## **DATASHEET - S811+R10P3S**



Soft starter, 105 A, 200 - 600 V AC, Us= 24 V DC, with control unit and pump algorithm, Frame size R

FATON°

Powering Business Worldwide

Part no. S811+R10P3S Catalog No. 168981

Alternate Catalog S811PLUSR10P3S

No.

**EL-Nummer** 4137465

(Norway)

### **Delivery program**

Delivery program			
Description			With internal bypass contacts
Function			Soft starter for three-phase loads, with control unit and pump algorithm
Mains supply voltage (50/60 Hz)	U <sub>LN</sub>	V AC	200 - 600
Supply voltage	$U_s$		24 V DC
Control voltage	U <sub>C</sub>		24 V DC
Assigned motor rating (Standard connection, In-Line)			
at 400 V, 50 Hz	P	kW	55
at 460 V, 60 Hz	Р	HP	75
Rated operational current			
AC-53	le	Α	105
AC-53, In-Delta	l <sub>e</sub>	Α	182
Startup class			CLASS 10 (star-delta replacement) CLASS 20 (heavy starting duty 3 x $I_e$ for 45 s) CLASS 30 (6 x $I_e$ for 30 s)
Rated operational voltage	U <sub>e</sub>		200 V 230 V 400 V 480 V 600 V
Connection to SmartWire-DT			no
Frame size			R

