

## Contents

<i>Description</i>	<i>Page</i>
<b>Type S801, Intelligent Technologies (IT) Soft Starters</b>	
Product Description . . . . .	39-22
Application Description . . . . .	39-22
Features . . . . .	39-22
Benefits . . . . .	39-22
Operation . . . . .	39-22
Catalog Number Selection . . . . .	39-24
Product Selection . . . . .	39-25
Options . . . . .	39-31
Accessories . . . . .	39-31
Standards and Certifications . . . . .	39-33
Technical Data and Specifications . . . . .	39-33
Dimensions . . . . .	39-34



S801

## Product Description

Eaton's Cutler-Hammer® Intelligent Technologies (IT) S801 Line of Reduced Voltage Soft Starters is very compact, multi-functional, easy to install and easy to program. Designed to control acceleration and deceleration of 3-phase motors, the line is available for current ranges from 12 amp all the way through 1000 amp applications and is suitable for mounting in motor control centers or in enclosed control (NEMA 1, 4, 4X and 12) applications.

## Application Description

The S801 line of IT Soft Starters is designed to be the smallest, most compact soft starter in the market today. With this small size, it can easily fit in place of existing soft starter designs, wye-delta starters or across-the-line NEMA and IEC starters. This feature allows easy retrofits of existing Motor Control Centers or Enclosures and saves the expense of replacing existing structure or adding a new one to house a soft starter.

The product is designed to work with 3-phase motors in a Delta (3-lead) configuration. The S801 works with all motors from fractional horsepower up to motors requiring 1000 amps of steady state current. The built-in overload (in ranges from 12 – 1000 amps) and run bypass contactor make installation and setup quick and easy. The overload also offers some advanced protective functions to give additional motor protection.

With the pump control option, it is the number one soft starter available for pumping applications. The unique soft stopping control provides a smooth transition for stopping a motor and eliminates the "water-hammer" effect that can damage pipes, valves and pumps.

## Features

- Built-in overload protection
- Built-in run bypass contactor
- Adjustable ramp times
- Adjustable torque control
- Adjustable kick start control
- Programmable overload settings, 31 – 100% (3.2:1) of rated current for the unit
- Physically fits in place of most NEMA and IEC starters
- Easy to use control interface module
- Soft stop control
- Multiple trip class settings (5, 10, 20 and 30)
- Six SCR control
- Optional pump control

## Benefits

- Reduced wear on belts, gears, chains, clutches, shafts and bearings
- Allows for controlling the inrush current to the motor
- Reduced inrush current leads to more stable power grid and can lower peak demand charges
- Elimination of water-hammer in pumping applications
- Less shock to product on conveyor lines and material handling gear
- 24V DC control enhances personnel and equipment safety

## Operation

### Overload Functionality

#### Overtemperature

Protects the device from overheating. Starter will shutdown at 110°C.

#### Jam

Selectable protective feature, unit trips to prevent damage to motor during normal run.

#### Stall

Selectable protective feature, unit trips to protect system in event motor can not get to rated speed in the defined ramp period.

#### Phase Loss

Selectable protective feature, trips under voltage loss condition to any phase.

#### Phase Reversal

Selectable protective feature, trips when phase rotation is something other than A-B-C.

#### Kick Start

Selectable feature which provides a current "kick" of up to 550% of full load current for 0 to 2.0 seconds. This provides the additional torque required at startup to break free a motor.

#### Ramp Start

Provides a constant increase in torque to the motor.

#### Current Limit Start

Limits the maximum current available to the motor during the startup phase.

#### Soft Stop

Allows for a controlled stopping of a frictional load.

#### Shorted SCR Detection

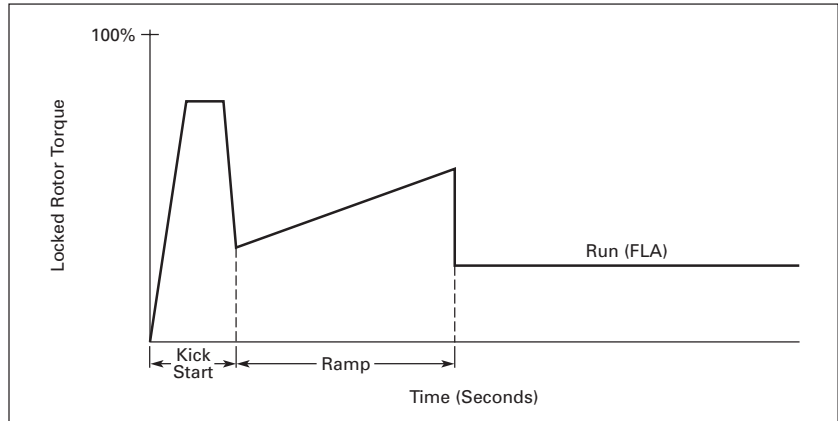
Monitors for shorted SCR in the power polls.

**Starting Characteristics**

**Kick Start**

Provides an initial boost of current to the motor to help break free the rotor and start spinning the motor.

- 0 – 85% of locked rotor torque.
- 0 – 2.0 seconds duration.

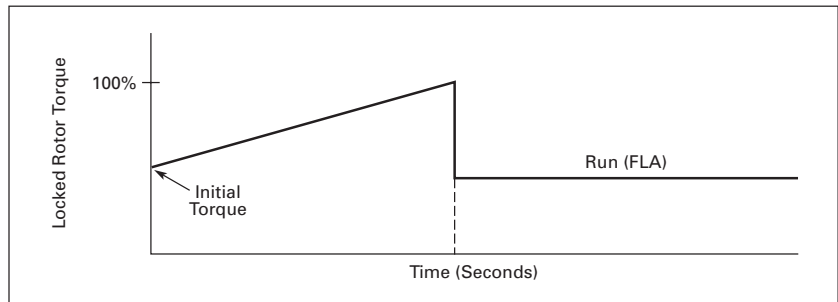


**Figure 39-8. Starting Characteristics — Kick Start**

**Ramp Start**

The most commonly used form of soft start. This allows you to set the initial torque value (of the ramp) and then raises it to full voltage conditions.

- Adjustable initial torque = 0 – 85% of locked rotor torque.
- Adjustable ramp time = .5 – 180 seconds (can be extended with factory modification).

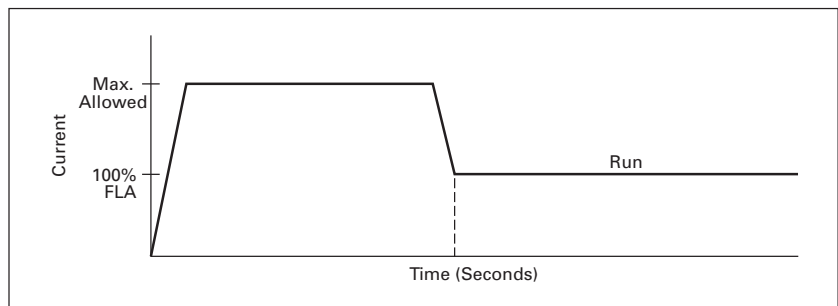


**Figure 39-9. Starting Characteristics — Ramp Start**

**Current Limit**

This mode of soft starting is used when it becomes necessary to limit the maximum starting current due to long start times or to protect the motor.

- Maximum current of 0 – 85% locked rotor current.
- Adjustable ramp time = .5 – 180 seconds (can be extended with factory modification).

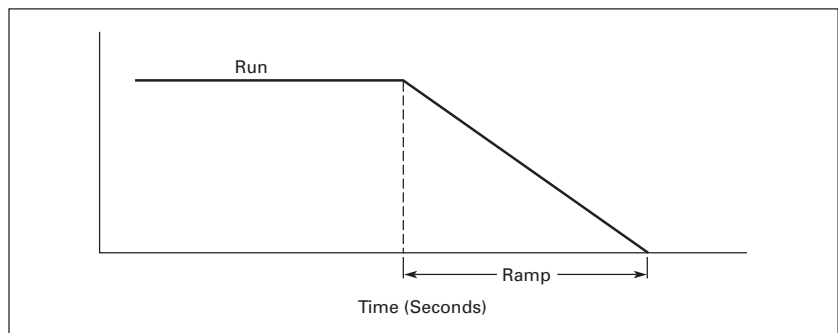


**Figure 39-10. Starting Characteristics — Current Limit**

**Soft Stop**

Used when an extended coast-to-rest period is desired. Often used with high friction loads where a sudden stop may cause system or product damage.

- Stop time = 0 – 60 seconds.

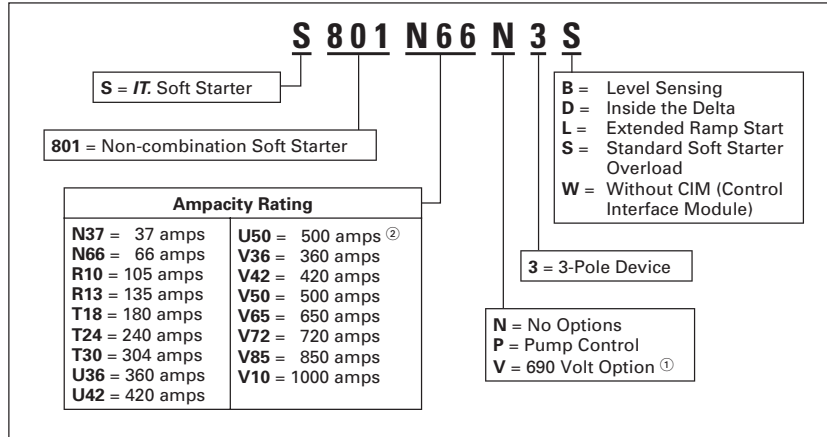


**Figure 39-11. Starting Characteristics — Soft Stop**

Type S801, Intelligent Technologies (IT.) Soft Starters

## Catalog Number Selection

Table 39-28. S801 Open Soft Starters Catalog Numbering System



<sup>①</sup> Not available on U-Frame.  
<sup>②</sup> U-Frame 500 Amp unit does not have IEC Certification.



65 mm, Catalog Number S801N



110 mm, Catalog Number S801R



200 mm, Catalog Number S801T



290 mm, Catalog Number S801V

**Product Selection**

**Base Ratings**

The table below is the base ratings for the IT Soft Starter. The tables included in this catalog are meant to be a selection table for different applications, but to match a unit to your exact application, consult with your local Eaton representative or call our Technical Resource Center.

**Table 39-29. 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

**Table 39-30. Product Selection — Standard Duty Rating Open Soft Starters**

Max. Current	Three-Phase Motor											Catalog Number ①②	Price U.S. \$
	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			
<b>Frame Size N</b>													
37	10	18.5	18.5	10	10	10	10	25	20	30	30	S801N37N3S	
66	18.5	30	37	20	15	20	20	50	40	60	50	S801N66N3S	
<b>Frame Size R</b>													
105	30	55	59	30	25	40	30	75	60	100	75	S801R10N3S	
135	40	63	80	40	30	50	40	100	75	125	100	S801R13N3S	
<b>Frame Size T</b>													
180	51	90	110	60	50	60	60	150	125	150	150	S801T18N3S	
240	75	110	147	75	60	75	75	200	150	200	200	S801T24N3S	
304	90	160	185	100	75	100	100	250	200	300	250	S801T30N3S	
<b>Frame Size U</b>													
360	110	185	220	125	100	150	125	300	250	350	300	S801U36N3S	
420	129	220	257	150	125	175	150	350	300	450	350	S801U42N3S	
500	150	257	300	150	150	200	150	400	350	500	450	S801U50N3S ③④	
<b>Frame Size V</b>													
360	110	185	220	125	100	150	125	300	250	350	300	S801V36N3S	
420	129	220	257	150	125	175	150	350	300	450	350	S801V42N3S	
500	150	257	300	150	150	200	150	400	350	500	450	S801V50N3S	
650	200	355	425	250	200	250	200	500	450	600	500	S801V65N3S	
720	220	400	450	—	—	300	250	600	500	700	600	S801V72N3S	
850	257	475	500	—	—	350	300	700	600	900	700	S801V85N3S	
1000	315	560	600	—	—	400	350	800	700	1000	800	S801V10N3S ⑤	

① For a longer ramp acceleration time of .5 to 360 seconds, see Page 39-31.  
 ② For 2-wire (level sensing) control, change the last digit from S to 2.  
 ③ 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.  
 ④ U-Frame 500 Amp does not have IEC Certification.  
 ⑤ For more information on optimum performance of the 1000A Frame Size V S801, see Appendix C of MN03902008E.

Type S801, Intelligent Technologies (IT) Soft Starters

### Severe Duty Ratings

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. For other applications, or when a question arises, a program in Bid Manager is designed to assist you in selecting the proper soft starter.

**Table 39-31. 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

**Table 39-32. Product Selection — Severe Duty Rating Open Soft Starters**

Max. Current	Three-Phase Motor												Catalog Number ①②	Price U.S. \$	
	kW Rating (50 Hertz)						hp Rating (60 Hertz)								
	230		380 – 400		440		200V		230V		460V				575V
Volt	Volt	Volt	Volt	1.0SF	1.15SF	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	20	15	S801N37N3S	
42	11	18.5	22	10	10	15	10	30	25	40	30	40	30	S801N66N3S	
<b>Frame Size R</b>															
65	15	30	33	15	15	20	15	50	40	50	50	75	60	S801R10N3S	
80	22	40	45	25	20	30	25	60	50	75	60	100	75	S801R13N3S	
<b>Frame Size T</b>															
115	33	59	63	30	30	40	30	75	75	100	100	100	100	S801T18N3S	
150	45	80	90	50	40	50	50	100	100	150	125	150	125	S801T24N3S	
192	55	100	110	60	50	75	60	150	125	200	150	200	150	S801T30N3S	
<b>Frame Size U</b>															
240	75	110	147	75	60	75	75	200	150	200	200	200	200	S801U36N3S	
305	90	160	185	100	75	100	100	250	200	300	250	300	250	S801U42N3S	
365	110	185	220	125	100	150	125	300	250	350	300	350	300	S801U50N3S ③	
<b>Frame Size V</b>															
240	75	110	147	75	60	75	75	200	150	200	200	200	200	S801V36N3S	
305	90	160	185	100	75	100	100	250	200	300	250	300	250	S801V42N3S	
365	110	185	220	125	100	150	125	300	250	350	300	350	300	S801V50N3S	
420	129	220	257	150	125	150	150	350	300	450	350	450	350	S801V65N3S	
480	147	257	295	150	150	200	150	400	350	500	450	500	450	S801V72N3S	
525	160	280	335	150	150	200	150	450	350	500	450	500	450	S801V85N3S	
600	185	315	375	200	150	250	200	500	450	600	500	600	500	S801V10N3S ④	

① For a longer ramp acceleration time of .5 to 360 seconds, see Page 39-31.  
 ② For 2-wire (level sensing) control, change the last digit from S to 2.  
 ③ U-Frame 500 Amp unit does not have IEC Certification.  
 ④ For more information on optimum performance of the 1000A Frame Size V S801, see Appendix C of MN03902008E.

Discount Symbol ..... 1CD1

**Inside-the-Delta Standard Duty Ratings**

**Table 39-33. 15 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C Ambient**

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

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 500 Amp 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.

