – XTCE015B	1	<b>XTCEXRLB ③</b>
	XTCE018C – XTCE032C	1	<b>XTCEXRLC</b>
	XTCE040D – XTCE065D	1	<b>XTCEXRLD</b>
	XTCE080F – XTCE150G	1	<b>XTCEXR LG</b>
	XTCE185L – XTCE250L	1	<b>XTCEXRLL</b>
	XTCE300M – XTCE400M	1	<b>XTCEXR LM400</b>

① For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B – G frames, mechanical lifespan is  $2.5 \times 10^6$  operations and the distance between contactors is 0 mm. For L – N frames, mechanical lifespan is  $5 \times 10^6$  operations and no auxiliary contact can be mounted between the mechanical interlock and the contactor — the distance between contactors is 15 mm.

② XTCEXMLG, XTCEXMLN and XTCEXMLNM consist of an interlock element and mounting plate.

③ Also includes Interlocking Bridge (XTCEXLBB). The following control cables are integrated for electrical interlock: K1M: A1 – K2M: 21; K1M: 21 – K2M: A1; K1M: A2 – K2M: A2.

# Less System Stress, Longer Life






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- Sophisticated solid-state overload protection maximizes the uptime of your machine

### Soft Starters Product Overview

			
<b>Description</b>	<b>Torque Limiter</b>	<b>S701</b>	<b>S801</b>
<b>Page</b>	Page 89	Page 90	Page 92

#### Power

Current Range (A)	Up to 25	Up to 25 and up to 30 with Bypass	37-1000
Phases	3-Phase and 1-Phase Motors	2-Phase Control	3
Input Voltage (Line Voltage)	Up to 600V	Up to 600V	0-600V; 690V on V and T Frame
Horsepower Range	Up to 20 hp	Up to 25 hp	230V: 10 – 400 hp; 20 – 800 hp 460V: 575V:30 – 1000 hp
Internal Run-Bypass	—	Can Have Bypass with Auxiliary Contact	Yes
Inside-the-Delta Control	—	—	Yes

#### Control

User Interface	Non-Digital Interface	Non-Digital Interface	DIP Switches and Rotary Dials
Control Voltage	—	24 – 300 ac/dc	24V dc
Communications	—	—	—
Program Relays	—	—	—

#### Soft Start

Voltage Ramp Initial Current	5 – 85% LRT	5 – 85% LRT	5 – 85% LRT
Voltage Ramp Time	0.5 – 5 sec.	0.5 – 20 sec.	0.5 – 180 sec.
Current Limit	—	—	5 – 85% LRT
Current Limit Time	—	—	0.5-180 sec.
Kick Start Current	—	0 – 85% LRT	5 – 85% LRT
Kick Start Time	—	0 – 200 ms	0 – 2 sec.
Jog	—	—	Yes

#### Soft Stop

Stop Ramp Time	—	0 – 20 sec.	0 – 60 sec.
Electronic DC Injection Braking	—	Yes	—
Preset Slow Speed	—	—	—
Pump Control	—	—	Optional

#### Environmental

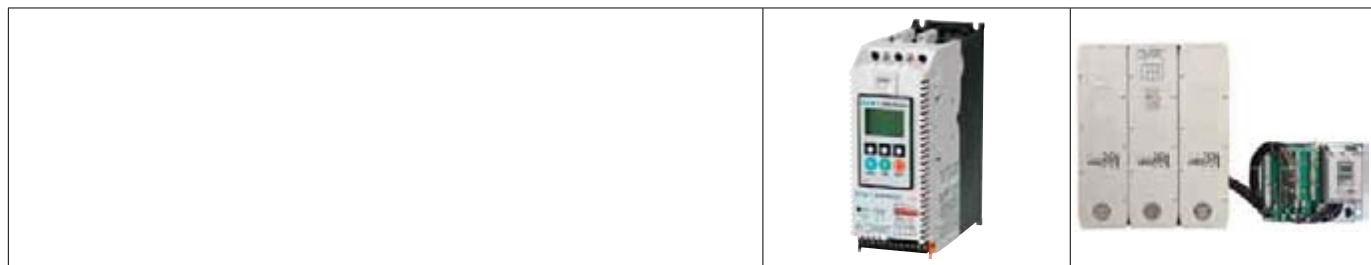
Operating Temperature °C	-30 to +40°C	-30 to +40°C	-30 to +50°C
Humidity	0 – 95% Non-condensing	0 – 95% Non-Condensing	0 – 95% Non-Condensing
Altitude	< 2000M	< 2000M	< 2000M

# Motor Control

## Soft Starters

### PRODUCT OVERVIEW

#### Soft Starters Product Overview (Continued)



Description	S811	MV811
Page	Page 98	Page 105

#### Power

Current Range (A)	37 – 1000	37 – 420
Phases	3	3
Input Voltage (Line Voltage)	0 – 600V; 690V on V and T Frame	2.5 kV, 5 kV, 7.2 kV
Horsepower Range	230V: 10 – 400 hp; 20 – 800 hp 460V: 575V:30 – 1000 hp	5000 hp
Internal Run-Bypass	Yes	Yes
Inside-the-Delta Control	Yes	—

#### Control

User Interface	LCD and Keypad	LCD and Keypad
Control Voltage	24V dc	24V dc
Communications	EtherNet/IP; Ethernet Modbus; Serial Modbus; PROFIBUS DP	EtherNet/IP; Ethernet Modbus; Serial Modbus; PROFIBUS DP
Program Relays	Yes	Yes

#### Soft Start

Voltage Ramp Initial Current	5 – 85% LRT	5 – 85% LRT
Voltage Ramp Time	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	5 – 85% LRT	5 – 85% LRT
Kick Start Time	0 – 2 sec.	0 – 2 sec.
Jog	Yes	Yes

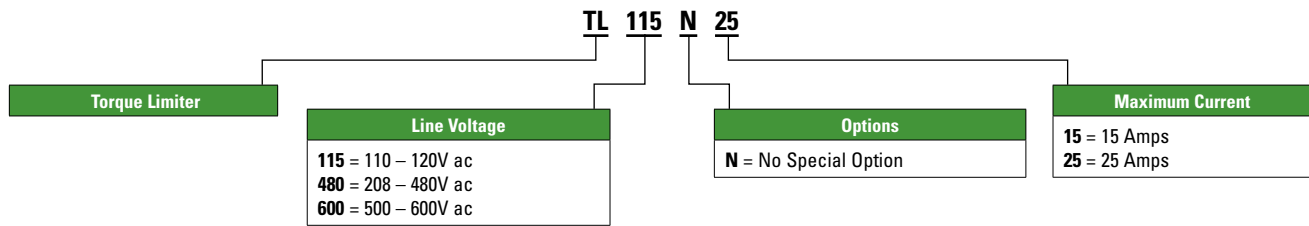
#### Soft Stop

Stop Ramp Time	0 – 60 sec.	0 – 60 sec.
Electronic DC Injection Braking	—	—
Preset Slow Speed	—	—
Pump Control	Optional	Optional

#### Environmental

Operating Temperature °C	-30 to +50°C	-30 to +40°C
Humidity	0 – 95% Non-Condensing	0 – 95% Non-Condensing
Altitude	< 2000M	< 2000M

