

Type S811, Soft Starters with DIM



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Type S811, Soft Starters with DIM

Product Description

Eaton’s S811 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.

Eaton’s line of S811 reduced voltage soft starters is very compact, multi-functional, easy to install and easy to set operating parameters. Designed to control the acceleration and deceleration of three-phase motors up to 690V, the line is available from 11–1000A.

The S811 is designed to be a complete package combining the silicon controlled rectifiers (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 S811 soft starter uses 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.

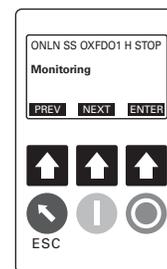
A voltage ramp start or current limit start is available. Kick start is available in either starting mode. The soft stop option allows for a ramp stop time that is longer than the coast to stop time. The pump control option provides a smooth transition for starting and stopping a motor and eliminating 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 and adjustable time delays to ride through system discrepancies.

The S811 has an easy to use Digital Interface Module (DIM) that allows the user to configure the device and to read system parameters and monitor system values. 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.

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.

Digital Interface Module (DIM)



Communications

The S811 has built-in communication capabilities through Eaton’s 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 Eaton D77D gateway.

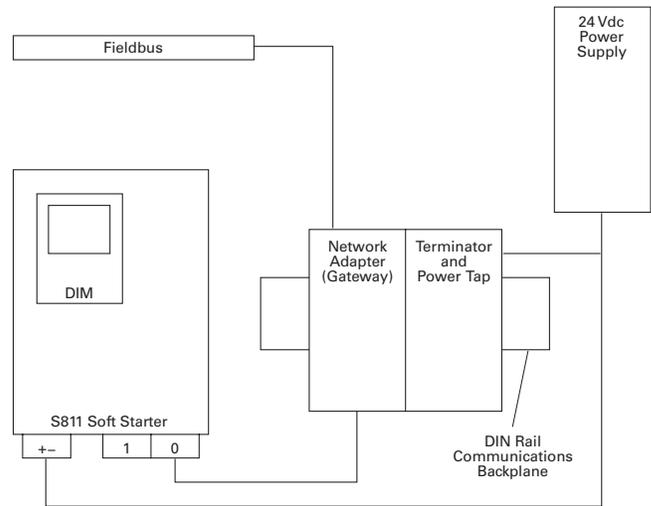
The gateway concentrates data from the devices into a single node. Configuration is simple—a single press of the gateway’s Auto Configuration button sets the system up for default operation. This automatically configures the I/O assemblies to the QCPort system devices. The data from these devices are 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

Communications Reference

Description	Part Number
DeviceNet network adapter	D77D-DNA
EtherNet Modbus network adapter	D77D-EMA
EtherNet/IP network adapter	D77D-EIP
PROFIBUS network adapter	D77D-PNA
Terminator and power tap	D77E-QPLR
DIN rail communications backplane, 7-position	D77E-BP7
DIN rail communications backplane, 12-position	D77E-BP12
85–264 Vac input, 24 Vdc output	PSG240E
360–575 Vac input, 24 Vdc output	PSG240F

S811 Connection



Operation

Starting and Stopping Modes

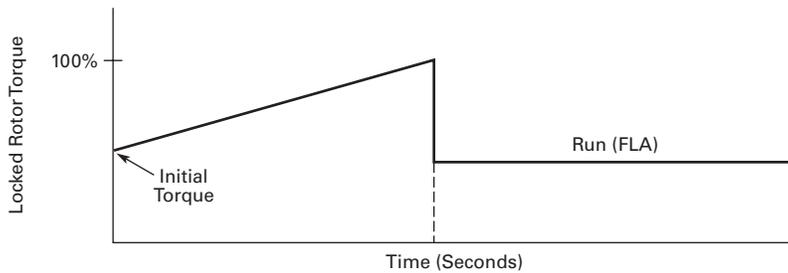
The S811 has a variety of starting and stopping methods to provide superior performance in the most demanding applications. The motor can be started in either voltage ramp start or current limit start mode. Kick start and soft stop are available within both starting modes.

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)

Starting Characteristics—Ramp Start



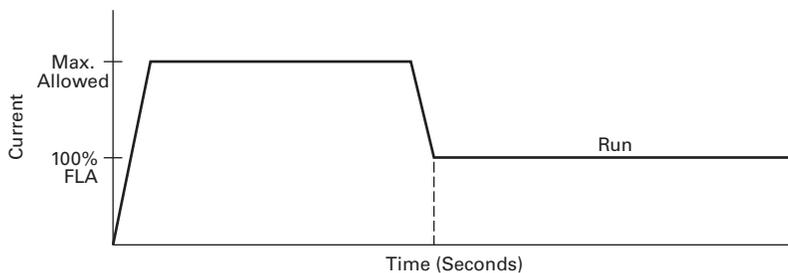
Current Limit Start

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)