**Table 39-34. 25 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C Ambient**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$	
	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	1.0SF	1.15SF		
<b>Frame Size N</b>														
58	9	15	18.5	15	10	15	15	40	30	50	40	S801N37N3D		
108	15	30	33	30	25	30	30	60	60	100	75	S801N66N3D		
<b>Frame Size R</b>														
164	25	45	55	50	40	50	50	125	100	125	125	S801R10N3D		
206	33	63	63	60	50	60	50	125	125	150	150	S801R13N3D		
<b>Frame Size T</b>														
257	45	80	90	75	60	75	60	150	150	250	200	S801T18N3D		
365	63	110	132	100	100	125	100	250	250	300	250	S801T24N3D		
477	80	147	160	125	125	150	125	300	300	400	400	S801T30N3D		
<b>Frame Size U</b>														
554	90	160	185	150	125	200	150	400	300	450	400	S801U36N3D		
646	110	200	220	200	150	250	200	500	400	550	450	S801U42N3D		
796	140	250	280	250	200	250	250	550	500	700	600	S801U50N3D ④⑤		
<b>Frame Size V</b>														
554	90	160	185	150	125	200	150	400	300	450	400	S801V36N3D		
646	110	200	220	200	150	250	200	500	400	550	450	S801V42N3D		
796	140	250	280	250	200	250	250	550	500	700	600	S801V50N3D		
1055	185	315	375	400	250	300	300	800	700	900	750	S801V65N3D		
1176	200	375	445	—	300	400	300	900	800	900	900	S801V72N3D		
1358	—	—	—	—	—	—	—	—	—	—	—	S801V85N3D		
—	—	—	—	—	—	—	—	—	—	—	—	S801V10N3D ⑥		

④ 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, 796A Inside-the-Delta Starter.  
 ⑤ U-Frame 500 Amp unit does not have IEC Certification.  
 ⑥ For more information on optimum performance of the 1000A Frame Size V Inside-the-Delta S801, see Appendix C of MN03902009E.

Discount Symbol ..... **1CD1**

Type S801, Intelligent Technologies (IT.) Soft Starters

### Inside-the-Delta Standard Duty Ratings

Table 39-35. 15 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 50°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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		
<b>Frame Size N</b>													
58	9	15	18.5	15	10	15	15	40	30	50	40	S801N37N3D	
108	15	30	33	30	25	30	30	60	60	100	75	S801N66N3D	
<b>Frame Size R</b>													
164	25	45	55	50	40	50	50	125	100	125	125	S801R10N3D	
206	33	63	63	60	50	60	60	125	125	150	150	S801R13N3D	
<b>Frame Size T</b>													
257	45	80	90	75	60	75	75	150	150	250	200	S801T18N3D	
365	63	110	132	100	100	125	100	250	250	300	250	S801T24N3D	
477	80	147	160	125	125	150	125	300	300	400	400	S801T30N3D	
<b>Frame Size U</b>													
554	90	160	185	150	125	200	150	400	300	450	400	S801U36N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S801U42N3D	
796	140	250	280	250	200	250	250	550	450	700	600	S801U50N3D ①	
<b>Frame Size V</b>													
554	90	160	185	150	125	200	150	400	300	450	400	S801V36N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S801V42N3D	
796	140	250	280	250	200	250	250	550	450	700	600	S801V50N3D	
1055	185	315	375	400	250	300	300	750	700	900	750	S801V65N3D	
1176	200	375	445	—	—	—	—	—	—	—	—	S801V72N3D	
1358	257	450	500	—	—	—	—	—	—	—	—	S801V85N3D	
—	—	—	—	—	—	—	—	—	—	—	—	S801V10N3D ②	

① U-Frame 500 Amp 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.

Table 39-36. 50 Second Ramp, 2 Starts per Hour, 300% Current Limit @ 50°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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		
<b>Frame Size N</b>													
36	5.5	10	11	7-1/2	7-1/2	7-1/2	7-1/2	25	15	25	25	S801N37N3D	
73	11	18.5	22	15	15	25	15	50	40	60	50	S801N66N3D	
<b>Frame Size R</b>													
103	15	30	33	25	25	30	25	60	60	75	75	S801R10N3D	
138	22	40	45	40	30	50	40	100	75	125	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>													
485	80	150	160	125	125	150	125	300	300	400	400	S801U36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S801U42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S801U50N3D ③	
<b>Frame Size V</b>													
485	80	150	160	125	125	150	125	300	300	400	400	S801V36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S801V42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S801V50N3D	
727	129	220	257	250	200	250	250	550	500	700	550	S801V65N3D	
816	147	257	295	250	250	300	250	600	550	750	700	S801V72N3D	
1021	180	315	375	300	250	300	300	750	600	900	750	S801V85N3D	
—	—	—	—	—	—	—	—	—	—	—	—	S801V10N3D ④	

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

④ For more information on optimum performance of the 1000A Frame Size V Inside-the-Delta S801, see Appendix C of MN03902009E.

Discount Symbol ..... 1CD1

**Inside-the-Delta Standard Duty Ratings**

**Table 39-37. 15 Second Ramp, 4 Starts per Hour, 450% Current Limit @ 40°C Ambient**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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			
<b>Frame Size N</b>													
47	7.5	12.5	15	10	10	15	10	30	25	40	30	S801N37N3D	
83	12.5	22	25	25	15	25	25	50	50	60	60	S801N66N3D	
<b>Frame Size R</b>													
126	18.5	37	40	30	30	40	30	75	60	100	100	S801R10N3D	
162	25	45	55	50	40	50	50	100	100	125	125	S801R13N3D	
<b>Frame Size T</b>													
266	45	80	90	75	60	100	75	150	150	250	200	S801T18N3D	
379	63	110	132	100	100	125	100	250	250	300	250	S801T24N3D	
485	80	150	160	125	125	150	125	300	300	400	400	S801T30N3D	
<b>Frame Size U</b>													
580	100	185	200	150	150	200	150	400	300	550	450	S801U36N3D	
695	110	200	250	200	150	250	200	450	400	600	550	S801U42N3D	
798	140	250	280	250	200	250	250	550	450	700	600	S801U50N3D ①	
<b>Frame Size V</b>													
580	100	185	200	150	150	200	150	400	300	550	450	S801V36N3D	
695	110	200	250	200	150	250	200	450	400	600	550	S801V42N3D	
798	140	250	280	250	200	250	250	550	450	700	600	S801V50N3D	
908	160	280	335	250	250	300	250	700	550	750	700	S801V65N3D	
1021	—	—	—	—	—	—	—	—	—	—	—	S801V72N3D	
1125	—	—	—	—	—	—	—	—	—	—	—	S801V85N3D	

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

**Table 39-38. 30 Second Ramp, 4 Starts per Hour, 450% Current Limit @ 40°C Ambient**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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			
<b>Frame Size N</b>													
36	5.5	10	12.5	7-1/2	7-1/2	7-1/2	7-1/2	25	15	25	25	S801N37N3D	
69	11	18.5	22	15	15	15	15	50	40	50	50	S801N66N3D	
<b>Frame Size R</b>													
96	15	25	30	25	25	30	25	60	50	75	60	S801R10N3D	
130	22	37	45	30	30	40	30	75	75	100	100	S801R13N3D	
<b>Frame Size T</b>													
257	45	80	90	75	60	75	75	150	150	250	200	S801T18N3D	
365	63	110	132	100	100	125	100	250	250	300	250	S801T24N3D	
448	80	140	160	125	125	150	125	300	250	400	300	S801T30N3D	
<b>Frame Size U</b>													
503	90	160	185	150	125	150	150	300	300	450	400	S801U36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S801U42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S801U50N3D ②	
<b>Frame Size V</b>													
503	90	160	185	150	125	150	150	300	300	450	400	S801V36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S801V42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S801V50N3D	
727	129	220	257	250	200	250	250	550	450	700	550	S801V65N3D	
796	—	—	—	—	—	—	—	—	—	—	—	S801V72N3D	
865	—	—	—	—	—	—	—	—	—	—	—	S801V85N3D	

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



**Type S801, Intelligent Technologies (IT.) Soft Starters**

**Inside-the-Delta Severe Duty Ratings**

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.

**Table 39-39. Severe Duty Inside-the-Delta Ratings**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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			
<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 S801N66N3D	
73	11	18.5	22	15	15	25	15	50	40	60	50		
<b>Frame Size R</b>													
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		
<b>Frame Size T</b>													
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		
<b>Frame Size U</b>													
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		
<b>Frame Size V</b>													
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 500 Amp 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.

**Options**

**Extended Ramp**

For a longer ramp acceleration time of .5 – 360 seconds, change the last digit in the Catalog Number from **Page 39-25** to **L**.

**Table 39-40. Extended Ramp Option**

Frame Size	Max. Current	Catalog Number	Price U.S. \$
N	37	S801N37N3L	
	66	S801N66N3L	
R	105	S801R10N3L	
	135	S801R13N3L	
T	180	S801T18N3L	
	240	S801T24N3L	
	304	S801T30N3L	
U	360	S801U36N3L	
	420	S801U42N3L	
	500	S801U50N3L ①	
V	360	S801V36N3L	
	420	S801V42N3L	
	500	S801V50N3L	
	650	S801V65N3L	
	720	S801V72N3L	
	850	S801V85N3L	
	1000	S801V10N3L	

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

**Extended Ramp and 690V Option**

For voltage ratings of 690V, use the table below.

**Table 39-41. 690V Option**

Frame Size	Max. Current	Catalog Number	Price U.S. \$
T	180	S801T18V3L	
	240	S801T24V3L	
	304	S801T30V3L	
V	360	S801V36V3L	
	420	S801V42V3L	
	500	S801V50V3L	
	650	S801V65V3L	
	850	S801V85V3L	

**Pump Control**

For pump control option, use the following table to select the product you are looking for. For sizing information, use the tables on **Pages 39-25 to 39-30**.

**Table 39-42. Pump Control Option**

Frame Size	Max. Current	Catalog Number	Price U.S. \$
N	37	S801N37P3S	
	66	S801N66P3S	
R	105	S801R10P3S	
	135	S801R13P3S	
T	180	S801T18P3S	
	240	S801T24P3S	
	304	S801T30P3S	
U	360	S801U36P3S	
	420	S801U42P3S	
	500	S801U50P3S ②	
V	360	S801V36P3S	
	420	S801V42P3S	
	500	S801V50P3S	
	650	S801V65P3S	
	720	S801V72P3S	
	850	S801V85P3S	
	1000	S801V10P3S	

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



*Surge Suppressor*



*Surge Suppressor Mounted on a 200 mm Device*

**Accessories**

**Surge Suppressors**

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).

**Table 39-43. Surge Suppressors**

Description	Catalog Number	Price U.S. \$
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 ③ and 290 mm units	EMS41	

③ T-Frame only.

## Type S801, Intelligent Technologies (IT.) Soft Starters

### Lug Kits

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.



Lug Kits — EML23

Table 39-44. Lug Kits

Frame Size	Frame Designation	Description	Catalog Number	Price U.S. \$
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	
		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	
290 mm SSRV	V	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 <sup>①</sup>	

<sup>①</sup> The EML33 does not have a CSA Listing.

### Lug Cover Kits

Replacement covers for the T and V frame are available in case of damage to the existing covers.

Table 39-45. Lug Cover Kits

Description	Catalog Number	Price U.S. \$
Lug Cover T, U Frame	EML27	
Lug Cover V Frame	EML34	

### Control Interface Module

The Control Interface Module (CIM) is available as a replacement part in two versions.

Table 39-46. CIM

Description	Catalog Number	Price U.S. \$
Blank Cover (Filler)	EMA68	
CIM for Standard Unit	EMA71	
CIM for Pump Control Option	EMA72	
Panel Mounting Kit — 3 ft. Cable 5 ft. Cable 8 ft. Cable 10 ft. Cable	EMA69A EMA69B EMA69C EMA69D	

### Control Wire Connector

Table 39-47. Control Wire Connector

Description	Catalog Number	Price U.S. \$
12 pin, 5 mm pitch Connector for Control Wiring	EMA75	

### User Manual

A comprehensive User Manual is available and can be downloaded free of charge from [www.eaton.com](http://www.eaton.com) by performing a document search for MN03902008E. The Inside-the-Delta User Manual can be found by searching for Pub. No. MN03902009E.

### Sales Demo Kit

A Demo Kit is available for use in customer presentations. It comes in a solid, lightweight carry case for easy use. The kit includes the following items:

- S801N66N3S — 65 Amp Soft Starter or S801R13N35
- PSS55A — 55 Watt Power Supply
- IT. Soft Starter brochure
- Cutout pictures of the four frame sizes
- Family photo

Table 39-48. Sales Demo Kits

Description	Catalog Number	Price U.S. \$
S801N66N3S	S801DEMOW	
S801R13N3S	S801RDEMOW	

### Functional Kits

### Mounting Plates

The Mounting Plates are designed to help make it easy to install or retrofit the soft starter into enclosures and MCCs. The soft starter can be mounted onto the plate prior to installation. The mounting plate is designed with tear drop mounting holes for easier installation.

Table 39-49. Mounting Plates

Description	Catalog Number	Price U.S. \$
Mounting Plate N Frame	EMM13N	
Mounting Plate R Frame	EMM13R	
Mounting Plate T, U Frame	EMM13T	
Mounting Plate V Frame	EMM13V	
Fan/Hood Accessory	EMM18	

### Adapter Plates

The Adapter Plate allows customers to retrofit a V-Frame 290 mm Soft Starter with the U-Frame 200 mm Soft Starter.

Table 39-50. Adapter Plates

Description	Catalog Number	Price U.S. \$
Adapter Plates <sup>②</sup>	EMM13U	

<sup>②</sup> For more information see Pub51719.

### Vibration Plates

The Vibration Plates allow the soft starter to be applied in high shock and vibration applications. The vibration plate allows vibration up to 5g and shock in up to 40g. The soft starter is mounted onto the vibration plate prior to installation in the panel.

Table 39-51. Vibration Plates

Description	Catalog Number	Price U.S. \$
Vibration Plate N Frame	EMM14N	
Vibration Plate R Frame	EMM14R	
Vibration Plate T, U Frame	EMM14T	
Vibration Plate V Frame	EMM14V	

### Power Supplies

24V DC Power Supply which can be used with the S801 SSRV or as a stand-alone device.