#### TL Torque Limiter — Catalog Numbering System



#### TL Torque Limiter

- Rated operational voltage up to 600V ac
- Adjustable ramp times (0.5 – 5 seconds)
- Adjustable initial torque control (0 – 85%)
- Unlimited number of START/STOP operations per hour
- IP20 finger protection



#### TL Torque Limiter

Max. Current	Line Voltage	kW Rating (50 Hertz)				Horsepower Rating								Catalog Number
		110/120V	230V	380 – 400V	440V	200V		230V		460V		575V		
						1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	

#### 1-Phase Motor — 115V Versions

15	110 – 120	0.5	N/A	N/A	N/A	3/4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TL115N15
25	110 – 120	1.5	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	TL115N25

#### 3-Phase Motor

15	208 – 480	N/A	4	5.5	7.5	N/A	3	3	3	3	10	7-1/2	N/A	N/A	TL480N15
15	500 – 600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	10	TL600N15
25	208 – 480	N/A	7.5	12.5	12.5	N/A	5	5	7-1/2	5	15	15	N/A	N/A	TL480N25
25	500 – 600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	20	TL600N25

#### 1-Phase Motor

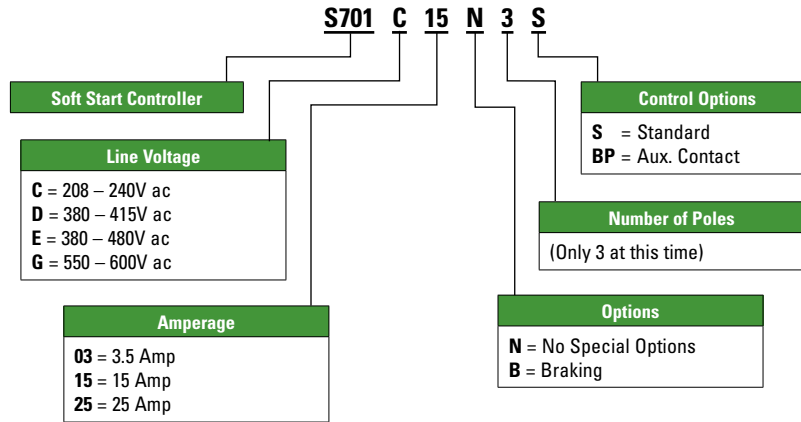
15	208 – 240	N/A	2.2	N/A	N/A	N/A	2	2	3	3	N/A	N/A	N/A	N/A	TL480N15
15	380 – 480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	5	N/A	N/A	N/A	TL480N15
25	208 – 240	N/A	4	7.5	N/A	N/A	3	3	5	5	N/A	N/A	N/A	N/A	TL480N25
25	380 – 480	N/A	N/A	7.5	N/A	N/A	N/A	N/A	N/A	10	10	N/A	N/A	N/A	TL480N25

# Motor Control

## Soft Starters

### CATALOG SELECTION / PRODUCT SELECTION

#### S701 Soft Start Controller — Catalog Numbering System



#### S701 Soft Start Controller

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



#### Soft Start Controllers

Max. Current	Line Voltage	Control Voltage (V ac/V dc)	3-Phase Motor											Catalog Number
			kW Rating (50 Hertz)			Horsepower Rating (60 Hertz)								
			230V	380 – 400V	440V	200V		230V		460V		575V		
						1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	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	S701C03N3S
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	S701D03N3S
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	S701E03N3S
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	S701G03N3S
15	208 – 240	24 – 240	4	N/A	N/A	3	3	3	3	N/A	N/A	N/A	N/A	S701C15N3S
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	S701E15N3S
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	S701G15N3S
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	S701C25N3S
25	380 – 480	24 – 300	N/A	11	12.5	N/A	N/A	N/A	N/A	15	15	N/A	N/A	S701E25N3S
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	S701G25N3S

## 5701 Soft Start Controller

### Soft Start Controller with Auxiliary Contact

Max. Current	Line Voltage	Control Voltage (V ac/V dc)	3-Phase Motor											Catalog Number
			kW Rating (50 Hertz)			Horsepower Rating								
						200V		230V		460V		575V		
			230V	380 – 400V	440V	1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	

#### Ratings without Bypass

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	S701C25N3BP
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	S701E25N3BP
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	S701G25N3BP

#### Ratings with Bypass

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	S701C25N3BP
30	380 – 480	24 – 300	N/A	15	15	N/A	N/A	N/A	N/A	20	15	N/A	N/A	S701E25N3BP
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	S701G25N3BP

### Soft Start Controller with Brake

Max. Current	Line Voltage	Control Voltage (V ac/V dc)	3-Phase Motor											Catalog Number
			kW Rating (50 Hertz)			Horsepower Rating								
						200V		230V		460V		575V		
			230V	380 – 400V	440V	1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	1.0 SF	1.15 SF	

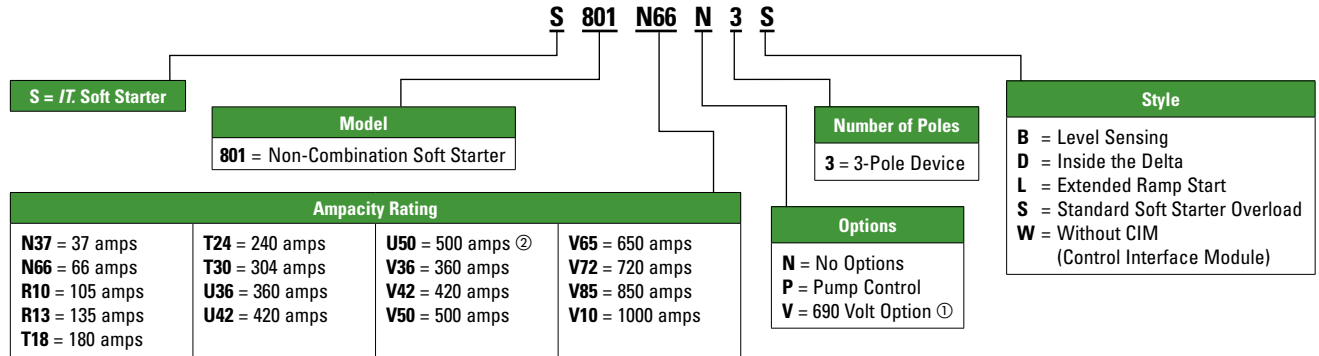
25	208 – 240	24 – 240	5.5	N/A	N/A	5	5	7-1/2	5	N/A	N/A	N/A	N/A	S701C25B3S
25	380 – 480	24 – 300	N/A	12.5	12.5	N/A	N/A	N/A	N/A	15	15	N/A	N/A	S701E25B3S

# Motor Control

## Soft Starters

### CATALOG SELECTION

#### S801 Soft Starter — Catalog Numbering System



① Not available on U-Frame.

② U-Frame 500 Amp unit does not have IEC Certification.

### S801 Soft Starter

- 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



### Standard Duty Ratings

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

**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.

### Standard Duty Rated Open Soft Starters

Max. Current	3-Phase Motor											Catalog Number ①
	kW Rating (50 Hertz)			hp Rating (60 Hertz)								
	230 Volt	380 – 400 Volt	440 Volt	200V		230V		460V		575V		
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF		

#### Frame Size N

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>

#### Frame Size R

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>

#### Frame Size T

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>

#### Frame Size U

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

#### Frame Size V

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

① For 2-wire (level sensing) control, change the last digit from S to 2.

