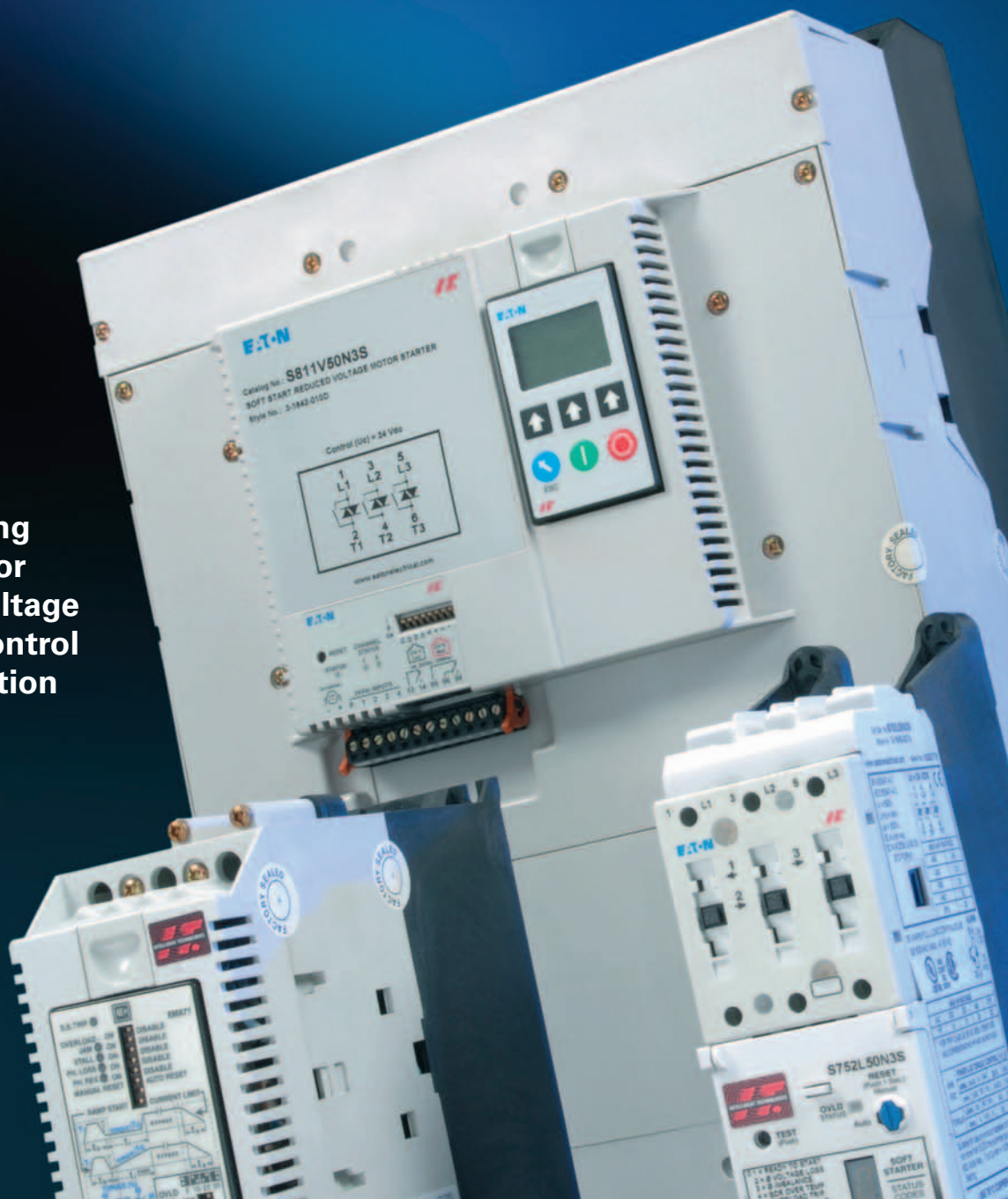
Intelligent Technologies
IT Soft Starters

Product Guide

- Built-in bypass contactor
- Diagnostic displays
- Communications
- IEC 60947-4-2

Intelligent, space-saving solutions for reduced voltage starting, control and protection of motors.



Eaton's Electrical operations

As a market-leading manufacturer of circuit protection and control equipment, Eaton's world leading switch and fuse-gear, circuit breaker and wiring accessory products are distributed across the globe. Incorporating the latest technological advances, Eaton products are the result of a comprehensive ongoing development programme and comply with the industry's most rigorous quality standards. This all serves to make Eaton an industry benchmark, with unsurpassed quality and performance guaranteed. This extensive product range, together with a lengthy experience and specialist knowledge serves to make Eaton your first source solutions provider.

Find out more on www.eatonelectrical.com

World-Class Support

At Eaton, our goal is to deliver world-class support as well as products.

This is why we continue to invest in our customer service capability to ensure you have easy access to the services you need, when you need them.

Integrated service strategy

Our integrated service strategy is based upon linking key locations and personnel along with a complete range of services to provide you "one-call" customer service.
A central support number allows you to access these support services by selecting the product group and service required. We then ensure it is quickly routed to a qualified support agent. The result is service that delivers you solutions … fast.
A single point of contact for all your enquiries is just one of the benefits you can look forward to as an Eaton customer.

Services Portfolio

Extensive support services

Our service strategy includes an extensive selection of technical and commercial services designed to help you specify, order and receive products quickly and efficiently.

Price & Availability
- Prompt Product Pricing
- Up-to-date stock availability

Order & Shipment status
- Order Checking and Status
- Shipment details

Technical Support
- "Over the phone" resolution
- Technical data assistance
- Selection and cross-reference

After Sales Support
- Debit/Credit note resolution
- Policy Returns support

Project Co-Ordination
- Order tracking for Systems based orders
- On-site Project Management service
- Tailored Delivery service

Engineered Site Services
- Installation and Commissioning
- Maintenance and Service Solution support
- 24 hour "call out" emergency service

Distributor Product Training
- Individual or Group Product training forums
- Use of "In house" training facilities

How to use this Product Guide

Two steps to find your product

STEP 1

Choose main group

STEP 2

Choose list number

Indexes

Search by product name or list number.

Eaton list number index

Legend

Function of coloured text bars:

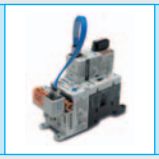
Products

Accessories

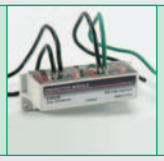
Technical data, drawings & specifications

Product Guide index





General characteristics, Soft Starters

Intelligent Technologies, Open Type S752, S801 & S811

Eaton's Intelligent Technologies (IT.) S752 Line of Reduced Voltage Soft Starter is very compact, multi-functional, easy to install and easy to program. Designed to control the acceleration and deceleration of three-phase motors, the device is available in configurations to be applied either in the line of the motor, or in the delta windings of the motor.

The S801 and S811 are designed to be a complete package combining the Silicon Controlled Rectifiers (SCRs), bypass contactor and overload protection in one, very compact unit. The IT. S811 offers enhanced functionality with the DIM (Digital Interface Module) and communications capabilities.

Standards

- IEC 60947-4-2
- EN 60947-4-2
- CE marked

S752L02N3S

The feature-packed Eaton S752 Soft Starter

- Soft acceleration and deceleration reduces wear on belts, gears, chains, clutches, shafts and bearings.
- Minimises the peak inrush current's stress on the power system.
- Minimises peak starting torque to diminish mechanical system wear and damage.
- Six SCRs control all three motor phases providing smooth acceleration and deceleration performance.
- 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 minimising nuisance trips. Advanced selectable protective features safeguard the motor and system against a variety of system faults.
- Wide range of overload FLA settings (31 – 100% of rated current) and selectable trip class (10, 20, 30) allows for wide application range while offering users the flexibility to fine tune the starter to match their specific application requirements.
- Variable ramp times and torque control settings provide unlimited starting configurations, allowing for maximum application flexibility.
- Internal run bypass contactors and overload protection eliminate the need for additional devices, thereby reducing enclosure sizes, minimising installation and wiring time and reducing overall assembly size and cost.
- Run bypass significantly reduces the heat generated as compared to non-bypass soft starters. Less heat minimises enclosure size and cooling requirements and maximises the life of all devices in the enclosure.
- Soft stop control suits applications where an abrupt stop of the load is not acceptable.
- Removable, lockable control terminal block reduces maintenance replacement costs. Also provides the opportunity for OEMs to reduce assembly and test costs by utilising pre-assembled wire harnesses.
- 24V DC control module enhances personnel and equipment safety.

