January 2005

Reduced Voltage Motor Starters

Contents

Note: Supplement to Publication No. CA08102001E — Tab 39.

S811 IT. Soft Starter

S811 Open Soft Starters

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. 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) and communications 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 1. 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.

The S811 has built-in communications capabilities through Cutler-Hammer QC (Quick Connect) Port. The QCPort enables the soft starter to be connected to a variety of networks, including DeviceNet™ and EtherNet/Modbus. The advantage of QCPort is that multiple control components can be connected to one Cutler-Hammer gateway. The gateway concentrates data from the devices into a single node. Configuration is simple — a single press 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 a single input and output messages.

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

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.
- 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 impeding 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. 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.

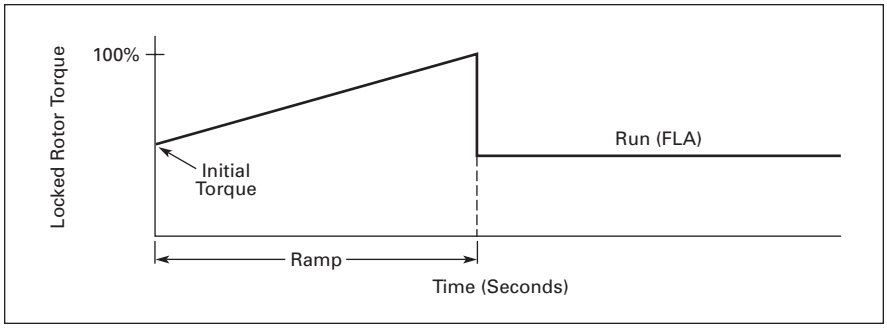


Figure 2. Starting Characteristics — Ramp Start

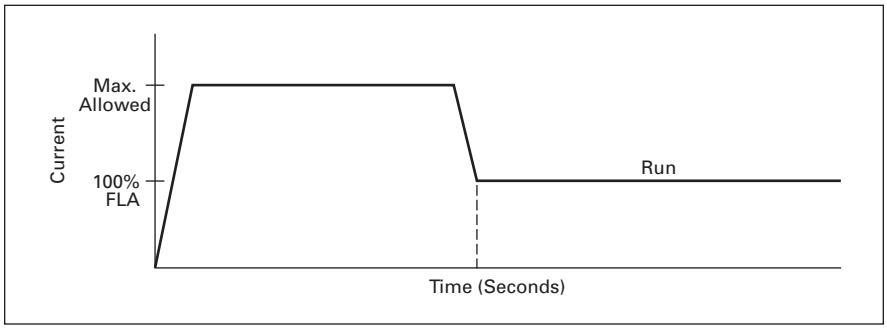


Figure 3. Starting Characteristics — Current Limit Start

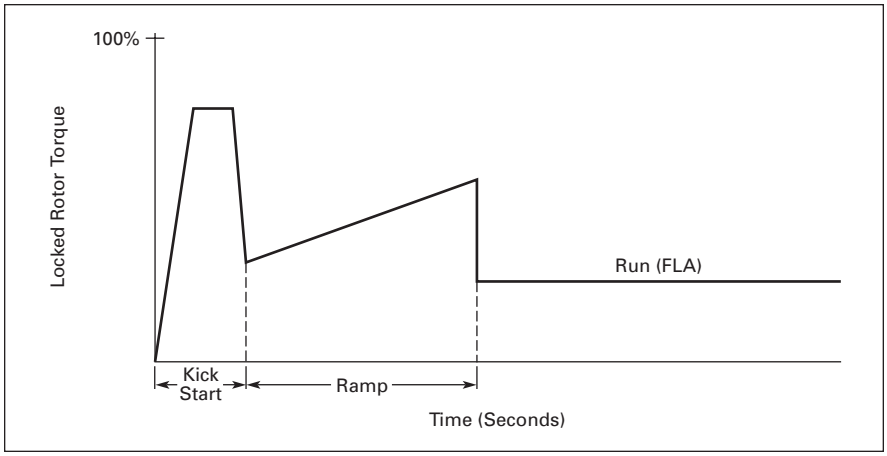


Figure 4. Starting Characteristics — Kick Start

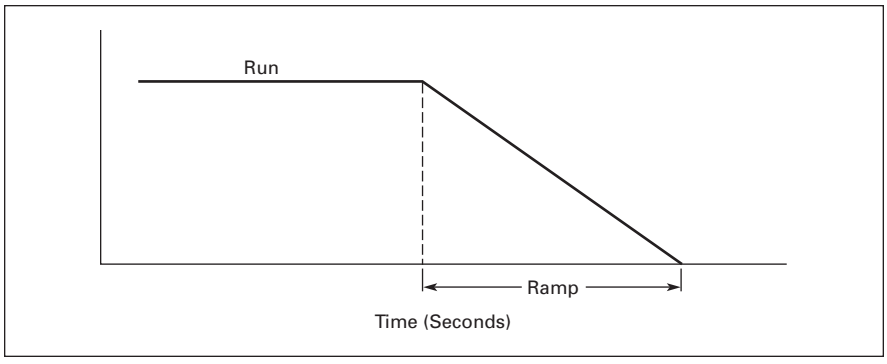


Figure 5. Starting Characteristics — Soft Stop

Catalog Number Selection

Table 1. S811 Open Soft Starters Catalog Numbering System

S 811 T 30 N 3 S

S = ***IT.*** Soft Starter

811 = Non-combination Soft Starter

Frame Size

N = 65 mm
R = 110 mm
T = 200 mm
V = 290 mm

Ampacity Rating

37 = 37 amps	**36** = 360 amps
66 = 66 amps	**42** = 420 amps
10 = 105 amps	**50** = 500 amps
13 = 135 amps	**65** = 650 amps
18 = 180 amps	**72** = 720 amps
24 = 240 amps	**85** = 850 amps
30 = 304 amps	**10** = 1000 amps

N = No Options
P = Pump Control
V = 690V Option
(Frame T18 through V85)

3 = 3-Pole Device

S = Standard Soft Starter (edge sensing is default of selectable setting)
L = Extended Ramp Start
W = Without 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.

Table 2. 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 3. Product Selection — Standard Duty Rating Open Soft Starters

Frame Size	Max. Current	Three-Phase Motor											Catalog Number ①	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		
N	37	10	18.5	18.5	10	10	10	10	25	20	30	30	**S811N37N3S**	1,890.
	66	18.5	30	37	20	15	20	20	50	40	60	50	**S811N66N3S**	2,905.
R	105	30	55	59	30	25	40	30	75	60	100	75	**S811R10N3S**	4,385.
	135	40	63	80	40	30	50	40	100	75	125	100	**S811R13N3S**	5,250.
T	180	51	90	110	60	50	60	60	150	125	150	150	**S811T18N3S**	5,580.
	240	75	110	147	75	60	75	75	200	150	200	200	**S811T24N3S**	5,940.
	304	90	160	185	100	75	100	100	250	200	300	250	**S811T30N3S**	6,310.
V	360	110	185	220	125	100	150	125	300	250	350	300	**S811V36N3S**	7,350.
	420	129	220	257	150	125	175	150	350	300	450	350	**S811V42N3S**	8,280.
	500	150	257	300	150	150	200	150	400	350	500	450	**S811V50N3S**	9,310.
	650	200	355	425	250	200	250	200	500	450	600	500	**S811V65N3S**	10,480.
	720	220	400	450	—	—	300	250	600	500	700	600	**S811V72N3S**	12,040.
	850	257	475	500	—	—	350	300	700	600	900	700	**S811V85N3S**	14,580.
	1000	315	560	600	—	—	400	350	800	700	1000	800	**S811V10N3S**	24,340.

① For a longer ramp acceleration time of 0.5 to 360 seconds, see **Page 9**.

Table 4. 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 5. Product Selection — Severe Duty Rating Open Soft Starters

Frame Size	Max. Current	Three-Phase Motor											Catalog Number ②	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		
N	22	5.5	10	11	5	5	7-1/2	5	15	10	20	15	**S811N37N3S**	1,890.
	42	11	18.5	22	10	10	15	10	30	25	40	30	**S811N66N3S**	2,905.
R	65	15	30	33	15	15	20	15	50	40	50	50	**S811R10N3S**	4,385.
	80	22	40	45	25	20	30	25	60	50	75	60	**S811R13N3S**	5,250.
T	115	33	59	63	30	30	40	30	75	75	100	100	**S811T18N3S**	5,580.
	150	45	80	90	50	40	50	50	100	100	150	125	**S811T24N3S**	5,940.
	192	55	100	110	60	50	75	60	150	125	200	150	**S811T30N3S**	6,310.
V	240	75	110	147	75	60	75	75	200	150	200	200	**S811V36N3S**	7,350.
	305	90	160	185	100	75	100	100	250	200	300	250	**S811V42N3S**	8,280.
	365	110	185	220	125	100	150	125	300	250	350	300	**S811V50N3S**	9,310.
	420	129	220	257	150	125	150	150	350	300	450	350	**S811V65N3S**	10,480.
	480	147	257	295	150	150	200	150	400	350	500	450	**S811V72N3S**	12,040.
	525	160	280	335	150	150	200	150	450	350	500	450	**S811V85N3S**	14,580.
	600	185	315	375	200	150	250	200	500	450	600	500	**S811V10N3S**	24,340.

② For a longer ramp acceleration time of 0.5 to 360 seconds, see **Page 9**.

Discount Symbol **1CD1**

Options

Extended Ramp

For a longer ramp acceleration time of .5 – 360 seconds, change the last digit in the Catalog Number from **Page 8** to **L**.

Table 6. Extended Ramp Option

Frame Size	Max. Current	Catalog Number	Price U.S. $
N	37	**S811N37N3L**	2,280.
	66	**S811N66N3L**	3,295.
R	105	**S811R10N3L**	4,775.
	135	**S811R13N3L**	5,440.
T	180	**S811T18N3L**	5,980.
	240	**S811T24N3L**	6,340.
	304	**S811T30N3L**	6,700.
V	360	**S811V36N3L**	7,750.
	420	**S811V42N3L**	8,660.
	500	**S811V50N3L**	9,700.
	650	**S811V65N3L**	10,870.
	720	**S811V72N3L**	12,430.
	850	**S811V85N3L**	14,960.
	1000	**S811V10N3L**	23,870.

690V Option

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

Table 7. 690V Option

Frame Size	Max. Current	Catalog Number	Price U.S. $
T	180	**S811T18V3L**	6,080.
	240	**S811T24V3L**	6,440.
	304	**S811T30V3L**	6,810.
V	360	**S811V36V3L**	7,850.
	420	**S811V42V3L**	8,780.
	500	**S811V50V3L**	9,810.
	650	**S811V65V3L**	10,980.
	720	**S811V72V3L**	12,540.
	850	**S811V85V3L**	15,080.

Pump Control

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

Table 8. Pump Control Option

Frame Size	Max. Current	Catalog Number	Price U.S. $
N	37	**S811N37P3S**	3,060.
	66	**S811N66P3S**	4,085.
R	105	**S811R10P3S**	5,550.
	135	**S811R13P3S**	6,430.
T	180	**S811T18P3S**	6,770.
	240	**S811T24P3S**	7,110.
	304	**S811T30P3S**	7,470.
V	360	**S811V36P3S**	8,550.
	420	**S811V42P3S**	9,460.
	500	**S811V50P3S**	10,490.
	650	**S811V65P3S**	11,680.
	720	**S811V72P3S**	13,220.
	850	**S811V85P3S**	15,770.
	1000	**S811V10P3S**	24,620.