Starting Characteristics—Current Limit Start

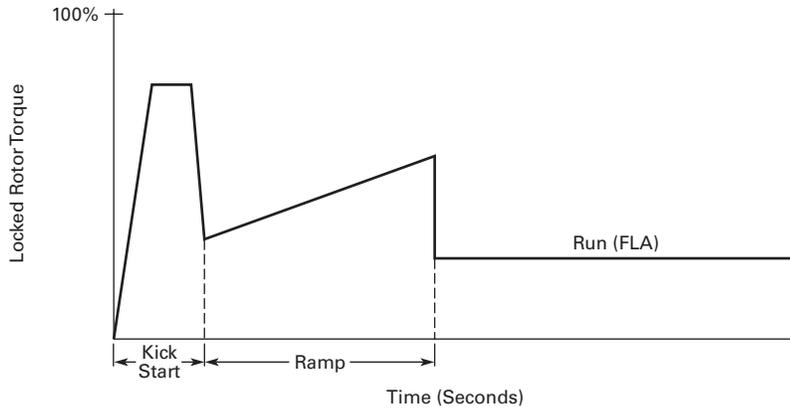


Kick Start

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

Starting Characteristics—Kick Start

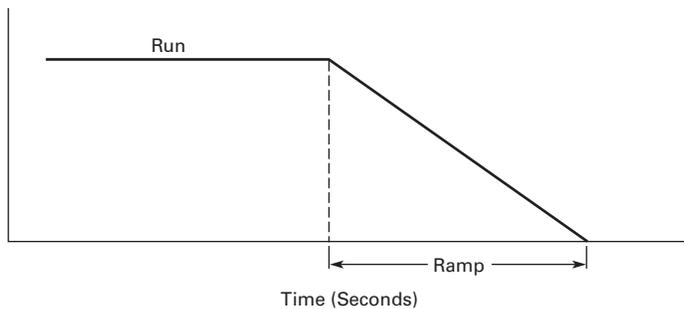


Soft Stop

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

Starting Characteristics—Soft Stop



Edge and Level Sensing Control**Edge Sensing**

Edge sensing requires +24 Vdc power be momentarily applied to Pin 1 (with terminal P at +24 Vdc) to initiate a start under all conditions. After a stop or fault occurs, the +24 Vdc 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 +24 Vdc power to Terminal 1 before starting is required regardless of the position of the auto reset switch on the DIM.

Level Sensing

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

- Terminal P is supplied with +24 Vdc (to start from Terminal Block, Input #3 must also be enabled)
- The auto reset switch on the DIM 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.

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

Features and Benefits

- Communication capabilities with various protocols
- 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 internal 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
- Manage peak starting torque to diminish mechanical system wear and damage
- 24 Vdc control voltage 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 based on the heat energy introduced into the motor during the start process. A 100% value represents the maximum safe internal 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 a thermal memory value of less than 100%. 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 parameter is adjustable from 32% to 100% of the unit's rated current. 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 Eaton 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 in bypass, 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 during 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 power pole's thermal capacity is exceeded. The soft starter will trip in over temperature conditions, preventing device failure.

Each power 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.

When using a communications network, alarms can be implemented in the process monitoring system warning of an impending trip before the trip occurs, halting the process.

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 trip can be manually reset through the DIM or through the communications network. The trip can also be electrically reset by energizing a 24 Vdc 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 to accommodate short temporary voltage drops during the start process.

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 allows 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 inline 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 internal 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. When using a communications network, alarms can be implemented in the process monitoring system warning of an impending trip before the trip occurs, halting the process. Costly system downtime can be avoided.

DC Control Voltage

Monitors level of the 24 Vdc 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 power 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.

PCB Device Temperature

An increase in printed circuit board (device) temperature is a strong indication of an increase in ambient temperature. High ambient temperature operation can be identified with the device temperature data. Device temperature increases can be due to undersized enclosures, failure of cooling fans or blocked venting. High operating 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.

1.2

Reduced Voltage Motor Starters

Solid-State Starters

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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. Thirty 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. Eaton communicating cover control or other communicating protective device is required to take advantage of this feature.

Standards and Certifications

- IEC 60947-4-2
- EN 60947-4-2
- UL listed (NMFT-E202571) Frame N37 to V85
- UL recognized (NMFT2)–Frame V10
- CE marked
- CSA certified (3211 06)
- CSA elevator (2411 01)

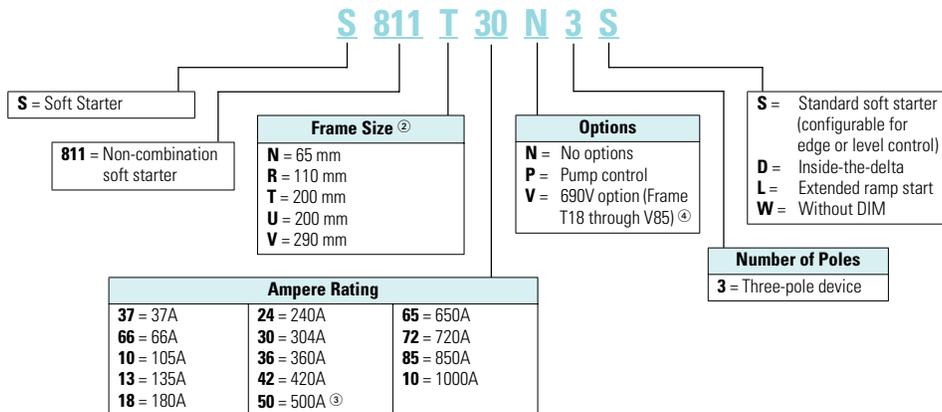


Instructional Leaflets

- User manual MN03902002E
- Inside-the-Delta user manual MN03902009E
- 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

Catalog Number Selection

S811 Open Soft Starters ①



Notes

- ① All units require a 24 Vdc power supply found on catalog Page V6-T1-107, or equivalent.
- ② T-, U- and V-Frames require lug kits found on Page V6-T1-107.
- ③ U-Frame 500A unit does not have IEC certification.
- ④ Not available in U-Frame.

Product Selection

Standard Duty Ratings

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

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 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.

S811



Standard Duty— 15 Second Ramp, 4 Starts per Hour, 300% Current Limit at 40°C

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)						575–690V ^①	Catalog Number	
	230V	380–400V	440V	200V 1.0SF	230V 1.15SF	460V 1.0SF	1.15SF	1.15SF	1.0SF			1.15SF
Frame Size N												
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
Frame Size R												
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
Frame Size T												
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
Frame Size U												
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^②
Frame Size V												
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	550	—	—	400	350	800	700	900	800	S811V10N3S^③

For **Pump Option**, replace character **8** with **"P"** and also, see **Page V6-T1-108**.