S752L02N3S

S752 Diagnostic Features

The S752 has an easy to read LED that displays the device status as well as identifying the condition that caused a fault. The fault display is a useful tool in system troubleshooting. The following fault cross-reference is listed on the cover of the device to facilitate fault identification:

LED Display Code	Device Status or Fault
0	Ready To Start
1	Line Phase Reversal
2	Phase Loss Fault
3	Phase Imbalance Fault
4	SCR Over Temperature Fault
5	Overload Trip Fault
6	Test Trip Fault
7	Bypass Dropout Fault
8	Overload Communications Fault
9	Temperature Sensor Fault

S801N37N3S

The feature-packed Eaton S801 Soft Starters

- 6 SCR control
- 24V dc control for enhanced personnel safety
- 4 physical frame sizes:
  - 65mm N frame 66A 600V ac
  - 110mm R frame 135A 600V ac
  - 200mm T frame 304A 690V ac
  - 200mm U frame 420A 575V ac
  - 290mm V frame 1000A 690V ac
- Run bypass mode:
  - internal bypass contactor closes when motor is up to speed removing the SCR from the circuit
  - significantly reduces heat generated
  - minimises enclosure size
- Integral solid state overload relay
  - programmable protective feature
  - accurate current measurement & trip setting
  - models true motor heating and cooling
  - wide range of overload relay settings (31–100%)
  - selectable trip class (5–30)
  - fault indication
  - fault identification
- Voltage ramp or current limit start
  - 0.5–180 second ramp
  - 0–85% initial torque
  - soft stop 0-60 seconds
  - adjustable kick start
  - option for 360 second ramp
- Pump control option available
  - reduces water hammer in pumping applications
- Edge or level sensing
  - standard is edge
  - field selectable

S811N66N3S

The feature-packed Eaton S811 Soft Starters

- Same robust power structure and dimension as the S801 with the addition of:
- Digital interface module (DIM)
- Real time process and diagnostic data
  - control
    start and stop the device
  - configure
    modify control parameters
    enable or disable protection settings
    set communication variables
    set password access levels
- Monitor
  - 3Ø line currents
  - 3Ø pole currents
  - ave line current
  - ave pole current
  - current as %FLA
  - 3Ø pole voltages
  - thermal memory
  - DC control voltage
  - pole temp °C
  - device temp °C
  - start count
- Diagnostics
  - 30 different faults identified
  - communications
  - inter-device communication
  - control voltage low
  - device over temperature
  - phase loss
  - phase imbalance
  - under load
  - over current
  - jam
  - bypass failure
  - overload
  - test fault
  - instantaneous over current
  - ram fault
  - motor control communication loss
  - temperature sensor fault
  - hardware failure watchdog
  - under voltage
  - over voltage
  - phase reversal
  - motor control command device missing
  - inter-device communication interruption
  - memory corruption fault
  - SCR not firing
  - SCR shorted
  - SCR over current
  - voltage line loss
  - stall
  - voltage zero cross lost fault
  - holds the last 10 fault codes
- communication
  - QCport
  - IT network adapter from QCport
    devicenet
    ethernet/modbus
    profibus

S752 Soft Starters

Intelligent Technologies (IT.) S752 Product selection – In-line and inside-the-delta

The Eaton S752 is designed to be a complete package combining the SCRs, bypass contactor and overload protection in one, very compact device. The in-line device is available for current ranges from 0.25 to 50 amps. The inside-the-delta device is available for current ranges from 0.44 to 78 amps.

See page 9 for S752 Accessories.
See page 16 for S752 Technical details.
See page 18 for S752 Starting characteristics.

S752L02N3S

S752 Soft Starter, in-line, standard duty rating 230-440V

Standard duty ratings are defined as those that do not exceed any of the following operating conditions. For applications above 40°C, derate 1% per °C.

- 25 second ramp, 2 starts per hour, 40°C ambient, 300% FLA current
- 15 second ramp, 4 starts per hour, 40°C ambient, 300% FLA current
- 10 second ramp, 6 starts per hour, 40°C ambient, 300% FLA current
- 7.5 second ramp, 8 starts per hour, 40°C ambient, 300% FLA current
- 3.0 second ramp, 15 starts per hour, 40°C ambient, 300% FLA current

Maximum Continuous Current (A)	FLA Current Range (A)	kW Rating 230V (50 Hz)	kW Rating 380 – 400V (50 Hz)	kW Rating 440V (50 Hz)	Eaton list number
0.8	0.25 – 0.8	0.3	0.37	0.55	**S752L01N3S**
1.9	0.59 – 1.9	0.6	1.1	1.1	**S752L02N3S**
4.4	1.4 – 4.4	1.5	2.2	3	**S752L04N3S**
9	2.8 – 9.0	3	5.5	5.5	**S752L09N3S**
16	5.0 – 16	5.5	10	11	**S752L16N3S**
27	8.4 – 27	10	15	18.5	**S752L27N3S**
50	16 – 50	12.5	22	30	**S752L50N3S**

S752L02N3S

S752 Soft Starter, in-line, heavy duty rating 230-440V

Heavy duty ratings are defined as those that do exceed any of the following operating conditions. For applications above 40°C, derate 1% per °C.

- 25 second ramp, 2 starts per hour, 40°C ambient, 400% FLA current
- 15 second ramp, 4 starts per hour, 40°C ambient, 400% FLA current
- 10 second ramp, 6 starts per hour, 40°C ambient, 400% FLA current
- 7.5 second ramp, 8 starts per hour, 40°C ambient, 400% FLA current
- 3.0 second ramp, 15 starts per hour, 40°C ambient, 400% FLA current

Maximum Continuous Current (A)	FLA Current Range (A)	kW Rating 230V (50 Hz)	kW Rating 380 – 400V (50 Hz)	kW Rating 440V (50 Hz)	Eaton list number
0.8	0.25 – 0.8	0.3	0.37	0.55	**S752L01N3S**
1.9	0.59 – 1.9	0.6	1.1	1.1	**S752L02N3S**
4.4	1.4 – 4.4	1.5	2.2	3	**S752L04N3S**
9	2.8 – 9.0	3	5.5	5.5	**S752L09N3S**
16	5.0 – 16	5.5	10	11	**S752L16N3S**
27	8.4 – 27	10	15	18.5	**S752L27N3S**
50	16 – 50	12.5	15	20	**S752L50N3S**

S752 Soft Starter, in-line, severe duty ratings

Severe duty ratings are defined as those that do exceed any of the heavy duty operating conditions. Please contact Eaton for severe duty application assistance.

S752L27N3DV06

S752 Soft Starter, inside-delta, standard duty rating

Standard duty ratings are defined as those that do not exceed any of the following operating conditions.

- 10 second ramp, 6 starts per hour, 40°C ambient, 300% FLA current
- 7.5 second ramp, 8 starts per hour, 40°C ambient, 300% FLA current
- 3.0 second ramp, 15 starts per hour, 40°C ambient, 300% FLA current
- For applications above 40°C, derate 1% per °C.

Maximum Continuous Current (A)	FLA Current Range (A)	kW Rating 230V (50 Hz)	kW Rating 380 – 400V (50 Hz)	kW Rating 440V (50 Hz)	Eaton list number
1.3	0.44 – 1.3	0.18	0.37	0.55	**S752L01N3DV06**
3.2	1.1 – 3.2	0.55	1.1	1.5	**S752L02N3DV06**
7.6	2.5 – 7.6	1.5	3	4	**S752L04N3DV06**
15	4.9 – 15	3.7	6.5	8	**S752L09N3DV06**
27	8.7 – 27	6.5	12.5	15	**S752L16N3DV06**
46	15 – 46	12.5	22	25	**S752L27N3DV06**
78	28 – 86	22	37	45	**S752L50N3DV06**

S752L27N3DV06

S752 Soft Starter, inside-delta, heavy duty rating

Heavy duty ratings are defined as those that do not exceed any of the following operating conditions.

- 10 second ramp, 6 starts per hour, 40°C ambient, 400% FLA current
- 7.5 second ramp, 8 starts per hour, 40°C ambient, 400% FLA current
- 3.0 second ramp, 15 starts per hour, 40°C ambient, 400% FLA current
- For applications above 40°C, derate 1% per °C.

Maximum Continuous Current (A)	FLA Current Range (A)	kW Rating 230V (50 Hz)	kW Rating 380 – 400V (50 Hz)	kW Rating 440V (50 Hz)	Eaton list number
1.3	0.44 – 1.3	0.18	0.37	0.55	**S752L01N3DV06**
3.2	1.1 – 3.2	0.55	1.1	1.5	**S752L02N3DV06**
7.6	2.5 – 7.6	1.5	3	4	**S752L04N3DV06**
15	4.9 – 15	3.7	6.5	8	**S752L09N3DV06**
27	8.7 – 27	6.5	12.5	15	**S752L16N3DV06**
46	15 – 46	12.5	22	25	**S752L27N3DV06**
78	28 – 86	15	25	30	**S752L50N3DV06**

PSS25F

S752 Soft Starters, power supplies

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

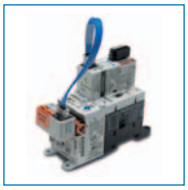
Description	Input (Vac)	Output (DC) voltage	Eaton list number
Power Supply	90 – 260	24	**PSS25E**
Power Supply	380 – 480	24	**PSS25F**

EMA13

S752 Soft Starters, auxiliary contacts

- The S752 allows for the use of top mounted auxiliary contacts. These contacts can be used for up-to-speed indication.
- One EMA70 or one EMA13/EMA14 may be used in the Centre position in conjunction with two of these devices in the outer positions.