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 9. Surge Suppressors

Description	Catalog Number	Price U.S. $
600V MOV for 65 mm and 110 mm units	**EMS38**	172.
600V MOV for 200 mm and 290 mm units	**EMS39**	172.
690V MOV for 200 mm and 290 mm units	**EMS41**	200.

Surge Suppressor

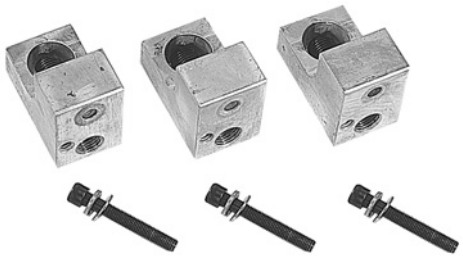
Surge Suppressor Mounted on a 200 mm Device

Discount Symbol **1CD1**

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 10. Lug Kits

Frame Size	Frame Designation	Description	Catalog Number	Price U.S. $
200 mm SSRV	T	2 cable connections, 4 AWG to 1/0 cable	**EML22**	157.00
		1 cable connection, 4/0 to 500 MCM cable	**EML23**	176.00
		2 cable connections, 4/0 to 500 MCM cable	**EML24**	223.00
		1 cable connection, 2/0 to 300 MCM cable	**EML25**	157.00
		2 cable connections, 2/0 to 300 MCM cable	**EML26**	199.00
290 mm SSRV	V	2 cable connections, 4/0 to 500 MCM cable	**EML28**	361.00
		4 cable connections, 4/0 to 500 MCM cable	**EML30**	362.00
		6 cable connections, 4/0 to 500 MCM cable	**EML32**	525.00
		4 cable connections, 2/0 to 300 MCM cable	**EML33** ①	367.00

① 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 11. Lug Cover Kits

Description	Catalog Number	Price U.S.$
Lug Cover T Frame	**EML27**	70.50
Lug Cover V Frame	**EML34**	87.50

Digital Interface Module

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

Table 12. DIM

Description	Catalog Number	Price U.S. $
Blank Cover (Filler)	**EMA68**	52.50
DIM	**EMA91**	332.00
Panel Mounting Kit —		
3 ft. Cable	**EMA69A**	175.00
5 ft. Cable	**EMA69B**	198.00
8 ft. Cable	**EMA69C**	220.00
10 ft. Cable	**EMA69D**	243.00

Control Wire Connector

Table 13. Control Wire Connector

Description	Catalog Number	Price U.S.$
12 pin, 5 mm pitch Connector for Control Wiring	**EMA75L**	15.00

User Manual

A comprehensive user manual is available and can be downloaded free of charge from www.EatonElectrical.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 14. Mounting Plates

Description	Catalog Number	Price U.S. $
Mounting Plate N Frame	**EMM13N**	55.00
Mounting Plate R Frame	**EMM13R**	76.00
Mounting Plate T Frame	**EMM13T**	84.50
Mounting Plate V Frame	**EMM13V**	109.00
Fan/Hood Accessory	**EMM18**	141.00

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 15. Vibration Plates

Description	Catalog Number	Price U.S. $
Vibration Plate N Frame	**EMM14N**	141.00
Vibration Plate R Frame	**EMM14R**	152.00
Vibration Plate T Frame	**EMM14T**	175.00
Vibration Plate V Frame	**EMM14V**	204.00

Power Supplies

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

Table 16. Power Supplies

Description	Catalog Number	Price U.S. $
115V AC Input 24V DC Output	**PSS55A**	251.00
230V AC Input 24V DC Output	**PSS55B**	251.00
380 – 480V AC Input 24V DC Output	**PSS55C**	300.00

DIN Rail Power Supply Mounting Kit (35 mm)

Table 17. DIN Rail Mounting Kit

Description	Catalog Number	Price U.S. $
DIN Rail Mounting Kit (35 mm)	**PSSDIN**	24.00

Discount Symbol **1CD1**

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, V-Frame: 10-8576
  - 290 mm, T-Frame: 10-8577

Technical Data

Table 18. Specifications— *IT.* Soft Starter

Soft Starter (Partial Catalog Number)	**S811 N37**	**S811 N66**	**S811 R10**	**S811 R13**	**S811 T18**	**S811 T24**	**S811 T30**	**S811 V36**	**S811 V42**	**S811 V50**	**S811 V65**	**S811 V72**	**S811 V85**	**S811 V10** ①
Max. Current Capacity	37	66	105	135	180	240	304	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	203 – 650	225 – 720	265 – 580	320 – 1000

Dimensions

Width in Inches (mm)	2.66 (67.6)	4.42 (112.2)	7.67 (194.8)	11.05 (280.6)
Height in Inches (mm)	7.38 (187.4)	7.92 (201.2)	12.71 (322.9)	16.57 (420.8)
Depth in Inches (mm)	6.48 (164.5)	6.64 (168.7)	6.39 (162.4)	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	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	2, 4 or 6
Wire Sizes	14 – 2	14 – 4/0	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^2	3.31

Control Power Requirements

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

Relays (1) Class A and C

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

① UR Recognized Product

Table 18. Specifications— *IT.* Soft Starter (Continued)

Soft Starter (Partial Catalog Number)	S811 N37	S811 N66	S811 R10	S811 R13	S811 T18	S811 T24	S811 T30	S811 V36	S811 V42	S811 V50	S811 V65	S811 V72	S811 V85	S811 V10
Max. Current Capacity	37	66	105	135	180	240	304	360	420	500	650	720	850	1000
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													

Dimensions

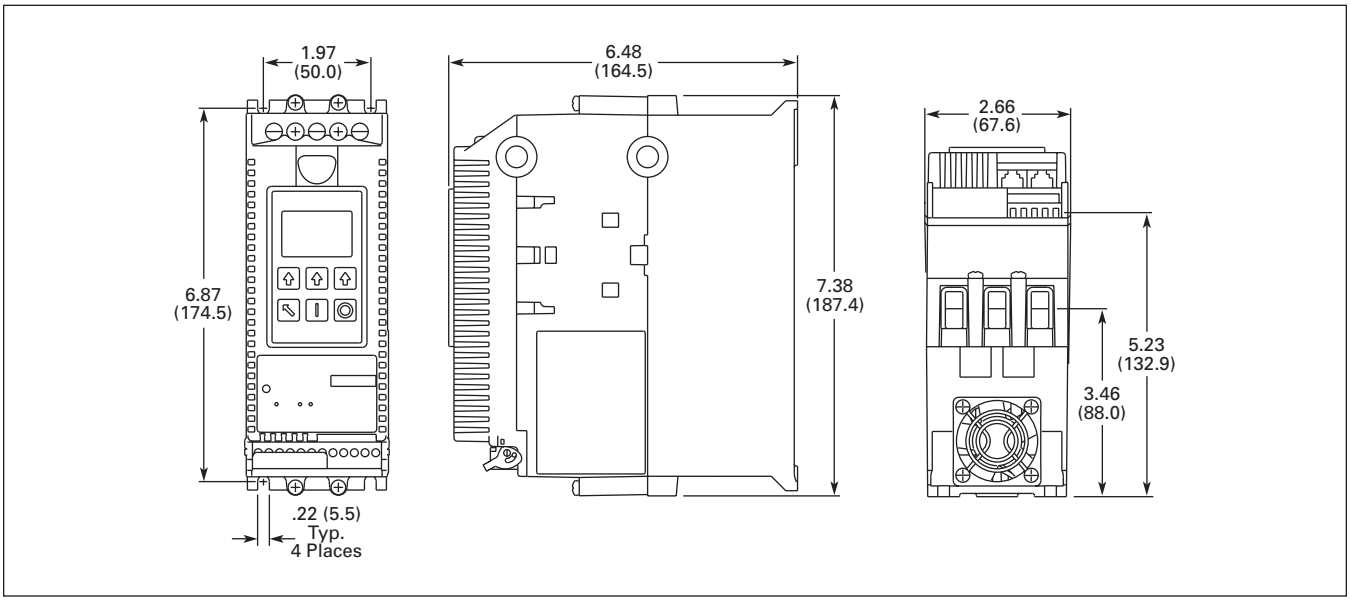


Figure 6. N-Frame (65 mm) S811 Approximate Dimensions in Inches (mm)

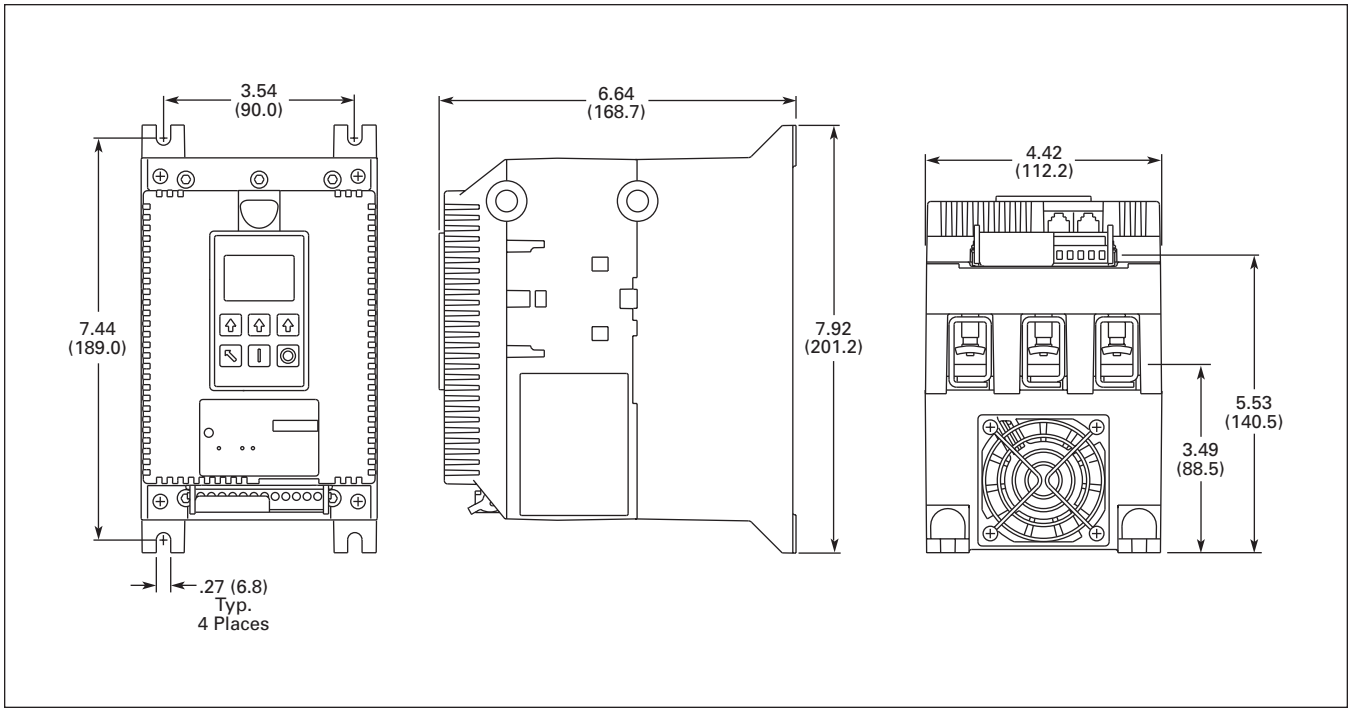


Figure 7. R-Frame (110 mm) S811 Approximate Dimensions in Inches (mm)