② 15 sec. start, 300% inrush, 40°C, 1 start every 15 minutes. If these start parameters are exceeded, please refer to 290 mm V-Frame, 500A starter.

③ U-Frame 500 Amp does not have IEC Certification.

④ For more information on optimum performance of the 1000A Frame Size V S801, see Appendix C of MN03902008E.

# Motor Control

## Soft Starters

### PRODUCT SELECTION

#### S801 Soft Starter

##### Severe Duty Ratings

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

**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 4, or the current limit set is over 300%. Example: 35-Second Ramp, 5 Starts per Hour, 350% Current Limit @ 40°C Ambient.

##### Severe Duty Rated Open Soft Starters

Max. Current	3-Phase Motor											Catalog Number ①
	kW Rating (50 Hertz)			hp Rating (60 Hertz)								
	230	380 – 400	440	200V		230V		460V		575V		
	Volt	Volt	Volt	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	

##### Frame Size N

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

##### Frame Size R

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

##### Frame Size T

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

##### Frame Size U

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

##### Frame Size V

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

① For 2-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.

## S801 Soft Starter

### 15-Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C Ambient, Inside-the-Delta Ratings

Max. Continuous Motor Line Current	3-Phase Motor											Catalog Number
	kW Rating (50 Hertz)			hp Rating (60 Hertz)								
	230	380 – 400	440	200V		230V		460V		575V		
	Volt	Volt	Volt	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	

#### Frame Size N

65	10	18.5	18.5	15	15	15	15	40	30	50	50	S801N37N3D S801N66N3D
114	18.5	30	37	30	25	30	30	75	60	100	75	

#### Frame Size R

182	30	55	59	50	40	60	50	125	100	150	125	S801R10N3D S801R13N3D
234	40	63	80	60	50	75	60	150	125	200	150	

#### Frame Size T

311	51	90	110	100	75	100	100	250	200	250	250	S801T18N3D S801T24N3D S801T30N3D
415	75	110	147	125	100	125	125	300	250	300	300	
526	90	160	185	150	125	150	150	400	300	400	400	

#### Frame Size U

623	110	185	220	200	150	250	200	450	400	550	450	S801U36N3D S801U42N3D S801U50N3D ①②
727	129	220	257	250	200	300	250	550	450	700	550	
865	150	257	300	250	250	300	250	600	550	750	700	

#### Frame Size V

623	110	185	220	200	150	250	200	450	400	550	450	S801V36N3D S801V42N3D S801V50N3D S801V65N3D S801V72N3D S801V85N3D S801V10N3D ③
727	129	220	257	250	200	300	250	550	450	700	550	
865	150	257	300	250	250	300	250	600	550	750	700	
1125	200	355	425	400	300	400	300	750	700	900	750	
1246	—	—	—	—	—	—	—	—	—	—	—	
1471	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	

① 15-sec. start, 300% inrush, 40°C, 1 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.

# Motor Control

## Soft Starters

### PRODUCT SELECTION

#### S801 Soft Starter

#### Severe Duty Inside-the-Delta Ratings

Max. Continuous Motor Line Current	3-Phase Motor											Catalog Number
	kW Rating (50 Hertz)			hp Rating (60 Hertz)								
	230	380 – 400	440	200V		230V		460V		575V		
	Volt	Volt	Volt	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	

#### Frame Size N

39	5.5	10	11	7-1/2	7-1/2	10	7-1/2	25	15	30	25	S801N37N3D S801N66N3D
73	11	18.5	22	15	15	25	15	50	40	60	50	

#### Frame Size R

111	15	30	33	25	25	30	25	75	60	75	75	S801R10N3D S801R13N3D
138	22	40	45	40	30	50	40	100	75	120	100	

#### Frame Size T

199	33	59	63	50	50	60	50	125	125	150	150	S801T18N3D S801T24N3D S801T30N3D
257	45	80	90	75	60	75	75	150	150	250	200	
324	55	100	110	100	75	100	100	250	200	300	250	

#### Frame Size U

415	75	110	147	125	100	125	125	300	250	300	300	S801U36N3D S801U42N3D S801U50N3D ①
526	90	160	185	150	120	150	150	400	300	450	400	
623	110	185	220	200	150	250	200	450	400	550	450	

#### Frame Size V

415	75	110	147	125	100	125	125	300	250	300	300	S801V36N3D S801V42N3D S801V50N3D S801V65N3D S801V72N3D S801V85N3D S801V10N3D ②
526	90	160	185	150	120	150	150	400	300	450	400	
623	110	185	220	200	150	250	200	450	400	550	450	
727	129	220	257	250	200	250	250	550	450	700	550	
816	147	257	295	250	250	300	250	600	550	750	700	
908	160	280	335	250	250	300	250	700	550	750	700	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	

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.


### S801 Soft Starter — Accessories

#### Pump Control Option

Frame Size	Max. Current	Catalog Number
N	37	S801N37P3S S801N66P3S
	66	
R	105	S801R10P3S S801R13P3S
	135	
T	180	S801T18P3S S801T24P3S S801T30P3S
	240	
	304	
	360	
U	360	S801U36P3S S801U42P3S S801U50P3S ①
	420	
	500	
	500	
V	360	S801V36P3S S801V42P3S S801V50P3S S801V65P3S
	420	
	500	
	650	
	720	
	850 1000	

① U-Frame 500A unit does not have IEC Certification.


#### Surge Suppressors

	Description	Catalog Number
	600V MOV for 65 mm and 110 mm Units	EMS38
	600V MOV for 200 mm and 290 mm Units	EMS39
	690V MOV for 200 mm and 290 mm Units ①	EMS41

① T-Frame only.

**Note:** 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).

#### Lug Kits

	Frame Size	Frame Designation	Description	Catalog Number
	200 mm SSRV	T, U	2 Cable Connections, 4 AWG to 1/0 Cable	EML22
			1 Cable Connection, 4/0 to 500 MCM Cable	EML23
	290 mm SSRV	V	2 Cable Connections, 4/0 to 500 MCM Cable	EML24
			1 Cable Connection, 2/0 to 300 MCM Cable	EML25
			2 Cable Connections, 2/0 to 300 MCM Cable	EML26
			2 Cable Connections, 4/0 to 500 MCM Cable	EML28
			4 Cable Connections, 4/0 to 500 MCM Cable	EML30
			6 Cable Connections, 4/0 to 500 MCM Cable	EML32
4 Cable Connections, 2/0 to 300 MCM Cable	EML33 ①			

① The EML33 does not have a CSA Listing.