Table 39-52. Power Supplies

Description	Catalog Number	Price U.S. \$
115V AC Input 24V DC Output	PSS55A	
230V AC Input 24V DC Output	PSS55B	
380 – 480V AC Input 24V DC Output	PSS55C	

### DIN Rail Power Supply Mounting Kit (35 mm)

Table 39-53. DIN Rail Mounting Kit

Description	Catalog Number	Price U.S. \$
DIN Rail Mounting Kit (35 mm)	PSSDIN	

Discount Symbol ..... 1-CD1

## Standards and Certifications

- IEC 947 compliant
- EN 60947-4-2
- CSA Certification
- cUL<sub>US</sub> Listed (File # E202571)
- CE marked

## Technical Data and Specifications

**Table 39-54. Specifications— IT. Soft Starter**

Soft Starter (Partial Catalog Number)	S801 N37	S801 N66	S801 R10	S801 R13	S801 T18	S801 T24	S801 T30	S801 U36	S801 U42	S801 U50 ①	S801 V36	S801 V42	S801 V50	S801 V65	S801 V72	S801 V85	S801 V10 ②
Max. Current Capacity	37	66	105	135	180	240	304	360	420	500	360	420	500	650	720	850	1000
<b>Dimensions</b>																	
Width in Inches (mm)	2.60 (66.0)		4.37 (111.0)		7.65 (194.4)			7.73 (196.3)			11.03 (280.2)						
Height in Inches (mm)	7.38 (187.4)		7.92 (201.1)		12.71 (322.9)			12.72 (323.1)			16.57 (420.8)						
Depth in Inches (mm)	6.63 (168.4)		7.03 (178.6)		6.69 (169.8)			7.08 (179.9)			7.23 (183.7)						
Weight in lbs. (kg)	5.8 (2.6)		10.5 (4.8)		48 (21.8) w/Lugs 41 (18.6) w/o Lugs			48 (21.8) w/Lugs 41 (18.6) w/o Lugs			103 (46.8) w/Lugs 91 (41.4) w/o Lugs						
<b>General Information</b>																	
Bypass Mechanical Lifespan	10M																
Insulating Voltage U <sub>i</sub>	660V																
Ramp Time Range	.5 – 180 Seconds (.5 – 360 Seconds Extended Ramp)																
Resistance to Vibration	3g																
Resistance to Shock	15g																
<b>Electrical Information</b>																	
Operating Voltage	200 – 600V																
Operating Frequency	47 – 63 Hz																
Overload Setting	30 – 100%																
Trip Class	5, 10, 20, & 30																
<b>Cabling Capacity (IEC 947)</b>																	
Number of Conductors	1		1		1 or 2			1 or 2			2, 4 or 6						
Wire Sizes	14 – 2		14 – 4/0		4 AWG to 500 MCM			4 AWG to 500 MCM			2/0 to 500 MCM						
Type of Connectors	Box Lug							Add-On Lug Kit									
<b>Control Wiring (12-Pin)</b>																	
Wire Sizes in AWG	22 – 14																
Number of Conductors (Stranded)	2 (or one AWG 12)																
Torque Requirements in lb-in	3.5																
Solid, Stranded or Flexible Max. Size in mm <sup>2</sup>	3.31																
<b>Control Power Requirements</b>																	
Voltage Range (24V ± 10%)	21.6 – 26.4																
Steady State Current Amps	1.0		1.0		1.0			1.0			1.4						
Inrush Current Amps	10		10		10			10			10						
Ripple	1%																
<b>Relays (1) Class A and C</b>																	
Voltage AC — maximum	240																
Voltage DC — maximum	120																
Amps — maximum	3																
<b>Environment</b>																	
Temperature — Operating	-30 – 50°C (No derating) Consult factory for operation > 50° C																
Temperature — Storage	-50 – 70°C																
Altitude	<2000 Meters — Consult factory for operation > 2000m																
Humidity	<95% Non-condensing																
Operating Position	Any																
Pollution degree IEC947-1	3																
Impulse withstand Voltage IEC947-4-1	6000V																

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

② UR Recognized Product.

**Dimensions**

**39**

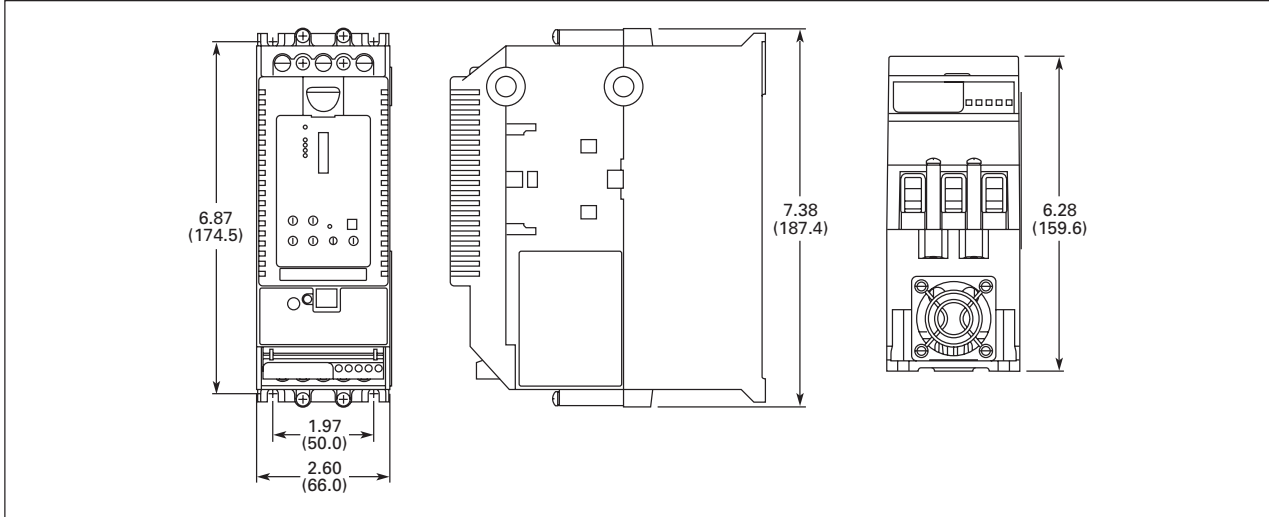


Figure 39-12. N-Frame (65 mm) S801 Approximate Dimensions in Inches (mm)

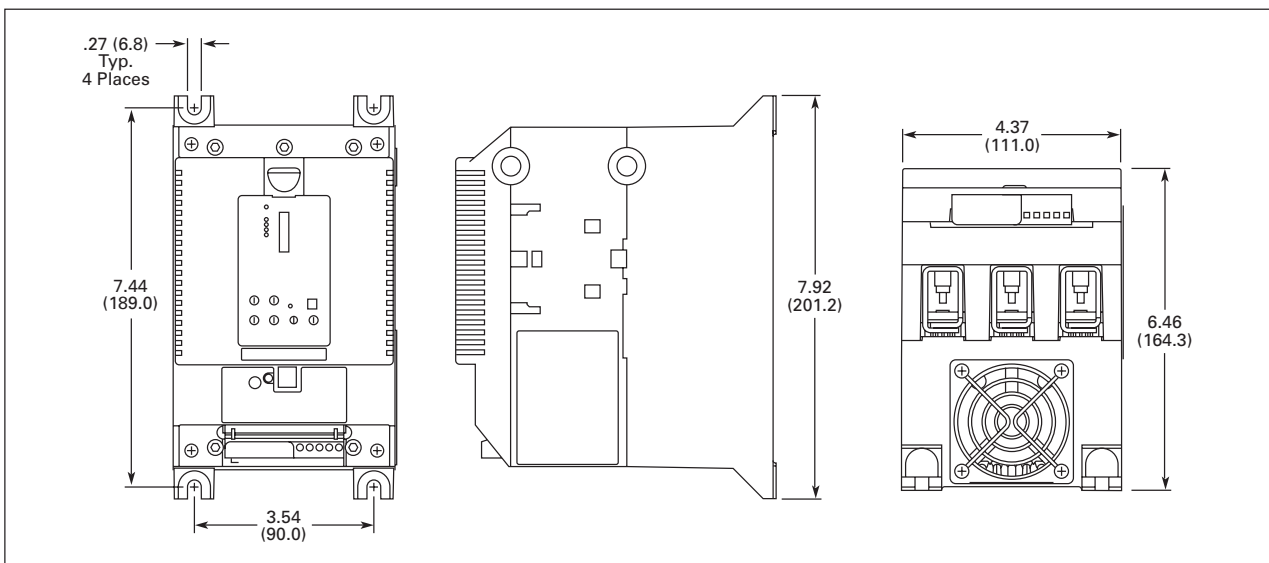
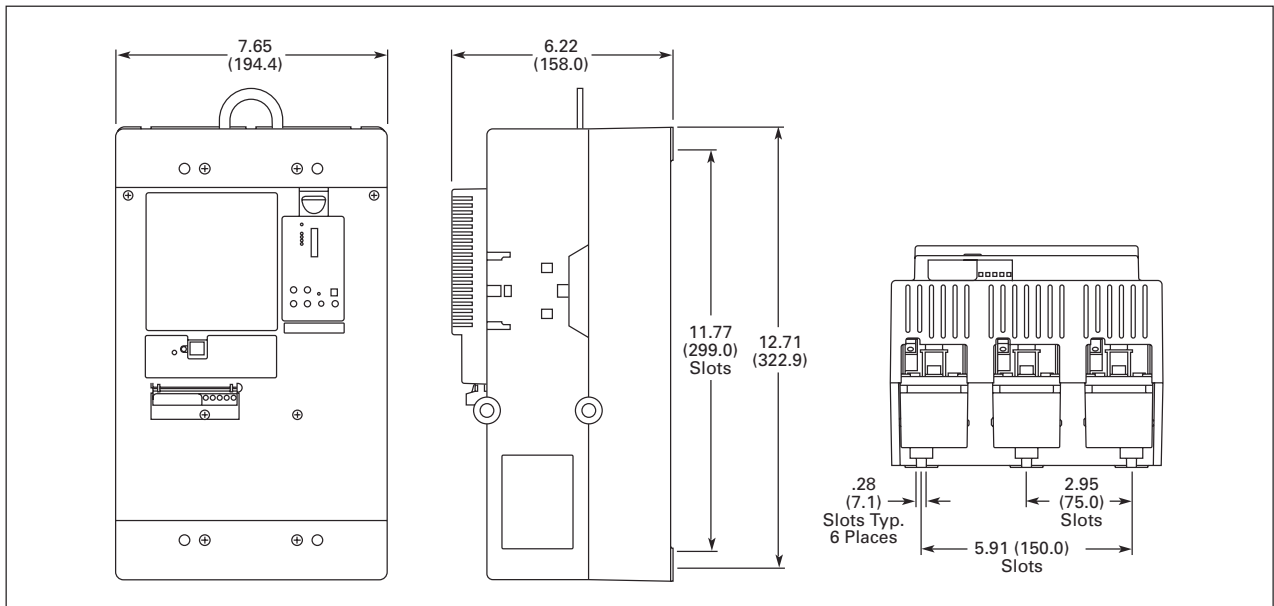
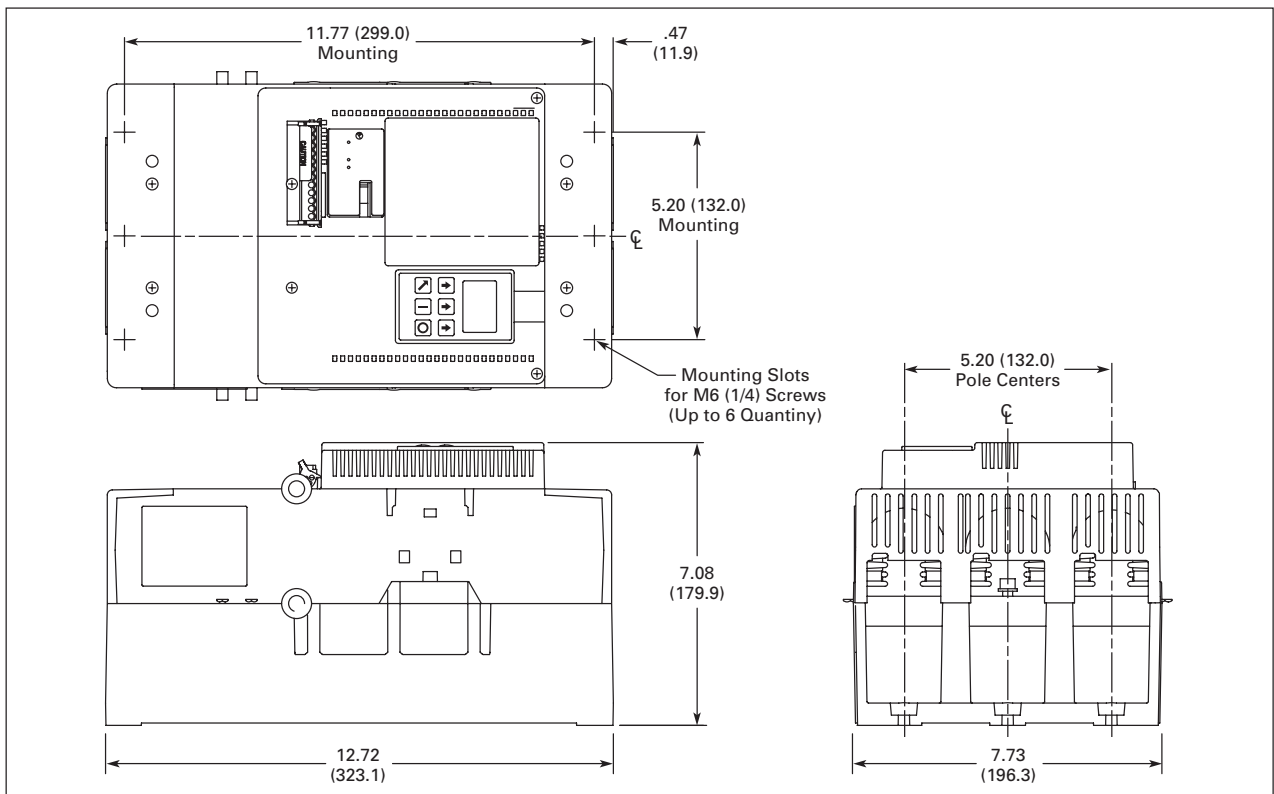


Figure 39-13. R-Frame (110 mm) S801 Approximate Dimensions in Inches (mm)



**Figure 39-14. T-Frame (200 mm) S801 Approximate Dimensions in Inches (mm)**



**Figure 39-15. U-Frame (200 mm) S801 Approximate Dimensions in Inches (mm)**

39

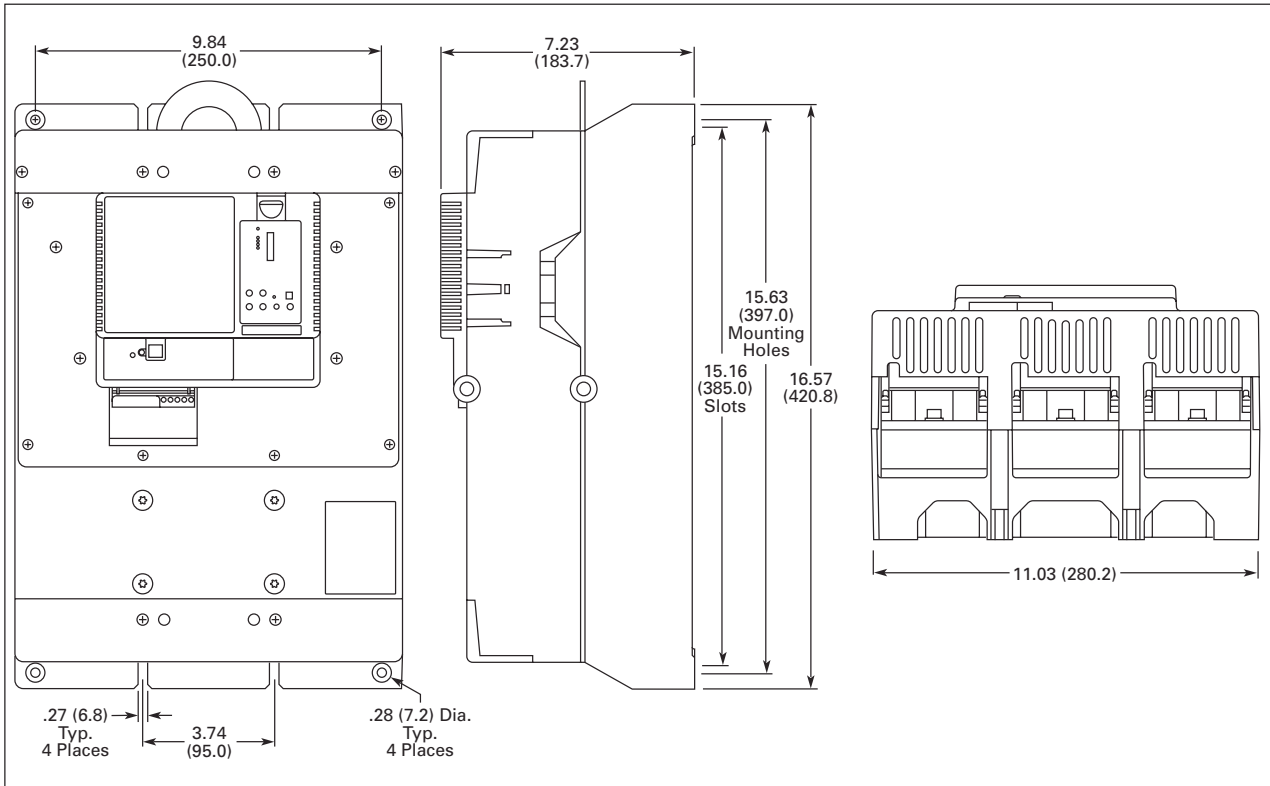


Figure 39-16. V-Frame (290 mm) S801 Approximate Dimensions in Inches (mm)