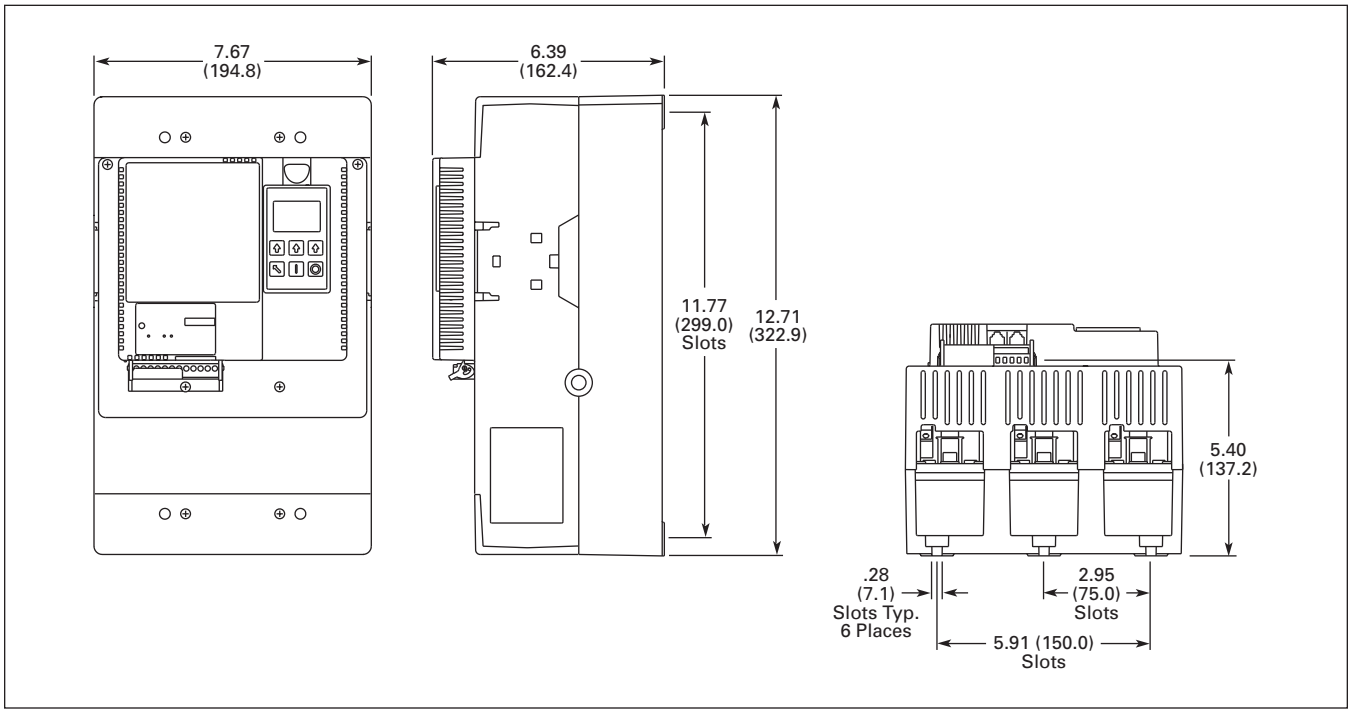


Figure 8. T-Frame (200 mm) S811 Approximate Dimensions in Inches (mm)

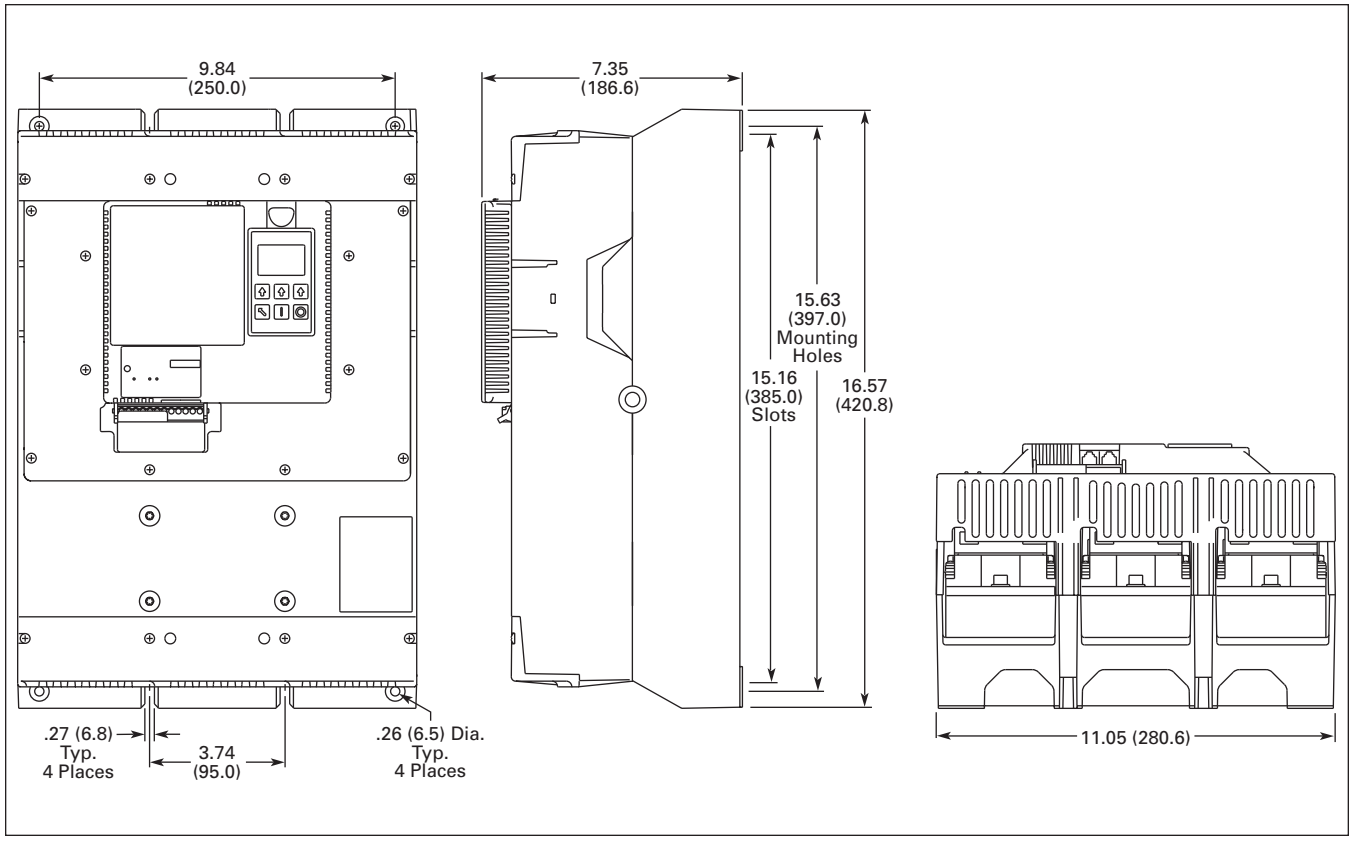


Figure 9. V-Frame (290 mm) S811 Approximate Dimensions in Inches (mm)

S811 Enclosed Soft Starters

Enclosed 40 hp Soft Starter

Product Description

Eaton's revolutionary design for soft starters is shown in the S811 soft starter products which are members of the Cutler-Hammer® Intelligent Technologies (***IT.***) family of products. These Reduced Voltage Soft Starters are the most compact, multi-functional, easy-to-install products on the market. Their superiority begins with the control package, which features 24V DC control, onboard Digital Signal Processor (DSP), and use of a low impedance run contactor, all of which contribute to the ***IT.*** Soft Starter's safety, advanced functionality and compact size.

Designed to control acceleration and deceleration of three-phase motors, products are available from 37 to 1000 amps and are suitable for mounting in a variety of enclosures including Type 1, 12, 3R, 4, 4X and 7/9.

- Built-in overload protection
  - Adjustable trip class 5, 10, 20, 30
  - 30 – 100% FLA adjustment
  - Selectable phase loss protection
- Selectable current limit or ramp start
- Adjustable ramp times
  - 0 – 180 seconds standard
  - Extended ramps available
- Adjustable torque control
- Adjustable kick start control
- Soft Stop control
  - 0 – 60 seconds standard
  - Extended times available
- Built-in low impedance contactor
- Six SCR Control in all units
- Selectable phase reversal protection
- Digital interface module

Features and Benefits

- Mechanical stress on system
  - Reduced wear on belts, gears, chains, clutches, shafts and bearings. You can get up to 2 – 6 times the life on standard belts by switching to a soft starter.
  - Elimination of water-hammer in pumping applications extends component life and helps limit leakage in system.
  - Lower shock to product on conveyor lines and material handling gear.
  - Able to catch motors and fans on the fly and control their acceleration.
- Electrical system improvements
  - Limits the peak inrush current as required by many local codes.
  - Helps to eliminate sags on the plant electrical grid when starting large loads, thus avoiding brown-out conditions.
- 24V DC advantages
  - Offers improved personnel safety by eliminating the need for 120V AC in the enclosure.
  - Soft Starter able to ride through 50% voltage conditions indefinitely due to 24V DC power supply and 0% for up to 100 mS.
- 690V option available on 180 Amp rating and larger.

Standards and Certifications

- UL 508
- IEC 947-4-2
- EN 60947.2
- CE Marked EMC/LV Directives
- CSA – 22.2
- ABS Type Approved

Options

Pump Control Option

- Designed to reduce "water-hammer" during start-up and stopping sequences
- Stop ramp extended to 120 seconds to help control larger motors and systems with long piping runs

LCD Display

- 2 line x 20 character LED back-lit LCD display
- NEMA 4 rated
- Parameters
  - Voltage L-L (AB, BC, AC)
  - Phase Current
  - Average Current
  - Overload Current Setting
  - Pole Temperature
  - Relay Trip Class
  - Thermal Pile
  - Fault History
  - Average line current as a % of FLA
  - DC Control Voltage
  - Start Count
- English or Spanish version

Table 19. Options

Description	Modification Code
Pump Control Option	**P42**
Extended Ramp	**R1**

Cover Control

Flange Control Kits

For on-the-job conversion of Type 1, 3R, 4, 4X and 12 enclosed starters. Knockouts are provided on the Type 1 flange. Type 3R, 4, 4X and 12 have prepunched holes with removable hole plugs.

Factory Installed Pilot Devices

To order factory installed pilot devices, change the 9th character of the Catalog Number to the alpha shown in the table below. Example: to order an **ECS90J4CAA** with START/STOP pushbuttons and a red pilot light, change the **A** to a **C**, i.e. ECS90J4C**C**A.