**Note:** 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.

#### Power Supplies

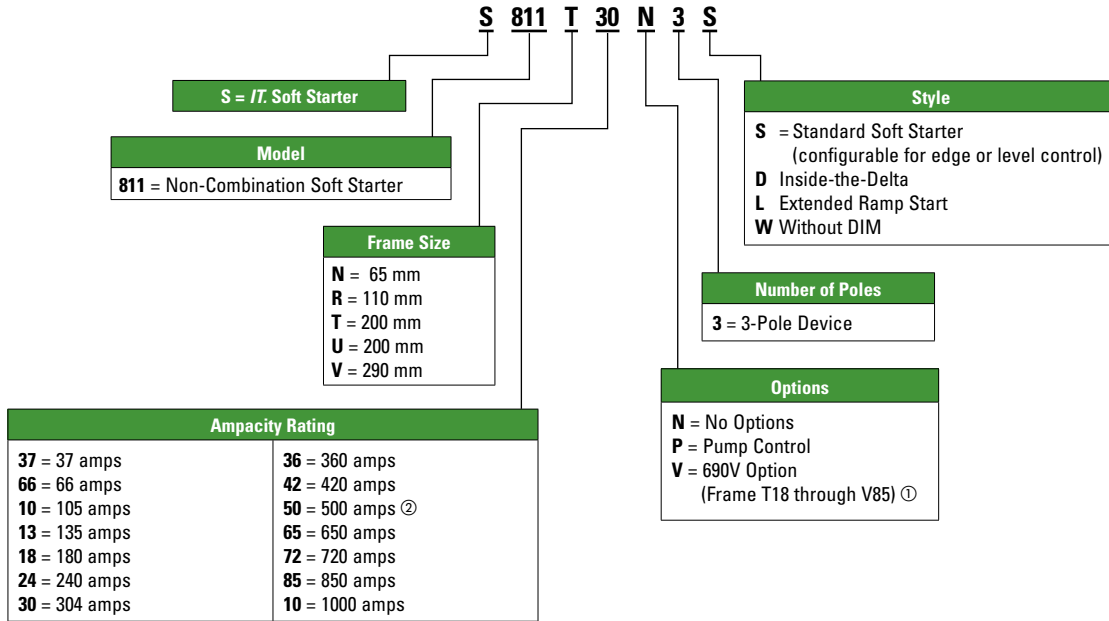
Description	Catalog Number
115V ac Input 24V dc Output	PSS55A
230V ac Input 24V dc Output	PSS55B
380 – 480V ac Input 24V dc Output	PSS55C

# Motor Control

## Soft Starters

### CATALOG SELECTION

#### S811 Communicating Soft Starter — Catalog Numbering System



① Not available on U-Frame.

② U-Frame 500A unit does not have IEC Certification.

#### S811 Communicating Soft Starter

- 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 and piping systems while minimizing the downtime caused by system failure
- Smallest in industry, minimizing panel/enclosure size



# Motor Control

## Soft Starters

### PRODUCT SELECTION

#### S811 Communicating Soft Starter

##### Standard Duty Ratings

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

**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.

##### 15-Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C

Max. Current	3-Phase Motors											Catalog Number
	kW Rating (50 Hz)			hp Rating (60 Hz)								
	230V	380 – 400V	440V	200V		230V		460V		575V		
				1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
37	10	18.5	18.5	10	10	10	10	25	20	30	30	<b>S811R10N3S</b>
66	18.5	30	37	20	15	20	20	50	40	60	50	<b>S811N66N3S</b>

##### Frame Size N

37	10	18.5	18.5	10	10	10	10	25	20	30	30	<b>S811R10N3S</b>
66	18.5	30	37	20	15	20	20	50	40	60	50	<b>S811N66N3S</b>

##### Frame Size R

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>

##### Frame Size T

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>

##### Frame Size U

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> ②

##### Frame Size V

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	50	—	—	400	350	800	700	900	800	<b>S811V10N3S</b> ①

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

② 500A rating does not have IEC certification.

### S811 Communicating Soft Starter

#### Severe Duty Ratings

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

**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 4, or the current limit set is over 300%. Example: 35-second ramp, 5 starts per hour, 350% current limit @ 40°C ambient.

#### >30-Second Ramp, >4 Starts per Hour or >300% Current Limit

Max. Current	3-Phase Motors											Catalog Number
	kW Rating (50 Hz)			hp Rating (60 Hz)								
	230V	380 – 400V	440V	200V		230V		460V		575V		
				1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
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

#### Frame Size N

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

#### Frame Size R

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

#### Frame Size T

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

#### Frame Size U

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

#### Frame Size V

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

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

# Motor Control

## Soft Starters

### PRODUCT SELECTION

#### S811 Communicating Soft Starter

15-Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C Ambient, Inside-the-Delta Standard Duty Ratings

Max. Continuous Motor Line Current	3-Phase Motor											Catalog Number
	kW Rating (50 Hertz)			hp Rating (60 Hertz)								
	230	380 – 400	440	200V		230V		460V		575V		
	Volt	Volt	Volt	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	

#### Frame Size N

65	10	18.5	18.5	15	15	15	15	40	30	50	50	S811N37N3D S811N66N3D
114	18.5	30	37	30	25	30	30	75	60	100	75	

#### Frame Size R

182	30	55	59	50	40	60	50	125	100	150	125	S811R10N3D S811R13N3D
234	40	63	80	60	50	75	60	150	125	200	150	

#### Frame Size T

311	51	90	110	100	75	100	100	250	200	250	250	S811T18N3D S811T24N3D S811T30N3D
415	75	110	147	125	100	125	125	300	250	300	300	
526	90	160	185	150	125	150	150	400	300	400	400	

#### Frame Size U

623	110	185	220	200	150	250	200	450	400	550	450	S811U36N3D S811U42N3D S811U50N3D ①②
727	129	220	257	250	200	300	250	550	450	700	550	
865	150	257	300	250	250	300	250	600	550	750	700	

#### Frame Size V

623	110	185	220	200	150	250	200	450	400	550	450	S811V36N3D S811V42N3D S811V50N3D S811V65N3D S811V72N3D S811V85N3D S811V10N3D ③
727	129	220	257	250	200	300	250	550	450	700	550	
865	150	257	300	250	250	300	250	600	550	750	700	
1125	200	355	425	400	300	400	300	750	700	900	750	
1246	—	—	—	—	—	—	—	—	—	—	—	
1471	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	

① 15 sec. start, 300% inrush, 40°C, 1 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.

## S811 Communicating Soft Starter

### Inside-the-Delta Severe Duty Ratings

Max. Continuous Motor Line Current	3-Phase Motor											Catalog Number
	kW Rating (50 Hertz)			hp Rating (60 Hertz)								
	230	380 – 400	440	200V		230V		460V		575V		
	Volt	Volt	Volt	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	

#### Frame Size N

39	5.5	10	11	7-1/2	7-1/2	10	7-1/2	25	15	30	25	S811N37N3D S811N66N3D
73	11	18.5	22	15	15	25	15	50	40	60	50	

#### Frame Size R

111	15	30	33	25	25	30	25	75	60	75	75	S811R10N3D S811R13N3D
138	22	40	45	40	30	50	40	100	75	120	100	

#### Frame Size T

199	33	59	63	50	50	60	50	125	125	150	150	S811T18N3D S811T24N3D S811T30N3D
257	45	80	90	75	60	75	75	150	150	250	200	
324	55	100	110	100	75	100	100	250	200	300	250	

#### Frame Size U

415	75	110	147	125	100	125	125	300	250	300	300	S811U36N3D S811U42N3D S811U50N3D ①
526	90	160	185	150	120	150	150	400	300	450	400	
623	110	185	220	200	150	250	200	450	400	550	450	

#### Frame Size V

415	75	110	147	125	100	125	125	300	250	300	300	S811V36N3D S811V42N3D S811V50N3D S811V65N3D S811V72N3D S811V85N3D S811V10N3D ②
526	90	160	185	150	120	150	150	400	300	450	400	
623	110	185	220	200	150	250	200	450	400	550	450	
727	129	220	257	250	200	250	250	550	450	700	550	
816	147	257	295	250	250	300	250	600	550	750	700	
908	160	280	335	250	250	300	250	700	550	750	700	
—	—	—	—	—	—	—	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	—	

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.