**Contents**

<i>Description</i>	<i>Page</i>
<b>Type S811, Intelligent Technologies (IT.) Soft Starters with DIM</b>	
Product Description . . . . .	39-37
Application Description . . . . .	39-37
Features and Benefits . . . . .	39-39
Operation . . . . .	39-42
Catalog Number Selection . . . . .	39-43
Product Selection . . . . .	39-44
Options . . . . .	39-54
Accessories . . . . .	39-54
Standards and Certifications . . . . .	39-55
Instructional Leaflets . . . . .	39-55
Technical Data and Specifications . . . . .	39-56
Dimensions . . . . .	39-57



**S811 Open Soft Starter**

**Product Description**

Eaton's Cutler-Hammer® *IT.* S801 revolutionized the reduced voltage control marketplace with its advanced feature set and small size. In fact, readers of an industry leading control publication rated Cutler-Hammer Soft Starters best in customer satisfaction in March 2004 and April 2006. The new *IT.* S811 from Eaton's electrical business offers all the popular features of the S801, but adds enhanced functionality with the new DIM (Digital Interface Module), communications, metering, monitoring and diagnostics capabilities.

The Cutler-Hammer Intelligent Technologies (*IT.*) Line of S811 Reduced Voltage Soft Starters is very compact, multi-functional, easy to install and easy to program. Designed to control the acceleration and deceleration of three-phase motors up to 690V, the line is available from 11 amps through 1,000 amps.

The S811 is designed to be a complete package combining the SCRs, bypass contactor and overload in one, very compact unit. The S811 is available as a component for panel mounting, in motor control centers or in enclosed control (NEMA Type 1, 3R, 4, 4X, 7/9 and 12).

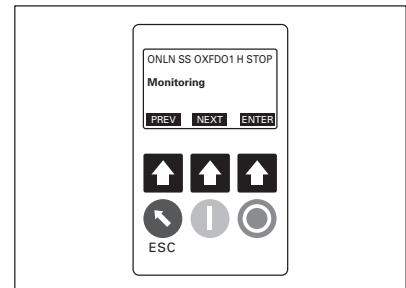
**Application Description**

Designed to control the acceleration and deceleration of three-phase motors, the *IT.* S811 soft starter uses Silicon Controlled Rectifiers (SCRs) to control the voltage to soft start and soft stop the motor. After the motor is started, internal run bypass contactors close, resulting in the motor running directly across-the-line. The built-in solid-state overload protects the motor from overload conditions with sophisticated algorithms that model true motor heating, resulting in better motor protection and fewer nuisance trips. Advanced protective and diagnostic features reduce downtime.

A voltage ramp start or current limit start is available. Kick start is available in either starting mode. The soft stop option allows for a ramp stop time that is longer than the coast to stop time. The pump control option provides a smooth transition for starting and stopping a motor and eliminating the "water-hammer" effect that can damage pipes, valves and pumps.

The S811 offers an impressive array of advanced protective features. Not only are the protective features selectable, but many offer variable settings allowing the user to fine tune the starter to meet specific system requirements.

The S811 has an easy to use Digital Interface Module (DIM) that allows the user to configure the device and to read system parameters. The DIM includes an LCD display and keypad to scroll through the various menus. The DIM allows the user to modify control parameters, enable or disable protections, set communication variables, monitor system parameters such as line voltages and currents, and access the fault queue.



**Figure 39-17. Digital Interface Module (DIM)**

The DIM can be removed from the S811 and remote mounted. Kits are available to door mount the DIM, enabling users to safely configure, commission, monitor and troubleshoot the system at the electrical panel without opening the enclosure door. This will help eliminate the possibility of an arc flash incident.

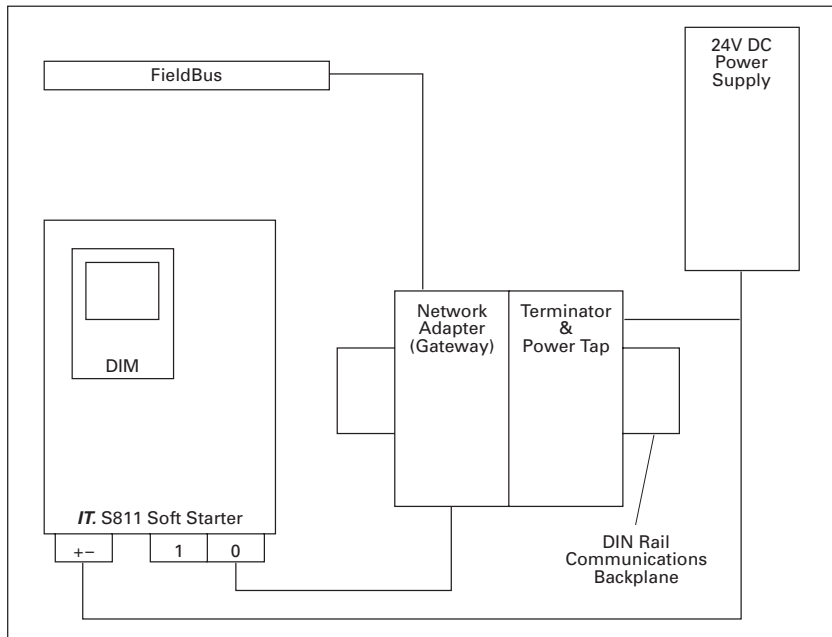


**Type S811, Intelligent Technologies (IT) Soft Starters with DIM**

**Communications**

The S811 has built-in communication capabilities through Cutler-Hammer QC (Quick Connect) Port. QCPort enables the soft starter to be connected to a variety of networks, including DeviceNet™, EtherNet/Modbus, EtherNet/IP and PROFIBUS. The advantage of QCPort is that multiple control components can be connected to one Cutler-Hammer *IT*. D77D gateway. The gateway concentrates data from the devices into a single node. Configuration is simple — a single press of the gateway's Auto Configuration button sets the system up for default operation. This automatically configures the I/O assemblies to the QCPort system devices. The data from these devices are then assembled into single input and output messages.

The S811 communication parameters can be configured with the DIM or through the fieldbus using CH Studio Component Manager. Advanced communication configuration settings provide the system integrator with powerful tools to facilitate system optimization.



**Figure 39-18. S811 Connection Diagram**

**Table 39-55. Communications Reference**

Description	Part Number	Catalog Page
DeviceNet Network Adapter	D77D-DNA	50-36
EtherNet Modbus Network Adapter	D77D-EMA	50-38
EtherNet/IP Network Adapter	D77D-EIP	50-40
PROFIBUS Network Adapter	D77D-PNA	50-42
Terminator and Power Tap	D77E-QPLR	50-31
DIN Rail Communications Backplane, 7-position	D77E-BP7	50-31
DIN Rail Communications Backplane, 12-position	D77E-BP12	50-31
24V DC Power Supply (120V AC Input)	PSS55A	44-65
24V DC Power Supply (240V AC Input)	PSS55B	44-65
24V DC Power Supply (480V AC Input)	PSS55C	44-65

## Features and Benefits

- The DIM (Digital Interface Module) provides an intuitive, easy-to-use human interface with powerful configuration capabilities to maximize system performance.
- Door or device mounted DIM enables users to safely configure, commission, monitor and troubleshoot the system at the electrical panel 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. Increase uptime by providing data for process management and preventive diagnostics.
- Run bypass mode greatly reduces internal heating created by the greater power dissipation in the SCRs. Bypass contactor directly connects the motor to the line and improves system efficiency by reducing internal power losses.
- Internal solid-state overload protection provides accurate current measurement and trip settings. Sophisticated algorithms solve a series of differential equations that model true motor heating and cooling, resulting in superior motor overload protection while minimizing nuisance trips. Advanced selectable protective features safeguard the motor and system against a variety of system faults.
- Internal run bypass contactors and overload protection eliminate the need for additional devices, reducing enclosure sizes, minimizing installation and wiring time and reducing overall assembly size and cost.
- Wide range of overload FLA settings (31 – 100% of rated current) and a selectable trip class (5 – 30) offers users the flexibility to fine tune the starter to match specific application requirements.
- Variable ramp times and torque control settings provide unlimited starting configurations, allowing for maximum application flexibility.
- Kick-start feature enables soft starting of high friction loads.
- Soft stop control for applications where an abrupt stop of the load is not acceptable.

- Pump control option with sophisticated pump algorithms on both starting and stopping that minimize the pressure surges that cause water hammer. The pump control option will maximize the life of the pump and piping systems while minimizing the downtime caused by system failure.
- Six SCRs control all three motor phases, providing smooth acceleration and deceleration performance.
- Soft acceleration and deceleration reduces wear on belts, gears, chains, clutches, shafts and bearings.
- Reduce the peak inrush current's stress on the power system.
- Minimize peak starting torque to diminish mechanical system wear and damage.
- 24V DC control module enhances personnel and equipment safety.
- Removable, lockable control terminal block reduces maintenance costs. Also provides the opportunity for OEMs to reduce assembly and test costs by utilizing pre-assembled wire harnesses.

## Protective Features

All protective features can be configured, enabled or disabled with the DIM or through the communications network.

### Motor Overload

The S811 includes electronic overload protection as standard. The overload meets applicable requirements for a motor overload protective device. The overload protects the motor from over heat conditions with the use of sophisticated algorithms that model true motor heating, resulting in superior motor protection and fewer nuisance trips.

The S811 calculates a thermal memory value. A 100% value represents the maximum safe temperature of the motor. When the thermal memory value reaches 100%, an overload trip will occur removing power to the motor. Upon trip, the S811 stores the calculated motor heating value and will not allow a motor re-start until the motor has sufficiently cooled. This feature ensures the motor will not be damaged by repeated overload trip, reset and re-start cycles.

The thermal memory value can be monitored through the DIM or the communications network. The thermal memory value can be of great use in determining an impending overload trip condition. Alarms can be implemented in the process monitoring system warning of an impending trip before a trip occurs halting the process. Costly system downtime can be avoided.

The trip current is adjusted to match the specific application requirements by entering the motor nameplate full load current rating and trip class. The FLA adjustment includes a 3 to 1 adjustment range. The overload trip class is adjustable from class 5 through class 30. The overload is ambient temperature compensated — meaning its trip characteristics will not vary with changes in ambient temperature. The overload protection can be enabled, disabled, or disabled on start.

### Short Circuit

The use of a short circuit protective device in coordination with the S811 is required in branch motor circuits by most electrical codes. Short circuit coordination ratings with both fuses and Cutler-Hammer molded case circuit breakers are available providing customers with design flexibility. The S811 has short circuit coordination ratings as an open component, an enclosed starter, and in a motor control center.

### Jam

Excessive current and torque up to locked rotor levels can occur in a jam condition. The condition can result in stress and damage to the motor, load, mechanical system, and the electrical distribution system. Jam protection prevents the stress and damage from a jam during normal run. After the motor is started, a current greater than 300% FLA setting will cause the starter to trip on a jam fault.

### Stall

Excessive current and torque up to locked rotor levels can occur in a stall condition. The condition can lead to an overload trip and result in stress and damage to the motor, load, mechanical system, and the electrical distribution system. Stall protection prevents stress and damage to a motor that has not come up to speed, or stalled after the soft start time. The S811 will trip to protect the system in the event that the motor did not get to the rated speed in the defined soft start period. A current greater than 200% FLA at the end of the soft start period will cause the starter to trip on a stall fault.

### Pole Over Temperature

High ambient temperatures, extended ramp times and high duty cycle conditions may cause the S811 power pole conductors to reach a temperature that exceeds their thermal rating. The S811 is equipped with sensors that monitor the temperature of the power poles. Over temperature protection occurs if the device's thermal capacity is exceeded. The soft starter will trip in over temperature conditions, preventing device failure.

The device pole temperature value can be monitored through the DIM or the communications network. This feature can be of use in determining an impending over temperature trip condition. Alarms can be implemented in the process monitoring system warning of an impending trip before a trip occurs, halting the process. Costly system shutdown can be avoided.

### Phase Loss

Loss of a phase can cause a significant increase in the current drawn in the remaining two phases. Phase loss can lead to motor damage before an eventual overload trip occurs. Phase loss is typically an indication of a failure in the electrical distribution system. The S811 will detect a phase loss and trip if any phase current drops below a preset value. The phase loss trip level is adjustable from 0% to 100% of the average of the other two phase levels with an adjustable trip delay of 0.1 to 60 seconds.

### Phase Imbalance

Phase current or voltage imbalance can cause a significant increase in the current drawn in the remaining two phases. Phase imbalance can lead to motor damage before an eventual overload trip. Phase imbalance is typically an indication of a failure in the electrical distribution system or the motor. The S811 will detect both current and voltage phase imbalances and trip if any phase becomes imbalanced as compared to the average of the other two phases.

The phase current imbalance trip level is adjustable from 0% to 100% of the average of the current in the other two phases with an adjustable trip delay of 0.1 to 60 seconds.

The phase voltage imbalance trip level is adjustable from 0% to 100% of the average of the voltage in the other two phases with an adjustable trip delay of 0.1 to 60 seconds.

### Reset Mode

The S811 can be set up for automatic or manual reset on trip. The manual reset mode requires the operator to physically press the RESET button located on the soft starter. The overload can be manually reset through the DIM or through the communications network. The overload can also be electrically reset by energizing a 24V DC input on the control terminal block.

The automatic reset mode allows the soft starter to be automatically reset as soon as the trip condition is no longer present. With the automatic reset mode, after the fault is no longer present, the motor will be restarted as soon as a valid start signal is present.

### Phase Reversal

The S811 can determine if the proper line phase sequence is present by default. The device will trip if the line phase sequence is something other than A-B-C. The S811 can be configured to operate under reversed phase conditions (A-C-B).