Pole configurations	Max no. per Soft Starter	Eaton list number
1NO	3	**EMA13**
1NC	3	**EMA14**
1NO/1NC	3	**EMA15**
2NO	3	**EMA16**
2NC	3	**EMA17**
1NO/1NC Logic Level	3	**EMA70**



D77B-DSNAP-X3

S752 Soft Starter, DeviceNet adaptor

- For further info please see Eaton publication MN05004001E.

Description	Eaton list number
DeviceNet adaptor	**D77B-DSNAP-X3**
DeviceNet adaptor HOA	**D77B-DSNAP-X1**

Intelligent Technologies (IT.) S801 and S811 Product selection

The S801 and S811 are designed to meet a variety of motor applications and customer needs. 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 Eaton.

See page 13 for S801 and S811 Accessories
See page 19 for S801 and S811 Technical details
See page 23 for S801 and S811 Starting characteristics - standard and severe duties

S801N37N3S

S811N66N3S

S801 and S811 Open Soft Starters, standard duty ratings, 230 - 440V

Frame Size[1)]	Max. Current	Three-Phase Motor kW Rating 230V (50 Hz)	Three-Phase Motor kW Rating 380 – 400V (50 Hz)	Three-Phase Motor kW Rating 440V (50 Hz)	Eaton list number S801	Eaton list number S811
N	37	10	18.5	18.5	**S801N37N3S**	**S811N37N3S**
N	66	18.5	30	37	**S801N66N3S**	**S811N66N3S**
R	105	30	55	59	**S801R10N3S**	**S811R10N3S**
R	135	40	63	80	**S801R13N3S**	**S811R13N3S**
T	180	51	90	110	**S801T18N3S**	**S811T18N3S**
T	240	75	110	147	**S801T24N3S**	**S811T24N3S**
T	304	90	160	185	**S801T30N3S**	**S811T30N3S**
U	360	110	185	220	**S801U36N3S**	**S811U36N3S**
U	420	129	220	257	**S801U42N3S**	**S811U42N3S**
V	360	110	185	220	**S801V36N3S**	**S811V36N3S**
V	420	129	220	257	**S801V42N3S**	**S811V42N3S**
V	500	150	257	300	**S801V50N3S**	**S811V50N3S**
V	650	200	355	425	**S801V65N3S**	**S811V65N3S**
V	720	220	400	450	**S801V72N3S**	**S811V72N3S**
V	850	257	475	500	**S801V85N3S**	**S811V85N3S**
V	1000	315	560	600	**S801V10N3S**	**S811V10N3S**

[1)]Frame sizes T, U & V require terminals, see page 14

S801N37N3S

S811N66N3S

S801 and S811 Open Soft Starters, severe duty ratings, 230 - 440V

Frame Size[1)]	Max. Current	Three-Phase Motor kW Rating 230V (50 Hz)	Three-Phase Motor kW Rating 380 – 400V (50 Hz)	Three-Phase Motor kW Rating 440V (50 Hz)	Eaton list number S801	Eaton list number S811
N	22	5.5	10	11	**S801N37N3S**	**S811N37N3S**
N	42	11	18.5	22	**S801N66N3S**	**S811N66N3S**
R	65	15	30	33	**S801R10N3S**	**S811R10N3S**
R	80	22	40	45	**S801R13N3S**	**S811R13N3S**
T	115	33	59	63	**S801T18N3S**	**S811T18N3S**
T	150	45	80	90	**S801T24N3S**	**S811T24N3S**
T	192	55	100	110	**S801T30N3S**	**S811T30N3S**
U	240	75	110	147	**S801U36N3S**	**S811U36N3S**
U	305	90	160	185	**S801U42N3S**	**S811U42N3S**
V	240	75	110	147	**S801V36N3S**	**S811V36N3S**
V	305	90	160	185	**S801V42N3S**	**S811V42N3S**
V	365	110	185	220	**S801V50N3S**	**S811V50N3S**
V	420	129	220	257	**S801V65N3S**	**S811V65N3S**
V	480	147	257	295	**S801V72N3S**	**S811V72N3S**
V	525	160	280	335	**S801V85N3S**	**S811V85N3S**
V	600	185	315	375	**S801V10N3S**	**S811V10N3S**

[1)]Frame sizes T, U & V require terminals, see page 14

S801N37N3L

S811N66N3L

S801 and S811 Open Soft Starters, extended ramp option

- For a longer ramp acceleration time of 0.5 – 360 seconds, the last digit is changed in the Eaton List Number from S to L.

Frame Size[1)]	Max Current (A)	Eaton list number S801	Eaton list number S811
N	37	**S801N37N3L**	**S811N37N3L**
N	66	**S801N66N3L**	**S811N66N3L**
R	105	**S801R10N3L**	**S811R10N3L**
R	135	**S801R13N3L**	**S811R13N3L**
T	180	**S801T18N3L**	**S811T18N3L**
T	240	**S801T24N3L**	**S811T24N3L**
T	304	**S801T30N3L**	**S811T30N3L**
U	360	**S801U36N3L**	**S811U36N3L**
U	420	**S801U42N3L**	**S811U42N3L**
V	360	**S801V36N3L**	**S811V36N3L**
V	420	**S801V42N3L**	**S811V42N3L**
V	500	**S801V50N3L**	**S811V50N3L**
V	650	**S801V65N3L**	**S811V65N3L**
V	720	**S801V72N3L**	**S811V72N3L**
V	850	**S801V85N3L**	**S811V85N3L**
V	1000	**S801V10N3L**	**S811V10N3L**

[1)]Frame sizes T, U & V require terminals, see page 14

S801N37V3S

S811N66V3S

S801 and S811 Open Soft Starters, 690V option

- 690V ratings are available on the T and V Frames by changing the 8th digit in the Eaton List Number from an N to a V.

Frame Size[1)]	Max Current (A)	Eaton list number S801	Eaton list number S811
T	180	**S801T18V3L**	**S811T18V3L**
T	240	**S801T24V3L**	**S811T24V3L**
T	304	**S801T30V3L**	**S811T30V3L**
V	360	**S801V36V3L**	**S811V36V3L**
V	420	**S801V42V3L**	**S811V42V3L**
V	500	**S801V50V3L**	**S811V50V3L**
V	650	**S801V65V3L**	**S811V65V3L**
V	720	**S801V72V3L**	**S811V72V3L**
V	850	**S801V85V3L**	**S811V85V3L**

[1)]Frame sizes T & V require terminals, see page 14

S801N37P3S

S811N66P3S

S801 and S811 Open Soft Starters, pump control option

- For pump control option, the 8th digit in the Catalogue Number is changed to P.

Frame Size[1)]	Max Current (A)	Eaton list number S801	Eaton list number S811
N	37	**S801N37P3S**	**S811N37P3S**
N	66	**S801N66P3S**	**S811N66P3S**
R	105	**S801R10P3S**	**S811R10P3S**
R	135	**S801R13P3S**	**S811R13P3S**
T	180	**S801T18P3S**	**S811T18P3S**
T	240	**S801T24P3S**	**S811T24P3S**
T	304	**S801T30P3S**	**S811T30P3S**
U	360	**S801U36P3S**	**S811U36P3S**
U	420	**S801U42P3S**	**S811U42P3S**
V	360	**S801V36P3S**	**S811V36P3S**
V	420	**S801V42P3S**	**S811V42P3S**
V	500	**S801V50P3S**	**S811V50P3S**
V	650	**S801V65P3S**	**S811V65P3S**
V	720	**S801V72P3S**	**S811V72P3S**
V	850	**S801V85P3S**	**S811V85P3S**
V	1000	**S801V10P3S**	**S811V10P3S**

[1)]Frame sizes T, U & V require terminals, see page 14

PSS55A

S801 and S811 Soft Starters, power supplies

- 24V DC Power Supply which can be used with the S801 and S811 SSRV or as a stand- alone device.