# Motor Control

## Soft Starters

### PRODUCT SELECTION


#### S811 Communicating Soft Starter — Accessories

##### Pump Control Option

Frame Size	Max. Current	Catalog Number
N	37	S811N37P3S
	66	S811N66P3S
R	105	S811R10P3S
	135	S811R13P3S
T	180	S811T18P3S
	240	S811T24P3S
	304	S811T30P3S
U	360	S811U36P3S
	420	S811U42P3S
	500	S811U50P3S
V	360	S811V36P3S
	420	S811V42P3S
	500	S811V50P3S
	650	S811V65P3S
	720	S811V72P3S
	850	S811V85P3S
	1000	S811V10P3S

① U-Frame 500A unit does not have IEC Certification.


##### Surge Suppressors

	Description	Catalog Number
	600V MOV for 200 mm and 290 mm Units	EMS39
	690V MOV for 200 mm ①	EMS41

① T-Frame only.

**Note:** 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).

##### Lug Kits

	Frame Size	Frame Designation	Description	Catalog Number
	200 mm SSRV	T, U	2 Cable Connections, 4 AWG to 1/0 Cable 1 Cable Connection, 4/0 to 500 MCM Cable 2 Cable Connections, 4/0 to 500 MCM Cable 1 Cable Connection, 2/0 to 300 MCM Cable 2 Cable Connections, 2/0 to 300 MCM Cable	EML22 EML23 EML24 EML25 EML26
	290 mm SSRV	V	2 Cable Connections, 4/0 to 500 MCM Cable 4 Cable Connections, 4/0 to 500 MCM Cable 6 Cable Connections, 4/0 to 500 MCM Cable 4 Cable Connections, 2/0 to 300 MCM Cable	EML28 EML30 EML32 EML33

① The EML33 does not have a CSA Listing.

**Note:** 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.

##### Digital Interface Module

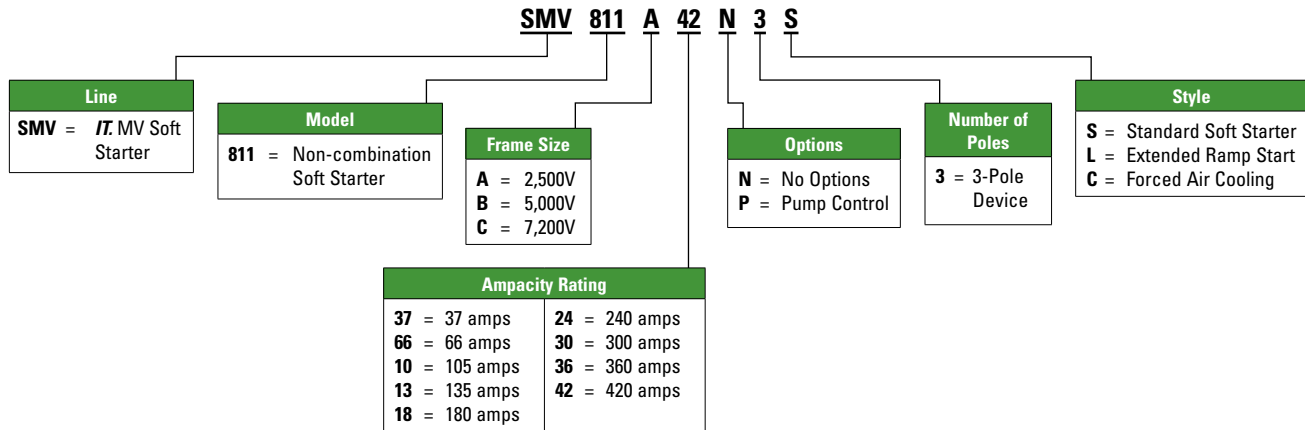
Description	Catalog Number
Blank Cover (Filler)	EMA68
DIM	EMA91
Panel Mounting Kit — 3 ft. Cable 5 ft. Cable 8 ft. Cable 10 ft. Cable	EMA69A EMA69B EMA69C EMA69D

**Note:** The Digital Interface Module (DIM) is available as a replacement part. 24V dc Power Supply can be used with the S811 SSRV or as a stand-alone device.

##### Power Supplies

Description	Catalog Number
115V ac Input 24V dc Output	PSS55A
230V ac Input 24V dc Output	PSS55B
380 – 480V AC Input 24V dc Output	PSS55C

## MV811 Medium Voltage Soft Starter — Catalog Numbering System



# Motor Control

## Soft Starters

### PRODUCT SELECTION

#### MV811 Medium Voltage Soft Starter

- 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
- Built-in run bypass contactor significantly reduces the heat generated by the starter, minimizing enclosure sizes and costs
- Provides accurate current measurement and trip settings
- Advanced selectable protective features safeguard the motor and system against a variety of system faults
- Sophisticated pump algorithm on both starting and stopping minimize the pressure surges that cause water hammer
- Electronic overload protection



#### 15-Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C — Frames A and B

Frame	Max Current	3-Phase Motor												Catalog Number	
		kW Rating (50 – 60 Hertz)						hp Rating (50 – 60 Hertz)							
		2300 Volt	3000 Volt	3300 Volt	3600 Volt	4160 Volt	4800 Volt	2300V 1.15SF	3000V 1.15SF	3300V 1.15SF	3600V 1.15SF	4160V 1.15SF	4800V 1.15SF		
A	37	125	—	—	—	—	—	125	—	—	—	—	—	—	SMV811A37N3S
B	37	125	163	200	219	253	261	125	150	200	200	250	300	SMV811B37N3S	
A	66	223	—	—	391	—	—	250	—	—	—	—	—	SMV811A66N3S	
B	66	223	291	320	391	451	521	250	350	400	400	450	500	SMV811B66N3S	
A	105	355	—	—	—	—	—	400	—	—	—	—	—	SMV811A105N3S	
B	105	355	463	510	621	718	828	400	500	600	600	700	800	SMV811B105N3S	
A	135	457	—	—	799	—	1065	500	—	—	—	—	—	SMV811A135N3S	
B	135	457	596	655	799	923	1065	500	700	800	800	900	1000	SMV811B135N3S	
A	180	609	—	—	—	—	—	700	—	—	—	—	—	SMV811A180N3S	
B	180	609	794	873	1065	1231	1420	700	1000	1000	1100	1200	1400	SMV811B180N3S	
A	240	812	—	—	—	—	—	900	—	—	—	—	—	SMV811A240N3S	
B	240	812	1059	1165	1420	1641	1893	900	1300	1400	1500	1600	1800	SMV811B240N3S	
A	304	1028	—	—	—	—	—	1200	—	—	—	—	—	SMV811A304N3S	
B	304	1028	1341	1475	1799	2087	2398	1200	1600	1800	2000	2000	2300	SMV811B304N3S	
A	360	1218	—	—	—	—	—	1300	—	—	—	—	—	SMV811A360N3S	
B	360	1218	1588	1747	2130	2461	2840	1300	2000	2100	2300	2400	2800	SMV811B360N3S	
A	420	1421	—	—	—	—	—	1600	—	—	—	—	—	SMV811A420N3S	
B	420	1421	1853	2038	2485	2872	3313	1600	2300	2500	2700	2800	3300	SMV811B420N3S	