Table 20. Non-reversing Pilot Devices

Description	Factory Installed Flange Control		Field Installation Kits		Description	Factory Installed Flange Control		Field Installation Kits	
	Position 9 Alpha	Adder U.S. $	Catalog Number	Price U.S. $		Position 9 Alpha	Adder U.S. $	Catalog Number	Price U.S. $
No Cover Mounted Pilot Devices	**A**	—	—	—	START Pushbutton	**L**	180.00	**C400T3**	44.75
START/STOP Pushbuttons	**B**	180.00	**C400T1**	65.00	ON Pushbutton	**M**	180.00	**C400T4**	44.75
with Red RUN Pilot Light	**C**	360.00	—	—	OFF Pushbutton	**N**	180.00	**C400T5**	44.75
with Red RUN/Green OFF Lights	**D**	540.00	—	—	Red RUN Pilot Light	**P**	180.00	**C400T9** ①	129.00
					Green OFF	**Q**	180.00	**C400T10** ①	121.00
					Red RUN/Green OFF Pilot Lights	**R**	320.00	**C400T11** ①	240.00
ON/OFF Pushbuttons	**E**	180.00	**C400T2**	65.00	START/STOP Selector Switch	**S**	180.00	**C400T13**	65.00
with Red RUN Pilot Light	**F**	360.00	—	—	with Red RUN Pilot Light	**T**	360.00	—	—
with Red RUN/Green OFF Lights	**G**	540.00	—	—	with Red RUN/Green OFF Lights	**U**	540.00	—	—
HAND/OFF/AUTO Selector Switch	**H**	180.00	**C400T12**	65.00	ON/OFF Selector Switch	**V**	180.00	**C400T14**	65.00
with Red RUN Pilot Light	**J**	360.00	—	—	with Red RUN Pilot Light	**W**	360.00	—	—
with Red RUN/Green OFF Lights	**K**	540.00	—	—	with Red RUN/Green OFF Lights	**X**	540.00	—	—

① Add Code Letter from the table below to Catalog Number for voltage — Kits only. Example: C400T9**B**.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
120V 60 Hz	**A**	240V 60 Hz	**B**	480V 60 Hz	**C**
208V 60 Hz	**E**	380V 50 Hz	**L**	600V 60 Hz	**D**

Catalog Number Selection

Table 21. Solid-State Enclosed Control Catalog Numbering System

E C S 93 S 1 C A A

Type

S = Solid-State

Class	Page
93 = Non-combination *IT*. Soft Start	**17**
94 = Combination *IT*. Soft Start with Fusible Disconnect	**19**
95 = Combination *IT*. Soft Start with HMCP	**21**

Amps

S811

Q = 37	**Z** = 240	**5** = 650
S = 66	**1** = 304	**6** = 720
V = 105	**2** = 360	**7** = 850
W = 135	**3** = 420	**8** = 1000
Y = 180	**4** = 500	

Enclosure Type

1 = Type 1
2 = Type 3R
3 = Type 4
4 = Type 4X
6 = Type 7/9
8 = Type 12
9 = Type 4X, 316 Stainless Steel

Voltage

B = 230V	**E** = 200V
C = 460V	**Q** = 24V DC
D = 575V	

Disconnect Fuse Clip Ratings

A = None	**G** = 100A/600V R	**N** = 600A/600V R
B = 30A/250V R	**H** = 200A/250V R	**P** = 800A/600V L
C = 30A/600V R	**J** = 200A/600V R	**Q** = 1200A/600V L
D = 60A/250V R	**K** = 400A/250V R	**R** = 1600A/600V L
E = 60A/600V R	**L** = 400A/600V R	**S** = 2000A/600V L
F = 100A/250V R	**M** = 600A/250V R	**T** = by Description

Breaker

A = None	**F** = 50A	**L** = 600A
B = 3A	**G** = 100A	**P** = 1200A
C = 7A	**H** = 150A	**Q** = 1600A
D = 15A	**J** = 250A	
E = 30A	**K** = 400A	

Cover Control

See **Table 20** for Options

Discount Symbol **1CD1C**

Product Selection

Non-combination

Table 22. Class ECS93 — S811 *IT.* Soft Starter Enclosures — Type 1, 3R and 4X

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Type 1		Type 3R		Type 4X ④		Component Soft Starter (Open)
				Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size — 65 mm										
37A	200V	10	24V DC	**ECS93Q1EAA**	2,900.	**ECS93Q2EAA**	3,100.	**ECS93Q4EAA**	4,280.	**S811N37N3S**
	230V	10		**ECS93Q1BAA**	2,900.	**ECS93Q2BAA**	3,100.	**ECS93Q4BAA**	4,280.	
	460V	25		**ECS93Q1CAA**	2,900.	**ECS93Q2CAA**	3,100.	**ECS93Q4CAA**	4,280.	
	575V	30		**ECS93Q1DAA**	2,900.	**ECS93Q2DAA**	3,100.	**ECS93Q4DAA**	4,280.	
66A	200V	20	24V DC	**ECS93S1EAA**	4,250.	**ECS93S2EAA**	5,000.	**ECS93S4EAA**	6,500.	**S811N66N3S**
	230V	20		**ECS93S1BAA**	4,250.	**ECS93S2BAA**	5,000.	**ECS93S4BAA**	6,500.	
	460V	50		**ECS93S1CAA**	4,250.	**ECS93S2CAA**	5,000.	**ECS93S4CAA**	6,500.	
	575V	60		**ECS93S1DAA**	4,250.	**ECS93S2DAA**	5,000.	**ECS93S4DAA**	6,500.	
Frame Size — 110 mm										
105A	200V	30	24V DC	**ECS93V1EAA**	6,600.	**ECS93V2EAA**	7,000.	**ECS93V4EAA**	9,350.	**S811R10N3S**
	230V	40		**ECS93V1BAA**	6,600.	**ECS93V2BAA**	7,000.	**ECS93V4BAA**	9,350.	
	460V	75		**ECS93V1CAA**	6,600.	**ECS93V2CAA**	7,000.	**ECS93V4CAA**	9,350.	
	575V	100		**ECS93V1DAA**	6,600.	**ECS93V2DAA**	7,000.	**ECS93V4DAA**	9,350.	
135A	200V	40	24V DC	**ECS93W1EAA**	7,950.	**ECS93W2EAA**	8,750.	**ECS93W4EAA**	11,250.	**S811R13N3S**
	230V	50		**ECS93W1BAA**	7,950.	**ECS93W2BAA**	8,750.	**ECS93W4BAA**	11,250.	
	460V	100		**ECS93W1CAA**	7,950.	**ECS93W2CAA**	8,750.	**ECS93W4CAA**	11,250.	
	575V	125		**ECS93W1DAA**	7,950.	**ECS93W2DAA**	8,750.	**ECS93W4DAA**	11,250.	
Frame Size — 200 mm										
180A	200V	60	24V DC	**ECS93Y1EAA**	9,100.	**ECS93Y2EAA**	10,200.	**ECS93Y4EAA**	13,100.	**S811T18N3S**
	230V	60		**ECS93Y1BAA**	9,100.	**ECS93Y2BAA**	10,200.	**ECS93Y4BAA**	13,100.	
	460V	150		**ECS93Y1CAA**	9,100.	**ECS93Y2CAA**	10,200.	**ECS93Y4CAA**	13,100.	
	575V	150		**ECS93Y1DAA**	9,100.	**ECS93Y2DAA**	10,200.	**ECS93Y4DAA**	13,100.	
240A	200V	75	24V DC	**ECS93Z1EAA**	9,700.	**ECS93Z2EAA**	11,500.	**ECS93Z4EAA**	14,500.	**S811T24N3S**
	230V	75		**ECS93Z1BAA**	9,700.	**ECS93Z2BAA**	11,500.	**ECS93Z4BAA**	14,500.	
	460V	200		**ECS93Z1CAA**	9,700.	**ECS93Z2CAA**	11,500.	**ECS93Z4CAA**	14,500.	
	575V	200		**ECS93Z1DAA**	9,700.	**ECS93Z2DAA**	11,500.	**ECS93Z4DAA**	14,500.	
304A	200V	100	24V DC	**ECS9311EAA**	10,720.	**ECS9312EAA**	13,000.	**ECS9314EAA**	16,300.	**S811T30N3S**
	230V	100		**ECS9311BAA**	10,720.	**ECS9312BAA**	13,000.	**ECS9314BAA**	16,300.	
	460V	250		**ECS9311CAA**	10,720.	**ECS9312CAA**	13,000.	**ECS9314CAA**	16,300.	
	575V	300		**ECS9311DAA**	10,720.	**ECS9312DAA**	13,000.	**ECS9314DAA**	16,300.	
Frame Size — 290 mm										
360A	200V	125	24V DC	**ECS9321EAA**	13,000.	**ECS9322EAA**	15,500.	**ECS9324EAA**	17,900.	**S811V36N3S**
	230V	150		**ECS9321BAA**	13,000.	**ECS9322BAA**	15,500.	**ECS9324BAA**	17,900.	
	460V	300		**ECS9321CAA**	13,000.	**ECS9322CAA**	15,500.	**ECS9324CAA**	17,900.	
	575V	350		**ECS9321DAA**	13,000.	**ECS9322DAA**	15,500.	**ECS9324DAA**	17,900.	
420A	200V	150	24V DC	**ECS9331EAA**	15,500.	**ECS9332EAA**	17,500.	**ECS9334EAA**	20,700.	**S811V42N3S**
	230V	175		**ECS9331BAA**	15,500.	**ECS9332BAA**	17,500.	**ECS9334BAA**	20,700.	
	460V	350		**ECS9331CAA**	15,500.	**ECS9332CAA**	17,500.	**ECS9334CAA**	20,700.	
	575V	450		**ECS9331DAA**	15,500.	**ECS9332DAA**	17,500.	**ECS9334DAA**	20,700.	
500A	200V	150	24V DC	**ECS9341EAA**	17,200.	**ECS9342EAA**	18,900.	**ECS9344EAA**	22,900.	**S811V50N3S**
	230V	200		**ECS9341BAA**	17,200.	**ECS9342BAA**	18,900.	**ECS9344BAA**	22,900.	
	460V	400		**ECS9341CAA**	17,200.	**ECS9342CAA**	18,900.	**ECS9344CAA**	22,900.	
	575V	500		**ECS9341DAA**	17,200.	**ECS9342DAA**	18,900.	**ECS9344DAA**	22,900.	
650A	200V	250	24V DC	**ECS9351EAA**	18,400.	**ECS9352EAA**	21,300.	**ECS9354EAA**	28,000.	**S811V65N3S**
	230V	250		**ECS9351BAA**	18,400.	**ECS9352BAA**	21,300.	**ECS9354BAA**	28,000.	
	460V	500		**ECS9351CAA**	18,400.	**ECS9352CAA**	21,300.	**ECS9354CAA**	28,000.	
	575V	600		**ECS9351DAA**	18,400.	**ECS9352DAA**	21,300.	**ECS9354DAA**	28,000.	
720A	230V	300	24V DC	**ECS9361BAA**	19,900.	**ECS9362BAA**	30,400.	**ECS9364BAA**	37,100.	**S811V72N3S**
	460V	600		**ECS9361CAA**	19,900.	**ECS9362CAA**	30,400.	**ECS9364CAA**	37,100.	
	575V	700		**ECS9361DAA**	19,900.	**ECS9362DAA**	30,400.	**ECS9364DAA**	37,100.	
850A	230V	350	24V DC	**ECS9371BAA**	22,500.	**ECS9372BAA**	32,400.	**ECS9374BAA**	39,800.	**S811V85N3S**
	460V	700		**ECS9371CAA**	22,500.	**ECS9372CAA**	32,400.	**ECS9374CAA**	39,800.	
	575V	900		**ECS9371DAA**	22,500.	**ECS9372DAA**	32,400.	**ECS9374DAA**	39,800.	
1000A	230V	400	24V DC	**ECS9381BAA**	25,000.	**ECS9382BAA**	36,500.	**ECS9384BAA**	43,000.	**S811V10N3S**
	460V	800		**ECS9381CAA**	25,000.	**ECS9382CAA**	36,500.	**ECS9384CAA**	43,000.	
	575V	1000		**ECS9381DAA**	25,000.	**ECS9382DAA**	36,500.	**ECS9384DAA**	43,000.	