### **Technical data**

#### General

Standard's Approvals Appro	delleral			
Approvals Approvals  Climatic proofing  Ambient temperature  Operation Storage  Mounting position  Degree of Protection Integrated  Overvoltage category/pollution degree  Overvoltage category/pollution degree  Radio interference level (IEC/EN 55011)  Storage  Degree of Protection (IEC/EN 55011)  Approvals  Licanoparate  Licanoparate  Licanoparate  Licanoparate  Licanoparate  Licanoparate  Licanoparate  Licanoparate  Licanoparate  Degree of Protection  Integrated  Nouroling against direct contact  Overvoltage category/pollution degree  Radio interference level (IEC/EN 55011)  Stock resistance  Radio interference level (IEC/EN 55011)  Radio interference level (IEC/EN 55011)  Approvals  Licanoparate  Licanoparate  Licanoparate  Damp heat, constant, to IEC 60068-2-3  Damp heat, constant, to IEC 60068-2-10  As required  Protection no.5% Derating  Protection no.5% Derating  As required  Protection 19 P20 (terminals IP00)  Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof  II/3  II	Standards			UL 508 CSA22.2-14-1995
CSA   CCCC   CCCC   CCCCCCCCCCCCCCCCCC	Approvals			CE
Ambient temperature  Operation Storage Altitude Mounting position Degree of protection Degree of Protection Integrated Protection against direct contact Overvoltage category/pollution degree Radio interference level (IEC/EN 55011) Storage  Damp heat, cyclic, to IEC 60068-2-10  Pamb heat, cyclic, to IEC 60068-2-10  Damp heat, cyclic, to IEC 60068-2-10  Ambient temperature  Damp heat, cyclic, to IEC 60068-2-10  An evenue and solution in IEC 60068-2-10  An evenue and solution and solution in IEC 60068-2-10  An overvoltage category/pollution degree Radio interference level (IEC/EN 55011)  An evenue and solution in IEC 60068-2-10  An evenue and solution in	Approvals			CSA C-Tick
Operation Storage 8 °C -50 - +70  Altitude Mounting position Degree of protection Integrated Protection against direct contact Overvoltage category/pollution degree  Radio interference level (IEC/EN 55011) Storage  8 °C -50 - +70  As required  P-2000 m, above that each 100 m 0.5% Derating As required  Protection (1920) (terminals IP00) Protection type IP40 can be achieved on all sides with covers SS-IP20-N. Finger- and back-of-hand proof II/3  A  Static heat dissipation, non-current-dependent Pvs W 47	Climatic proofing			
Storage 8 °C -50 - +70  Altitude m 0 - 2000 m, above that each 100 m 0.5% Derating  Mounting position  Degree of protection  Degree of Protection  Integrated Protection against direct contact  Overvoltage category/pollution degree  Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  Possible 1 - 20 - 2000 m, above that each 100 m 0.5% Derating  As required  Protection m 0 - 2000 m, above that each 100 m 0.5% Derating  As required  Protection as a sequired  Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof  II/3  A  4  4  4  4  4  4  4  4  4  4  4  4	Ambient temperature			
Altitude m 0 - 2000 m, above that each 100 m 0.5% Derating  Mounting position  Degree of protection  Degree of Protection  Integrated  Protection against direct contact  Overvoltage category/pollution degree  Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  m 0 - 2000 m, above that each 100 m 0.5% Derating  As required  Protection (1920 (terminals IP00))  IP20 (terminals IP00)  Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof  II/3  A  Static heat dissipation, non-current-dependent  Pvs W 47	Operation	θ	°C	-30 - +50
Mounting position  Degree of protection  Degree of Protection  Integrated  Protection against direct contact  Overvoltage category/pollution degree  Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  As required  Protection against IP00)  Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof  II/3  Shock resistance  A Static heat dissipation, non-current-dependent  Pvs W 47	Storage	9	°C	-50 - +70
Degree of protection  Degree of Protection Integrated Protection against direct contact  Overvoltage category/pollution degree Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  Ple20 (terminals IP00) Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof II/3  15 g  A  Static heat dissipation, non-current-dependent  Pvs W 47	Altitude		m	0 - 2000 m, above that each 100 m 0.5% Derating
Degree of Protection Integrated Protection against direct contact Protection against direct contact Finger- and back-of-hand proof  Overvoltage category/pollution degree Il/3 Shock resistance Radio interference level (IEC/EN 55011) A Static heat dissipation, non-current-dependent  IP20 (terminals IP00) Protection type IP40 can be achieved on all sides with covers SS-IP20-N. Finger- and back-of-hand proof  Il/3  A Static heat dissipation, non-current-dependent  Pvs W 47	Mounting position			As required
Integrated Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof II/3  Shock resistance Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  Protection type IP40 can be achieved on all sides with covers SS-IP20-N.  Finger- and back-of-hand proof II/3  A  4  4  4  4  4  4  4  4  4  4  4  4	Degree of protection			
Protection against direct contact  Overvoltage category/pollution degree  Shock resistance  Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  Finger- and back-of-hand proof  II/3  15 g  A  Static heat dissipation, non-current-dependent  Pvs W 47	Degree of Protection			IP20 (terminals IP00)
Overvoltage category/pollution degree II/3 Shock resistance I5 g Radio interference level (IEC/EN 55011) A Static heat dissipation, non-current-dependent P <sub>vs</sub> W 47	Integrated			Protection type IP40 can be achieved on all sides with covers SS-IP20-N.
Shock resistance 15 g Radio interference level (IEC/EN 55011) A Static heat dissipation, non-current-dependent P <sub>vs</sub> W 47	Protection against direct contact			Finger- and back-of-hand proof
Radio interference level (IEC/EN 55011)  Static heat dissipation, non-current-dependent  P <sub>vs</sub> W  47	Overvoltage category/pollution degree			11/3
Static heat dissipation, non-current-dependent P <sub>vs</sub> W 47	Shock resistance			15 g
	Radio interference level (IEC/EN 55011)			A
Weight kg 4.8	Static heat dissipation, non-current-dependent	$P_{vs}$	W	47
	Weight		kg	4.8

### **Main conducting paths**

Main conducting paths			
Rated operating voltage	U <sub>e</sub>	V AC	200 - 600
Supply frequency	$f_{LN}$	Hz	50/60
Rated operational current	le	Α	
AC-53, In-Delta	I <sub>e</sub>	Α	182
AC-53	I <sub>e</sub>	Α	105
Assigned motor rating (Standard connection, In-Line)			
at 230 V, 50 Hz	Р	kW	30
at 400 V, 50 Hz	Р	kW	55
at 500 V, 50 Hz	P	kW	55
at 200 V, 60 Hz	Р	НР	30
at 230 V, 60 Hz	P	НР	40
at 460 V, 60 Hz	P	НР	75
at 600 V, 60 Hz	P	НР	100
Assigned motor rating (delta connection)			
at 230 V, 50 Hz	P	kW	55
at 400 V, 50 Hz	P	kW	90
at 500 V, 50 Hz	P	kW	110
at 230 V, 60 Hz		НР	60
at 480 V, 60 Hz		НР	150
at 600 V, 60 Hz	P	НР	150
Overload cycle to IEC/EN 60947-4-2			
AC-53a			105 A: AC-53a: 4.0 - 32: 99 - 3
Internal bypass contacts			/
Short-circuit rating			
Type "1" coordination			NZMN2-S125
Terminal capacities			
Cable lengths			
Solid		$mm^2$	1 x (2.5 - 95)
Flexible with ferrule		mm <sup>2</sup>	1 x (2.5 - 95)
Stranded		mm <sup>2</sup>	1 x (2.5 - 95)
Solid or stranded		AWG	1 x (14 - 4/0)
Tightening torque		Nm	11.3
Screwdriver (PZ: Pozidriv)		mm	4 mm Innensechskant
Control cables			
Solid		mm <sup>2</sup>	1 x (2.5 - 4)
Solid		mm <sup>-</sup>	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	6 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 <sub>s</sub>	
DC-operated		V DC	21.6 - 26.4
Drop-out voltage	x U <sub>s</sub>		
DC operated		V DC	