### Shorted SCR Detection

The S811 monitors the operation of the power poles and will trip under a shorted SCR condition.

### Open SCR Detection

The S811 monitors the operation of the power poles and will trip under an open SCR condition.

### Low Current

Low current conditions can be a result of a loss of load or a failure in the mechanical system. The S811 has low current protection that will trip if the average RMS current falls below a preset value. The low current protection can be programmed as a percent of motor FLA from 0% to 100%.

### Low Voltage

Low voltage conditions can result from disturbances in the electrical power distribution system. Low voltage conditions can cause a malfunction and damage to electrical equipment. The S811 has low voltage protection that will trip if the average RMS voltage falls below a preset value. The low voltage protection can be programmed as a percent of nominal voltage from 1% to 99% with a trip delay of 0.1 to 60 seconds.

### High Voltage

High voltage conditions can result from disturbances in the electrical power distribution system. High voltage conditions can cause malfunctions or failures of electrical equipment. The S811 has high voltage protection that will trip if the average RMS voltage is greater than a preset value. The high voltage protection can be programmed as a percent of nominal voltage from 101% to 120% with a trip delay of 0.1 to 60 seconds.

## Monitoring Capabilities

The S811 has an impressive array of system monitoring capabilities that allow users to access real time process and diagnostic data. This data can be viewed at the device with the DIM or through a communications network. Data over a communications network can provide valuable insight into the condition of the equipment and processes. Maintenance and production personnel can monitor critical operational and maintenance data from a central control station that can be located far away from the production facility. Process data can be monitored to determine system anomalies that may indicate a need for preventive maintenance or an impending failure. Adjustments made through the communications network can reduce costs by minimizing the time traveling to the location where the motor controls are located. When faults do occur, real time fault data can assist maintenance in troubleshooting and planning repair resources. Remote reset signals can be given to tripped devices without the need for manual intervention by maintenance personnel.

### Average Line Current

Provides the average of the three-phase RMS line currents in amps, accurate to within 2%. Current data can be used to indicate a need for maintenance. Increased currents in a fixed load application can indicate a reduction in system efficiencies and performance, signifying system maintenance is due.

### Average Pole Current

Provides the average of the three-phase RMS pole currents in amps, accurate to within 2%. The pole current is the current through the soft starter. The line and pole current will be identical in in-line applications, and will differ in inside-the-delta applications.

### Average line current as a % FLA

Provides the average RMS line current as a percentage of the S811 FLA setting.

### Three-Phase Line Currents

Provides three RMS phase line currents in amps, accurate to within 2%. Imbalances or changes in the relative phase current to one another can indicate anomalies in the motor or electrical distribution system.

### Three-Phase Pole Currents

Provides three RMS phase pole currents in amps, accurate to within 2%. The pole current is the current through the soft starter. The line and pole current will be identical in in-line applications, and will differ in inside-the-delta applications.

### Three-Phase Line Voltages

Provides the individual RMS three-phase line voltages. Imbalances or changes in the relative phase voltage to one another can indicate anomalies in the motor or electrical distribution system. Voltage can be used to monitor electrical distribution system performance. Warnings, alarms and system actions to low or high voltage conditions can be implemented.

### Percent Thermal Memory

Provides the real time calculated thermal memory value. The S811 calculates thermal memory value. A 100% value represents the maximum safe temperature of the motor. When the thermal memory value reaches 100%, an overload trip will occur, removing power to the motor.

The thermal memory value can be of great use in determining an impending overload trip condition. Alarms can be implemented in the process monitoring system warning of an impending trip before a trip occurs, halting the process. Costly system downtime can be avoided.

### DC Control Voltage

Monitors level of the 24V DC control voltage. Fluctuations in control voltage can cause component malfunction and failure. System control voltage data can be used to implement warnings, alarms and system actions to low or high voltage conditions.

### Pole Temperature

Increases in pole temperature are caused by increases in ambient temperature, start/stop times and start duty cycles. Changes in pole temperatures represent a change in system operating conditions. Identifying unexpected operating conditions or changes can prompt maintenance and aid in process evaluation activities.

### Device Temperature

An increase in device temperature is a strong indication of an increase in ambient temperature. High ambient temperature operation can be identified with the Device Temperature data. Ambient temperature increases can be due to loss of enclosure cooling fans or blocked venting. High ambient temperatures will reduce the life of all electrical equipment in the enclosure.

### Start Count

Start count data can be used to monitor system output, schedule preventative maintenance, identify system anomalies and identify changes in system operation.

## Diagnostics

### Fault Queue

Current fault and a fault queue containing the last nine system faults can be read through the DIM or communications network. Fault identification can minimize troubleshooting time and cost and prevent arc flash incidents. The fault queue can be remotely accessed through a communications network to assist in planning maintenance resources. 30 different faults can be identified by the S811.

### Control Status

The S811 provides data that represents system conditions that can be read through the DIM or the communications network. This data identifies the status of the system and the control commands the system is requesting of the S811. This can be used for advanced troubleshooting and system integration activities.

### Breaker Status

The S811 has provisions to read and display circuit breaker status. Cutler-Hammer communicating Cover Control or other communicating protective device is required to take advantage of this feature.

## Operation

### Starting and Stopping Modes

The S811 has a variety of starting and stopping methods to provide superior performance in the most demanding applications. The motor can be started in either Voltage Ramp Start or Current Limit Start mode. Kick Start and Soft Stop are available within both starting modes.

#### Voltage Ramp Start

Provides a voltage ramp to the motor resulting in a constant torque increase. The most commonly used form of soft start, this start mode allows you to set the initial torque value and the duration of the ramp to full voltage conditions. Bypass contactors close after ramp time.

- Adjustable initial torque 0 – 85% of locked rotor torque.
- Adjustable ramp time 0.5 – 180 seconds (can be extended with factory modification).

#### Current Limit Start

Limits the maximum current available to the motor during the start phase. This mode of soft starting is used when it becomes necessary to limit the maximum starting current due to long start times or to protect the motor. This start mode allows you to set the maximum starting current as a percentage of locked rotor current and the duration of the current limit. Bypass contactors close after current limit time.

- Maximum current of 0 – 85% locked rotor current.
- Adjustable ramp time 0.5 – 180 seconds (can be extended with factory modification).

#### Kick Start

Selectable feature in both Voltage Ramp Start and Current Limit Start modes. Provides a current and torque “kick” for 0 to 2.0 seconds. This provides greater initial current to develop additional torque to breakaway a high friction load.

- 0 – 85% of locked rotor torque
- 0 – 2.0 seconds duration

#### Soft Stop

Allows for a controlled stopping of a load. Used when a stop-time that is greater than the coast-to-stop time is desired. Often used with high friction loads where a sudden stop may cause system or load damage.

- Stop time = 0 – 60 seconds.

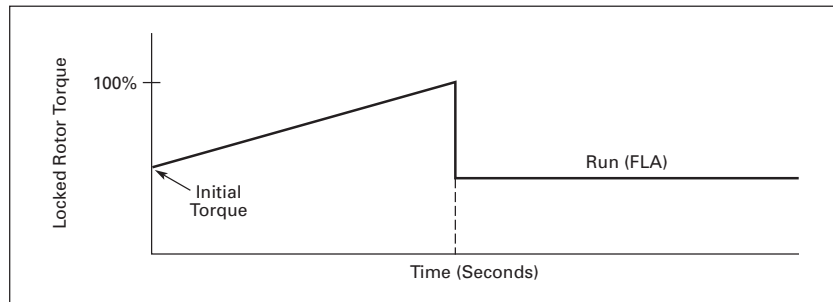


Figure 39-19. Starting Characteristics — Ramp Start

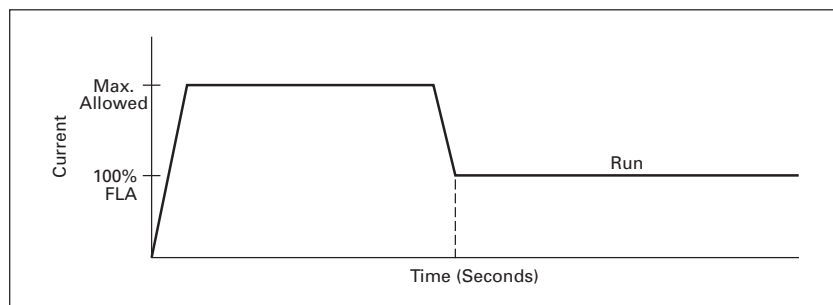


Figure 39-20. Starting Characteristics — Current Limit Start

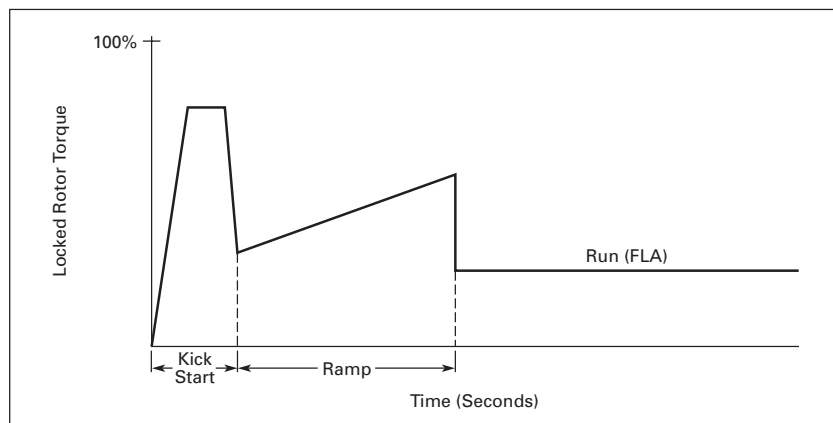


Figure 39-21. Starting Characteristics — Kick Start

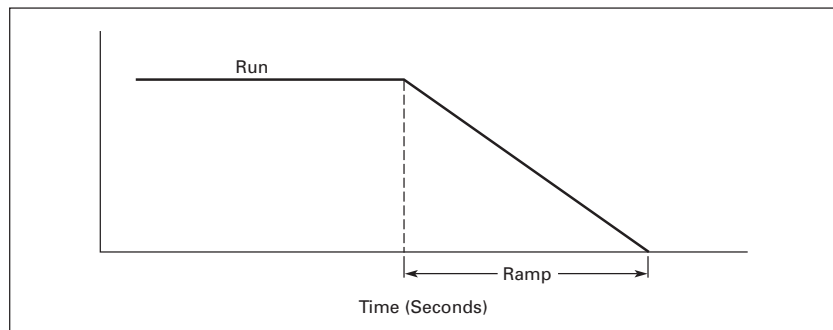
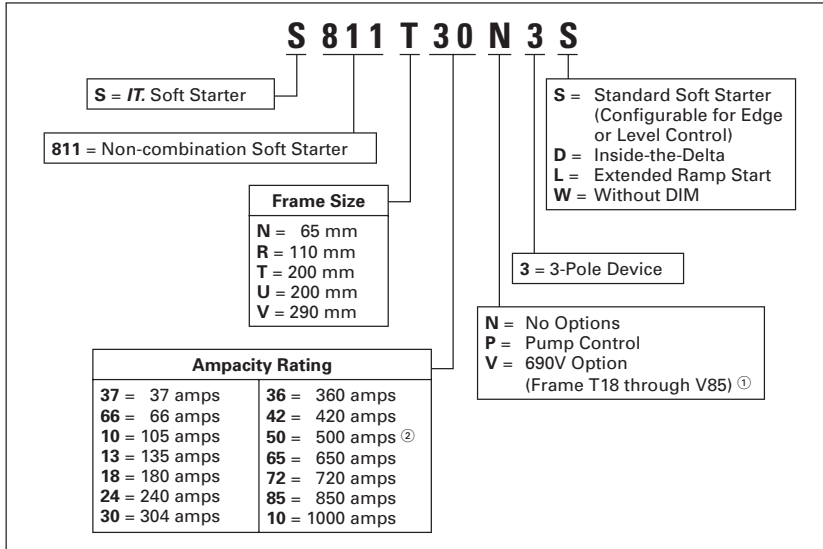


Figure 39-22. Starting Characteristics — Soft Stop

**Catalog Number Selection**

**Table 39-56. S811 Open Soft Starters Catalog Numbering System**



① Not available in U-Frame.  
② U-Frame 500 Amp unit does not have IEC Certification.

**Edge and Level Sensing Control**

**Edge Sensing**

Edge sensing is denoted with an “S” in the last character of the Catalog Number. *Example:* S801T30N3S.

Edge sensing requires +24V DC power be momentarily applied to pin 1 (with terminal P at +24V DC) to initiate a start under all conditions. After a stop or fault occurs, the +24V DC must be removed, then reapplied to pin 1 before another start can occur. This control configuration should be used when restarting of the motor after a fault or stop must be supervised manually or as a part of a control scheme. The cycling of +24V DC power to terminal 1 before starting is required regardless of the position of the auto reset switch on the CIM.

**Level Sensing**

Level sensing is denoted with a “B” in the last character of the Catalog Number. *Example:* S801T30N3B.

Level sensing will enable a motor to restart after a fault is cleared without cycling +24V DC power to terminal 1 as long as:

- Terminal P is supplied with +24V DC (to start from Terminal Block, Input #3 must also be enabled),
- The auto reset switch on the CIM is set to enabled,
- All faults have been reset.

This control configuration should be used where it is desirable to restart a motor after a fault without additional manual or automatic control. An example of this condition would be on a remote pumping station where it is desirable to automatically restart a pump after a power outage without operator intervention.

**If the auto reset feature is used, CAUTION must be exercised to assure that any restart occurs in a safe manner.**

Type S811, Intelligent Technologies (IT) Soft Starters with DIM

## Product Selection

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. For other applications, or when a question arises, consult with your local Eaton Representative or call our Technical Resource Center.

## Standard Duty

Table 39-57. 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

39

Table 39-58. Product Selection — 15 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
<b>Frame Size N</b>													
37	10	18.5	18.5	10	10	10	10	25	20	30	30	S811N37N3S	
66	18.5	30	37	20	15	20	20	50	40	60	50	S811N66N3S	
<b>Frame Size R</b>													
105	30	55	59	30	25	40	30	75	60	100	75	S811R10N3S	
135	40	63	80	40	30	50	40	100	75	125	100	S811R13N3S	
<b>Frame Size T</b>													
180	51	90	110	60	50	60	60	150	125	150	150	S811T18N3S	
240	75	110	147	75	60	75	75	200	150	200	200	S811T24N3S	
304	90	160	185	100	75	100	100	250	200	300	250	S811T30N3S	
<b>Frame Size U</b>													
360	110	185	220	125	100	150	125	300	250	350	300	S811U36N3S	
420	129	220	257	150	125	175	150	350	300	450	350	S811U42N3S	
500	150	257	300	150	150	200	150	400	350	500	450	S811U50N3S <sup>②</sup>	
<b>Frame Size V</b>													
360	110	185	220	125	100	150	125	300	250	350	300	S811V36N3S	
420	129	220	257	150	125	175	150	350	300	450	350	S811V42N3S	
500	150	257	300	150	150	200	150	400	350	500	450	S811V50N3S	
650	200	355	425	250	200	250	200	500	450	600	500	S811V65N3S	
720	220	400	450	—	—	300	250	600	500	700	600	S811V72N3S	
850	257	475	500	—	—	350	300	700	600	900	700	S811V85N3S	
1000	277	525	50	—	—	400	350	800	700	900	800	S811V10N3S <sup>①</sup>	

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.