## MV811 Medium Voltage Soft Starter

### 15-Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C — Frame C

Max Current	3-Phase Motor												Catalog Number
	kW Rating (50 – 60 Hertz)						hp Rating (50 – 60 Hertz)						
	5500	6000	6300	6600	6900	7200	5500	6000	6300	6600	6900	7200	
	Volt	Volt	Volt	Volt	Volt	Volt	1.15SF	1.15SF	1.15SF	1.15SF	1.15SF	1.15SF	
37	299	326	343	359	375	392	300	350	350	400	400	400	SMV811C37N3S
66	534	582	611	641	670	699	500	600	600	700	700	700	SMV811C66N3S
105	849	926	973	1019	1065	1112	900	1000	1000	1100	1100	1250	SMV811C10N3S
135	1092	1191	1251	1310	1370	1429	1200	1300	1300	1400	1500	1600	SMV811C13N3S
180	1456	1588	1668	1747	1862	1906	1600	1700	1800	1900	2000	2100	SMV811C18N3S
240	1941	2118	2223	2329	2435	2541	2100	2300	2400	2500	2700	2800	SMV811C24N3S
304	2459	2682	2816	2950	3085	3219	2700	2900	3100	3200	3400	3600	SMV811C30N3S
360	2912	3176	3335	3494	3653	3812	3200	3500	3700	3800	4000	4200	SMV811C36N3S
420	3397	3706	3891	4076	4262	4447	3700	4100	4300	4500	4700	5000	SMV811C42N3S

### Severe Duty Ratings, >30-Second Ramp, >4 Starts per Hour or >300% Current Limit — Frames A and B

Frame	Max Current	3-Phase Motor												Catalog Number
		kW Rating (50 – 60 Hertz)						hp Rating (50 – 60 Hertz)						
		2300	3000	3300	3600	4160	4800	2300V	3000V	3300V	3600V	4160V	4800V	
		Volt	Volt	Volt	Volt	Volt	Volt	1.15SF	1.15SF	1.15SF	1.15SF	1.15SF	1.15SF	
A	22	—	—	—	—	—	—	—	—	—	—	—	—	SMV811A37N3S
B	22	—	—	107	116	135	155	—	—	125	125	150	150	SMV811B37N3S
A	42	142	—	—	—	—	—	150	—	—	—	—	—	SMV811A66N3S
B	42	142	185	204	222	257	296	150	200	200	200	250	300	SMV811B66N3S
A	65	220	—	—	—	—	—	250	—	—	—	—	—	SMV811A10N3S
B	65	220	278	315	344	398	495	250	300	350	350	400	500	SMV811B10N3S
A	80	271	—	—	—	—	—	300	—	—	—	—	—	SMV811A13N3S
B	80	271	353	388	424	489	565	300	400	400	450	500	600	SMV811B13N3S
A	115	389	—	—	—	—	—	400	—	—	—	—	—	SMV811A18N3S
B	115	389	507	558	609	703	812	400	500	600	600	800	900	SMV811B18N3S
A	150	507	—	—	—	—	—	500	—	—	—	—	—	SMV811A24N3S
B	150	507	662	728	794	918	1059	500	700	800	800	1000	1100	SMV811B24N3S
A	192	649	—	—	—	—	—	700	—	—	—	—	—	SMV811A30N3S
B	192	649	847	932	1016	1175	1355	700	900	1000	1100	1300	1500	SMV811B30N3S
A	240	812	—	—	—	—	—	900	—	—	—	—	—	SMV811A36N3S
B	240	812	1059	1165	1271	1468	1694	900	1200	1300	1400	1600	1800	SMV811B36N3S
A	305	1032	—	—	—	—	—	1100	—	—	—	—	—	SMV811A42N3S
B	305	1032	1346	1480	1615	1866	2153	1100	1500	1600	1800	2100	2400	SMV811B42N3S

# Motor Control

## Soft Starters

### PRODUCT SELECTION

#### MV811 Medium Voltage Soft Starter

#### Severe Duty Ratings, >30-Second Ramp, >4 Starts per Hour or >300% Current Limit — Frame C

Max Current	3-Phase Motor												Catalog Number
	kW Rating (50 – 60 Hertz)						hp Rating (50 – 60 Hertz)						
	5500	6000	6300	6600	6900	7200	5500	6000	6300	6600	6900	7200	
	Volt	Volt	Volt	Volt	Volt	Volt	1.15SF	1.15SF	1.15SF	1.15SF	1.15SF	1.15SF	
22	178	194	204	214	223	233	200	200	200	200	250	250	SMV811C37N3S
42	340	371	389	408	426	445	350	400	400	450	450	500	SMV811C66N3S
65	526	573	602	631	660	688	500	600	600	700	700	700	SMV811C10N3S
80	647	705	741	776	812	847	600	700	800	800	900	900	SMV811C13N3S
115	930	1015	1065	1116	1167	1218	1000	1100	1100	1200	1300	1300	SMV811C18N3S
150	1213	1323	1390	1456	1522	1588	1300	1400	1500	1600	1600	1700	SMV811C24N3S
192	1553	1694	1779	1863	1948	2033	1700	1800	1900	2000	2100	2200	SMV811C30N3S
240	1941	2118	2223	2329	2435	2541	2100	2300	2400	2500	2700	2800	SMV811C36N3S
305	2467	2691	2826	3200	3096	3229	2700	2900	3100	3200	3400	3600	SMV811C42N3S

#### Pump Control

Max. Voltage	Max. Current Rating	Catalog Number
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##### A-Frame

2,500	37	SMV811A37P3S SMV811A66P3S SMV811A10P3S SMV811A13P3S SMV811A18P3S
	66	
	105	
	135	
	180	
	240	SMV811A24P3S SMV811A30P3S SMV811A36P3S SMV811A42P3S
	304	
	360	
	420	

##### B-Frame

5,000	37	SMV811B37P3S SMV811B66P3S SMV811B10P3S SMV811B13P3S SMV811B18P3S
	66	
	105	
	135	
	180	
	240	SMV811B24P3S SMV811B30P3S SMV811B36P3S SMV811B42P3S
	304	
	360	
	420	

##### C-Frame

7,200	37	SMV811C37P3S SMV811C66P3S SMV811C10P3S SMV811C13P3S SMV811C18P3S
	66	
	105	
	135	
	180	
	240	SMV811C24P3S SMV811C30P3S SMV811C36P3S SMV811C42P3S
	304	
	360	
	420	

#### Power Pole Cooling Kit

Description	Catalog Number
Cooling Kit	MW02A

#### Remote DIM Mounting Kit

Description	Catalog Number
Remote Mounting Kit with 3 ft. Cable	EMA69A
Remote Mounting Kit with 5 ft. Cable	EMA69B
Remote Mounting Kit with 8 ft. Cable	EMA69C
Remote Mounting Kit with 10 ft. Cable	EMA69D


#### Power Supplies

Line Voltage	Catalog Number	Steady State Wattage	Inrush Wattage	Input Voltage	List Pricing
2.5 kV	PSS300E	300W	500W	110 – 240V ac	631.00
2.5 kV	PSS600C	600W	1000W	380 – 480V ac	1054.00
5 kV	PSS600C	600W	1000W	380 – 480V ac	1054.00
7.2 kV	PSS600C	600W	1000W	380 – 480V ac	1054.00

Note: A minimum wire size of 14 AWG (2.5 mm<sup>2</sup>) should be used between the power supply and the 24V dc + and - terminals.