Drop-out voltage, DC-operated, max.		V DC	3
Pick-up time		V 50	
DC operated		ms	100
Drop-out time		1113	100
DC operated		ms	100
Regulator supply		1110	
Voltage	U <sub>s</sub>	V	24 V DC +10 %/- 10 %
Current consumption			1000
	l <sub>e</sub>	mA	
Current consumption at peak performance (close bypass) at 24 V DC	I <sub>Peak</sub>	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		Α	3 A, AC-11
Soft start function			
Ramp times			
Acceleration		S	200
Ramp time, max.		S	360
Deceleration (Control of the Control		S	0 - 120
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			(minimum name time 1a)
Fast switching (semiconductor contactor)			- (minimum ramp time 1s)
Soft start function			Facual solution associated for control and a
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			<b>/</b>
Potential isolation between power and control sections			<b>/</b>
Communication Interfaces			Modbus RTU

# Design verification as per IEC/EN 61439

Technical data for design verification

Rated operational current for specified heat dissipation	In	Α	105
Heat dissipation per pole, current-dependent	P <sub>vid</sub>	W	0
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	47
Static heat dissipation, non-current-dependent	P <sub>vs</sub>	W	47
Heat dissipation capacity	P <sub>diss</sub>	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 switch gear must be observed. $\label{eq:constraint}$
10.12 Electromagnetic compatibility			Is the panel builder's responsibility. The specifications for the switch gear must be observed. $\label{eq:constraint}$
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 (ecl@ss10.01-27-37-09-07 (ACO300011))