Notes

- ① 690V is available only from T18 thru V85. Not available on U-Frames.
- ② 500A rating does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

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S811



Standard Duty—25 Second Ramp, 4 Starts per Hour, 300% Current Limit at 40°C

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)				575–690V ^①				Catalog Number
	230V	380–400V	440V	200V 1.0SF	1.15SF	230V 1.0SF	1.15SF	460V 1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
34	9	15	18.5	10	7-1/2	10	10	25	20	30	25	S811N37N3S
63	15	30	33	20	15	20	20	40	40	60	50	S811N66N3S
Frame Size R												
96	25	45	55	30	25	30	30	75	60	75	75	S811R10N3S
120	33	63	63	40	30	40	40	75	75	100	100	S811R13N3S
Frame Size T												
150	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
278	80	147	160	75	75	100	75	200	200	250	250	S811T30N3S
Frame Size U												
320	90	160	185	100	75	125	100	250	200	300	250	S811U36N3S
380	110	200	220	125	100	150	125	300	250	350	300	S811U42N3S
460	140	250	280	150	125	150	150	350	300	450	400	S811U50N3S^②
Frame Size V												
320	90	160	185	100	75	125	100	250	200	300	250	S811V36N3S
380	110	200	220	125	100	150	125	300	250	350	300	S811V42N3S
460	140	250	280	150	125	150	150	350	300	450	400	S811V50N3S
610	185	315	375	250	150	200	200	500	450	600	500	S811V65N3S
680	200	375	445	—	200	250	200	600	500	700	600	S811V72N3S
810	250	450	500	—	—	300	300	700	600	900	700	S811V85N3S
890	290	510	560	—	—	400	350	700	600	900	700	S811V10N3S^③

For **Pump Option**, replace character **8** with **"P"** and also, see **Page V6-T1-108**.

Notes

- ① 690V is available only from T18 thru V85. Not available on U-Frames.
- ② 500A rating does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

S811



Standard Duty— 15 Second Ramp, 4 Starts per Hour, 300% Current Limit at 50°C

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)		230V		460V		575–690V ^①		Catalog Number
	230V	380–400V	440V	200V 1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
34	9	15	18.5	10	7-1/2	10	10	25	20	30	25	S811N37N3S
63	15	30	33	20	15	20	20	40	40	60	50	S811N66N3S
Frame Size R												
96	25	45	55	30	25	30	30	75	60	75	75	S811R10N3S
120	33	63	63	40	30	40	40	75	75	100	100	S811R13N3S
Frame Size T												
150	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
278	80	147	160	75	75	100	75	200	200	250	250	S811T30N3S
Frame Size U												
320	90	160	185	100	75	125	100	250	200	300	250	S811U36N3S
460	110	200	220	125	100	150	125	300	250	350	300	S811U42N3S
460	140	250	280	150	125	150	150	350	300	450	400	S811U50N3S^②
Frame Size V												
320	90	160	185	100	75	125	100	250	200	300	250	S811V36N3S
380	110	200	220	125	100	150	125	300	250	350	300	S811V42N3S
460	140	250	280	150	125	150	150	350	300	450	400	S811V50N3S
610	185	315	375	250	150	200	200	500	450	600	500	S811V65N3S
680	200	375	445	—	200	250	200	600	500	700	600	S811V72N3S
830	257	450	500	—	—	300	300	700	600	900	700	S811V85N3S
960	302	510	540	—	—	350	300	800	700	900	800	S811V10N3S^③

For **Pump Option**, replace character **8** with **“P”** and also, see **Page V6-T1-108**.

Notes

- ① 690V is available only from T18 thru V85. Not available on U-Frames.
- ② 500A rating does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

S811



Standard Duty—50 Second Ramp, 2 Starts per Hour, 300% Current Limit at 50°C

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)				575–690V ^①				Catalog Number
	230V	380–400V	440V	200V 1.0SF	1.15SF	230V 1.0SF	1.15SF	460V 1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
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
Frame Size R												
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
Frame Size T												
115	33	59	63	30	30	40	30	75	75	100	100	S811T18N3S
150	45	80	90	50	40	50	50	100	100	150	125	S811T24N3S
192	55	100	110	60	50	60	60	150	125	200	150	S811T30N3S
Frame Size U												
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
Frame Size V												
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^③

For **Pump Option**, replace character **8** with **“P”** and also, see **Page V6-T1-108**.

Notes

- ① 690V is available only from T18 thru V85. Not available on U-Frames.
- ② 500A rating does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

S811



Standard Duty— 15 Second Ramp, 4 Starts per Hour, 450% Current Limit at 40°C

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)				575–690V ^①				Catalog Number
	230V	380–400V	440V	200V		230V		460V		1.15SF		
				1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
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
Frame Size R												
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
Frame Size T												
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
Frame Size U												
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
Frame Size V												
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^②

For **Pump Option**, replace character **8** with **“P”** and also, see **Page V6-T1-108**.

Notes

- ① 690V is available only from T18 thru V85. Not available on U-Frames.
- ② For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

S811



Standard Duty—30 Second Ramp, 4 Starts per Hour, 450% Current Limit at 40°C

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)				575–690V ^①				Catalog Number
	230V	380–400V	440V	200V 1.0SF	1.15SF	230V 1.0SF	1.15SF	460V 1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
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
Frame Size R												
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
Frame Size T												
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
Frame Size U												
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
380	110	200	220	125	100	150	125	300	250	350	300	S811U50N3S
Frame Size V												
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^②

For **Pump Option**, replace character **8** with **"P"** and also, see **Page V6-T1-108**.

Notes

- ① 690V is available only from T18 thru V85. Not available on U-Frames.
- ② For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

Severe Duty

Severe Duty Ratings

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

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 at 40°C ambient.