#### MV811 Medium Voltage Soft Starter

##### Terminal Pad Kits

	Description	Conductor Type	Catalog Number
	Terminal Pad Kit to Accept 3/8-16 Bolt, 1.12 Inch Max Ring Tang (28.5 mm)	Ring lug	<b>MW01A</b>
	Terminal Pad Kit to Accept 3/8-16 Bolt, 2.0 Inch Max Width Bus Bar (50.8 mm) Horizontal	Bus bar	<b>MW01B</b>
	Terminal Pad Kit to Accept 3/8-16 Bolt, 1.5 Inch Max Width Bus Bar (38.1 mm) Vertical	Bus bar	<b>MW01C</b>
	Terminal Pad Kit to Accept 1/2-13 Bolt, 2.0 Inch Max Width Bus Bar (50.8 mm) Horizontal	Bus bar	<b>MW01D</b>

**Note:** The soft starter power modules are supplied without terminal pads. Terminal pads are fastened to the soft starter power bus and provide a threaded hole for customer connection. Kits are available to accept either a bus bar or a ring terminal connection. Each kit includes instructions, three terminal pads, hardware to fasten to either the line or line side power bus, and hardware for customer connections.



# Pre-Configured, Highly Programmable



*Powering Business Worldwide*

- Compact fractional and integral adjustable frequency drives, out of the box and ready to run
- Startup wizard and advanced diagnostic capabilities for ease of use
- Aftermarket support organization with industry-leading drive specialists for pre- and post-sale support
- Custom software available to meet the unique application requirements

#### Drives Product Overview

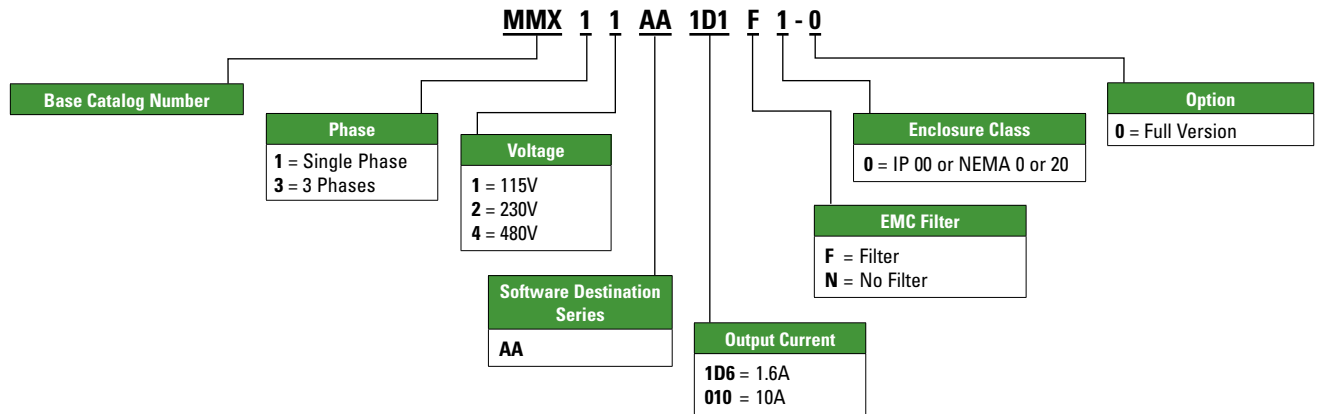
									
Description	M-Max Machinery Drive			SVX9000 Drive					
Page	Page 112			Page 113					
Frame	<b>MI-1</b>	<b>MI-2</b>	<b>MI-3</b>	<b>FR4</b>	<b>FR5</b>	<b>FR6</b>	<b>FR7</b>	<b>FR8</b>	<b>FR9</b>
Height (Inches)	6.2	7.7	10.3	12.9	16.5	2.2	24.8	30.1	45.3
Width (Inches)	2.6	3.5	3.9	5.0	5.6	7.6	9.3	11.5	18.9
Depth (Inches)	3.9	4	4.3	7.5	8.4	9.3	10.1	13.5	13.4
I/O	<ul style="list-style-type: none"> <li>• 6 Digital Inputs</li> <li>• 2 Analog Inputs (V and mA)</li> <li>• 1 Analog Output</li> <li>• 2 Relay Outputs</li> <li>• RS-485 Interface (Modbus RTU)</li> </ul>			<ul style="list-style-type: none"> <li>• 6 Digital Inputs</li> <li>• 2 Analog Inputs (V and mA)</li> <li>• 2 Digital Outputs, Form C Relays</li> <li>• 1 Digital Output, Open Collector</li> <li>• 1 Analog Output</li> <li>• Varied Communication Options</li> </ul>					

# Motor Control

## Drives

### CATALOG SELECTION / PRODUCT SELECTION

#### M-Max™ Machinery Drive — Catalog Numbering System



#### M-Max Machinery Drive

- 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 1 min., 200% starting current for 2 secs. in every 20 sec. period, conformal coated boards, 2 year warranty
- RoHS compliance



#### M-Max Machinery Drive

P(kW)	P(hp)	I <sub>N</sub> (A)	Catalog Number
<b>Input 115V 1-phase</b>		<b>Out 230V 3-phase</b> ①	
0.25	0.33	1.7	MMX11AA1D7F0-0
0.37	0.5	2.4	MMX11AA2D4F0-0
0.55	0.75	2.8	MMX11AA2D8F0-0
0.75	1	3.7	MMX11AA3D7F0-0
1.1	1.5	4.8	MMX11AA4D8F0-0
<b>Input 230V 1-phase</b>		<b>Out 230V 3-phase</b> ②	
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	MMX12AA007F0-0
2.2	3	9.6	MMX12AA9D6F0-0
<b>Input 230V 3-phase</b>		<b>Out 230V 3-phase</b> ①	
0.25	0.33	1.7	MMX32AA1D7F0-0
0.37	0.5	2.4	MMX32AA2D4F0-0
0.55	0.75	2.8	MMX32AA2D8F0-0
0.75	1	3.7	MMX32AA3D7F0-0
1.1	1.5	4.8	MMX32AA4D8F0-0
1.5	2	7	MMX32AA007F0-0
2.2	3	11	MMX32AA011F0-0

① Available May 2009.

② Available April 2009.