Description	Input (Vac)	Output (DC) voltage	Eaton list number
Power Supply	115	24	**PSS55A**
Power Supply	230	24	**PSS55B**
Power Supply	380 - 480	24	**PSS55C**

PSSDIN

S801 and S811 Soft Starters, DIN rail power supply mounting kit (35mm)

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

Description	Eaton list number
DIN Rail Mounting Kit	**PSSDIN**

EMA69A

S811 Soft Starters, digital interface module panel mounting kits

Description	Cable length (m)	Eaton list number
Blank Cover (Filler)		**EMA68**
Panel Mounting Kit	1	**EMA69A**
Panel Mounting Kit	1.5	**EMA69B**
Panel Mounting Kit	2.5	**EMA69C**
Panel Mounting Kit	3	**EMA69D**

EMA91

S811 Soft Starters, replacement DIM

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

Description	Eaton list number
DIM	**EMA91**


EMS38

S801 and S811 Soft Starters, 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).

Description	Eaton list number
600V MOV for 65 mm and 110 mm units	**EMS38**
600V MOV for 200 mm and 290 mm units	**EMS39**
690V MOV for 200 mm and 290 mm units[1)]	**EMS41**

[1)]T Frame only


EML25

S801 and S811 Soft Starters, terminal kits

- The 200 mm and 290 mm soft starters do not include lugs.
- The 200 mm and 290 mm soft starters each have different terminal options based on your wiring needs. Each terminal kit contains three terminals which can be mounted on either the load or line side.

Frame Size	Frame Designation	Description	Eaton list number
200 mm	T, U	2 cable connections, 16 – 50mm^2	**EML22**
200 mm	T, U	1 cable connection, 107 – 250mm^2	**EML23**
200 mm	T, U	2 cable connections, 107 – 250mm^2	**EML24**
200 mm	T, U	1 cable connection, 67 – 150mm^2	**EML25**
200 mm	T, U	2 cable connections, 67 – 150mm^2	**EML26**
290 mm	V	2 cable connections, 107 – 250mm^2	**EML28**
290 mm	V	4 cable connections, 107 – 250mm^2	**EML30**
290 mm	V	6 cable connections, 107 – 250mm^2	**EML32**
290 mm	V	4 cable connections, 67 – 150mm^2	**EML33**[1)]

[1)]The EML33 does not have a CSA listing


EML27

S801 and S811 Soft Starters, terminal cover replacement kits

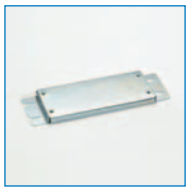
- Replacement covers for the T, U and V frame are available in case of damage to the existing covers.

Description	Frame Designation	Eaton list number
Terminal cover kit	T, U	**EML27**
Terminal cover kit	V	**EML34**


EMA75

S801 and S811 Soft Starters, control wire connector

Description	Eaton list number
12 pin, 5mm pitch Connector for Control Wiring	**EMA75**


EMM13N

S801 and S811 Soft Starters, mounting plates

- The Mounting Plates are designed to help make it easy to install or retrofit the soft starter into enclosures and Motor Control Centres. 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.

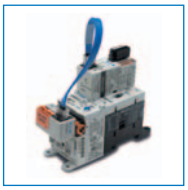
Description	Frame Designation	Eaton list number
Mounting Plate	N	**EMM13N**
Mounting Plate	R	**EMM13R**
Mounting Plate	T, U	**EMM13T**
Mounting Plate	V	**EMM13V**
Fan/Hood Accessory		**EMM18**

EMM14N

S801 and S811 Soft Starters, 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.

Description	Frame Designation	Eaton list number
Vibration Plate	N	**EMM14N**
Vibration Plate	R	**EMM14R**
Vibration Plate	T, U	**EMM14T**
Vibration Plate	V	**EMM14V**

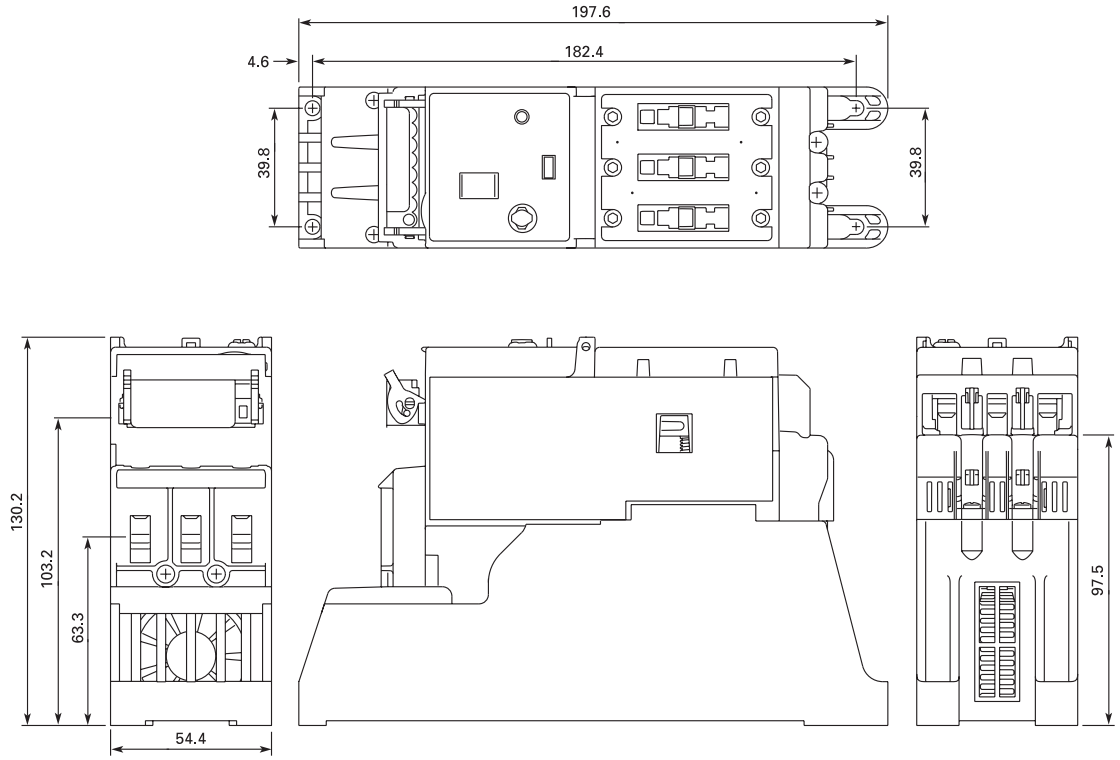


D77D-DNA

S811 Soft Starter, communications network adaptors

Description	Eaton list number
DeviceNet Network Adaptor	**D77D-DNA**
EtherNet Modbus Network Adaptor	**D77D-EMA**
EtherNet/IP Network Adaptor	**D77D-EIP**
PROFIBUS Network Adaptor	**D77D-PNA**
Terminator and Power Tap	**D77E-QPLR**
DIN Rail Communications Backplane, 7-position	**D77E-BP7**
DIN Rail Communications Backplane, 12-position	**D77E-BP12**