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS93S1EAA becomes ECS93S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS93S**4**EAA. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**. To order Nonmetallic, change that digit to **5**.

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Table 23. Class ECS93 — S811 *IT.* Soft Starter Enclosures — Type 7/9 and 12

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Type 7/9		Type 12		Component Soft Starter (Open)
				Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size — 65 mm								
37A	200V	10	24V DC	**ECS93Q6EAA**	6,800.	**ECS93Q8EAA**	3,100.	**S811N37N3S**
	230V	10		**ECS93Q6BAA**	6,800.	**ECS93Q8BAA**	3,100.	
	460V	25		**ECS93Q6CAA**	6,800.	**ECS93Q8CAA**	3,100.	
	575V	30		**ECS93Q6DAA**	6,800.	**ECS93Q8DAA**	3,100.	
66A	200V	20	24V DC	**ECS93S6EAA**	8,600.	**ECS93S8EAA**	5,000.	**S811N66N3S**
	230V	20		**ECS93S6BAA**	8,600.	**ECS93S8BAA**	5,000.	
	460V	50		**ECS93S6CAA**	8,600.	**ECS93S8CAA**	5,000.	
	575V	60		**ECS93S6DAA**	8,600.	**ECS93S8DAA**	5,000.	
Frame Size — 110 mm								
105A	200V	30	24V DC	**ECS93V6EAA**	13,020.	**ECS93V8EAA**	7,000.	**S811R10N3S**
	230V	40		**ECS93V6BAA**	13,020.	**ECS93V8BAA**	7,000.	
	460V	75		**ECS93V6CAA**	13,020.	**ECS93V8CAA**	7,000.	
	575V	100		**ECS93V6DAA**	13,020.	**ECS93V8DAA**	7,000.	
135A	200V	40	24V DC	**ECS93W6EAA**	16,850.	**ECS93W8EAA**	8,750.	**S811R13N3S**
	230V	50		**ECS93W6BAA**	16,850.	**ECS93W8BAA**	8,750.	
	460V	100		**ECS93W6CAA**	16,850.	**ECS93W8CAA**	8,750.	
	575V	125		**ECS93W6DAA**	16,850.	**ECS93W8DAA**	8,750.	
Frame Size — 200 mm								
180A	200V	60	24V DC	**ECS93Y6EAA**	21,000.	**ECS93Y8EAA**	10,200.	**S811T18N3S**
	230V	60		**ECS93Y6BAA**	21,000.	**ECS93Y8BAA**	10,200.	
	460V	150		**ECS93Y6CAA**	21,000.	**ECS93Y8CAA**	10,200.	
	575V	150		**ECS93Y6DAA**	21,000.	**ECS93Y8DAA**	10,200.	
240A	200V	75	24V DC	**ECS93Z6EAA**	22,400.	**ECS93Z8EAA**	11,500.	**S811T24N3S**
	230V	75		**ECS93Z6BAA**	22,400.	**ECS93Z8BAA**	11,500.	
	460V	200		**ECS93Z6CAA**	22,400.	**ECS93Z8CAA**	11,500.	
	575V	200		**ECS93Z6DAA**	22,400.	**ECS93Z8DAA**	11,500.	
304A	200V	100	24V DC	**ECS9316EAA**	29,400.	**ECS9318EAA**	12,600.	**S811T30N3S**
	230V	100		**ECS9316BAA**	29,400.	**ECS9318BAA**	12,600.	
	460V	250		**ECS9316CAA**	29,400.	**ECS9318CAA**	12,600.	
	575V	300		**ECS9316DAA**	29,400.	**ECS9318DAA**	12,600.	
Frame Size — 290 mm								
360A	200V	125	24V DC	**ECS9326EAA**	④	**ECS9328EAA**	15,200.	**S811V36N3S**
	230V	150		**ECS9326BAA**	④	**ECS9328BAA**	15,200.	
	460V	300		**ECS9326CAA**	④	**ECS9328CAA**	15,200.	
	575V	350		**ECS9326DAA**	④	**ECS9328DAA**	15,200.	
420A	200V	150	24V DC	**ECS9336EAA**	④	**ECS9338EAA**	17,500.	**S811V42N3S**
	230V	175		**ECS9336BAA**	④	**ECS9338BAA**	17,500.	
	460V	350		**ECS9336CAA**	④	**ECS9338CAA**	17,500.	
	575V	450		**ECS9336DAA**	④	**ECS9338DAA**	17,500.	
500A	200V	150	24V DC	**ECS9346EAA**	④	**ECS9348EAA**	18,900.	**S811V50N3S**
	230V	200		**ECS9346BAA**	④	**ECS9348BAA**	18,900.	
	460V	400		**ECS9346CAA**	④	**ECS9348CAA**	18,900.	
	575V	500		**ECS9346DAA**	④	**ECS9348DAA**	18,900.	
650A	200V	250	24V DC	**ECS9356EAA**	④	**ECS9358EAA**	21,300.	**S811V65N3S**
	230V	250		**ECS9356BAA**	④	**ECS9358BAA**	21,300.	
	460V	500		**ECS9356CAA**	④	**ECS9358CAA**	21,300.	
	575V	600		**ECS9356DAA**	④	**ECS9358DAA**	21,300.	
720A	230V	300	24V DC	**ECS9366BAA**	④	**ECS9368BAA**	30,400.	**S811V72N3S**
	460V	600		**ECS9366CAA**	④	**ECS9368CAA**	30,400.	
	575V	700		**ECS9366DAA**	④	**ECS9368DAA**	30,400.	
850A	230V	350	24V DC	**ECS9376BAA**	④	**ECS9378BAA**	32,400.	**S811V85N3S**
	460V	700		**ECS9376CAA**	④	**ECS9378CAA**	32,400.	
	575V	900		**ECS9376DAA**	④	**ECS9378DAA**	32,400.	
1000A	230V	400	24V DC	**ECS9386BAA**	④	**ECS9388BAA**	36,500.	**S811V10N3S**
	460V	800		**ECS9386CAA**	④	**ECS9388CAA**	36,500.	
	575V	1000		**ECS9386DAA**	④	**ECS9388DAA**	36,500.	

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS93S1EAA becomes ECS93S1**Q**AA-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ Consult Eaton.

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Combination with Fusible Disconnect

Table 24. Class ECS94 – S811 *IT.* Soft Starter Enclosures — Type 1 and 3R

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Switch Rating	Type 1		Type 3R		Component Soft Starter (Open)
					Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size — 65 mm									
37A	200V	3 10	24V DC	30A 60A	**ECS94Q1EAB** **ECS94Q1EAD**	4,590. 4,590.	**ECS94Q2EAB** **ECS94Q2EAD**	5,300. 5,300.	**S811N37N3S**
	230V	7-1/2 10		30A 60A	**ECS94Q1BAB** **ECS94Q1BAD**	4,590. 4,590.	**ECS94Q2BAB** **ECS94Q2BAD**	5,300. 5,300.	**S811N37N3S**
	460V	15 25		30A 60A	**ECS94Q1CAC** **ECS94Q1CAE**	4,590. 4,590.	**ECS94Q2CAC** **ECS94Q2CAE**	5,300. 5,300.	**S811N37N3S**
	575V	20 30		30A 60A	**ECS94Q1DAC** **ECS94Q1DAE**	4,590. 4,590.	**ECS94Q2DAC** **ECS94Q2DAE**	5,300. 5,300.	**S811N37N3S**
66A	200V	10 20	24V DC	60A 100A	**ECS94S1EAD** **ECS94S1EAF**	5,600. 5,600.	**ECS94S2EAD** **ECS94S2EAF**	6,900. 6,900.	**S811N66N3S**
	230V	15 20		60A 100A	**ECS94S1BAD** **ECS94S1BAF**	5,600. 5,600.	**ECS94S2BAD** **ECS94S2BAF**	6,900. 6,900.	**S811N66N3S**
	460V	50		100A	**ECS94S1CAG**	5,600.	**ECS94S2CAG**	6,900.	**S811N66N3S**
	575V	40 60		60A 100A	**ECS94S1DAE** **ECS94S1DAG**	5,600. 5,600.	**ECS94S2DAE** **ECS94S2DAG**	6,900. 6,900.	**S811N66N3S**
Frame Size — 110 mm									
105A	200V 230V 460V 575V	30 40 75 100	24V DC	200A 200A 200A 200A	**ECS94V1EAH** **ECS94V1BAH** **ECS94V1CAJ** **ECS94V1DAJ**	9,400. 9,400. 9,400. 9,400.	**ECS94V2EAH** **ECS94V2BAH** **ECS94V2CAJ** **ECS94V2DAJ**	9,500. 9,500. 9,500. 9,500.	**S811R10N3S**
135A	200V 230V 460V 575V	40 50 100 125	24V DC	200A 200A 200A 200A	**ECS94W1EAH** **ECS94W1BAH** **ECS94W1CAJ** **ECS94W1DAJ**	9,800. 9,800. 9,800. 9,800.	**ECS94W2EAH** **ECS94W2BAH** **ECS94W2CAJ** **ECS94W2DAJ**	11,100. 11,100. 11,100. 11,100.	**S811R13N3S**
Frame Size — 200 mm									
180A	200V 230V 460V 575V	60 60 150 150	24V DC	400A 400A 400A 400A	**ECS94Y1EAK** **ECS94Y1BAK** **ECS94Y1CAL** **ECS94Y1DAL**	13,000. 13,000. 13,000. 13,000.	**ECS94Y2EAK** **ECS94Y2BAK** **ECS94Y2CAL** **ECS94Y2DAL**	13,800. 13,800. 13,800. 13,800.	**S811T18N3S**
240A	200V 230V 460V 575V	75 75 200 200	24V DC	400A 400A 400A 400A	**ECS94Z1EAK** **ECS94Z1BAK** **ECS94Z1CAL** **ECS94Z1DAL**	13,700. 13,700. 13,700. 13,700.	**ECS94Z2EAK** **ECS94Z2BAK** **ECS94Z2CAL** **ECS94Z2DAL**	15,500. 15,500. 15,500. 15,500.	**S811T24N3S**
304A	200V 230V 460V 575V	100 100 250 300	24V DC	400A 400A 400A 400A	**ECS9411EAK** **ECS9411BAK** **ECS9411CAL** **ECS9411DAL**	15,900. 15,900. 15,900. 15,900.	**ECS9412EAK** **ECS9412BAK** **ECS9412CAL** **ECS9412DAL**	17,700. 17,700. 17,700. 17,700.	**S811T30N3S**
Frame Size — 290 mm									
360A	200V 230V 460V 575V	125 125 300 350	24V DC	600A 600A 600A 600A	**ECS9421EAM** **ECS9421BAM** **ECS9421CAN** **ECS9421DAN**	20,300. 20,300. 20,300. 20,300.	**ECS9422EAM** **ECS9422BAM** **ECS9422CAN** **ECS9422DAN**	22,000. 22,000. 22,000. 22,000.	**S811V36N3S**
420A	200V 230V 460V 575V	150 150 350 450	24V DC	600A 600A 600A 600A	**ECS9431EAM** **ECS9431BAM** **ECS9431CAN** **ECS9431DAN**	22,000. 22,000. 22,000. 22,000.	**ECS9432EAM** **ECS9432BAM** **ECS9432CAN** **ECS9432DAN**	25,400. 25,400. 25,400. 25,400.	**S811V42N3S**
500A	200V 230V 460V 575V	150 200 400 500	24V DC	800A 800A 800A 800A	**ECS9441EAP** **ECS9441BAP** **ECS9441CAP** **ECS9441DAP**	24,000. 24,000. 24,000. 24,000.	**ECS9442EAP** **ECS9442BAP** **ECS9442CAP** **ECS9442DAP**	29,300. 29,300. 29,300. 29,300.	**S811V50N3S**
650A	460V 575V	500 600	24V DC	800A 800A	**ECS9451CAP** **ECS9451DAP**	27,400. 27,400.	**ECS9452CAP** **ECS9452DAP**	34,700. 34,700.	**S811V65N3S**
720A	460V 575V	600 700	24V DC	1200A 1200A	**ECS9461CAQ** **ECS9461DAQ**	24,900. 24,900.	**ECS9462CAQ** **ECS9462DAQ**	35,500. 35,500.	**S811V72N3S**
850A	460V 575V	700 800	24V DC	1600A 1600A	**ECS9471CAR** **ECS9471DAR**	26,500. 26,500.	**ECS9472CAR** **ECS9472DAR**	36,400. 36,400.	**S811V85N3S**
1000A	230V 460V 575V	400 800 1000	24V DC	④ ④ ④	**ECS9481BA_** ④ **ECS9481CA_** ④ **ECS9481DA_** ④	29,900. 29,900. 29,900.	**ECS9482BA_** ④ **ECS9482CA_** ④ **ECS9482DA_** ④	39,900. 39,900. 39,900.	**S811V10N3S**