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Severe Duty—>30 Second Ramp, >4 Starts per Hour or >300% Current Limit

Max. Current	Three-Phase Motors kW Rating (50 Hz)			hp Rating (60 Hz)				575–690V ①		Catalog Number		
	230V	380–400V	440V	200V	230V	460V	1.0SF	1.15SF				
	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF				
Frame Size N												
22	5.5	10	11	5	5	7-1/2	5	15	10	20	15	S811N37N3S
42	11	18.5	22	10	10	15	10	30	25	40	30	S811N66N3S
Frame Size R												
65	15	30	33	15	15	20	15	50	40	50	50	S811R10N3S
80	22	40	45	25	20	30	25	60	50	75	60	S811R13N3S
Frame Size T												
115	33	59	63	30	30	40	30	75	75	100	100	S811T18N3S
150	45	80	90	50	40	50	50	100	100	150	125	S811T24N3S
192	55	100	110	60	50	75	60	150	125	200	150	S811T30N3S
Frame Size U												
240	75	110	147	75	60	75	75	200	150	200	200	S811U36N3S
305	90	160	185	100	75	100	100	250	200	300	250	S811U42N3S
Frame Size V												
240	75	110	147	75	60	75	75	200	150	200	200	S811V36N3S
305	90	160	185	100	75	100	100	250	200	300	250	S811V42N3S
365	110	185	220	125	100	150	125	300	250	350	300	S811V50N3S
420	129	220	257	150	125	150	150	350	300	450	350	S811V65N3S
480	147	257	295	150	150	200	150	400	350	500	450	S811V72N3S
525	160	280	335	150	150	200	150	450	350	500	450	S811V85N3S
575	172	303	370	200	150	250	200	500	450	600	500	S811V10N3S ②

Notes

① 690V is available only from T18 thru V85. Not available on U-Frames.

② For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

Inside-the-Delta Standard Duty Ratings

S811



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

Max. Continuous Motor Line Current	Three-Phase Motor kW Rating (50 Hz)			hp Rating (60 Hz)								Catalog Number
	230V	380–400V	440V	200V	230V	460V	575V	1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
65	10	18.5	18.5	15	15	15	15	40	30	50	50	S811N37N3D
114	18.5	30	37	30	25	30	30	75	60	100	75	S811N66N3D
Frame Size R												
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
Frame Size T												
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
Frame Size U												
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}
Frame Size V												
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

Notes

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

S811



Inside-the-Delta Standard Duty—25 Second Ramp, 4 Starts per Hour, 300% Current Limit at 40°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor												Catalog Number
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380–400V	440V	200V 1.0SF	1.15SF	230V 1.0SF	1.15SF	460V 1.0SF	1.15SF	575V 1.0SF	1.15SF		
Frame Size N													
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	
Frame Size R													
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	
Frame Size T													
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	
Frame Size U													
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 ①②	
Frame Size V													
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 ③	

Notes

- 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, 796A inside-the-delta starter.
- ② U-Frame 500A unit does not have IEC certification.
- ③ For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

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S811



Inside-the-Delta Standard Duty— 15 Second Ramp, 4 Starts per Hour, 300% Current Limit at 50°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor kW Rating (50 Hz)			hp Rating (60 Hz)								Catalog Number
	230V	380–400V	440V	200V 1.0SF	1.15SF	230V 1.0SF	1.15SF	460V 1.0SF	1.15SF	575V 1.0SF	1.15SF	
Frame Size N												
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
Frame Size R												
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
Frame Size T												
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
Frame Size U												
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
Frame Size V												
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

Notes

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

S811



Inside-the-Delta Standard Duty—50 Second Ramp, 2 Starts per Hour, 300% Current Limit at 50°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor kW Rating (50 Hz)			hp Rating (60 Hz)								Catalog Number
				200V		230V		460V		575V		
	230V	380–400V	440V	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
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
Frame Size R												
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
Frame Size T												
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
Frame Size U												
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 ①
Frame Size V												
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 ②

Notes

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

② For more information on optimum performance of the 1000A Frame Size V S811, see Appendix E of MN03902002E.

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S811



Inside-the-Delta Standard Duty— 15 Second Ramp, 4 Starts per Hour, 450% Current Limit at 40°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor												Catalog Number
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380–400V	440V	200V		230V		460V		575V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
Frame Size N													
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
Frame Size R													
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
Frame Size T													
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
Frame Size U													
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
Frame Size V													
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

Note

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

S811



Inside-the-Delta Standard Duty—30 Second Ramp, 4 Starts per Hour, 450% Current Limit at 40°C Ambient

Max. Continuous Motor Line Current	Three-Phase Motor												Catalog Number
	kW Rating (50 Hz)			hp Rating (60 Hz)									
				200V		230V		460V		575V			
	230V	380–400V	440V	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF		
Frame Size N													
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	
Frame Size R													
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	
Frame Size T													
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	
Frame Size U													
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 ①	
Frame Size V													
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	

Note

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

1

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 at 40°C ambient.

S811



Inside-the-Delta Severe Duty

Max. Continuous Motor Line Current	Three-Phase Motor												Catalog Number
	kW Rating (50 Hz)			hp Rating (60 Hz)									
	230V	380–400V	440V	200V		230V		460V		575V			
			1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF			
Frame Size N													
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	
Frame Size R													
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	
Frame Size T													
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	
Frame Size U													
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	
Frame Size V													
415	75	110	147	125	100	125	125	300	250	300	300	S811V36N3D	
526	90	160	185	150	120	150	150	400	300	450	400	S811V42N3D	
623	110	185	220	200	150	250	200	450	400	550	450	S811V50N3D	
727	129	220	257	250	200	250	250	550	450	700	550	S811V65N3D	
816	147	257	295	250	250	300	250	600	550	750	700	S811V72N3D	
908	160	280	335	250	250	300	250	700	550	750	700	S811V85N3D	
—	—	—	—	—	—	—	—	—	—	—	—	S811V10N3D ②	

Notes

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

Accessories

Lug Kits

The T and U frame (200 mm) and V frame (290 mm) each have different lug options based on your wiring needs.

The T and U frame (200 mm) and V frame (290 mm) soft starters each have different lug options based on your wiring needs. Each lug kit contains three lugs that can be mounted on either the load or line side.