S752 Soft Starter, dimensional drawings – mm



S752 Auxiliary contacts, utilisation characteristics for EMA13-EMA17

DC-13 utilisation

Ue Voltage (V)	24	48	125	250
Ie Amps (A)	5	2.5	1.1	0.55

AC-15 utilisation

Ue Voltage (V)	48	120	240	440
Ie Amps (A)	8	6	4	2

S752 Auxiliary contacts, utilisation characteristics for EMA70

DC-12 utilisation

Ue Voltage (V)	30
Ie Amps (A)	0.1

AC-12 utilisation

Ue Voltage (V)	250
Ie Amps (A)	0.1

S752 Open Soft Starters, Technical characteristics

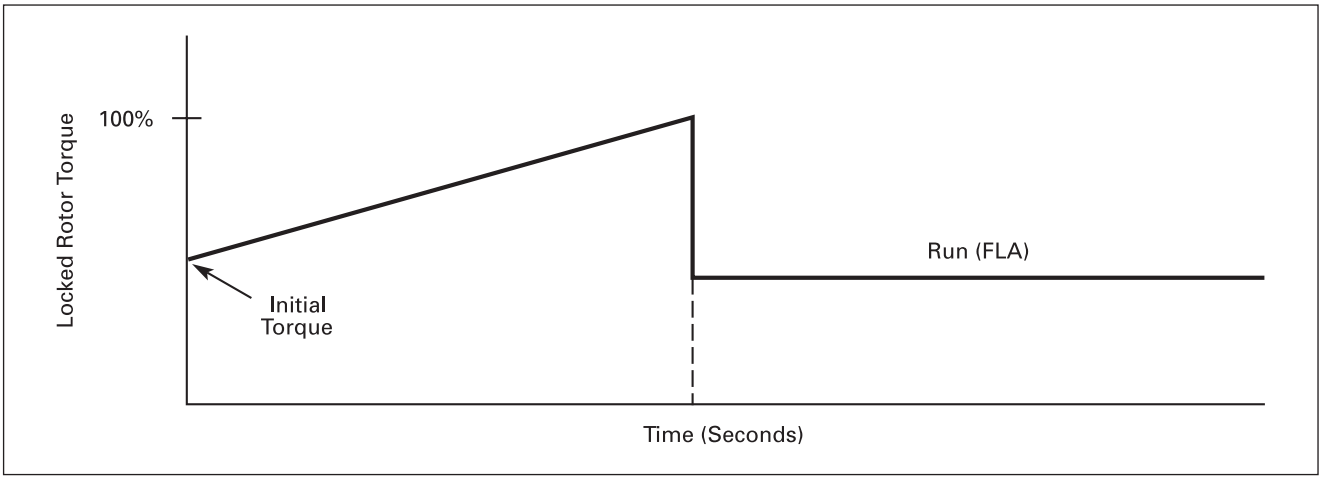
Soft Starter (Partial list number)	S752 L01	S752 L02	S752 L04	S752 L09	S752 L16	S752 L27	S752 L50
In-Line Current Capacity	0.8	1.9	4.4	9.0	16	27	50
Inside-the-Delta Current Capacity	1.3	3.2	7.6	15	27	46	78
Dimensions							
Width (mm)	54	54	54	54	54	54	54
Depth (mm)	130	130	130	130	130	130	130
Height (mm)	198	198	198	198	198	198	198
Weight (kg)	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Electrical Characteristics							
Line Voltage (V AC)	200 – 600	200 – 600	200 – 600	200 – 600	200 – 600	200 – 600	200 – 600
Operating Frequency (Hz)	47 – 63	47 – 63	47 – 63	47 – 63	47 – 63	47 – 63	47 – 63
Leakage Current (mA AC max.)	15	15	15	15	15	15	15
Min. Operating Current (mA)	100	100	100	100	100	100	100
Control Voltage (24V DC±10%)	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4	21.6 – 26.4
Response Time Max.	100 mS	100 mS	100 mS	100 mS	100 mS	100 mS	100 mS
Control Steady State Current	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA	200 mA
Inrush Current (During Bypass)	3.6A @ 50mS	3.6A @ 50mS	3.6A @ 50mS	3.6A @ 50mS	3.6A @ 50mS	3.6A @ 50mS	3.6A @ 50mS
Control Wiring							
(+ and -) 1 Wire per Terminal	1.5–2.5mm²	1.5–2.5mm²	1.5–2.5mm²	1.5–2.5mm²	1.5–2.5mm²	1.5–2.5mm²	1.5–2.5mm²
(+ and -) 2 Wires per Terminal	1.5mm²	1.5mm²	1.5mm²	1.5mm²	1.5mm²	1.5mm²	1.5mm²
(P,F,1,2,3) 1 Wire per Terminal	0.5–2.5mm²	0.5–2.5mm²	0.5–2.5mm²	0.5–2.5mm²	0.5–2.5mm²	0.5–2.5mm²	0.5–2.5mm²
(P,F,1,2,3) 2 Wires per Terminal	0.75–1.5mm²	0.75–1.5mm²	0.75–1.5mm²	0.75–1.5mm²	0.75–1.5mm²	0.75–1.5mm²	0.75–1.5mm²
Torque (max.)	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm
Driver	3.5mm Flat	3.5mm Flat	3.5mm Flat	3.5mm Flat	3.5mm Flat	3.5mm Flat	3.5mm Flat
Terminals L1, L2, L3/T1, T2, T3 — Use Class B 75°C copper wire only							
1 Wire per Terminal	1.5–16mm²	1.5–16mm²	1.5–16mm²	1.5–16mm²	1.5–16mm²	1.5–16mm²	1.5–16mm²
2 Wires per Terminal	1.5–12mm²	1.5–12mm²	1.5–12mm²	1.5–12mm²	1.5–12mm²	1.5–12mm²	1.5–12mm²
Torque (max.)							
1.5–6mm²	4 Nm	4 Nm	4 Nm	4 Nm	4 Nm	4 Nm	4 Nm
10mm²	4.5 Nm	4.5 Nm	4.5 Nm	4.5 Nm	4.5 Nm	4.5 Nm	4.5 Nm
6–4mm²	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm
Connector Type	Box Lug	Box Lug	Box Lug	Box Lug	Box Lug	Box Lug	Box Lug
Driver - Hex Key	3mm	3mm	3mm	3mm	3mm	3mm	3mm
Environmental Characteristics							
Temperature – Operating (no derating)	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C	-35° – 50°C
Temperature – Derate >50°C (max. 65°C)	-1% per °C	-1% per °C	-1% per °C	-1% per °C	-1% per °C	-1% per °C	-1% per °C
Temperature – Storage	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C	-40° – 80°C
Altitude (Metres) – No Derating	2000	2000	2000	2000	2000	2000	2000
Altitude > 2000M	1% per 100m	1% per 100m	1% per 100m	1% per 100m	1% per 100m	1% per 100m	1% per 100m
Humidity - Non-condensing	95%	95%	95%	95%	95%	95%	95%
Operating Position	Vertical ± 30°	Vertical ± 30°	Vertical ± 30°	Vertical ± 30°	Vertical ± 30°	Vertical ± 30°	Vertical ± 30°
Impulse Withstand Voltage IEC 947-4-1	4000V	4000V	4000V	4000V	4000V	4000V	4000V
Rated Insulation Voltage (Ui)	660V	660V	660V	660V	660V	660V	660V
Installation Category	III	III	III	III	III	III	III
Vibration IEC 68-2-6	3g 10 – 150 Hz	3g 10 – 150 Hz	3g 10 – 150 Hz	3g 10 – 150 Hz	3g 10 – 150 Hz	3g 10 – 150 Hz	3g 10 – 150 Hz
Shock	15g	15g	15g	15g	15g	15g	15g
Degree of Protection	IP20	IP20	IP20	IP20	IP20	IP20	IP20
Agency Approvals	IEC, CE	IEC, CE	IEC, CE	IEC, CE	IEC, CE	IEC, CE	IEC, CE

S752 Open Soft Starters, starting characteristics

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 contactor(s) close after ramp time.

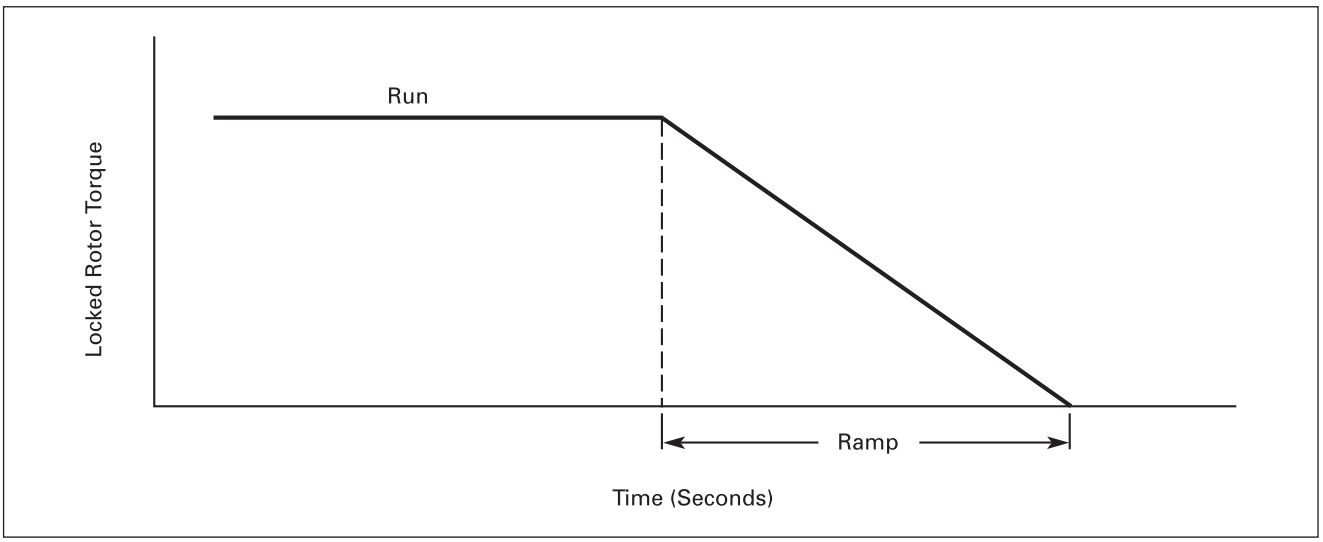
- Adjustable initial torque 0 – 95% of locked rotor torque.
- Adjustable ramp time .5 – 30 seconds.