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS94S1EAD becomes ECS94S1**Q**AD-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ Consult Eaton.

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Table 25. Class ECS94 – S811 *IT.* Soft Starter Enclosures — Type 4X and 12

Amps	Motor Voltage	hp ②③	Coil Voltage ①	Switch Rating	Type 4X ④		Type 12		Component Soft Starter (Open)
					Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size — 65 mm									
37A	200V	3	24V DC	30A	**ECS94Q4EAB**	7,170.	**ECS94Q8EAB**	5,700.	**S811N37N3S**
		10		60A	**ECS94Q4EAD**	7,170.	**ECS94Q8EAD**	5,700.	
	230V	7-1/2		30A	**ECS94Q4BAB**	7,170.	**ECS94Q8BAB**	5,700.	**S811N37N3S**
		10		60A	**ECS94Q4BAD**	7,170.	**ECS94Q8BAD**	5,700.	
	460V	15		30A	**ECS94Q4CAC**	7,170.	**ECS94Q8CAC**	5,700.	**S811N37N3S**
		25		60A	**ECS94Q4CAE**	7,170.	**ECS94Q8CAE**	5,700.	
	575V	20		30A	**ECS94Q4DAC**	7,170.	**ECS94Q8DAC**	5,700.	**S811N37N3S**
		30		60A	**ECS94Q4DAE**	7,170.	**ECS94Q8DAE**	5,700.	
66A	200V	10	24V DC	60A	**ECS94S4EAD**	8,600.	**ECS94S8EAD**	6,900.	**S811N66N3S**
		20		100A	**ECS94S4EAF**	8,600.	**ECS94S8EAF**	6,900.	
	230V	15		60A	**ECS94S4BAD**	8,600.	**ECS94S8BAD**	6,900.	**S811N66N3S**
		20		100A	**ECS94S4BAF**	8,600.	**ECS94S8BAF**	6,900.	
	460V	50		100A	**ECS94S4CAG**	8,600.	**ECS94S8CAG**	6,900.	**S811N66N3S**
	575V	40		60A	**ECS94S4DAE**	8,600.	**ECS94S8DAE**	6,900.	**S811N66N3S**
		60		100A	**ECS94S4DAG**	8,600.	**ECS94S8DAG**	6,900.	
Frame Size — 110 mm									
105A	200V	30	24V DC	200A	**ECS94V4EAH**	11,800.	**ECS94V8EAH**	9,500.	**S811R10N3S**
	230V	40		200A	**ECS94V4BAH**	11,800.	**ECS94V8BAH**	9,500.	
	460V	75		200A	**ECS94V4CAJ**	11,800.	**ECS94V8CAJ**	9,500.	
	575V	100		200A	**ECS94V4DAJ**	11,800.	**ECS94V8DAJ**	9,500.	
135A	200V	40	24V DC	200A	**ECS94W4EAH**	14,000.	**ECS94W8EAH**	11,100.	**S811R13N3S**
	230V	50		200A	**ECS94W4BAH**	14,000.	**ECS94W8BAH**	11,100.	
	460V	100		200A	**ECS94W4CAJ**	14,000.	**ECS94W8CAJ**	11,100.	
	575V	125		200A	**ECS94W4DAJ**	14,000.	**ECS94W8DAJ**	11,100.	
Frame Size — 200 mm									
180A	200V	60	24V DC	400A	**ECS94Y4EAK**	17,600.	**ECS94Y8EAK**	13,800.	**S811T18N3S**
	230V	60		400A	**ECS94Y4BAK**	17,600.	**ECS94Y8BAK**	13,800.	
	460V	150		400A	**ECS94Y4CAL**	17,600.	**ECS94Y8CAL**	13,800.	
	575V	150		400A	**ECS94Y4DAL**	17,600.	**ECS94Y8DAL**	13,800.	
240A	200V	75	24V DC	400A	**ECS94Z4EAK**	19,300.	**ECS94Z8EAK**	15,500.	**S811T24N3S**
	230V	75		400A	**ECS94Z4BAK**	19,300.	**ECS94Z8BAK**	15,500.	
	460V	200		400A	**ECS94Z4CAL**	19,300.	**ECS94Z8CAL**	15,500.	
	575V	200		400A	**ECS94Z4DAL**	19,300.	**ECS94Z8DAL**	15,500.	
304A	200V	100	24V DC	400A	**ECS9414EAK**	21,500.	**ECS9418EAK**	17,700.	**S811T30N3S**
	230V	100		400A	**ECS9414BAK**	21,500.	**ECS9418BAK**	17,700.	
	460V	250		400A	**ECS9414CAL**	21,500.	**ECS9418CAL**	17,700.	
	575V	300		400A	**ECS9414DAL**	21,500.	**ECS9418DAL**	17,700.	
Frame Size — 290 mm									
360A	200V	125	24V DC	600A	**ECS9424EAM**	27,500.	**ECS9428EAM**	22,000.	**S811V36N3S**
	230V	125		600A	**ECS9424BAM**	27,500.	**ECS9428BAM**	22,000.	
	460V	300		600A	**ECS9424CAN**	27,500.	**ECS9428CAN**	22,000.	
	575V	350		600A	**ECS9424DAN**	27,500.	**ECS9428DAN**	22,000.	
420A	200V	150	24V DC	600A	**ECS9434EAM**	31,000.	**ECS9438EAM**	25,400.	**S811V42N3S**
	230V	150		600A	**ECS9434BAM**	31,000.	**ECS9438BAM**	25,400.	
	460V	350		600A	**ECS9434CAN**	31,000.	**ECS9438CAN**	25,400.	
	575V	450		600A	**ECS9434DAN**	31,000.	**ECS9438DAN**	25,400.	
500A	200V	150	24V DC	800A	**ECS9444EAP**	35,000.	**ECS9448EAP**	29,300.	**S811V50N3S**
	230V	200		800A	**ECS9444BAP**	35,000.	**ECS9448BAP**	29,300.	
	460V	400		800A	**ECS9444CAP**	35,000.	**ECS9448CAP**	29,300.	
	575V	500		800A	**ECS9444DAP**	35,000.	**ECS9448DAP**	29,300.	
650A	460V	500	24V DC	800A	**ECS9454CAP**	42,600.	**ECS9458CAP**	34,700.	**S811V65N3S**
	575V	600		800A	**ECS9454DAP**	42,600.	**ECS9458DAP**	34,700.	
720A	460V	600	24V DC	1200A	**ECS9464CAQ**	43,500.	**ECS9468CAQ**	35,500.	**S811V72N3S**
	575V	700		1200A	**ECS9464DAQ**	43,500.	**ECS9468DAQ**	35,500.	
850A	460V	700	24V DC	1600A	**ECS9474CAR**	45,800.	**ECS9478CAR**	36,400.	**S811V85N3S**
	575V	800		1600A	**ECS9474DAR**	45,800.	**ECS9478DAR**	36,400.	
1000A	230V	400	24V DC	⑤	**ECS9484BA_** ⑤	49,500.	**ECS9488BA_** ⑤	39,900.	**S811V10N3S**
	460V	800		⑤	**ECS9484CA_** ⑤	49,500.	**ECS9488CA_** ⑤	39,900.	
	575V	1000		⑤	**ECS9484DA_** ⑤	49,500.	**ECS9488DA_** ⑤	39,900.	

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS94S1EAD becomes ECS94S1**Q**AD-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS94S**4**EAD. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**. To order Nonmetallic, change that digit to **5**.

⑤ Consult Eaton.

