



Soft starter, 650 A, 200 - 600 V AC,  $U_s = 24$  V DC, with control unit, Frame size V



Part no. **S811+V65N3S**  
 Catalog No. **169002**  
 Alternate Catalog No. **S811PLUSV65N3S**  
 EL-Nummer (Norway) **4137486**

## Delivery program

Description			This item is only available for a limited time and will be replaced by the following item: 169003, S811+V65P3S
Function			With internal bypass contacts
Mains supply voltage (50/60 Hz)	$U_{LN}$	V AC	200 - 600
Supply voltage	$U_s$		24 V DC
Control voltage	$U_C$		24 V DC
<b>Assigned motor rating (Standard connection, In-Line)</b>			
at 400 V, 50 Hz	P	kW	315
at 460 V, 60 Hz	P	HP	500
<b>Rated operational current</b>			
AC-53	$I_e$	A	650
AC-53, In-Delta	$I_e$	A	1125
Startup class			CLASS 10 (star-delta replacement) CLASS 20 (heavy starting duty $3 \times I_e$ for 45 s) CLASS 30 ( $6 \times I_e$ for 30 s)
Rated operational voltage	$U_e$		200 V 230 V 400 V 480 V 600 V
Connection to SmartWire-DT			no
Frame size			V
Ordering information			Terminal blocks for the terminals are required for frame sizes T, U, and V -> Accessories

## Technical data

### General

Standards			IEC/EN 60947-4-2 UL 508 CSA22.2-14-1995 GB14048
Approvals			CE
Approvals			UL CSA C-Tick CCC
Climatic proofing			Damp heat, constant, to IEC 60068-2-3 Damp heat, cyclic, to IEC 60068-2-10
Ambient temperature			
Operation	$\theta$	°C	-30 - +50
Storage	$\theta$	°C	-50 - +70
Altitude		m	0 - 2000 m, above that each 100 m 0.5% Derating
Mounting position			As required
Degree of protection			
Degree of Protection			IP20 (terminals IP00)
Integrated			Protection type IP40 can be achieved on all sides with covers SS-IP20-N.
Protection against direct contact			Finger- and back-of-hand proof
Overvoltage category/pollution degree			II/3
Shock resistance			15 g

Radio interference level (IEC/EN 55011)			A
Static heat dissipation, non-current-dependent	P <sub>Vs</sub>	W	109
Weight		kg	41.4

### Main conducting paths

Rated operating voltage	U <sub>e</sub>	V AC	200 - 600
Supply frequency	f <sub>LN</sub>	Hz	50/60
Rated operational current	I <sub>e</sub>	A	
AC-53, In-Delta	I <sub>e</sub>	A	1125
AC-53	I <sub>e</sub>	A	650
Assigned motor rating (Standard connection, In-Line)			
at 230 V, 50 Hz	P	kW	200
at 400 V, 50 Hz	P	kW	315
at 500 V, 50 Hz	P	kW	450
at 200 V, 60 Hz	P	HP	200
at 230 V, 60 Hz	P	HP	250
at 460 V, 60 Hz	P	HP	500
at 600 V, 60 Hz	P	HP	600
Assigned motor rating (delta connection)			
at 230 V, 50 Hz	P	kW	200
at 400 V, 50 Hz	P	kW	630
at 500 V, 50 Hz	P	kW	450
at 230 V, 60 Hz		HP	450
at 480 V, 60 Hz		HP	850
at 600 V, 60 Hz	P	HP	1100
Overload cycle to IEC/EN 60947-4-2			
AC-53a			650 A: AC-53a: 4.0 - 32: 99 - 3
Internal bypass contacts			✓
Short-circuit rating			
Type "1" coordination			NZMN4-ME875

### Terminal capacities

Cable lengths			
Solid		mm <sup>2</sup>	2 x (120 - 240) 4 x (70 - 240) 6 x (120 - 240)
Flexible with ferrule		mm <sup>2</sup>	2 x (120 - 240) 4 x (70 - 240) 6 x (120 - 240)
Stranded		mm <sup>2</sup>	2 x (120 - 240) 4 x (70 - 240) 6 x (120 - 240)
Solid or stranded		AWG	2 x (4 - 500 kcmil) 4 x (4 - 500 kcmil) 6 x (4 - 500 kcmil)
Control cables			
Solid		mm <sup>2</sup>	1 x (2.5 - 4) 2 x (1.0 - 2.5)
Flexible with ferrule		mm <sup>2</sup>	1 x (2.5 - 4) 2 x (1.0 - 2.5)
Stranded		mm <sup>2</sup>	1 x (2.5 - 4) 2 x (1.0 - 2.5)
Solid or stranded		AWG	36 x (12 - 14) 2 x (12 - 14)
Tightening torque		Nm	0.4
Screwdriver		mm	0,6 x 3,5