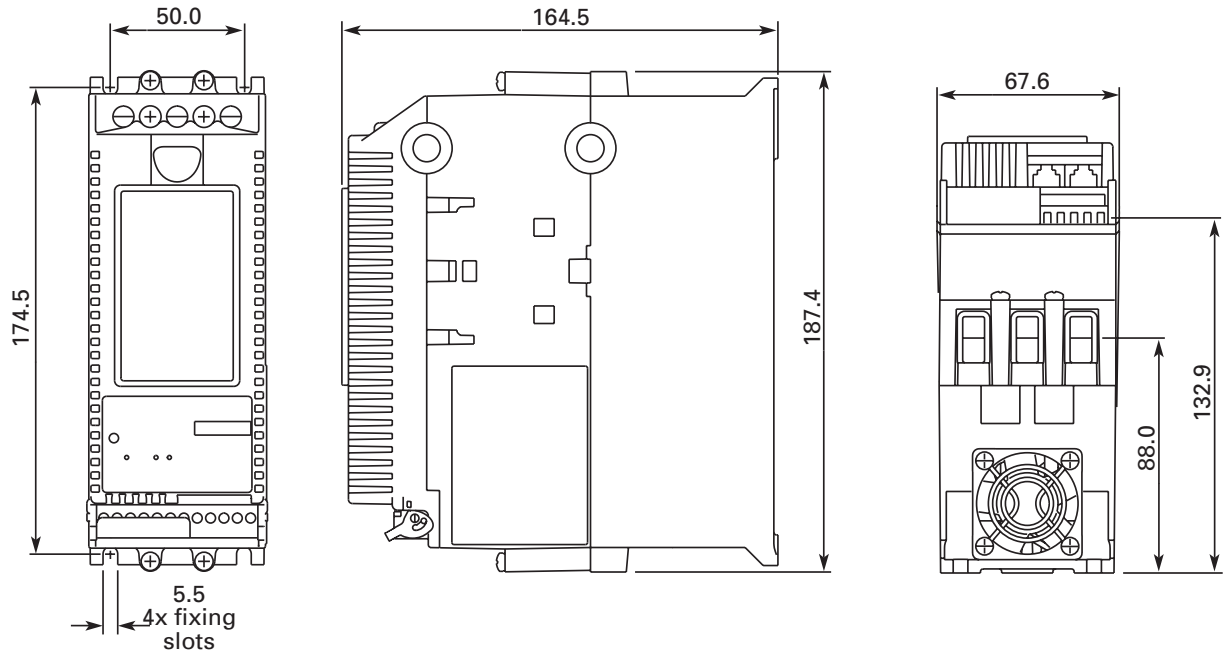
Soft Stop

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 produc-t damage.

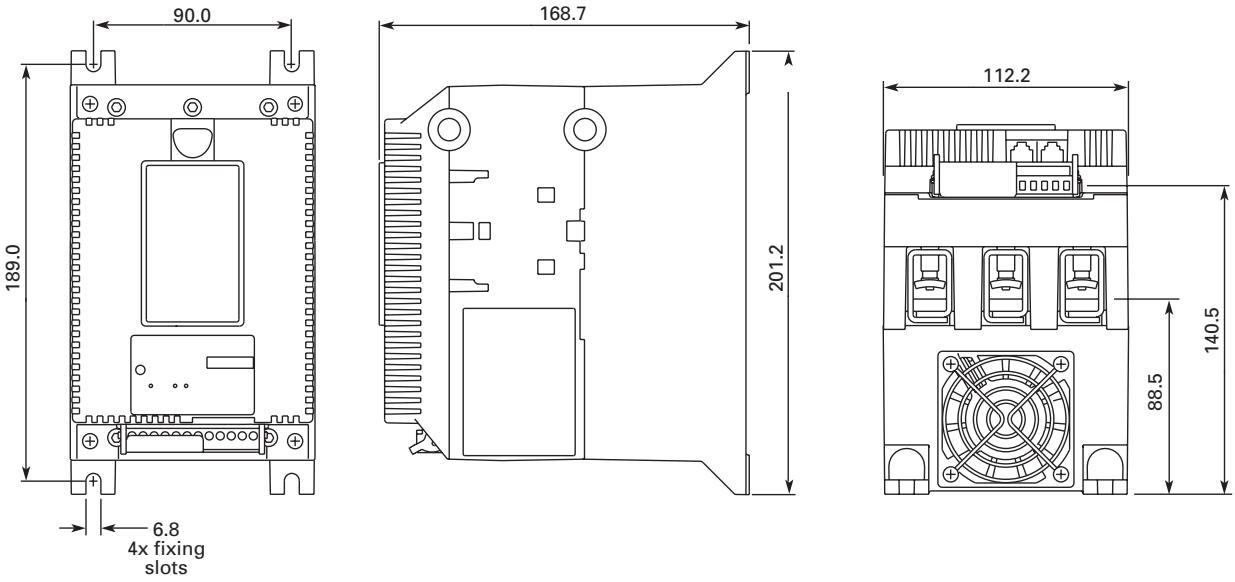
- Stop time = 0 – 30 seconds.



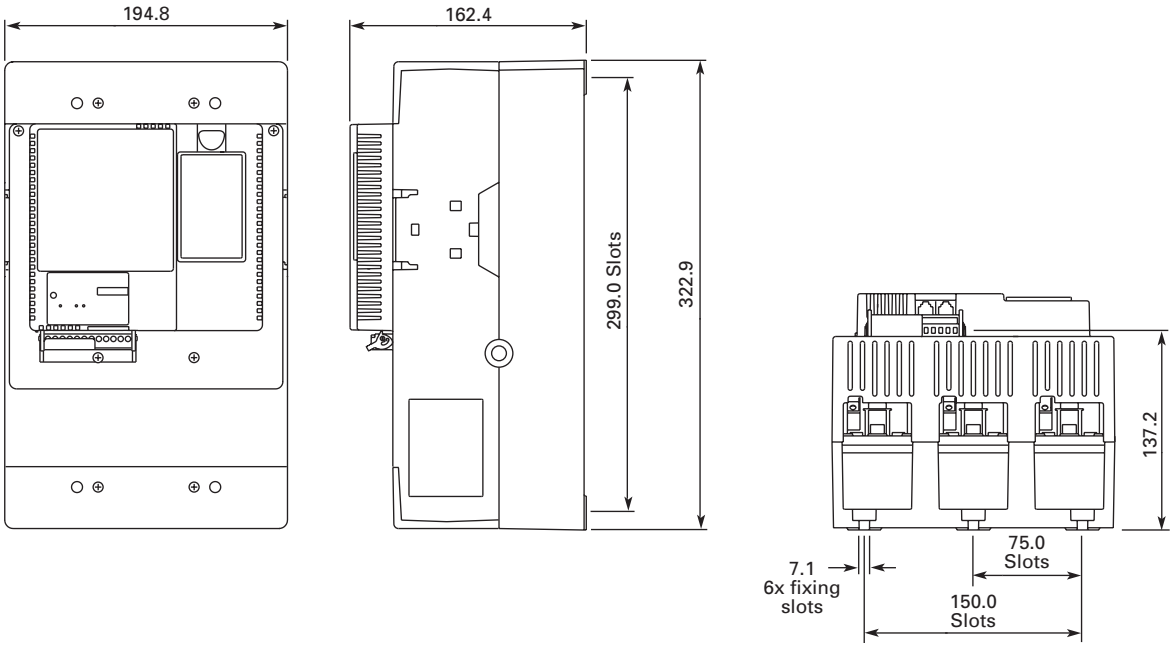
S801 and S811 Soft Starters, N-Frame dimensional drawing – mm



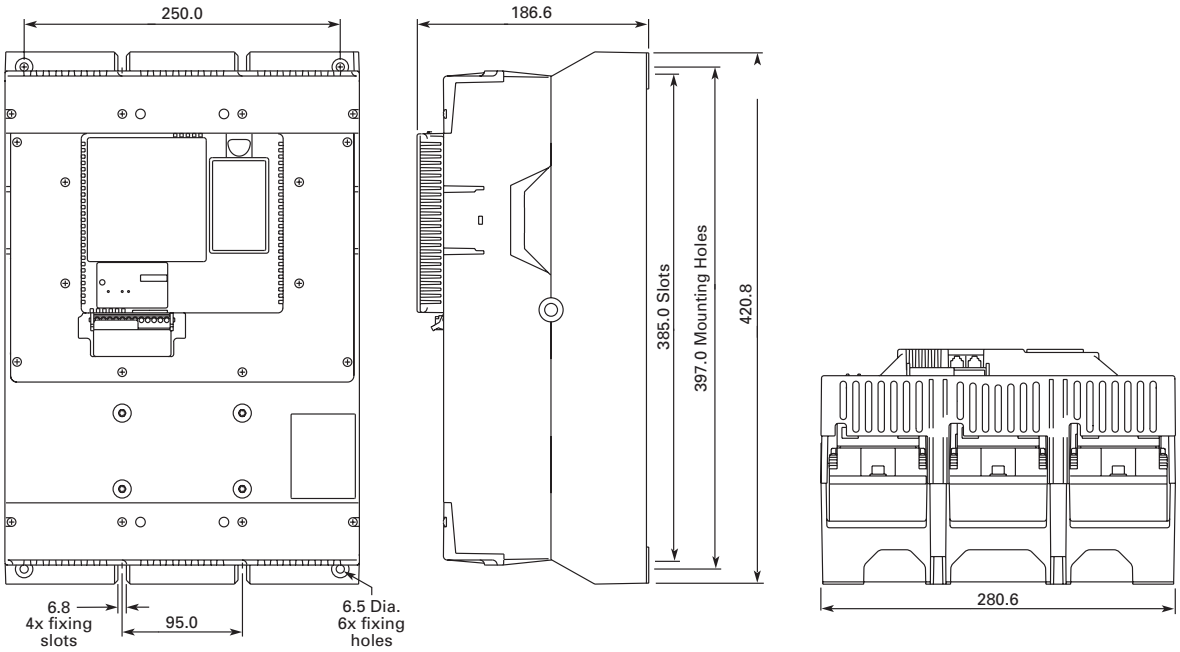
S801 and S811 Soft Starters, R-Frame dimensional drawing – mm