Lug Kit



Lug Kits

Frame Size	Frame Designation	Description	Catalog Number
200 mm SSRV	T, U	2 cable connections, 4 AWG to 1/0 cable	EML22
		1 cable connection, 4/0 to 500 kcmil cable	EML23
		2 cable connections, 4/0 to 500 kcmil cable	EML24
		1 cable connection, 2/0 to 300 kcmil cable	EML25
		2 cable connections, 2/0 to 300 kcmil cable	EML26
		290 mm SSRV	V
		4 cable connections, 4/0 to 500 kcmil cable	EML30
		6 cable connections, 4/0 to 500 kcmil cable	EML32
		4 cable connections, 2/0 to 300 kcmil cable	EML33 ^①

Power Supplies

24 Vdc power supply that can be used with the S811 SSRV or as a stand-alone device.

Power Supplies

Description	Catalog Number
85–264 Vac input 24 Vdc output	PSG240E
360–575 Vac input 24 Vdc output	PSG240F

Lug Cover Kits

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

Lug Cover Kits

Description	Catalog Number
Lug cover T-, U-Frame	EML27
Lug cover V-Frame	EML34

IP20 Kits

IP20 Kits

Description	Catalog Number
N-Frame kit	SS-IP20-N
R-Frame kit	SS-IP20-R
T- and U-Frame kit	SS-IP20-TU
V-Frame kit	SS-IP20-V

Surge Suppressors

The surge suppressor can mount on either the line or load side of the soft starter. It is designed to clip the line voltage (or load side induced voltage).

Surge Suppressor



Surge Suppressors

Description	Catalog Number
600V MOV for 200 mm and 290 mm units	EMS39
690V MOV for 200 mm and 290 mm units ^②	EMS41

Notes

- ① The EML33 does not have a CSA listing.
- ② T-Frame only.
- ③ For more information, see Pub. 51719.

1

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.

Mounting Plates

Description	Catalog Number
Mounting Plate N-Frame	EMM13N
Mounting Plate R-Frame	EMM13R
Mounting Plate T-, U-Frame	EMM13T
Mounting Plate V-Frame	EMM13V

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.

Vibration Plates

Description	Catalog Number
Vibration plate N-Frame	EMM14N
Vibration plate R-Frame	EMM14R
Vibration plate T-, U-Frame	EMM14T
Vibration plate V-Frame	EMM14V

Adapter Plates

The adapter plate allows customers to retrofit a V-Frame 290 mm soft starter with the U-Frame 200 mm soft starter.

Adapter Plates

Description	Catalog Number
Adapter plates ^②	EMM13U

Control Wire Connector

Control Wire Connector

Description	Catalog Number
12-pin, 5 mm pitch connector for control wiring	EMA75

Control Interface Module

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

CIM

Description	Catalog Number
Blank cover (filler)	EMA68
CIM for standard unit	EMA71
CIM for pump control option	EMA72
Panel mounting kit	
3 ft cable	EMA69A
5 ft cable	EMA69B
8 ft cable	EMA69C
10 ft cable	EMA69D

Options

Pump Control

For pump control option, change the **8th** digit in the catalog number to **P**.

Pump Control Option

Frame Size	Max. Current	Catalog Number
N	37	S811N37P3S
	66	S811N66P3S
R	105	S811R10P3S
	135	S811R13P3S
T	180	S811T18P3S
	240	S811T24P3S
	304	S811T30P3S
U	360	S811U36P3S
	420	S811U42P3S
	500	S811U50P3S ^①
V	360	S811V36P3S
	420	S811V42P3S
	500	S811V50P3S
	650	S811V65P3S
	720	S811V72P3S
	850	S811V85P3S
	1000	S811V10P3S

Extended Ramp

For a longer ramp acceleration time of 0.5–360 seconds, change the last digit in the catalog number from **Page V6-T1-93** to **L**.

Extended Ramp Option

Frame Size	Max. Current	Catalog Number
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	S811V85N3L
	1000	S811V10N3L

Extended Ramp and 690V Option

690V ratings are available on the T- and V-Frames by changing the **8th** digit in the 0.0 to **V**.

690V Option

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

Cooling Fan Kit

The EMM18 cooling fan kit mounts on either side of any frame size S801 Soft Starter to provide additional printed circuit board cooling in high ambient operating temperatures.

Cooling Fan Kit

Description	Catalog Number
Fan Kit	EMM18

Notes

- ^① U-Frame 500A unit does not have IEC certification.
- ^② For more information, see Pub 51719.

Technical Data and Specifications

Soft Starters—S811

Description	S811 Soft Starter (Partial Catalog Number)			
	S811N37	S811N66	S811R10	S811R13
Max. current capacity	37	66	105	135
FLA range	11–37	20–66	32–105	42–135
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage Ui	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds extended ramp)			
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30			
Cabling Capacity (IEC 947)				
Number of conductors	1	1	1	1
Wire sizes	14–2	14–2	14–4/0	14–4/0
Type of connectors	Box lug	Box lug	Box lug	Box lug
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)			
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.0	1.0
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m			
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Soft Starters—S811, continued

Description	S811 Soft Starter (Partial Catalog Number)			
	S811T18	S811T24	S811T30	S811U36
Max. current capacity	180	240	304	360
FLA range	56–180	75–240	95–304	112–360
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage U_i	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds extended ramp)			
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30			
Cabling Capacity (IEC 947)				
Number of conductors	1 or 2	1 or 2	1 or 2	1 or 2
Wire sizes	4 AWG to 500 kcmil			
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)			
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.0	1.0
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m			
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Soft Starters—S811, continued