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Combination with Breaker

Table 26. Class ECS95 — S811 *IT.* Soft Starter Enclosures — Type 1, 3R and 4X

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	Type 1		Type 3R		Type 4X ④		Component Soft Starter (Open)
					Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size 65 mm											
37A	200V	1/2	24V DC	3A	**ECS95Q1EAB**	4,850.	**ECS95Q2EAB**	5,950.	**ECS95Q4EAB**	7,440.	**S811N37N3S**
		1		7A	**ECS95Q1EAC**	4,850.	**ECS95Q2EAC**	5,950.	**ECS95Q4EAC**	7,440.	
		3		15A	**ECS95Q1EAD**	4,850.	**ECS95Q2EAD**	5,950.	**ECS95Q4EAD**	7,440.	
		7-1/2		30A	**ECS95Q1EAE**	4,850.	**ECS95Q2EAE**	5,950.	**ECS95Q4EAE**	7,440.	
		10		50A	**ECS95Q1EAF**	4,850.	**ECS95Q2EAF**	5,950.	**ECS95Q4EAF**	7,440.	
	230V	1/2	24V DC	3A	**ECS95Q1BAB**	4,850.	**ECS95Q2BAB**	5,950.	**ECS95Q4BAB**	7,440.	**S811N37N3S**
		1		7A	**ECS95Q1BAC**	4,850.	**ECS95Q2BAC**	5,950.	**ECS95Q4BAC**	7,440.	
		3		15A	**ECS95Q1BAD**	4,850.	**ECS95Q2BAD**	5,950.	**ECS95Q4BAD**	7,440.	
		7-1/2		30A	**ECS95Q1BAE**	4,850.	**ECS95Q2BAE**	5,950.	**ECS95Q4BAE**	7,440.	
		10		50A	**ECS95Q1BAF**	4,850.	**ECS95Q2BAF**	5,950.	**ECS95Q4BAF**	7,440.	
	460V	3/4	24V DC	3A	**ECS95Q1CAB**	4,850.	**ECS95Q2CAB**	5,950.	**ECS95Q4CAB**	7,440.	**S811N37N3S**
		3		7A	**ECS95Q1CAC**	4,850.	**ECS95Q2CAC**	5,950.	**ECS95Q4CAC**	7,440.	
		7-1/2		15A	**ECS95Q1CAD**	4,850.	**ECS95Q2CAD**	5,950.	**ECS95Q4CAD**	7,440.	
		15		30A	**ECS95Q1CAE**	4,850.	**ECS95Q2CAE**	5,950.	**ECS95Q4CAE**	7,440.	
		25		50A	**ECS95Q1CAF**	4,850.	**ECS95Q2CAF**	5,950.	**ECS95Q4CAF**	7,440.	
	575V	1	24V DC	3A	**ECS95Q1DAB**	4,850.	**ECS95Q2DAB**	5,950.	**ECS95Q4DAB**	7,440.	**S811N37N3S**
		3		7A	**ECS95Q1DAC**	4,850.	**ECS95Q2DAC**	5,950.	**ECS95Q4DAC**	7,440.	
		7-1/2		15A	**ECS95Q1DAD**	4,850.	**ECS95Q2DAD**	5,950.	**ECS95Q4DAD**	7,440.	
		20		30A	**ECS95Q1DAE**	4,850.	**ECS95Q2DAE**	5,950.	**ECS95Q4DAE**	7,440.	
		30		50A	**ECS95Q1DAF**	4,850.	**ECS95Q2DAF**	5,950.	**ECS95Q4DAF**	7,440.	
66A	200V	10	24V DC	50A	**ECS95S1EAF**	5,900.	**ECS95S2EAF**	7,100.	**ECS95S4EAF**	8,900.	**S811N66N3S**
		20		100A	**ECS95S1EAG**	5,900.	**ECS95S2EAG**	7,100.	**ECS95S4EAG**	8,900.	
	230V	15	24V DC	50A	**ECS95S1BAF**	5,900.	**ECS95S2BAF**	7,100.	**ECS95S4BAF**	8,900.	**S811N66N3S**
		20		100A	**ECS95S1BAG**	5,900.	**ECS95S2BAG**	7,100.	**ECS95S4BAG**	8,900.	
	460V	50	24V DC	100A	**ECS95S1CAG**	5,900.	**ECS95S2CAG**	7,100.	**ECS95S4CAG**	8,900.	**S811N66N3S**
	575V	40	24V DC	50A	**ECS95S1DAF**	5,900.	**ECS95S2DAF**	7,100.	**ECS95S4DAF**	8,900.	**S811N66N3S**
		60		100A	**ECS95S1DAG**	5,900.	**ECS95S2DAG**	7,100.	**ECS95S4DAG**	8,900.	
Frame Size 110 mm											
105A	200V	25	24V DC	100A	**ECS95V1EAG**	8,300.	**ECS95V2EAG**	9,500.	**ECS95V4EAG**	11,900.	**S811R10N3S**
		30		150A	**ECS95V1EAH**	8,300.	**ECS95V2EAH**	9,500.	**ECS95V4EAH**	11,900.	
	230V	30	24V DC	100A	**ECS95V1BAG**	8,300.	**ECS95V2BAG**	9,500.	**ECS95V4BAG**	11,900.	**S811R10N3S**
		40		150A	**ECS95V1BAH**	8,300.	**ECS95V2BAH**	9,500.	**ECS95V4BAH**	11,900.	
	460V	60	24V DC	100A	**ECS95V1CAG**	8,300.	**ECS95V2CAG**	9,500.	**ECS95V4CAG**	11,900.	**S811R10N3S**
		75		150A	**ECS95V1CAH**	8,300.	**ECS95V2CAH**	9,500.	**ECS95V4CAH**	11,900.	
	575V	75	24V DC	100A	**ECS95V1DAG**	8,300.	**ECS95V2DAG**	9,500.	**ECS95V4DAG**	11,900.	**S811R10N3S**
		100		150A	**ECS95V1DAH**	8,300.	**ECS95V2DAH**	9,500.	**ECS95V4DAH**	11,900.	
135A	200V	40	24V DC	150A	**ECS95W1EAH**	9,900.	**ECS95W2EAH**	11,500.	**ECS95W4EAH**	14,300.	**S811R13N3S**
	230V	50		150A	**ECS95W1BAH**	9,900.	**ECS95W2BAH**	11,500.	**ECS95W4BAH**	14,300.	
	460V	100		150A	**ECS95W1CAH**	9,900.	**ECS95W2CAH**	11,500.	**ECS95W4CAH**	14,300.	
	575V	125		150A	**ECS95W1DAH**	9,900.	**ECS95W2DAH**	11,500.	**ECS95W4DAH**	14,300.	
Frame Size 200 mm											
180A	200V	60	24V DC	250A	**ECS95Y1EAJ**	12,200.	**ECS95Y2EAJ**	14,000.	**ECS95Y4EAJ**	18,000.	**S811T18N3S**
	230V	60		250A	**ECS95Y1BAJ**	12,200.	**ECS95Y2BAJ**	14,000.	**ECS95Y4BAJ**	18,000.	
	460V	150		250A	**ECS95Y1CAJ**	12,200.	**ECS95Y2CAJ**	14,000.	**ECS95Y4CAJ**	18,000.	
	575V	150		250A	**ECS95Y1DAJ**	12,200.	**ECS95Y2DAJ**	14,000.	**ECS95Y4DAJ**	18,000.	
240A	200V	75	24V DC	250A	**ECS95Z1EAJ**	14,500.	**ECS95Z2EAJ**	16,300.	**ECS95Z4EAJ**	19,800.	**S811T24N3S**
	230V	75		250A	**ECS95Z1BAJ**	14,500.	**ECS95Z2BAJ**	16,300.	**ECS95Z4BAJ**	19,800.	
	460V	200		400A	**ECS95Z1CAK**	14,500.	**ECS95Z2CAK**	16,300.	**ECS95Z4CAK**	19,800.	
	575V	250		250A	**ECS95Z1DAJ**	14,500.	**ECS95Z2DAJ**	16,300.	**ECS95Z4DAJ**	19,800.	
304A	200V	100	24V DC	400A	**ECS9511EAK**	16,500.	**ECS9512EAK**	18,300.	**ECS9514EAK**	22,000.	**S811T30N3S**
	230V	100		400A	**ECS9511BAK**	16,500.	**ECS9512BAK**	18,300.	**ECS9514BAK**	22,000.	
	460V	250		400A	**ECS9511CAK**	16,500.	**ECS9512CAK**	18,300.	**ECS9514CAK**	22,000.	
	575V	300		400A	**ECS9511DAK**	16,500.	**ECS9512DAK**	18,300.	**ECS9514DAK**	22,000.	

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS95S1EAF becomes ECS95S1**Q**AF-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS95S**4**EAF. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**. To order Nonmetallic, change that digit to **5**.

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Table 26. Class ECS95 — S811 *IT.* Soft Starter Enclosures — Type 1, 3R and 4X (Continued)

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	Type 1		Type 3R		Type 4X ④		Component Soft Starter (Open)
					Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size 290 mm											
360A	200V	125	24V DC	HMCP 600A	**ECS9521EAL**	19,400.	**ECS9522EAL**	21,300.	**ECS9524EAL**	26,600.	**S811V36N3S**
	230V	150		HMCP 600A	**ECS9521BAL**	19,400.	**ECS9522BAL**	21,300.	**ECS9524BAL**	26,600.	
	460V	300		HMCP 600A	**ECS9521CAL**	19,400.	**ECS9522CAL**	21,300.	**ECS9524CAL**	26,600.	
	575V	350		HMCP 600A	**ECS9521DAL**	19,400.	**ECS9522DAL**	21,300.	**ECS9524DAL**	26,600.	
420A	200V	150	24V DC	HMCP 600A	**ECS9531EAL**	21,100.	**ECS9532EAL**	24,600.	**ECS9534EAL**	30,200.	**S811V42N3S**
	230V	150		HMCP 600A	**ECS9531BAL**	21,100.	**ECS9532BAL**	24,600.	**ECS9534BAL**	30,200.	
	460V	350		HMCP 600A	**ECS9531CAL**	21,100.	**ECS9532CAL**	24,600.	**ECS9534CAL**	30,200.	
	575V	450		HMCP 600A	**ECS9531DAL**	21,100.	**ECS9532DAL**	24,600.	**ECS9534DAL**	30,200.	
500A	200V	150	24V DC	HMCP 600A	**ECS9541EAL**	22,000.	**ECS9542EAL**	27,200.	**ECS9544EAL**	32,800.	**S811V50N3S**
	230V	200		HMCP 600A	**ECS9541BAL**	22,000.	**ECS9542BAL**	27,200.	**ECS9544BAL**	32,800.	
	460V	400		HMCP 600A	**ECS9541CAL**	22,000.	**ECS9542CAL**	27,200.	**ECS9544CAL**	32,800.	
	575V	500		HMCP 600A	**ECS9541DAL**	22,000.	**ECS9542DAL**	27,200.	**ECS9544DAL**	32,800.	
650A	200V	200	24V DC	HMCP 1200A	**ECS9551EAP**	26,500.	**ECS9552EAP**	33,700.	**ECS9554EAP**	41,600.	**S811V65N3S**
	230V	250		HMCP 1200A	**ECS9551BAP**	26,500.	**ECS9552BAP**	33,700.	**ECS9554BAP**	41,600.	
	460V	450		HMCP 600A	**ECS9551CAL**	26,500.	**ECS9552CAL**	33,700.	**ECS9554CAL**	41,600.	
	460V	500		HMCP 1200A	**ECS9551CAP**	26,500.	**ECS9552CAP**	33,700.	**ECS9554CAP**	41,600.	
	575V	600		HMCP 1200A	**ECS9551DAP**	26,500.	**ECS9552DAP**	33,700.	**ECS9554DAP**	41,600.	
720A	460V	600	24V DC	HMCP 1200A	**ECS9561CAP**	30,700.	**ECS9562CAP**	39,500.	**ECS9564CAP**	47,100.	**S811V72N3S**
	575V	700		HMCP 1200A	**ECS9561DAP**	30,700.	**ECS9562DAP**	39,500.	**ECS9564DAP**	47,100.	
850A	460V	700	24V DC	HMCP 1200A	**ECS9571CAP**	35,000.	**ECS9572CAP**	44,300.	**ECS9574CAP**	50,600.	**S811V85N3S**
	575V	800		HMCP 1200A	**ECS9571DAP**	35,000.	**ECS9572DAP**	44,300.	**ECS9574DAP**	50,600.	
1000A	230V	400	24V DC	RD 1600	**ECS9581BAQ**	39,500.	**ECS9582BAQ**	48,200.	**ECS9584BAQ**	55,600.	**S811V10N3S**
	460V	800		RD 1600	**ECS9581CAQ**	39,500.	**ECS9582CAQ**	48,200.	**ECS9584CAQ**	55,600.	
	575V	1000		RD 1600	**ECS9581DAQ**	39,500.	**ECS9582DAQ**	48,200.	**ECS9584DAQ**	55,600.	