S801 and S811 Soft Starters, T & U-Frame dimensional drawing – mm



S801 and S811 Soft Starters, V-Frame dimensional drawing – mm



S801 Open Soft Starters

Partial List Number	N37	N66	R10	R13	T18	T24	T30	U36	U42	V36	V42	V50	V65	V72	V85	V10
Current Capacity (A)	37	66	105	135	180	240	304	360	420	360	420	500	650	720	850	1000
Dimensions																
Width in mm	67.6	67.6	112.2	112.2	194.8	194.8	194.8	196.3	196.3	280.6	280.6	280.6	280.6	280.6	280.6	280.6
Height in mm	187.4	187.4	201.2	201.2	322.9	322.9	322.9	323.1	323.1	420.8	420.8	420.8	420.8	420.8	420.8	420.8
Depth in mm	164.5	164.5	168.7	168.7	162.4	162.4	162.4	179.9	179.9	186.6	186.6	186.6	186.6	186.6	186.6	186.6
Wt (kg)	2.6	2.6	4.8	4.8	21.8	21.8	21.8	21.8	21.8	46.8	46.8	46.8	46.8	46.8	46.8	46.8
Wt (kg) without terminals					18.6	18.6	18.6	18.6	18.6	41.4	41.4	41.4	41.4	41.4	41.4	41.4
Cabling Capacity (IEC 947)																
No. of Conductors	1	1	1	1	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	2, 4 or 6						
Wire Sizes	2.5 — 95mm²		2.5 — 95mm²		107 — 250mm²			107 — 250mm²		107 — 250mm²						
Box Terminal	✔	✔	✔	✔	–	–	–	–	–	–	–	–	–	–	–	–
Add-On Terminal	–	–	–	–	–	–	–	✔	✔	✔	✔	✔	✔	✔	✔	✔
Control Power Requirements																
Range (24V ± 10%)	21.6 - 26.4															
Steady State Amps	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Inrush Amps	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Ripple	1%															
Max. Current Capacity	37	66	105	135	180	240	304	360	420	360	420	500	650	720	850	1000
General Information																
Mechanical Lifespan	10M															
Insulating Voltage Ui	660V*															
Ramp Time Range	0.5 — 180 Seconds (0.5 — 360 Seconds Extended Ramp)															
Vibration Resistance	3g															
Shock Resistance	15g															
Electrical Information																
Operating Voltage (V)	200 — 600*															
Operating Freq. (Hz)	47 — 63															
Overload Setting (%)	30 — 100															
Trip Class	5, 10, 20, & 30															
Control Wiring (12-Pin)																
Wire Sizes in mm²	1 — 2.5															
No. of Conductors (Stranded)	2															
Torque Requirements in N — m	4 — 7.4															
Solid, Stranded, Flexible Size (mm²)	3.31															
Relays Class A and C																
Voltage AC max.	240															
Voltage DC max.	120															
Amps maximum	3															
Environmental																
Temp.–Operating (°C)**	-30 — 50															
Temp.–Storage (°C)	-50 — 70															
Altitude (Metres) ***	<2000															
Humidity (Non-cond.)	<95%															
Operating Position	Any															
Pollution degree	3															
Impulse withstand Voltage IEC947-4-1	6000															

* 690V version available

** No derating – Consult Eaton for operation > 50°C

*** Consult factory for operation > 2000m

S811 Open Soft Starters

Partial List Number	N37	N66	R10	R13	T18	T24	T30	U36	U42	V36	V42	V50	V65	V72	V85	V10
Current Capacity (A)	37	66	105	135	180	240	304	360	420	360	420	500	650	720	850	1000
Dimensions																
Width in mm	67.6	67.6	112.2	112.2	194.8	194.8	194.8	196.3	196.3	280.6	280.6	280.6	280.6	280.6	280.6	280.6
Height in mm	187.4	187.4	201.2	201.2	322.9	322.9	322.9	323.1	323.1	420.8	420.8	420.8	420.8	420.8	420.8	420.8
Depth in mm	164.5	164.5	168.7	168.7	162.4	162.4	162.4	179.9	179.9	186.6	186.6	186.6	186.6	186.6	186.6	186.6
Wt (kg)	2.6	2.6	4.8	4.8	21.8	21.8	21.8	21.8	21.8	46.8	46.8	46.8	46.8	46.8	46.8	46.8
Wt (kg) without terminals					18.6	18.6	18.6	18.6	18.6	41.4	41.4	41.4	41.4	41.4	41.4	41.4
Cabling Capacity (IEC 947)																
No. of Conductors	1	1	1	1	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	2, 4 or 6						
Wire Sizes	2.5 — 95mm²		2.5 — 95mm²		107 — 250mm²			107 — 250mm²		107 — 250mm²						
Box Terminal	✔	✔	✔	✔	–	–	–	–	–	–	–	–	–	–	–	–
Add-On Terminal	–	–	–	–	–	–	–	✔	✔	✔	✔	✔	✔	✔	✔	✔
Control Power Requirements																
Range (24V ± 10%)	21.6 - 26.4															
Steady State Amps	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Inrush Amps	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Ripple	1%															
Max. Current Capacity	37	66	105	135	180	240	304	360	420	360	420	500	650	720	850	1000
General Information																
Mechanical Lifespan	10M															
Insulating Voltage Ui	660V*															
Ramp Time Range	0.5 — 180 Seconds (0.5 — 360 Seconds Extended Ramp)															
Vibration Resistance	3g															
Shock Resistance	15g															
Electrical Information																
Operating Voltage (V)	200 — 600*															
Operating Freq. (Hz)	47 — 63															
Overload Setting (%)	30 — 100															
Trip Class	5, 10, 20, & 30															
Control Wiring (12-Pin)																
Wire Sizes in mm²	1 — 2.5															
No. of Conductors (Stranded)	2															
Torque Requirements in N — m	4 — 7.4															
Solid, Stranded, Flexible Size (mm²)	3.31															
Relays Class A and C																
Voltage AC max.	240															
Voltage DC max.	120															
Amps maximum	3															
Environmental																
Temp.–Operating (°C)**	-30 — 50															
Temp.–Storage (°C)	-50 — 70															
Altitude (Metres) ***	<2000															
Humidity (Non-cond.)	<95%															
Operating Position	Any															
Pollution degree	3															
Impulse withstand Voltage IEC947-4-1	6000															

* 690V version available

** No derating – Consult Eaton for operation > 50°C

*** Consult factory for operation > 2000m

S801 and S811 Open Soft Starters, standard duty ratings, 230 - 440V, starting method data

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

S801 and S811 Open Soft Starters, severe duty ratings, 230 - 440V, starting method data

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

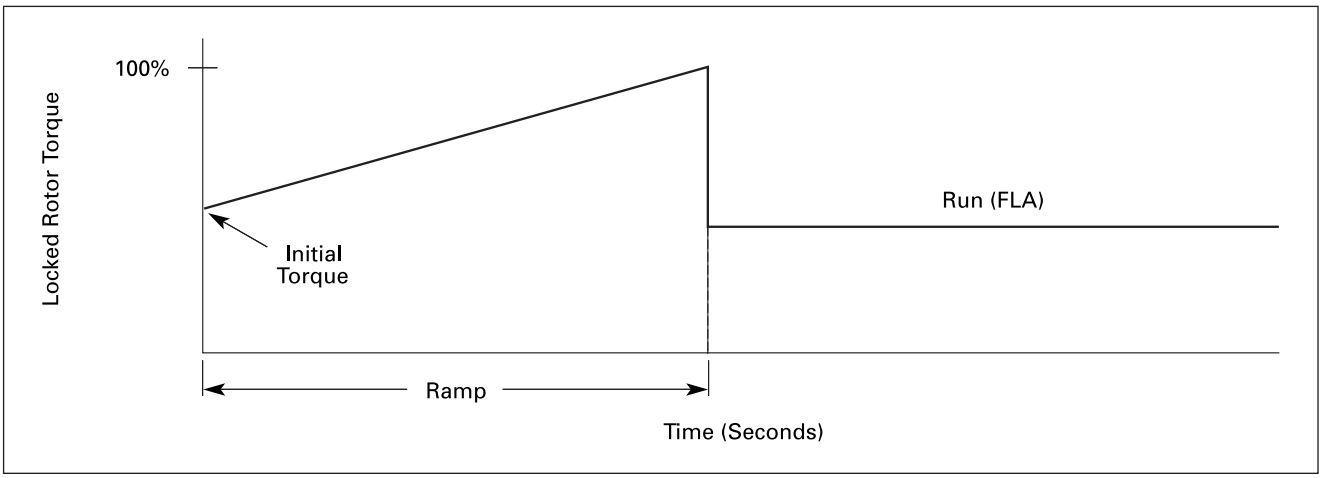
Starting and Stopping Modes

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.