Description	S811 Soft Starter (Partial Catalog Number)			
	S811U42	S811U50 [ⓐ]	S811V36	S811V42
Max. current capacity	420	500	360	420
FLA range	131–420	156–500	112–360	131–420
General Information				
Bypass mechanical lifespan	10M	10M	10M	10M
Insulating voltage U _i	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds extended ramp)			
Resistance to vibration	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g
Electrical Information				
Operating voltage	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Overload setting	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30			
Cabling Capacity (IEC 947)				
Number of conductors	1 or 2	1 or 2	2, 4 or 6	2, 4 or 6
Wire sizes	4 AWG to 500 kcmil			
Type of connectors	Add-on lug kit	Add-on lug kit	Add-on lug kit	Add-on lug kit
Control Wiring (12-Pin)				
Wire sizes in AWG	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)			
Torque requirements in lb-in	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31
Control Power Requirements				
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.0	1.0	1.4	1.4
Inrush current amps	10	10	10	10
Ripple	1%	1%	1%	1%
Relays (1) Class A and C				
Voltage AC—maximum	240	240	240	240
Voltage DC—maximum	120	120	120	120
Amps—maximum	3	3	3	3
Environment				
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C	–50 to 70°C	–50 to 70°C	–50 to 70°C
Altitude	<2000m—consult factory for operation >2000m			
Humidity	<95% noncondensing	<95% noncondensing	<95% noncondensing	<95% noncondensing
Operating position	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V

Note

[ⓐ] U-Frame 500A unit does not have IEC certification.

Soft Starters—S811, continued

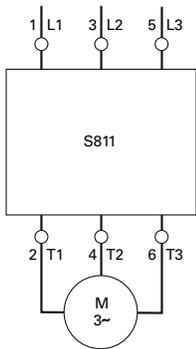
Description	S811 Soft Starter (Partial Catalog Number)				
	S811V50	S811V65	S811V72	S811V85	S811V10 ^①
Max. current capacity	500	650	720	850	1000
FLA range	156–500	203–650	225–720	265–580	320–1000
General Information					
Bypass mechanical lifespan	10M	10M	10M	10M	10M
Insulating voltage U _i	660V	660V	660V	660V	660V
Ramp time range	0.5–180 seconds (0.5–360 seconds extended ramp)				
Resistance to vibration	3g	3g	3g	3g	3g
Resistance to shock	15g	15g	15g	15g	15g
Electrical Information					
Operating voltage	200–600V	200–600V	200–600V	200–600V	200–600V
Operating frequency	47–63 Hz				
Overload setting	30–100%	30–100%	30–100%	30–100%	30–100%
Trip class	5, 10, 20 and 30				
Cabling Capacity (IEC 947)					
Number of conductors	2, 4 or 6				
Wire sizes	2/0 to 500 kcmil				
Type of connectors	Add-on lug kit				
Control Wiring (12-Pin)					
Wire sizes in AWG	22–14	22–14	22–14	22–14	22–14
Number of conductors (stranded)	2 (or one AWG 12)				
Torque requirements in lb-in	3.5	3.5	3.5	3.5	3.5
Solid, stranded or flexible max. size in mm ²	3.31	3.31	3.31	3.31	3.31
Control Power Requirements					
Voltage range (24V ±10%)	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4	21.6–26.4
Steady-state current amps	1.4	1.4	1.4	1.4	1.4
Inrush current amps	10	10	10	10	10
Ripple	1%	1%	1%	1%	1%
Relays (1) Class A and C					
Voltage AC—maximum	240	240	240	240	240
Voltage DC—maximum	120	120	120	120	120
Amps—maximum	3	3	3	3	3
Environment					
Temperature—operating	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C	–30 to 50°C (no derating) consult factory for operation >50°C
Temperature—storage	–50 to 70°C				
Altitude	<2000m—consult factory for operation >2000m				
Humidity	<95% noncondensing				
Operating position	Any	Any	Any	Any	Any
Pollution degree IEC947-1	3	3	3	3	3
Impulse withstand voltage IEC947-4-1	6000V	6000V	6000V	6000V	6000V

Note

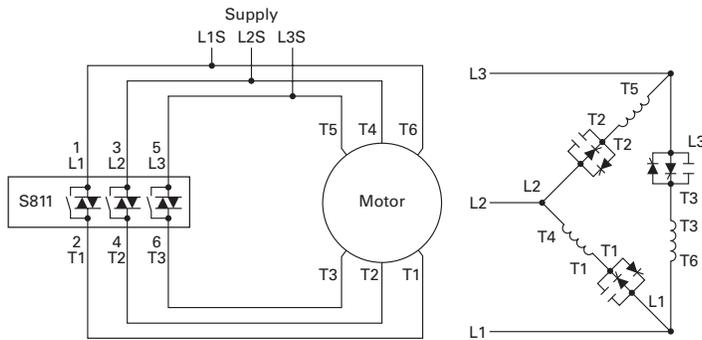
① UR recognized product.

Wiring Diagrams

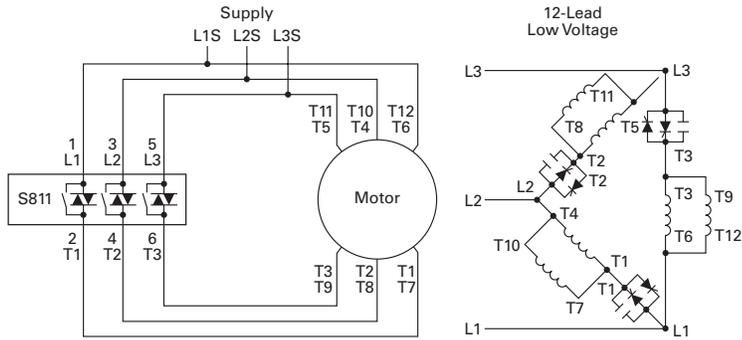
Line Connected Soft Starter



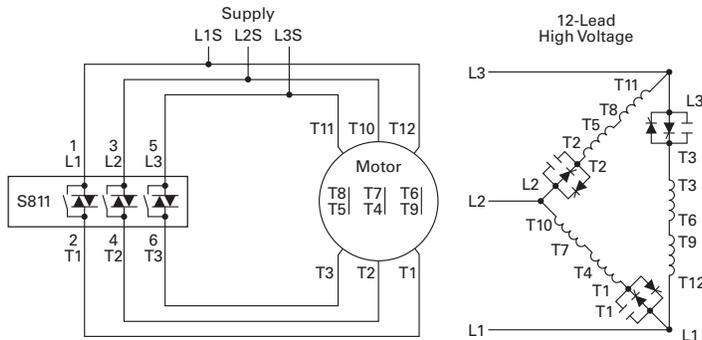
Inside-the-Delta Connected Soft Starter for a 6-Lead Motor