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS95S1EAF becomes ECS95S1**Q**AF-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECS95S**4**EAA. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**. To order Nonmetallic, change that digit to **5**.

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Table 27. Class ECS95 — S811 *IT.* Soft Starter Enclosures — Type 7/9 and 12

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	Type 7/9		Type 12		Component Soft Starter (Open)
					Catalog Number	Price U.S. $	Catalog Number	Price U.S. $	Catalog Number
Frame Size 65 mm									
37A	200V	1/2	24V DC	3A	**ECS95Q6EAB**	9,600.	**ECS95Q8EAB**	5,950.	**S811N37N3S**
		1		7A	**ECS95Q6EAC**	9,600.	**ECS95Q8EAC**	5,950.	
		3		15A	**ECS95Q6EAD**	9,600.	**ECS95Q8EAD**	5,950.	
		7-1/2		30A	**ECS95Q6EAE**	9,600.	**ECS95Q8EAE**	5,950.	
		10		50A	**ECS95Q6EAF**	9,600.	**ECS95Q8EAF**	5,950.	
	230V	1/2	24V DC	3A	**ECS95Q6BAB**	9,600.	**ECS95Q8BAB**	5,950.	**S811N37N3S**
		1		7A	**ECS95Q6BAC**	9,600.	**ECS95Q8BAC**	5,950.	
		3		15A	**ECS95Q6BAD**	9,600.	**ECS95Q8BAD**	5,950.	
		7-1/2		30A	**ECS95Q6BAE**	9,600.	**ECS95Q8BAE**	5,950.	
		10		50A	**ECS95Q6BAF**	9,600.	**ECS95Q8BAF**	5,950.	
	460V	3/4	24V DC	3A	**ECS95Q6CAB**	9,600.	**ECS95Q8CAB**	5,950.	**S811N37N3S**
		3		7A	**ECS95Q6CAC**	9,600.	**ECS95Q8CAC**	5,950.	
		7-1/2		15A	**ECS95Q6CAD**	9,600.	**ECS95Q8CAD**	5,950.	
		15		30A	**ECS95Q6CAE**	9,600.	**ECS95Q8CAE**	5,950.	
		25		50A	**ECS95Q6CAF**	9,600.	**ECS95Q8CAF**	5,950.	
	575V	1	24V DC	3A	**ECS95Q6DAB**	9,600.	**ECS95Q8DAB**	5,950.	**S811N37N3S**
		3		7A	**ECS95Q6DAC**	9,600.	**ECS95Q8DAC**	5,950.	
		7-1/2		15A	**ECS95Q6DAD**	9,600.	**ECS95Q8DAD**	5,950.	
		20		30A	**ECS95Q6DAE**	9,600.	**ECS95Q8DAE**	5,950.	
		30		50A	**ECS95Q6DAF**	9,600.	**ECS95Q8DAF**	5,950.	
66A	200V	10	24V DC	50A	**ECS95S6EAF**	11,000.	**ECS95S8EAF**	7,100.	**S811N66N3S**
		20		100A	**ECS95S6EAG**	11,000.	**ECS95S8EAG**	7,100.	
	230V	15	24V DC	50A	**ECS95S6BAF**	11,000.	**ECS95S8BAF**	7,100.	**S811N66N3S**
		20		100A	**ECS95S6BAG**	11,000.	**ECS95S8BAG**	7,100.	
	460V	50	24V DC	100A	**ECS95S6CAG**	11,000.	**ECS95S8CAG**	7,100.	**S811N66N3S**
	575V	40	24V DC	50A	**ECS95S6DAF**	11,000.	**ECS95S8DAF**	7,100.	**S811N66N3S**
		60		100A	**ECS95S6DAG**	11,000.	**ECS95S8DAG**	7,100.	
Frame Size 110 mm									
105A	200V	25	24V DC	100A	**ECS95V6EAG**	15,600.	**ECS95V8EAG**	9,500.	**S811R10N3S**
		30		150A	**ECS95V6EAH**	15,600.	**ECS95V8EAH**	9,500.	
	230V	30	24V DC	100A	**ECS95V6BAG**	15,600.	**ECS95V8BAG**	9,500.	**S811R10N3S**
		40		150A	**ECS95V6BAH**	15,600.	**ECS95V8BAH**	9,500.	
	460V	60	24V DC	100A	**ECS95V6CAG**	15,600.	**ECS95V8CAG**	9,500.	**S811R10N3S**
		75		150A	**ECS95V6CAH**	15,600.	**ECS95V8CAH**	9,500.	
	575V	75	24V DC	100A	**ECS95V6DAG**	15,600.	**ECS95V8DAG**	9,500.	**S811R10N3S**
		100		150A	**ECS95V6DAH**	15,600.	**ECS95V8DAH**	9,500.	
135A	200V	40	24V DC	150A	**ECS95W6EAH**	18,800.	**ECS95W8EAH**	11,500.	**S811R13N3S**
	230V	50		150A	**ECS95W6BAH**	18,800.	**ECS95W8BAH**	11,500.	
	460V	100		150A	**ECS95W6CAH**	18,800.	**ECS95W8CAH**	11,500.	
	575V	125		150A	**ECS95W6DAH**	18,800.	**ECS95W8DAH**	11,500.	
Frame Size 200 mm									
180A	200V	60	24V DC	250A	**ECS95Y6EAJ**	26,000.	**ECS95Y8EAJ**	14,000.	**S811T18N3S**
	230V	60		250A	**ECS95Y6BAJ**	26,000.	**ECS95Y8BAJ**	14,000.	
	460V	150		250A	**ECS95Y6CAJ**	26,000.	**ECS95Y8CAJ**	14,000.	
	575V	150		250A	**ECS95Y6DAJ**	26,000.	**ECS95Y8DAJ**	14,000.	
240A	200V	75	24V DC	250A	**ECS95Z6EAJ**	28,300.	**ECS95Z8EAJ**	16,300.	**S811T24N3S**
	230V	75		250A	**ECS95Z6BAJ**	28,300.	**ECS95Z8BAJ**	16,300.	
	460V	200		400A	**ECS95Z6CAK**	28,300.	**ECS95Z8CAK**	16,300.	
	575V	250		250A	**ECS95Z6DAJ**	28,300.	**ECS95Z8DAJ**	16,300.	
304A	200V	100	24V DC	400A	**ECS9516EAK**	30,400.	**ECS9518EAK**	18,300.	**S811T30N3S**
	230V	100		400A	**ECS9516BAK**	30,400.	**ECS9518BAK**	18,300.	
	460V	250		400A	**ECS9516CAK**	30,400.	**ECS9518CAK**	18,300.	
	575V	300		400A	**ECS9516DAK**	30,400.	**ECS9518DAK**	18,300.	

① All *IT.* soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS95S1EAF becomes ECS95S1**Q**AF-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

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Table 27. Class ECS95 — S811 *IT.* Soft Starter Enclosures — Type 7/9 and 12 (Continued)

Amps	Motor Voltage	hp ②③ 1.0 S.F.	Coil Voltage ①	Circuit Breaker Type	Type 7/9		Type 12		Component Soft Starter (Open)
					Catalog Number ④	Price U.S. $ ④	Catalog Number	Price U.S. $	Catalog Number
Frame Size 290 mm									
360A	200V 230V 460V 575V	125 150 300 350	24V DC	HMCP 600A HMCP 600A HMCP 600A HMCP 600A			**ECS9528EAL** **ECS9528BAL** **ECS9528CAL** **ECS9528DAL**	21,300. 21,300. 21,300. 21,300.	**S811V36N3S**
420A	200V 230V 460V 575V	150 150 350 450	24V DC	HMCP 600A HMCP 600A HMCP 600A HMCP 600A			**ECS9538EAL** **ECS9538BAL** **ECS9538CAL** **ECS9538DAL**	24,600. 24,600. 24,600. 24,600.	**S811V42N3S**
500A	200V 230V 460V 575V	150 200 400 500	24V DC	HMCP 600A HMCP 600A HMCP 600A HMCP 600A			**ECS9548EAL** **ECS9548BAL** **ECS9548CAL** **ECS9548DAL**	27,300. 27,300. 27,300. 27,300.	**S811V50N3S**
650A	200V 230V 460V 460V 575V	200 250 450 500 600	24V DC	HMCP 1200A HMCP 1200A HMCP 600A HMCP 1200A HMCP 1200A			**ECS9558EAP** **ECS9558BAP** **ECS9558CAL** **ECS9558CAP** **ECS9558DAP**	33,700. 33,700. 33,700. 33,700. 33,700.	**S811V65N3S**
720A	460V 575V	600 700	24V DC	HMCP 1200A HMCP 1200A			**ECS9568CAP** **ECS9568DAP**	39,500. 39,500.	**S811V72N3S**
850A	460V 575V	700 800	24V DC	HMCP 1200A HMCP 1200A			**ECS9578CAP** **ECS9578DAP**	44,300. 44,300.	**S811V85N3S**
1000A	230V 460V 575V	400 800 1000	24V DC	RD 1600 RD 1600 RD 1600			**ECS9588BAQ** **ECS9588CAQ** **ECS9588DAQ**	48,200. 48,200. 48,200.	**S811V10N3S**

① All ***IT.*** soft starters are furnished with 24V DC coils and control power supplies. For 24V DC separate control, use Mod Code **C35** and change the 8th digit to **Q** (i.e. ECS95S1EAF becomes ECS95S1**Q**AF-**C35**).

② Standard duty horsepower ratings are for 300% ramp current, 30 seconds ramp time, and 3 starts per hour. Consult Eaton for other ratings.

③ Based on 1.0 Service Factor. For 1.15 consult Eaton.

④ Consult Eaton.

Dimensions

Table 28. Minimum Enclosure Box Numbers

Rating	SSRV	Non-combination	Combination with Fuses	Combination with HMCP
		Box No. ⑤	Box No. ⑤	Box No. ⑤
.8 – 27A	S752	6A ⑥	B1 ⑦	A1 ⑧
37A	S801/S811	7A	B1	A1 ⑧
50A	S752	6A ⑥	C	A1 ⑧
66A	S801/S811	7A	C	A1
105A	S801/S811	7A	C D	B1
135A	S801/S811	G B1	C D	C
180A	S801/S811	8 C	F1E	E
240A	S801/S811	G1	F1E	E
304A	S801/S811	G1	F1E	E
360A	S801/S811	C G1	F1E	E
420A	S801/S811	D G1	F1E	E
500A	S801/S811	G1	F1E	F1E E
650A	S801/S811	G1 10	F1E	F1E
720A	S801/S811	G1 10	F1E	F1E
850A	S801/S811	G1 10	F1E	F1E
1000A	S801/S811	G1 10	F1E	F1E

⑤ Enclosure space will also accommodate for an ***IT.*** Power Supply, two 4-pole relays, CPT, and terminal blocks. Also includes space for a DNA module or MOV.

⑥ Same as footnote ⑤, but CPT is not included. Upsize to 7A enclosure to include space for a CPT and a full voltage bypass contactor.

⑦ Enclosure may be reduced to an A1, with all space for all items as in footnote ⑤, excluding relays and CPTs.

⑧ Same as footnote ⑤, but CPT is not included. Upsize to B1 enclosure to include space for a CPT and a full voltage bypass contactor.

Note: See Enclosed Control Catalog for Box Dimensions for Type 1, 3R, 4X, 7/9 and 12.

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