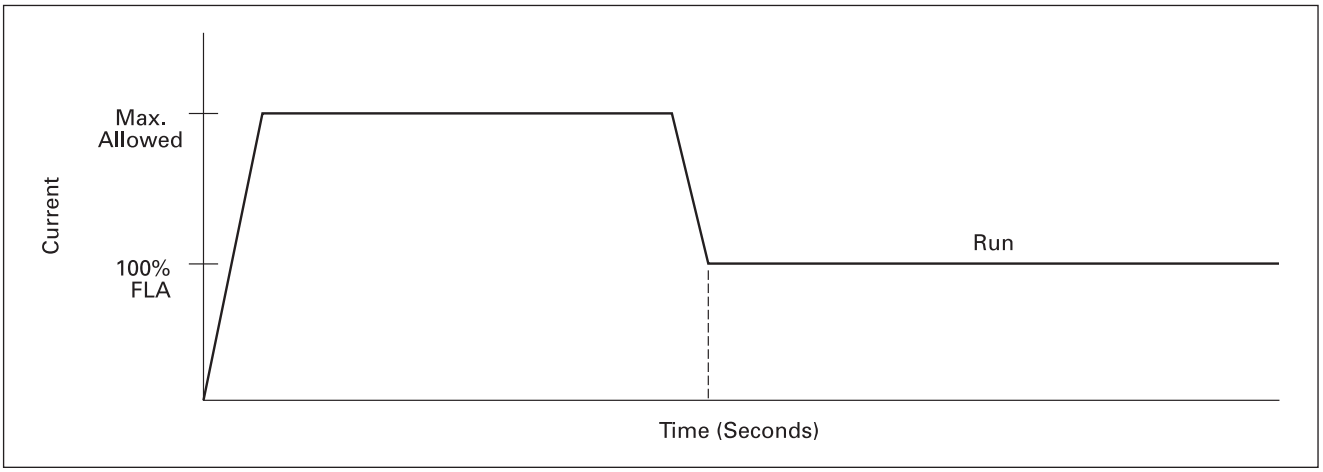
- Adjustable initial torque 0 - 85% of locked rotor torque.
- Adjustable ramp time 0.5 - 180 seconds (can be extended with factory modification).



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.

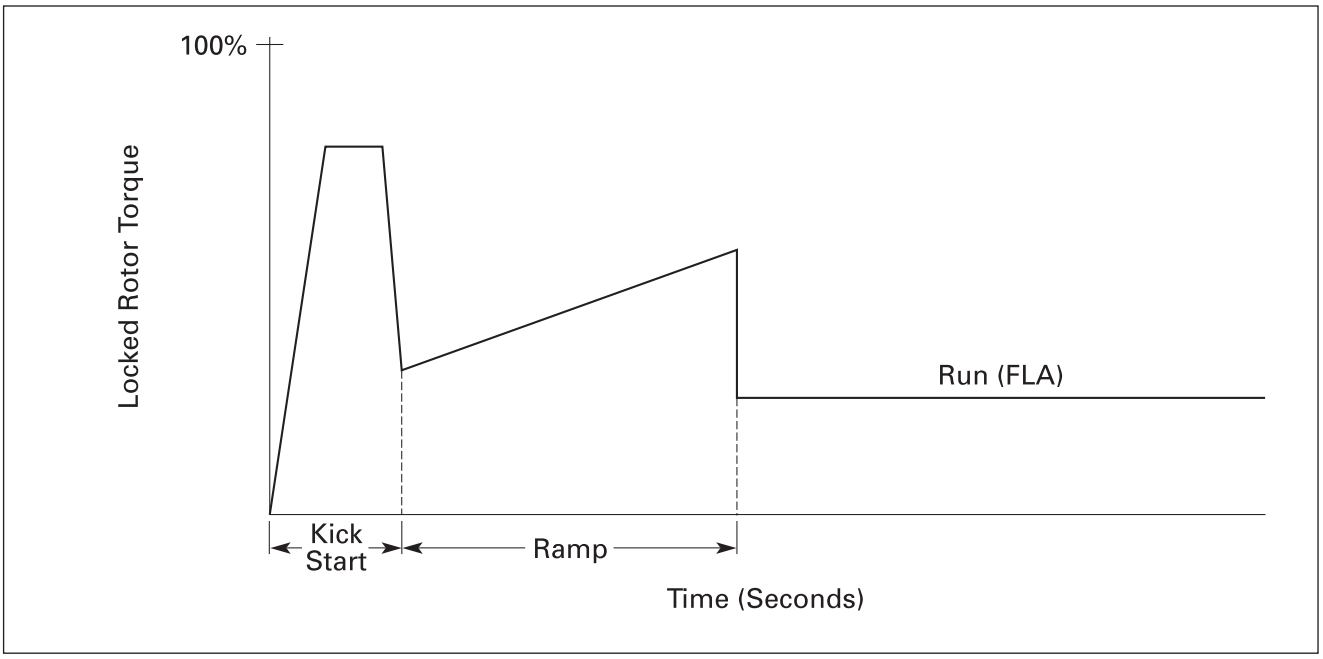
- Maximum current of 0 - 85% locked rotor current.
- Adjustable ramp time 0.5 - 180 seconds (can be extended with factory modification).



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.

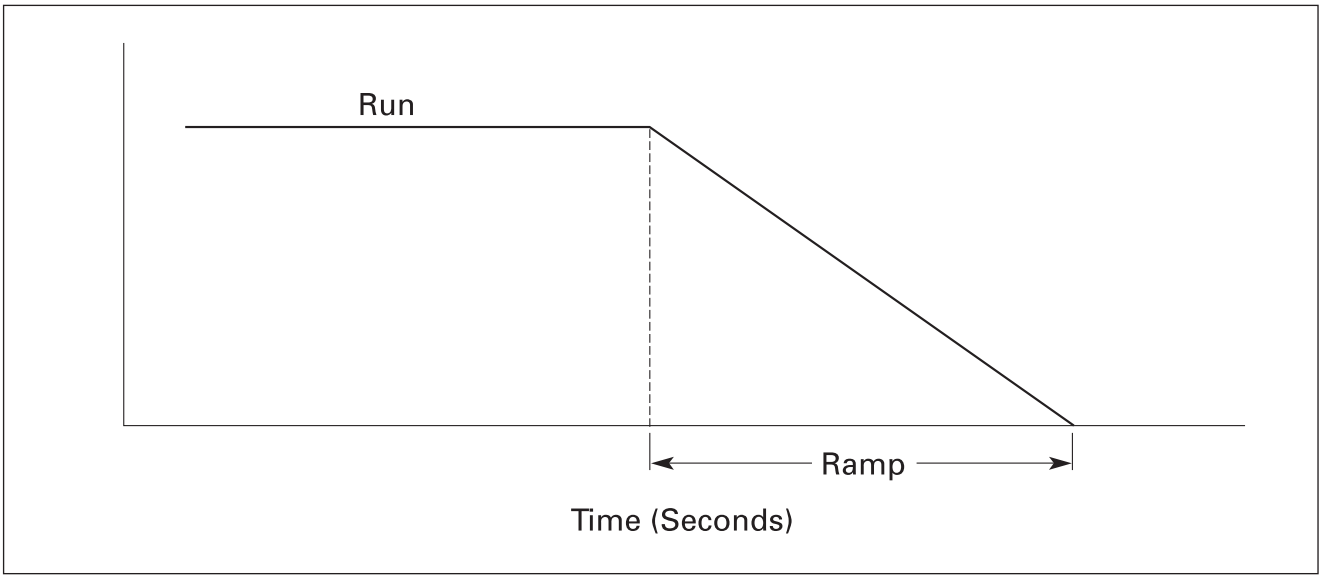
- 0 - 85% of locked rotor torque
- 0 - 2.0 seconds duration



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.



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