### Control circuit

Digital inputs			
Control voltage			
DC-operated		V DC	24 V DC +10 %/- 10 %
Current consumption 24 V		mA	
External 24 V		mA	150

External 24 V (no-load)			mA	100
Pick-up voltage			$x U_s$	
DC-operated			V DC	21.6 - 26.4
Drop-out voltage	$x U_s$			
DC operated			V DC	
Drop-out voltage, DC-operated, max.			V DC	3
Pick-up time				
DC operated			ms	100
Drop-out time				
DC operated			ms	100
Regulator supply				
Voltage	$U_s$	V		24 V DC +10 %/- 10 %
Current consumption	$I_e$	mA		1400
Current consumption at peak performance (close bypass) at 24 V DC	$I_{Peak}$	A/ms		10/150
Notes				External supply voltage
Analog inputs				
Number of current inputs				1
Current input			mA	4 - 20
Relay outputs				
Number				2
of which programmable				2
Voltage range		V AC		120 V AC/DC
AC-11 current range		A		3 A, AC-11

### Soft start function

Ramp times				
Acceleration			s	
Ramp time, max.			s	180
Deceleration			s	0 - 60
Start voltage (= turn-off voltage)			%	
Start voltage, max.			%	85
Start pedestal			%	
Start voltage, max.			%	85
Kickstart				
Voltage			%	
Kickstart voltage, max.			%	100
Duration				
50 Hz			ms	
Kickstart Duration 50 Hz max.			ms	2000
60 Hz			ms	
Kickstart Duration 60 Hz max.			ms	2000
Fields of application				
Fields of application				Soft starting of three-phase asynchronous motors
3-phase motors				✓

### Functions

Fast switching (semiconductor contactor)				- (minimum ramp time 1s)
Soft start function				✓
Reversing starter				External solution required (reversing contactor)
Suppression of closing transients				✓
Current limitation				✓
Overload monitoring				✓
Underload monitoring				✓
Fault memory		Faults		10
Suppression of DC components for motors				✓
Potential isolation between power and control sections				✓

Communication Interfaces		Modbus RTU
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## Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	$I_n$	A	650
Heat dissipation per pole, current-dependent	$P_{vid}$	W	0
Equipment heat dissipation, current-dependent	$P_{vid}$	W	109
Static heat dissipation, non-current-dependent	$P_{vs}$	W	109
Heat dissipation capacity	$P_{diss}$	W	0
Operating ambient temperature min.		°C	-30
Operating ambient temperature max.		°C	50
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
10.2.2 Corrosion resistance			Meets the product standard's requirements.
10.2.3.1 Verification of thermal stability of enclosures			Meets the product standard's requirements.
10.2.3.2 Verification of resistance of insulating materials to normal heat			Meets the product standard's requirements.
10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects			Meets the product standard's requirements.
10.2.4 Resistance to ultra-violet (UV) radiation			Meets the product standard's requirements.
10.2.5 Lifting			Does not apply, since the entire switchgear needs to be evaluated.
10.2.6 Mechanical impact			Does not apply, since the entire switchgear needs to be evaluated.
10.2.7 Inscriptions			Meets the product standard's requirements.
10.3 Degree of protection of ASSEMBLIES			Does not apply, since the entire switchgear needs to be evaluated.
10.4 Clearances and creepage distances			Meets the product standard's requirements.
10.5 Protection against electric shock			Does not apply, since the entire switchgear needs to be evaluated.
10.6 Incorporation of switching devices and components			Does not apply, since the entire switchgear needs to be evaluated.
10.7 Internal electrical circuits and connections			Is the panel builder's responsibility.
10.8 Connections for external conductors			Is the panel builder's responsibility.
10.9 Insulation properties			
10.9.2 Power-frequency electric strength			Is the panel builder's responsibility.
10.9.3 Impulse withstand voltage			Is the panel builder's responsibility.
10.9.4 Testing of enclosures made of insulating material			Is the panel builder's responsibility.
10.10 Temperature rise			The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 Short-circuit rating			Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.12 Electromagnetic compatibility			Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.13 Mechanical function			The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