Discount Symbol ..... 1CD1

**Type S811, Intelligent Technologies (IT) Soft Starters with DIM**

**Table 39-59. Product Selection — 25 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C**

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
<b>Frame Size N</b>													
34	9	15	18.5	10	7-1/2	10	10	25	20	30	25	S811N37N3S S811N66N3S	
63	15	30	33	20	15	20	20	40	40	60	50		
<b>Frame Size R</b>													
96	25	45	55	30	25	30	30	75	60	75	75	S811R10N3S S811R13N3S	
120	33	63	63	40	30	40	40	75	75	100	100		
<b>Frame Size T</b>													
150	45	80	90	50	40	50	50	100	100	150	125	S811T18N3S S811T24N3S S811T30N3S	
215	63	110	132	60	60	75	60	150	150	200	150		
278	80	147	160	75	75	100	75	200	200	250	250		
<b>Frame Size U</b>													
320	90	160	185	100	75	125	100	250	200	300	250	S811U36N3S S811U42N3S S811U50N3S ②	
380	110	200	220	125	100	150	125	300	250	350	300		
460	140	250	280	150	125	150	150	350	300	450	400		
<b>Frame Size V</b>													
320	90	160	185	100	75	125	100	250	200	300	250	S811V36N3S S811V42N3S S811V50N3S S811V65N3S	
380	110	200	220	125	100	150	125	300	250	350	300		
460	140	250	280	150	125	150	150	350	300	450	400		
610	185	315	375	250	150	200	200	500	450	600	500		
680	200	375	445	—	200	250	200	600	500	700	600	S811V72N3S S811V85N3S S811V10N3S ①	
810	250	450	500	—	—	300	300	700	600	900	700		
890	290	510	560	—	—	400	350	700	600	900	700		

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.

**Table 39-60. Product Selection — 15 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 50°C**

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
<b>Frame Size N</b>													
34	9	15	18.5	10	7-1/2	10	10	25	20	30	25	S811N37N3S S811N66N3S	
63	15	30	33	20	15	20	20	40	40	60	50		
<b>Frame Size R</b>													
96	25	45	55	30	25	30	30	75	60	75	75	S811R10N3S S811R13N3S	
120	33	63	63	40	30	40	40	75	75	100	100		
<b>Frame Size T</b>													
150	45	80	90	50	40	50	50	100	100	150	125	S811T18N3S S811T24N3S S811T30N3S	
215	63	110	132	60	60	75	60	150	150	200	150		
278	80	147	160	75	75	100	75	200	200	250	250		
<b>Frame Size U</b>													
320	90	160	185	100	75	125	100	250	200	300	250	S811U36N3S S811U42N3S S811U50N3S ②	
380	110	200	220	125	100	150	125	300	250	350	300		
460	140	250	280	150	125	150	150	350	300	450	400		
<b>Frame Size V</b>													
320	90	160	185	100	75	125	100	250	200	300	250	S811V36N3S S811V42N3S S811V50N3S S811V65N3S	
380	110	200	220	125	100	150	125	300	250	350	300		
460	140	250	280	150	125	150	150	350	300	450	400		
610	185	315	375	250	150	200	200	500	450	600	500		
680	200	375	445	—	200	250	200	600	500	700	600	S811V72N3S S811V85N3S S811V10N3S ①	
830	257	450	500	—	—	300	300	700	600	900	700		
960	302	510	540	—	—	350	300	800	700	900	800		

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.

Discount Symbol ..... 1CD1



**Type S811, Intelligent Technologies (IT) Soft Starters with DIM**

**Table 39-61. Product Selection — 50 Second Ramp, 2 Starts per Hour, 300% Current Limit @ 50°C**

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
<b>Frame Size N</b>													
21	5.5	10	11	5	5	5	5	15	10	15	15	S811N37N3S	
42	11	18.5	22	10	10	15	10	30	25	40	30	S811N66N3S	
<b>Frame Size R</b>													
60	15	30	33	15	15	20	15	40	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	60	60	150	125	200	150	S811T30N3S	
<b>Frame Size U</b>													
280	80	150	160	75	75	100	75	200	200	250	250	S811U36N3S	
340	110	180	200	100	100	125	100	250	200	350	300	S811U42N3S	
380	110	200	220	125	100	150	125	300	250	350	300	S811U50N3S ②	
<b>Frame Size V</b>													
280	80	150	160	75	75	100	75	200	200	250	250	S811V36N3S	
340	110	180	200	100	100	125	100	250	200	350	300	S811V42N3S	
380	110	200	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	
590	180	315	375	200	150	200	200	500	400	600	500	S811V85N3S	
650	205	370	415	250	200	250	200	500	450	600	500	S811V10N3S 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.

**Table 39-62. Product Selection — 15 Second Ramp, 4 Starts per Hour, 450% Current Limit @ 40°C**

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
<b>Frame Size N</b>													
29	7.5	12.5	15	7-1/2	7-1/2	10	7-1/2	20	15	25	20	S811N37N3S	
49	12.5	22	25	15	10	15	15	30	30	40	40	S811N66N3S	
<b>Frame Size R</b>													
73	18.5	37	40	20	20	25	20	50	40	60	60	S811R10N3S	
94	25	45	55	30	25	30	30	60	60	75	75	S811R13N3S	
<b>Frame Size T</b>													
155	45	80	90	50	40	60	50	100	100	150	125	S811T18N3S	
219	63	110	132	60	60	75	60	150	150	200	150	S811T24N3S	
280	80	150	160	75	75	100	75	200	200	250	250	S811T30N3S	
<b>Frame Size U</b>													
345	100	185	200	100	100	125	100	250	200	350	300	S811U36N3S	
405	110	200	250	125	100	150	125	300	250	400	350	S811U42N3S	
<b>Frame Size V</b>													
345	100	185	200	100	100	125	100	250	200	350	300	S811V36N3S	
405	110	200	250	125	100	150	125	300	250	400	350	S811V42N3S	
465	140	250	280	150	125	150	150	350	300	450	400	S811V50N3S	
530	160	280	335	150	150	200	150	450	350	500	450	S811V65N3S	
590	180	315	375	200	150	—	200	500	400	600	500	S811V72N3S	
651	200	355	425	—	—	—	—	600	450	700	600	S811V85N3S	
754	220	400	465	—	—	—	—	600	500	800	700	S811V10N3S ③	

③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

Discount Symbol ..... 1CD1

**Type S811, Intelligent Technologies (IT.) Soft Starters with DIM**

**Table 39-63. Product Selection — 30 Second Ramp, 4 Starts per Hour, 450% Current Limit @ 40°C**

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
<b>Frame Size N</b>													
21	5.5	10	12.5	5	5	5	5	15	10	15	15	S811N37N3S	
40	11	18.5	22	10	10	10	10	30	25	30	30	S811N66N3S	
<b>Frame Size R</b>													
55	15	25	30	15	15	20	15	40	30	50	40	S811R10N3S	
75	22	37	45	20	20	25	20	50	50	60	60	S811R13N3S	
<b>Frame Size T</b>													
151	45	80	90	50	40	50	50	100	100	150	125	S811T18N3S	
215	63	110	132	60	60	75	60	150	150	200	150	S811T24N3S	
264	80	140	160	75	75	100	75	200	150	250	200	S811T30N3S	
<b>Frame Size U</b>													
300	90	160	185	100	75	100	100	200	200	300	250	S811U36N3S	
340	100	180	200	100	100	125	100	250	200	350	300	S811U42N3S	
<b>Frame Size V</b>													
300	90	160	185	100	75	100	100	200	200	300	250	S811V36N3S	
340	100	180	200	100	100	125	100	250	200	350	300	S811V42N3S	
380	110	200	220	125	100	150	125	300	250	350	300	S811V50N3S	
420	129	220	257	150	125	150	150	350	300	450	350	S811V65N3S	
460	140	250	280	150	125	150	150	350	300	450	400	S811V72N3S	
500	150	257	300	150	150	200	150	400	350	500	450	S811V85N3S	
560	160	277	325	200	150	250	200	500	400	600	500	S811V10N3S <sup>①</sup>	

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

**Type S811, Intelligent Technologies (IT.) Soft Starters with DIM**

**Severe Duty**

**Table 39-64. 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

**Table 39-65. Product Selection — > 30 Second Ramp, > 4 Starts per Hour or >300% Current Limit**

Max. Current	Three-Phase Motors											Catalog Number	Price U.S. \$
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380 – 400V	440V	200V		230V		460V		575 – 690V			
			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 ①	

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

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.

**Inside-the-Delta Standard Duty Ratings**

**Table 39-66. 15 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C Ambient**

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

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 500 Amp 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.

**Table 39-67. 25 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 40°C Ambient**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$	
	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	1.0SF	1.15SF		
<b>Frame Size N</b>														
58	9	15	18.5	15	10	15	15	40	30	50	40	S811N37N3D		
108	15	30	33	30	25	30	30	60	60	100	75	S811N66N3D		
<b>Frame Size R</b>														
164	25	45	55	50	40	50	50	125	100	125	125	S811R10N3D		
206	33	63	63	60	50	60	50	125	125	150	150	S811R13N3D		
<b>Frame Size T</b>														
257	45	80	90	75	60	75	60	150	150	250	200	S811T18N3D		
365	63	110	132	100	100	125	100	250	250	300	250	S811T24N3D		
477	80	147	160	125	125	150	125	300	300	400	400	S811T30N3D		
<b>Frame Size U</b>														
554	90	160	185	150	125	200	150	400	300	450	400	S811U36N3D		
646	110	200	220	200	150	250	200	500	400	550	450	S811U42N3D		
796	140	250	280	250	200	250	250	550	500	700	600	S811U50N3D ④⑤		
<b>Frame Size V</b>														
554	90	160	185	150	125	200	150	400	300	450	400	S811V36N3D		
646	110	200	220	200	150	250	200	500	400	550	450	S811V42N3D		
796	140	250	280	250	200	250	250	550	500	700	600	S811V50N3D		
1055	185	315	375	400	250	300	300	800	700	900	750	S811V65N3D		
1176	200	375	445	—	300	400	300	900	800	900	900	S811V72N3D		
1358	—	—	—	—	—	—	—	—	—	—	—	S811V85N3D		
—	—	—	—	—	—	—	—	—	—	—	—	S811V10N3D ⑥		

④ 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, 796A Inside-the-Delta Starter.

⑤ U-Frame 500 Amp unit does not have IEC Certification.

⑥ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

Discount Symbol ..... 1CD1

Type S811, Intelligent Technologies (IT.) Soft Starters with DIM

## Inside-the-Delta Standard Duty Ratings

Table 39-68. 15 Second Ramp, 4 Starts per Hour, 300% Current Limit @ 50°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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		
<b>Frame Size N</b>													
58	9	15	18.5	15	10	15	15	40	30	50	40	S811N37N3D	
108	15	30	33	30	25	30	30	60	60	100	75	S811N66N3D	
<b>Frame Size R</b>													
164	25	45	55	50	40	50	50	125	100	125	125	S811R10N3D	
206	33	63	63	60	50	60	60	125	125	150	150	S811R13N3D	
<b>Frame Size T</b>													
257	45	80	90	75	60	75	75	150	150	250	200	S811T18N3D	
365	63	110	132	100	100	125	100	250	250	300	250	S811T24N3D	
477	80	147	160	125	125	150	125	300	300	400	400	S811T30N3D	
<b>Frame Size U</b>													
554	90	160	185	150	125	200	150	400	300	450	400	S811U36N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S811U42N3D	
796	140	250	280	250	200	250	250	550	450	700	600	S811U50N3D ①	
<b>Frame Size V</b>													
554	90	160	185	150	125	200	150	400	300	450	400	S811V36N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S811V42N3D	
796	140	250	280	250	200	250	250	550	450	700	600	S811V50N3D	
1055	185	315	375	400	250	300	300	750	700	900	750	S811V65N3D	
1176	200	375	445	—	—	—	—	—	—	—	—	S811V72N3D	
1358	257	450	500	—	—	—	—	—	—	—	—	S811V85N3D	
—	—	—	—	—	—	—	—	—	—	—	—	S811V10N3D ②	

① U-Frame 500 Amp 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.

Table 39-69. 50 Second Ramp, 2 Starts per Hour, 300% Current Limit @ 50°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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		
<b>Frame Size N</b>													
36	5.5	10	11	7-1/2	7-1/2	7-1/2	7-1/2	25	15	25	25	S811N37N3D	
73	11	18.5	22	15	15	25	15	50	40	60	50	S811N66N3D	
<b>Frame Size R</b>													
103	15	30	33	25	25	30	25	60	60	75	75	S811R10N3D	
138	22	40	45	40	30	50	40	100	75	125	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>													
485	80	150	160	125	125	150	125	300	300	400	400	S811U36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S811U42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S811U50N3D ③	
<b>Frame Size V</b>													
485	80	150	160	125	125	150	125	300	300	400	400	S811V36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S811V42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S811V50N3D	
727	129	220	257	250	200	250	250	550	500	700	550	S811V65N3D	
816	147	257	295	250	250	300	250	600	550	750	700	S811V72N3D	
1021	180	315	375	300	250	300	300	750	600	900	750	S811V85N3D	
—	—	—	—	—	—	—	—	—	—	—	—	S811V10N3D ④	

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

④ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

Discount Symbol ..... 1CD1

**Inside-the-Delta Standard Duty Ratings**

**Table 39-70. 15 Second Ramp, 4 Starts per Hour, 450% Current Limit @ 40°C Ambient**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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		
<b>Frame Size N</b>													
47	7.5	12.5	15	10	10	15	10	30	25	40	30	S811N37N3D	
83	12.5	22	25	25	15	25	25	50	50	60	60	S811N66N3D	
<b>Frame Size R</b>													
126	18.5	37	40	30	30	40	30	75	60	100	100	S811R10N3D	
162	25	45	55	50	40	50	50	100	100	125	125	S811R13N3D	
<b>Frame Size T</b>													
266	45	80	90	75	60	100	75	150	150	250	200	S811T18N3D	
379	63	110	132	100	100	125	100	250	250	300	250	S811T24N3D	
485	80	150	160	125	125	150	125	300	300	400	400	S811T30N3D	
<b>Frame Size U</b>													
580	100	185	200	150	150	200	150	400	300	550	450	S811U36N3D	
695	110	200	250	200	150	250	200	450	400	600	550	S811U42N3D	
798	140	250	280	250	200	250	250	550	450	700	600	S811U50N3D ①	
<b>Frame Size V</b>													
580	100	185	200	150	150	200	150	400	300	550	450	S811V36N3D	
695	110	200	250	200	150	250	200	450	400	600	550	S811V42N3D	
798	140	250	280	250	200	250	250	550	450	700	600	S811V50N3D	
908	160	280	335	250	250	300	250	700	550	750	700	S811V65N3D	
1021	—	—	—	—	—	—	—	—	—	—	—	S811V72N3D	
1125	—	—	—	—	—	—	—	—	—	—	—	S811V85N3D	

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

**Table 39-71. 30 Second Ramp, 4 Starts per Hour, 450% Current Limit @ 40°C Ambient**

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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		
<b>Frame Size N</b>													
36	5.5	10	12.5	7-1/2	7-1/2	7-1/2	7-1/2	25	15	25	25	S811N37N3D	
69	11	18.5	22	15	15	15	15	50	40	50	50	S811N66N3D	
<b>Frame Size R</b>													
96	15	25	30	25	25	30	25	60	50	75	60	S811R10N3D	
130	22	37	45	30	30	40	30	75	75	100	100	S811R13N3D	
<b>Frame Size T</b>													
257	45	80	90	75	60	75	75	150	150	250	200	S811T18N3D	
365	63	110	132	100	100	125	100	250	250	300	250	S811T24N3D	
448	80	140	160	125	125	150	125	300	250	400	300	S811T30N3D	
<b>Frame Size U</b>													
503	90	160	185	150	125	150	150	300	300	450	400	S811U36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S811U42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S811U50N3D ②	
<b>Frame Size V</b>													
503	90	160	185	150	125	150	150	300	300	450	400	S811V36N3D	
580	100	180	200	150	150	200	150	400	300	550	450	S811V42N3D	
646	110	200	220	200	150	250	200	450	400	550	450	S811V50N3D	
727	129	220	257	250	200	250	250	550	450	700	550	S811V65N3D	
796	—	—	—	—	—	—	—	—	—	—	—	S811V72N3D	
865	—	—	—	—	—	—	—	—	—	—	—	S811V85N3D	

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

Type S811, Intelligent Technologies (IT.) Soft Starters with DIM

### Inside-the-Delta Severe Duty Ratings

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.