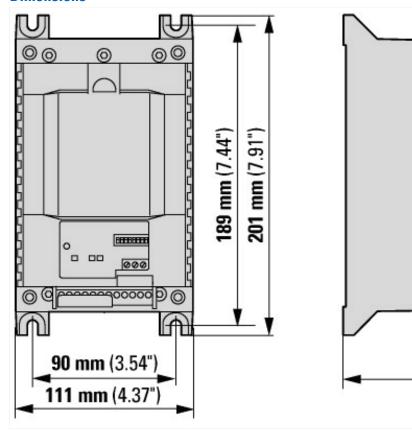
Rated operating voltage Ue  Rated power three-phase motor, inline, at 230 V  Rated power three-phase motor, inline, at 400 V  Rated power three-phase motor, inside delta, at 230 V  Rated power three-phase motor, inside delta, at 230 V  Rated power three-phase motor, inside delta, at 230 V  Rated power three-phase motor, inside delta, at 400 V  Rated power three-phase motor, inside delta, at 400 V  Function  Internal bypass  With display  Torque control  Rated surrounding temperature without derating  CC  Rated control supply voltage Us at AC 50HZ  Rated control supply voltage Us at AC 60HZ  Rated control supply voltage Us at DC  Voltage type for actuating  Voltage type for actuating  DC  Voltage type for actuating	(ecl@ss10.0.1-27-37-09-07 [ACO300011])		
Rated power three-phase motor, inline, at 230 V Rated power three-phase motor, inline, at 400 V Rated power three-phase motor, inside delta, at 230 V Rated power three-phase motor, inside delta, at 230 V Rated power three-phase motor, inside delta, at 400 V Rated power three-phase motor, inside delta, at 400 V Roted power three-phase motor, inside delta, at 400 V Roted power three-phase motor, inside delta, at 400 V Roted power three-phase motor, inside delta, at 400 V Roted power three-phase motor, inside delta, at 400 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted power three-phase motor, inside delta, at 200 V Roted phase	Rated operation current le at 40 °C Tu	А	105
Rated power three-phase motor, inline, at 400 V Rated power three-phase motor, inside delta, at 230 V Rated power three-phase motor, inside delta, at 230 V Rated power three-phase motor, inside delta, at 400 V Rated power three-phase motor, inside delta, at 400 V Runction Internal bypass With display Ves With display Torque control Rated surrounding temperature without derating Rated control supply voltage Us at AC 50HZ V V 0 - 0 Rated control supply voltage Us at AC 60HZ V V V V V V V V V V V V V V V V V V V	Rated operating voltage Ue	V	200 - 600
Rated power three-phase motor, inside delta, at 230 V Rated power three-phase motor, inside delta, at 400 V Ruction Internal bypass With display Torque control Rated surrounding temperature without derating Rated control supply voltage Us at AC 50HZ Rated control supply voltage Us at AC 60HZ Rated control supply voltage Us at DC Voltage type for actuating VkW Single direction Single direction Yes Single direction No Single direction Ves Single direction	Rated power three-phase motor, inline, at 230 V	kW	7 30
Rated power three-phase motor, inside delta, at 400 V  Function  Internal bypass  With display  Torque control  Rated surrounding temperature without derating  Rated control supply voltage Us at AC 50HZ  Rated control supply voltage Us at AC 60HZ  Voltage type for actuating  KW  90  Single direction  Yes  Yes  Vol  0  0  0  0  0  0  0  0  0  0  0  0  0	Rated power three-phase motor, inline, at 400 V	kW	55
Function  Internal bypass  With display  Torque control  Rated surrounding temperature without derating  Rated control supply voltage Us at AC 50HZ  Rated control supply voltage Us at AC 60HZ  Rated control supply voltage Us at DC  V  V  Voltage type for actuating  Single direction  Yes  Yes  You  0  0  0  0  0  0  0  0  0  0  0  0  0	Rated power three-phase motor, inside delta, at 230 V	kW	55
Internal bypass  With display  Yes  Torque control  Rated surrounding temperature without derating  Rated control supply voltage Us at AC 50HZ  Rated control supply voltage Us at AC 60HZ  Rated control supply voltage Us at DC  V  V  Voltage type for actuating  Ves  No  No  O - 0  C 50  O - 0  Q - 0  C 2 4 - 24  Voltage type for actuating  D C	Rated power three-phase motor, inside delta, at 400 $\rm V$	kW	90
With display Yes  Torque control Rated surrounding temperature without derating Rated control supply voltage Us at AC 50HZ V 0 - 0  Rated control supply voltage Us at AC 60HZ V V 0 - 0  Rated control supply voltage Us at DC V V 24 - 24  Voltage type for actuating  DC	Function		Single direction
Torque control Rated surrounding temperature without derating C S S O Rated control supply voltage Us at AC 50HZ V O - 0 Rated control supply voltage Us at AC 60HZ V V O - 0 Rated control supply voltage Us at DC V V V O - 0 C Rated control supply voltage Us at DC V DC C O C C C C C C C C C C C C C C C C	Internal bypass		Yes
Rated surrounding temperature without derating  CC 50  Rated control supply voltage Us at AC 50HZ  VV 0 - 0  Rated control supply voltage Us at AC 60HZ  VV 0 - 0  Rated control supply voltage Us at DC  VV 24 - 24  Voltage type for actuating  CC 50  DC	With display		Yes
Rated control supply voltage Us at AC 50HZ  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	Torque control		No
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	Rated surrounding temperature without derating	°C	50
Rated control supply voltage Us at DC V 24 - 24 Voltage type for actuating DC	Rated control supply voltage Us at AC 50HZ	V	0 - 0
Voltage type for actuating DC	Rated control supply voltage Us at AC 60HZ	V	0 - 0
	Rated control supply voltage Us at DC	V	24 - 24
Integrated motor overload protection Yes	Voltage type for actuating		DC
	Integrated motor overload protection		Yes

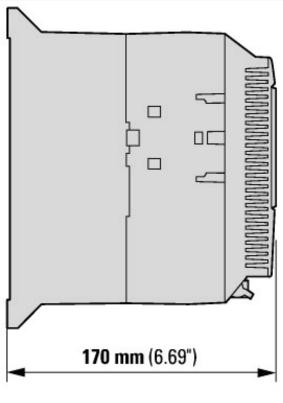
Release class	Adjustable
Degree of protection (IP)	IP00
Degree of protection (NEMA)	Other

# **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, 2411-01
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

http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4