#### M-Max Machinery Drive (Continued)

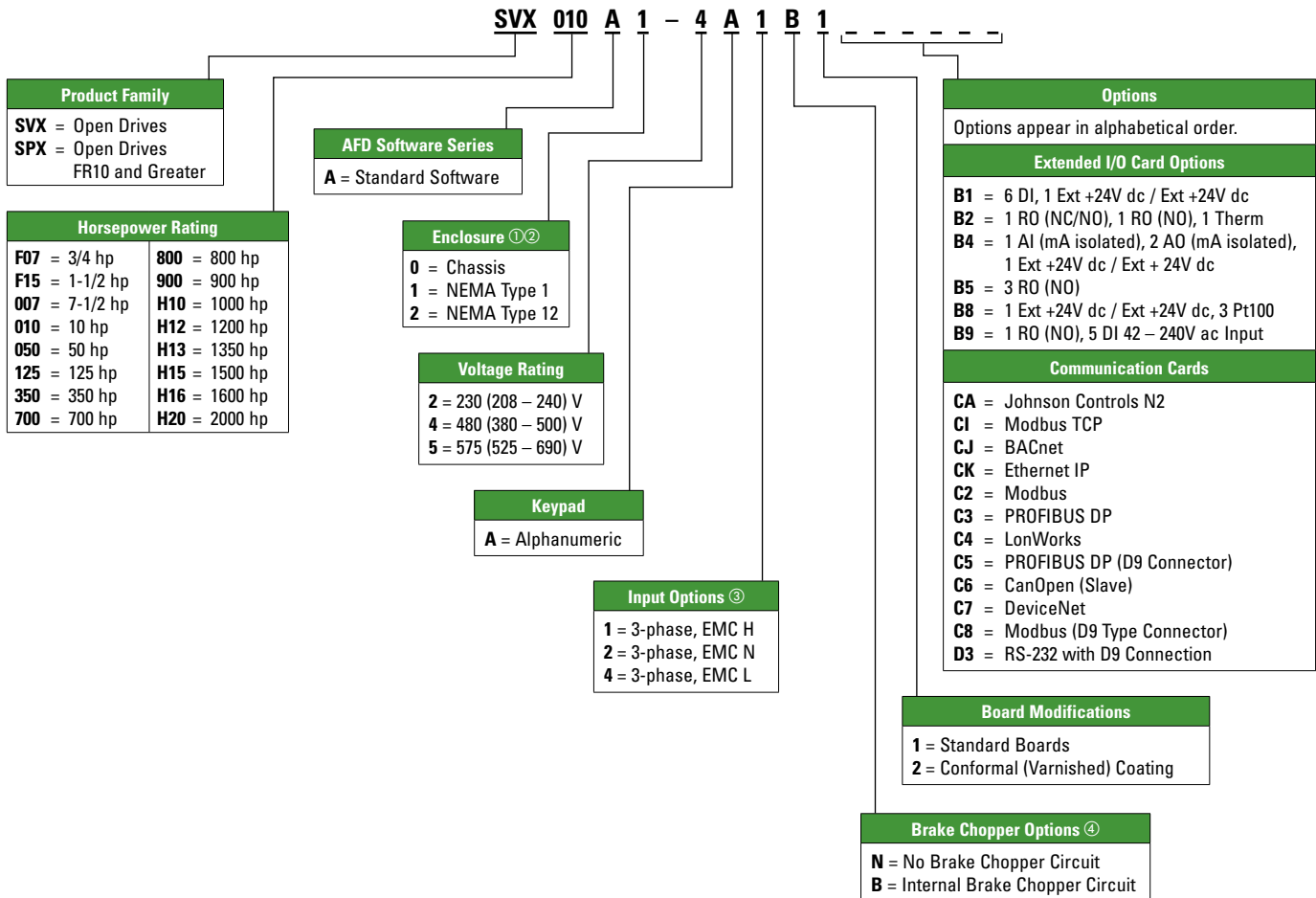
P(kW)	P(hp)	I <sub>N</sub> (A)	Catalog Number
<b>Input 480V 3-phase</b>		<b>Out 480V 3-phase</b> ①	
0.37	0.5	1.3	MMX34AA1D3F0-0
0.55	0.75	1.9	MMX34AA1D9F0-0
0.75	1	2.4	MMX34AA2D4F0-0
1.1	1.5	3.3	MMX34AA3D3F0-0
1.5	2	4.3	MMX34AA4D3F0-0
2.2	3	5.6	MMX34AA5D6F0-0
3	4	7.6	MMX34AA7D6F0-0
4	5.5	9	MMX34AA009F0-0
5.5	7.5	12	MMX34AA012F0-0
7.5	10	14	MMX34AA014F0-0

① Available April 2009.

#### Kits

Description	Catalog Number
NEMA -1 KIT for Frame MI-1	MMX-IP21-FS1
NEMA -1 KIT for Frame MI-2	MMX-IP21-FS2
NEMA -1 KIT for Frame MI-3	MMX-IP21-FS3
Drive to PC Communication Module	MMX-COM-PC

#### SVX9000 Drive — Catalog Numbering System



- 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**).  
**Note:** N = No Brake Chopper.

# Motor Control

## Drives

### PRODUCT SELECTION

#### SVX9000 Drive

- 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



Drives

#### 208 – 240V, Type 1 Drive

Frame Size	Delivery Code	hp (I <sub>H</sub> )	Current (I <sub>L</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

#### 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

#### 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	41	SVX030A1-5A4N1
				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		

### SVX9000 Drive — Accessories

#### Option Board Kits

Option Kit Description ①	Allowed Slot Locations ②	Field Installed	Factory Installed	SVX Ready Programs
		Catalog Number	Option Designator	Basic

#### Standard I/O Cards

2 RO (NC/NO)	B	<b>OPTA2</b>	—	X
6 DI, 1 DO, 2 AI, 1AO, 1 +10V dc Ref, 2 Ext +24V dc / EXT +24V dc	A	<b>OPTA9</b>	—	X

#### Extended I/O Card Options

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 +24V dc / Ext +24V dc	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 +24V dc / Ext +24V dc	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 +24V dc / Ext +24V dc, 3 Pt100	B, C, <b>D</b> , E	<b>OPTB8</b>	B8	—
1 RO (NO), 5 DI 42 – 240V ac Input	B, C, <b>D</b> , E	<b>OPTB9</b>	B9	—

#### Communication Cards

Modbus	D, E	<b>OPTC2</b>	C2	X
Johnson Controls N2 ③	D, E	<b>OPTC2</b>	CA	—
Modbus TCP	D, E	<b>OPTCI</b>	CI	X
BACnet	D, E	<b>OPTCJ</b>	CJ	X
Ethernet IP	D, E	<b>OPTCK</b>	CK	X
PROFIBUS DP	D, E	<b>OPTC3</b>	C3	X
LonWorks	D, E	<b>OPTC4</b>	C4	X
PROFIBUS DP (D9 Connector)	D, E	<b>OPTC5</b>	C5	X
DeviceNet	D, E	<b>OPTC7</b>	C7	X
Modbus (D9 Type Connector)	D, E	<b>OPTC8</b>	C8	X
Adapter — SPX Only	D, E	<b>OPTD1</b>	D1	X
Adapter — SPX Only	D, E	<b>OPTD2</b>	D2	X
RS-232 with D9 Connection	D, E	<b>OPTD3</b>	D3	X

#### Keypad

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>	—	—

① AI = Analog Input; AO = Analog Output, DI = Digital Input, DO = Digital Output, RO = Relay Output.

② Option card must be installed in one of the slots listed for that card. Slot indicated in Bold is the preferred location.

③ OPTC2 is a multi-protocol option card.

# Motor Control

## Drives

### PRODUCT SELECTION

#### SVX9000 Drive — Accessories

##### Miscellaneous Options

Description	Catalog Number
<b>9000XDrive</b> — 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, SVDrivecable must be used.	<b>9000XDRIVE</b>
<b>SVDrivecable</b> — 6 ft. (1.8 m) 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.	<b>SVDRIVECABLE</b>

##### NEMA Type 12 Conversion Kit

Frame Size	Delivery Code	Approximate Dimensions in Inches (mm)			Approximate Weight in Lb. (kg)	Catalog Number
		Length	Width	Height	Weight	
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>

**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.