## Technical data ETIM 7.0

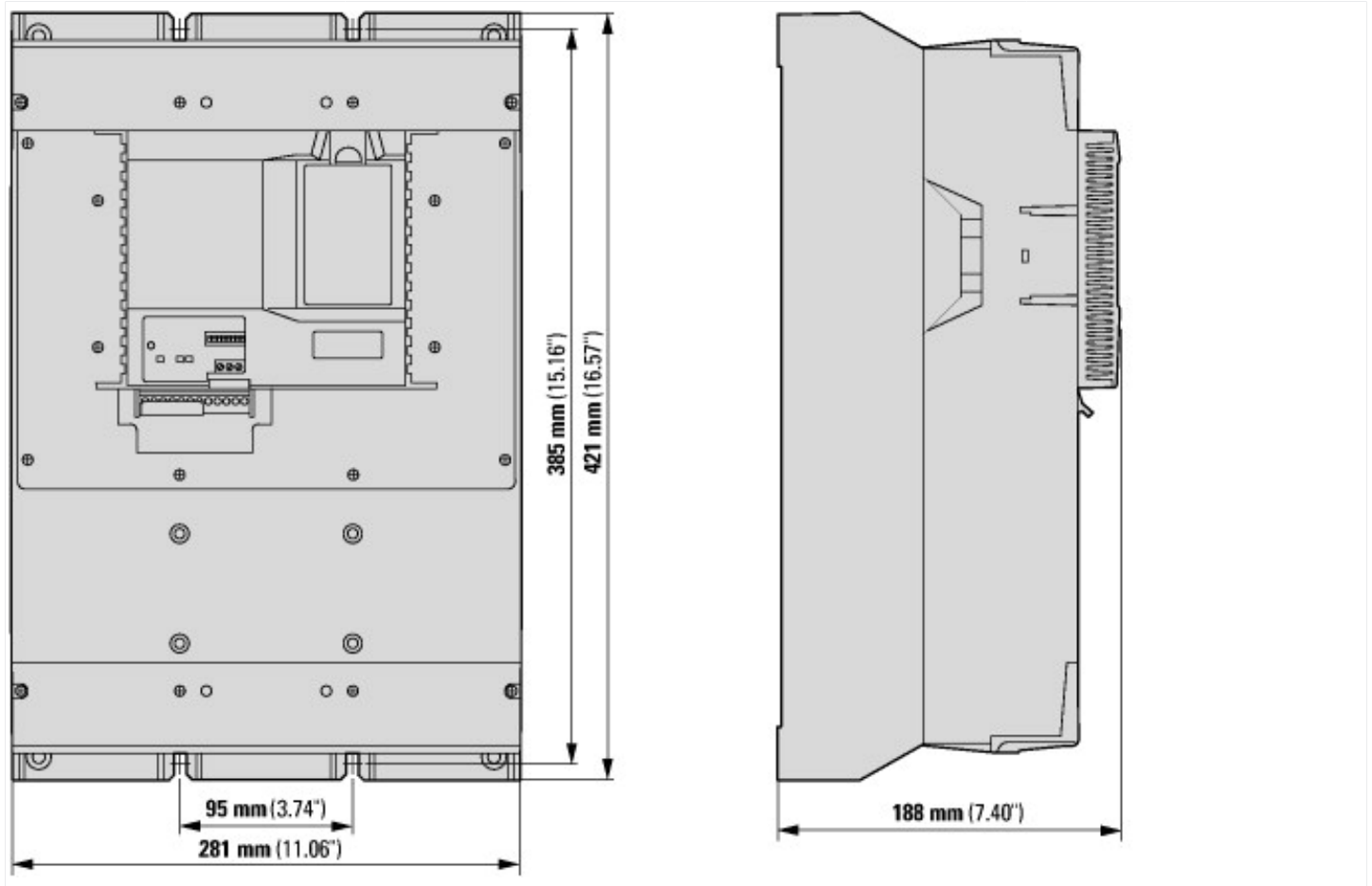
Low-voltage industrial components (EG000017) / Soft starter (EC000640)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Semiconductor motor controller or soft starter (ec@ss10.0.1-27-37-09-07 [ACO300011])			
Rated operation current $I_e$ at 40 °C $T_u$		A	650
Rated operating voltage $U_e$		V	200 - 600
Rated power three-phase motor, inline, at 230 V		kW	200
Rated power three-phase motor, inline, at 400 V		kW	315
Rated power three-phase motor, inside delta, at 230 V		kW	200
Rated power three-phase motor, inside delta, at 400 V		kW	630
Function			Single direction
Internal bypass			Yes
With display			Yes
Torque control			No
Rated surrounding temperature without derating		°C	50

Rated control supply voltage Us at AC 50HZ	V	0 - 0
Rated control supply voltage Us at AC 60HZ	V	0 - 0
Rated control supply voltage Us at DC	V	24 - 24
Voltage type for actuating		DC
Integrated motor overload protection		Yes
Release class		Adjustable
Degree of protection (IP)		IP00
Degree of protection (NEMA)		Other

## Approvals

Product Standards		IEC/EN 60947-4-2; UL 508; CSA C22.2 No. 14; CE marking
UL File No.		E202571
UL Category Control No.		NMFT
CSA File No.		LR 353
CSA Class No.		3211-06
North America Certification		UL listed, CSA certified
Suitable for		Branch Circuits, not as BCPD
Max. Voltage Rating		600 Vac
Degree of Protection		IP20 with kit

## Dimensions



## Additional product information (links)

Documentation	<a href="http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4">http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4</a>
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