Inside-the-Delta Connected Soft Starter for a 12-Lead Low Voltage Motor



Inside-the-Delta Connected Soft Starter for a 12-Lead High Voltage Motor



1

Dimensions

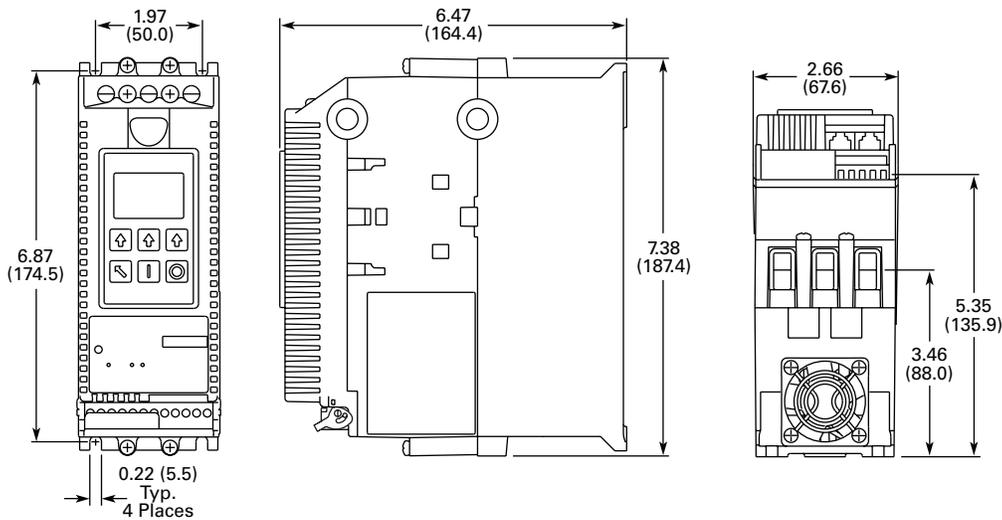
Approximate Dimensions in Inches (mm)

Soft Starters—S811

Partial Catalog Number	W	H	D	Weight in Lbs (kg)
S811N37	2.66 (67.6)	7.38 (187.4)	6.47 (164.4)	5.8 (2.6)
S811N66	2.66 (67.6)	7.38 (187.4)	6.47 (164.4)	5.8 (2.6)
S811R10	4.38 (111.3)	7.92 (201.2)	6.66 (169.2)	10.5 (4.8)
S811R13	4.38 (111.3)	7.92 (201.2)	6.66 (169.2)	10.5 (4.8)
S811T18	7.67 (194.8)	12.71 (322.9)	6.39 (162.4)	48 (21.8) with lugs 41 (18.6) without lugs
S811T24	7.67 (194.8)	12.71 (322.9)	6.39 (162.4)	48 (21.8) with lugs 41 (18.6) without lugs
S811T30	7.67 (194.8)	12.71 (322.9)	6.39 (162.4)	48 (21.8) with lugs 41 (18.6) without lugs
S811U36	7.73 (196.3)	12.72 (323.1)	7.08 (179.9)	48 (21.8) with lugs 41 (18.6) without lugs
S811U42	7.73 (196.3)	12.72 (323.1)	7.08 (179.9)	48 (21.8) with lugs 41 (18.6) without lugs
S811U50	7.73 (196.3)	12.72 (323.1)	7.08 (179.9)	48 (21.8) with lugs 41 (18.6) without lugs
S811V36	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs
S811V42	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs
S811V50	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs
S811V65	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs
S811V72	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs
S811V85	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs
S811V10	11.05 (280.6)	16.57 (420.8)	7.35 (186.6)	103 (46.8) with lugs 91 (41.4) without lugs

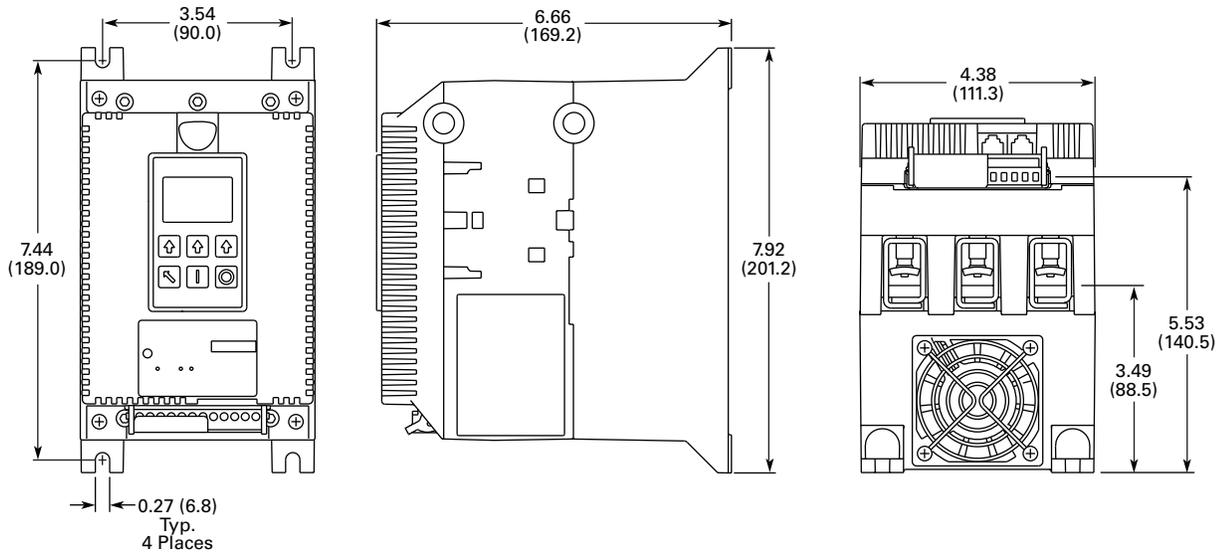
Also refer to dimension drawings below and on **Pages V6-T1-115 and V6-T1-116.**