Table 39-72. Severe Duty Inside-the-Delta Ratings

Max. Continuous Motor Line Current	Three-Phase Motor											Catalog Number	Price U.S. \$
	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			
<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	

① U-Frame 500 Amp 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.

### Typical Power Wiring Diagrams

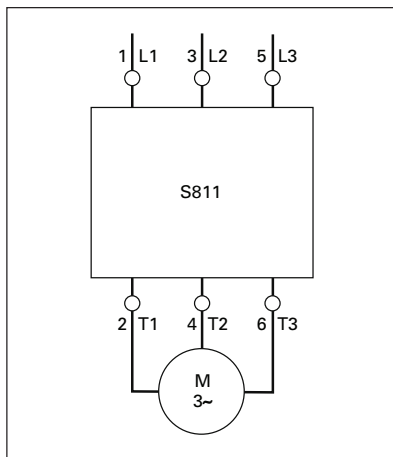
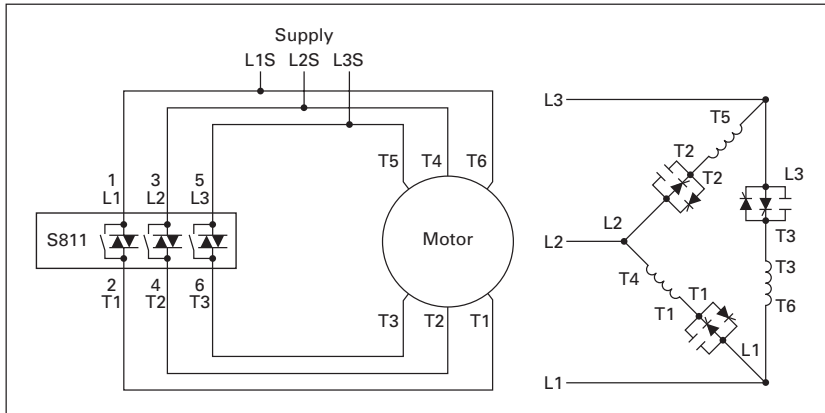
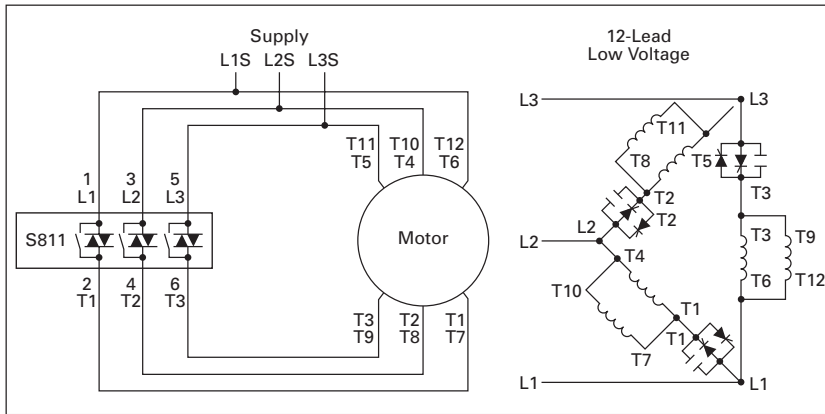


Figure 39-23. Line Connected Soft Starter Power Wiring Diagram

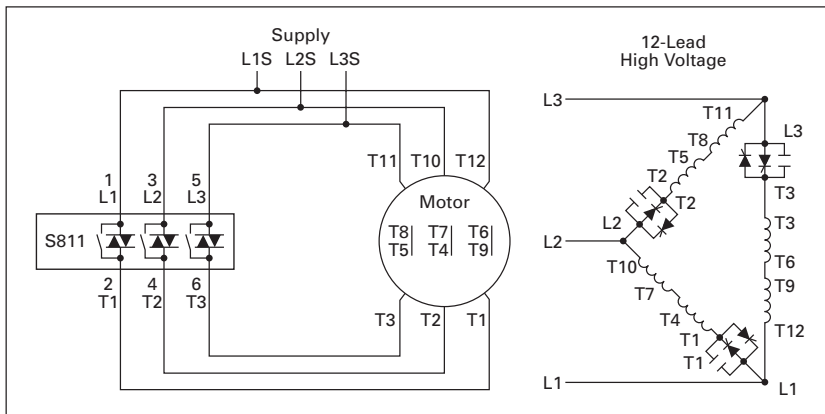
Discount Symbol ..... 1CD1



**Figure 39-24. Inside-the-Delta Connected Soft Starter Power Wiring Diagram for a 6-Lead Motor**



**Figure 39-25. Inside-the-Delta Connected Soft Starter Power Wiring Diagram for a 12-Lead Low Voltage Motor**



**Figure 39-26. Inside-the-Delta Connected Soft Starter Power Wiring Diagram for a 12-Lead High Voltage Motor**



Type S811, Intelligent Technologies (IT) Soft Starters with DIM

## Options

### Extended Ramp

For a longer ramp acceleration time of .5 – 360 seconds, change the last digit in the Catalog Number from Page 39-44 to L.

**Table 39-73. Extended Ramp Option**

Frame Size	Max. Current	Catalog Number	Price U.S. \$
N	37	S811N37N3L	
	66	S811N66N3L	
R	105	S811R10N3L	
	135	S811R13N3L	
T	180	S811T18N3L	
	240	S811T24N3L	
	304	S811T30N3L	
U	360	S811U36N3L	
	420	S811U42N3L	
	500	S811U50N3L ①	
V	360	S811V36N3L	
	420	S811V42N3L	
	500	S811V50N3L	
	650	S811V65N3L	
	720	S811V72N3L	
	850 1000	S811V85N3L S811V10N3L	

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

### Extended Ramp and 690V Option

690V ratings are available on the T and V Frames by changing the 8th digit in the Catalog Number to V.

**Table 39-74. 690V Option**

Frame Size	Max. Current	Catalog Number	Price U.S. \$
T	180	S811T18V3L	
	240	S811T24V3L	
	304	S811T30V3L	
V	360	S811V36V3L	
	420	S811V42V3L	
	500	S811V50V3L	
	650	S811V65V3L	
	720	S811V72V3L	
	850	S811V85V3L	

## Pump Control

For pump control option, change the 8th digit in the Catalog Number to P.

**Table 39-75. Pump Control Option**

Frame Size	Max. Current	Catalog Number	Price U.S. \$
N	37	S811N37P3S	
	66	S811N66P3S	
R	105	S811R10P3S	
	135	S811R13P3S	
T	180	S811T18P3S	
	240	S811T24P3S	
	304	S811T30P3S	
U	360	S811U36P3S	
	420	S811U42P3S	
	500	S811U50P3S ②	
V	360	S811V36P3S	
	420	S811V42P3S	
	500	S811V50P3S	
	650	S811V65P3S	
	720	S811V72P3S	
	850 1000	S811V85P3S S811V10P3S	

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

## Accessories

### Surge Suppressors

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).



Surge Suppressor

**Table 39-76. Surge Suppressors**

Description	Catalog Number	Price U.S. \$
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 ③ and 290 mm units	EMS41	

③ T-Frame only.

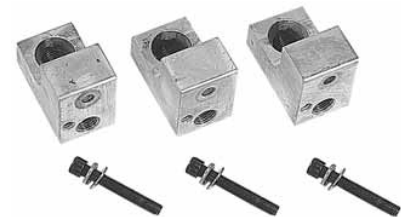


Surge Suppressor Mounted on a 200 mm Device

### Lug Kits

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.



Lug Kits — EML23

**Table 39-77. Lug Kits**

Frame Size	Frame Designation	Description	Catalog Number	Price U.S. \$
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	
		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	
290 mm SSRV	V	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 ④	

④ The EML33 does not have a CSA Listing.

### Lug Cover Kits

Replacement covers for the T and V frame are available in case of damage to the existing covers.

**Table 39-78. Lug Cover Kits**

Description	Catalog Number	Price U.S. \$
Lug Cover T, U Frame	EML27	
Lug Cover V Frame	EML34	

Discount Symbol ..... 1CD1

**Digital Interface Module**

The Digital Interface Module (DIM) is available as a replacement part.

**Table 39-79. DIM**

Description	Catalog Number	Price U.S. \$
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	

**Control Wire Connector**

**Table 39-80. Control Wire Connector**

Description	Catalog Number	Price U.S. \$
12 pin, 5 mm pitch Connector for Control Wiring	EMA75L	

**User Manual**

A comprehensive user manual is available and can be downloaded free of charge from [www.eaton.com](http://www.eaton.com) by performing a document search for MN03902002E.

**Mounting Plates**

The Mounting Plates are designed to help make it easy to install or retrofit the soft starter into enclosures and MCCs. The soft starter can be mounted onto the plate prior to installation. The mounting plate is designed with tear drop mounting holes for easier installation.

**Table 39-81. Mounting Plates**

Description	Catalog Number	Price U.S. \$
Mounting Plate N Frame	EMM13N	
Mounting Plate R Frame	EMM13R	
Mounting Plate T, U Frame	EMM13T	
Mounting Plate V Frame	EMM13V	
Fan/Hood Accessory	EMM18	

**Adapter Plates**

The Adapter Plate allows customers to retrofit a V-Frame 290 mm Soft Starter with the U-Frame 200 mm Soft Starter.

**Table 39-82. Adapter Plates**

Description	Catalog Number	Price U.S. \$
Adapter Plates ①	EMM13U	

① For more information see Pub. 51719.

**Vibration Plates**

The Vibration Plates allow the soft starter to be applied in high shock and vibration applications. The vibration plate allows vibration up to 5g and shock in up to 40g. The soft starter is mounted onto the vibration plate prior to installation in the panel.

**Table 39-83. Vibration Plates**

Description	Catalog Number	Price U.S. \$
Vibration Plate N Frame	EMM14N	
Vibration Plate R Frame	EMM14R	
Vibration Plate T, U Frame	EMM14T	
Vibration Plate V Frame	EMM14V	

**Power Supplies**

24V DC Power Supply which can be used with the S811 SSRV or as a stand-alone device.

**Table 39-84. Power Supplies**

Description	Catalog Number	Price U.S. \$
115V AC Input 24V DC Output	PSS55A	
230V AC Input 24V DC Output	PSS55B	
380 – 480V AC Input 24V DC Output	PSS55C	

**DIN Rail Power Supply Mounting Kit (35 mm)**

**Table 39-85. DIN Rail Mounting Kit**

Description	Catalog Number	Price U.S. \$
DIN Rail Mounting Kit (35 mm)	PSSDIN	

**Adapter Plates**

The Adapter Plate allows customers to retrofit a V-Frame 290 mm Soft Starter with the U-Frame 200 mm Soft Starter.

**Table 39-86. Adapter Plates**

Description	Catalog Number	Price U.S. \$
Adapter Plates ②	EMM13U	

② For more information see Pub51719.

**Standards and Certifications**

- IEC 60947-4-2
- EN 60947-4-2
- UL Listed (NMFT) – Frame N37 to V85
- UL Recognized (NMFT2) – Frame V10
- CE Marked
- CSA Certified (3211 06)
- CSA Elevator (2411 01)

**Instructional Leaflets**

- Instruction Manual: MN03902002E
- Outline Drawings:
  - 65 mm, N-Frame: 10-8574
  - 110 mm, R-Frame: 10-8575
  - 200 mm, T-Frame: 10-8576
  - 200 mm, U-Frame: 10-8857
  - 290 mm, V-Frame: 10-8577

## Type S811, Intelligent Technologies (IT.) Soft Starters with DIM

### Technical Data and Specifications

**Table 39-87. Specifications— IT. Soft Starter**

Soft Starter (Partial Catalog Number)	S811 N37	S811 N66	S811 R10	S811 R13	S811 T18	S811 T24	S811 T30	S811 U36	S811 U42	S811 U50 ①	S811 V36	S811 V42	S811 V50	S811 V65	S811 V72	S811 V85	S811 V10 ②
Max. Current Capacity	37	66	105	135	180	240	304	360	420	500	360	420	500	650	720	850	1000
FLA Range	11 – 37	20 – 66	32 – 105	42 – 135	56 – 180	75 – 240	95 – 304	112 – 360	131 – 420	156 – 500	112 – 360	131 – 420	156 – 500	203 – 650	225 – 720	265 – 580	320 – 1000

**Dimensions**

Width in Inches (mm)	2.66 (67.6)	4.38 (111.3)	7.67 (194.8)	7.73 (196.3)	11.05 (280.6)
Height in Inches (mm)	7.38 (187.4)	7.92 (201.2)	12.71 (322.9)	12.72 (323.1)	16.57 (420.8)
Depth in Inches (mm)	6.47 (164.4)	6.66 (169.2)	6.39 (162.4)	7.08 (179.9)	7.35 (186.6)
Weight in lbs. (kg)	5.8 (2.6)	10.5 (4.8)	48 (21.8) with lugs 41 (18.6) without lugs	48 (21.8) with lugs 41 (18.6) without lugs	103 (46.8) with lugs 91 (41.4) without lugs

**General Information**

Bypass Mechanical Lifespan	10M
Insulating Voltage Ui	660V
Ramp Time Range	.5 – 180 Seconds (.5 – 360 Seconds Extended Ramp)
Resistance to Vibration	3g
Resistance to Shock	15g

**Electrical Information**

Operating Voltage	200 – 600V
Operating Frequency	47 – 63 Hz
Overload Setting	30 – 100%
Trip Class	5, 10, 20, & 30

**Cabling Capacity (IEC 947)**

Number of Conductors	1	1	1 or 2	1 or 2	2, 4 or 6
Wire Sizes	14 – 2	14 – 4/0	4 AWG to 500 MCM	4 AWG to 500 MCM	2/0 to 500 MCM
Type of Connectors	Box Lug			Add-On Lug Kit	

**Control Wiring (12-Pin)**

Wire Sizes in AWG	22 – 14
Number of Conductors (Stranded)	2 (or one AWG 12)
Torque Requirements in lb-in	3.5
Solid, Stranded or Flexible Max. Size in mm <sup>2</sup>	3.31