N-Frame (65 mm) S811

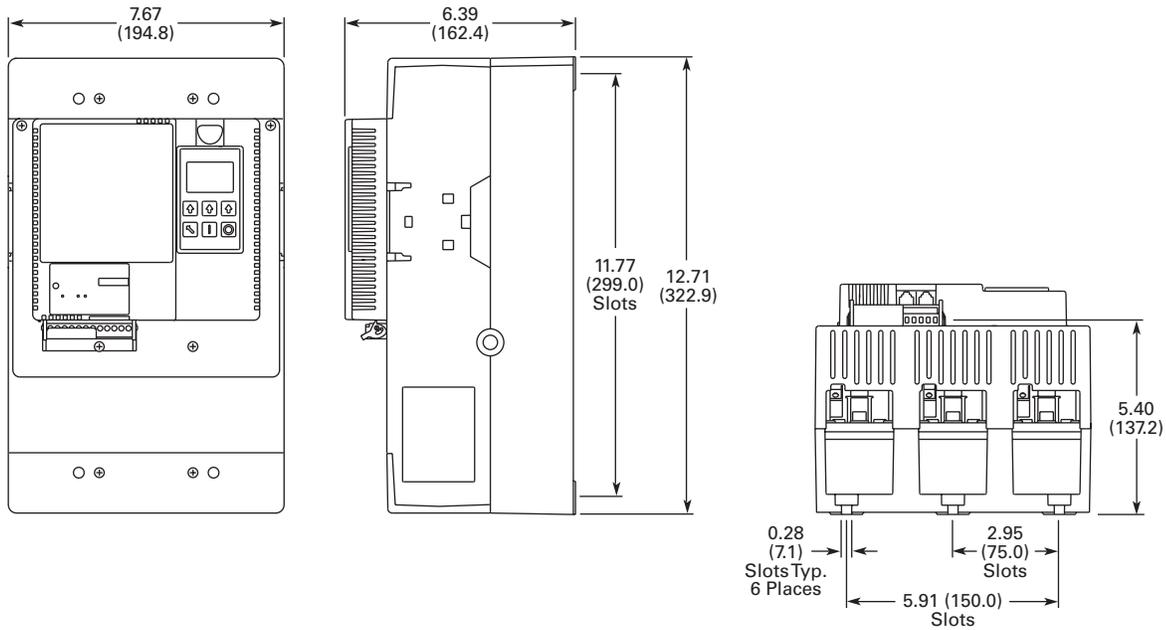


Approximate Dimensions in Inches (mm)

R-Frame (110 mm) S811



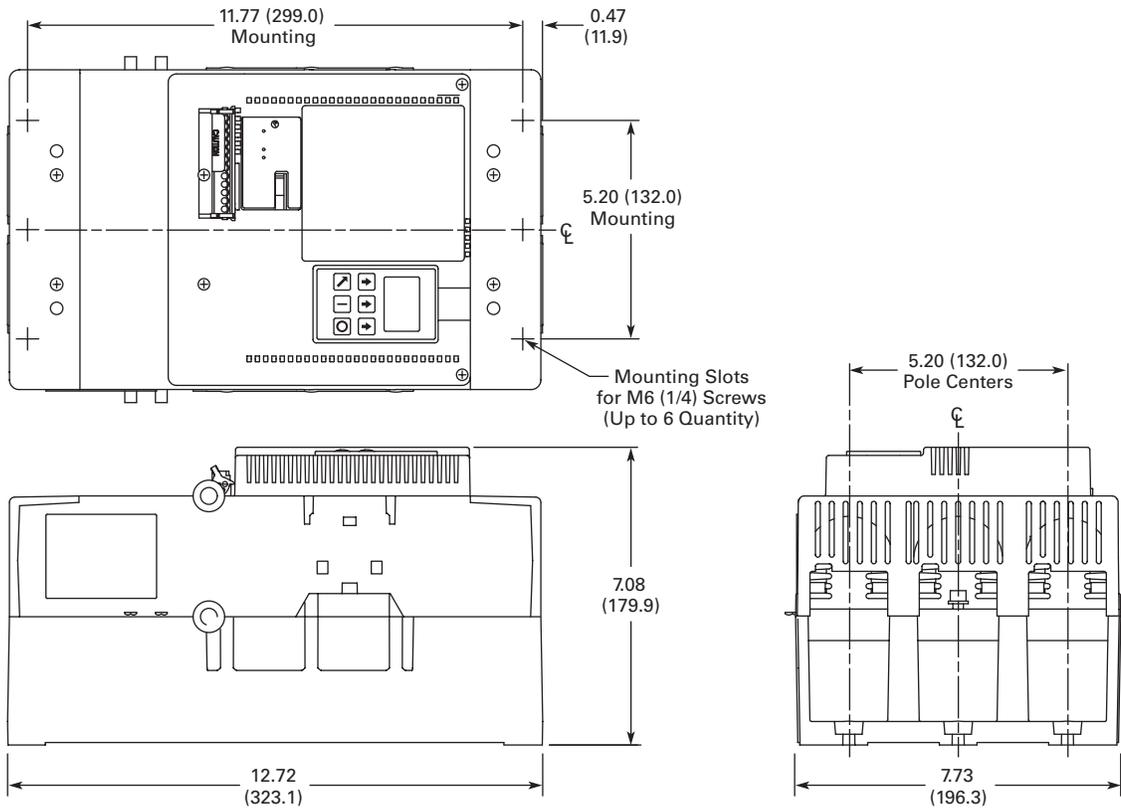
T-Frame (200 mm) S811



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Approximate Dimensions in Inches (mm)

U-Frame (200 mm) S811



V-Frame (290 mm) S811