**Control Power Requirements**

Voltage Range (24V ± 10%)	21.6 – 26.4				
Steady State Current Amps	1.0	1.0	1.0	1.0	1.4
Inrush Current Amps	10	10	10	10	10
Ripple	1%				

**Relays (1) Class A and C**

Voltage AC — maximum	240
Voltage DC — maximum	120
Amps — maximum	3

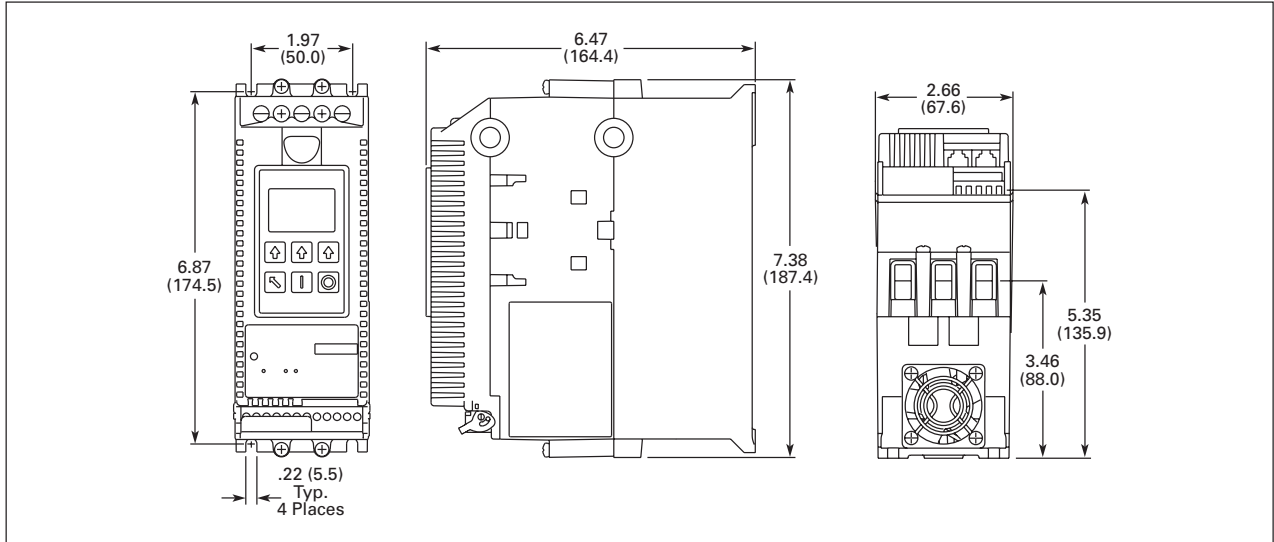
**Environment**

Temperature — Operating	-30 – 50°C (No derating) Consult factory for operation > 50° C
Temperature — Storage	-50 – 70°C
Altitude	<2000 Meters — Consult factory for operation > 2000m
Humidity	<95% Non-condensing
Operating Position	Any
Pollution degree IEC947-1	3
Impulse withstand Voltage IEC947-4-1	6000V

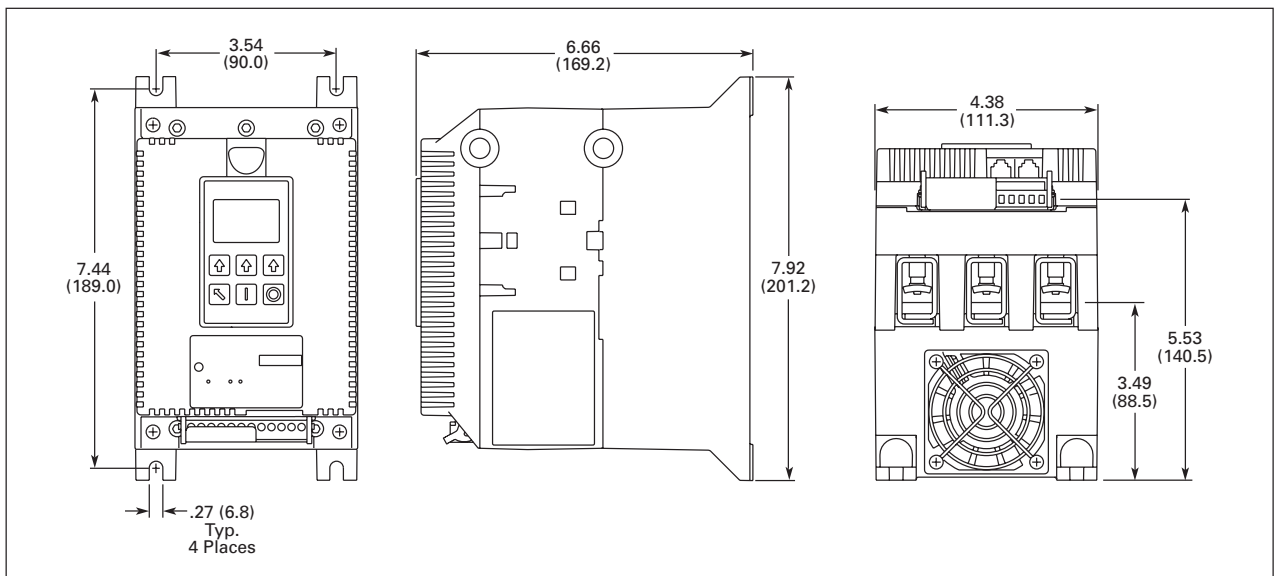
① U-Frame 500 Amp unit does not have IEC Certification.

② UR Recognized Product.

**Dimensions**



**Figure 39-27. N-Frame (65 mm) S811 Approximate Dimensions in Inches (mm)**



**Figure 39-28. R-Frame (110 mm) S811 Approximate Dimensions in Inches (mm)**

Type S811, Intelligent Technologies (IT.) Soft Starters with DIM

39

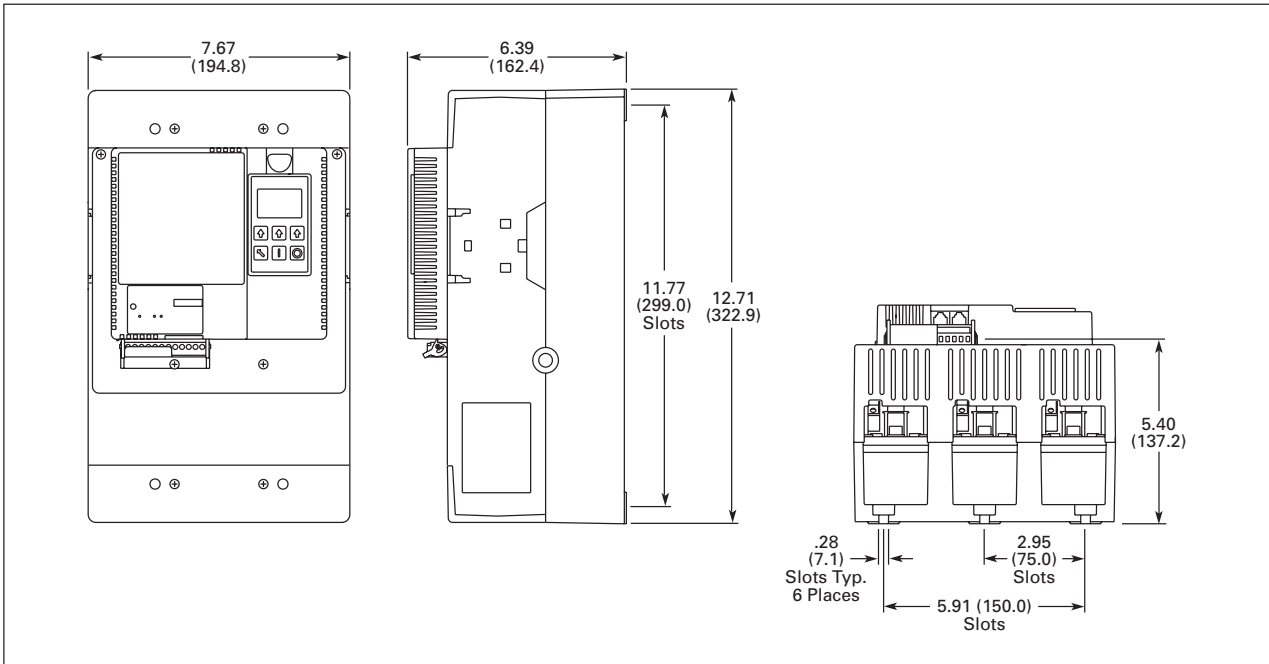


Figure 39-29. T-Frame (200 mm) S811 Approximate Dimensions in Inches (mm)

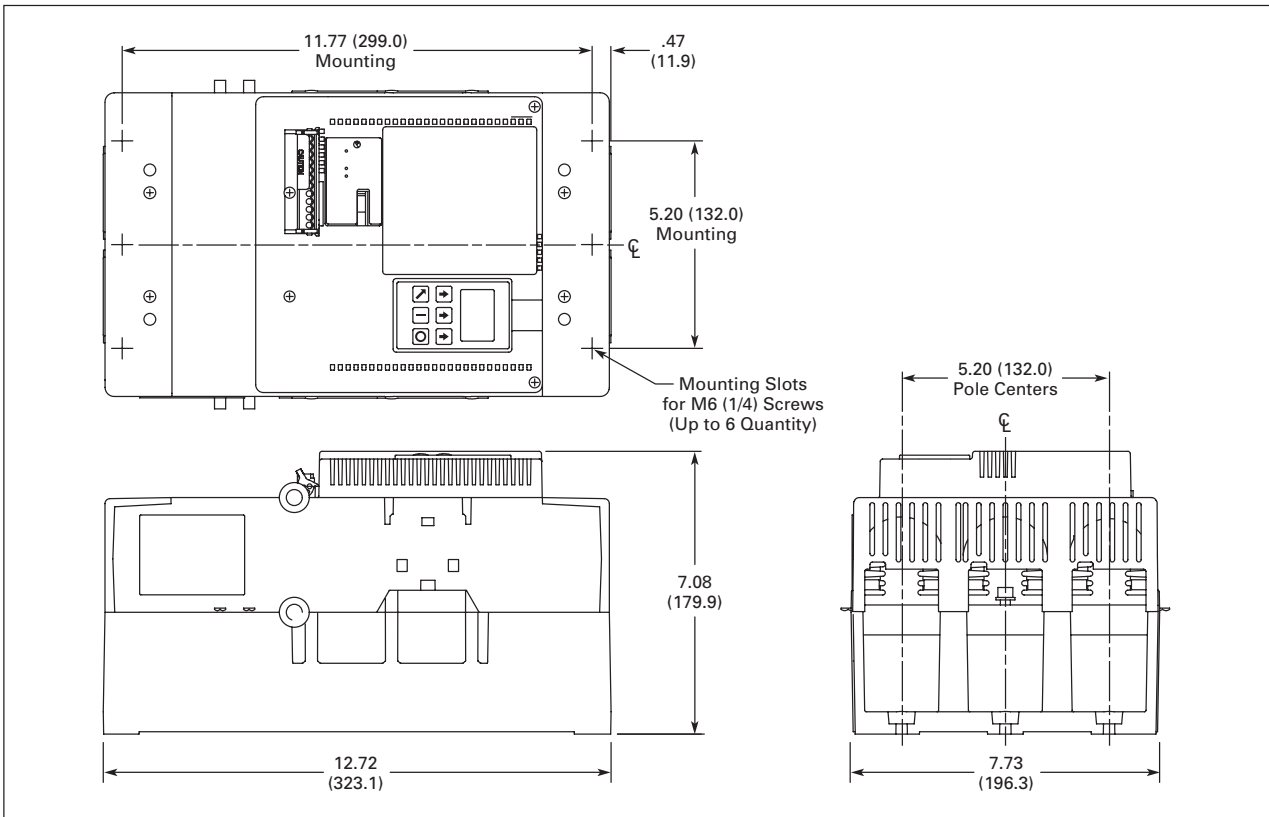
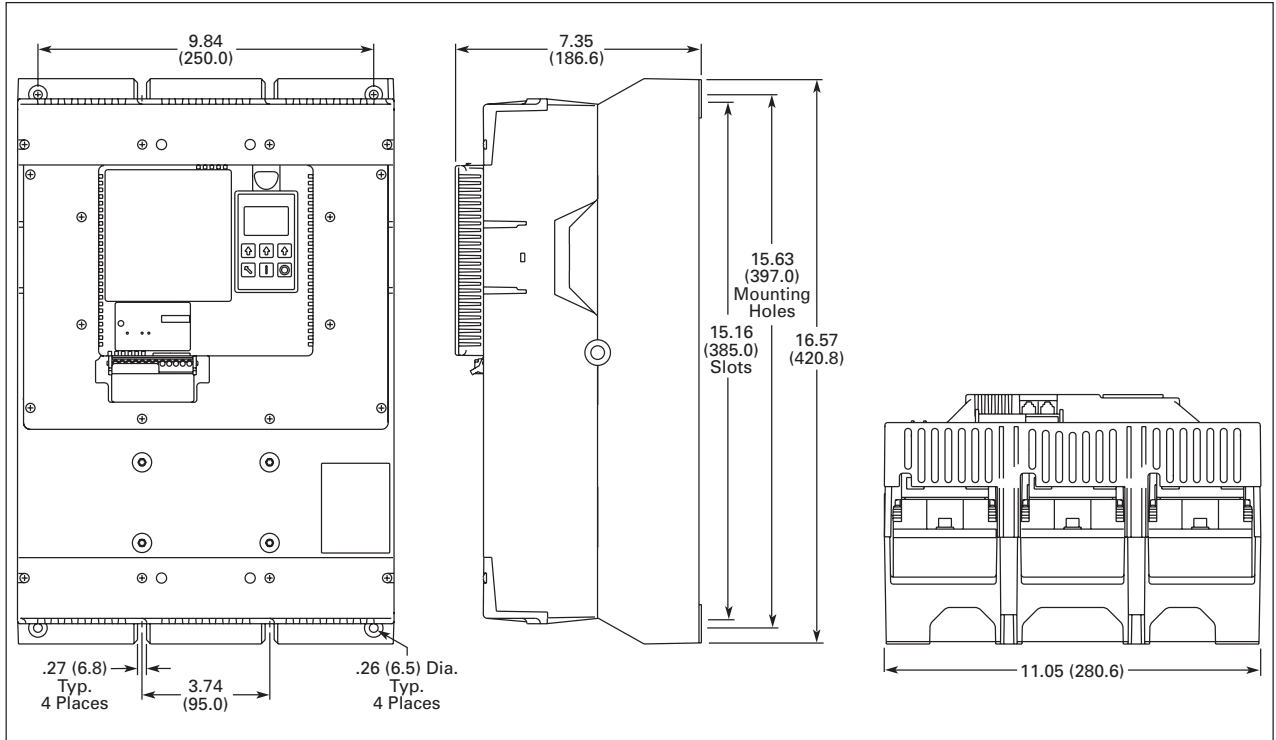


Figure 39-30. U-Frame (200 mm) S811 Approximate Dimensions in Inches (mm)



**Figure 39-31. V-Frame (290 mm) S811 Approximate Dimensions in Inches (mm)**