### **DATASHEET - S811+U42N3S**



Soft starter, 420 A, 200 - 600 V AC, Us= 24 V DC, with control unit, Frame size  $\mbox{U}$ 



Part no. \$811+U42N3\$ Catalog No. 169870

Alternate Catalog

S811PLUSU42N3S

No.

**EL-Nummer** 4110403

(Norway)

### **Delivery program**

		This item is only available for a limited time and will be replaced by the following item: 169873, S811+U42P3S
		With internal bypass contacts
		Soft starter for three-phase loads, with control unit
$U_{LN}$	V AC	200 - 600
$U_s$		24 V DC
U <sub>C</sub>		24 V DC
P	kW	200
P	HP	350
I <sub>e</sub>	Α	420
le	Α	727
		CLASS 10 (star-delta replacement) CLASS 20 (heavy starting duty 3 x $l_e$ for 45 s) CLASS 30 (6 x $l_e$ for 30 s)
U <sub>e</sub>		200 V 230 V 400 V 480 V 600 V
		no
		U
		Terminal blocks for the terminals are required for frame sizes T, U, and V -> $\mbox{\sc Accessories}$
	U <sub>s</sub> U <sub>C</sub> P P I <sub>e</sub> I <sub>e</sub>	U <sub>S</sub> U <sub>C</sub> P kW P HP  I <sub>e</sub> A I <sub>e</sub> A

### **Technical data**

#### General

UL 50	X22.2-14-1995 I 4048
Angroyals	
CSA C-Ticl	ick
	np heat, constant, to IEC 60068-2-3 np heat, cyclic, to IEC 60068-2-10
Ambient temperature	
Operation 8 °C -30 -	- +50
Storage 8 °C -50 -	- +70
Altitude m 0 - 200	2000 m, above that each 100 m 0.5% Derating
Mounting position As re	required
Degree of protection	
Degree of Protection IP20 (	0 (terminals IP00)
	IP20 degree of protection can be achieved on all sides by using optional ninal covers SS-IP20-TU.
Protection against direct contact Finge	ger- 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	92
Weight	i vs		18.6
Main conducting paths		kg	16.0
Rated operating voltage	U <sub>e</sub>	V AC	200 - 600
Supply frequency	f <sub>LN</sub>	Hz	50/60
			30/00
Rated operational current	l <sub>e</sub>	A	
AC-53, In-Delta	l <sub>e</sub>	Α	727
AC-53	l <sub>e</sub>	Α	420
Assigned motor rating (Standard connection, In-Line)			
at 230 V, 50 Hz	Р	kW	132
at 400 V, 50 Hz	Р	kW	200
at 500 V, 50 Hz	Р	kW	250
at 200 V, 60 Hz	Р	HP	125
at 230 V, 60 Hz	Р	HP	150
at 460 V, 60 Hz	P	HP	350
at 600 V, 60 Hz	P	HP	450
Assigned motor rating (delta connection)			
at 230 V, 50 Hz	Р	kW	200
at 400 V, 50 Hz	P	kW	400
at 500 V, 50 Hz	Р	kW	500
at 230 V, 60 Hz		HP	300
at 480 V, 60 Hz		HP	600
at 600 V, 60 Hz	P	HP	750
Overload cycle to IEC/EN 60947-4-2			
AC-53a			420 A: AC-53a: 4.0 - 32: 99 - 3
Internal bypass contacts			✓
Short-circuit rating			
Type "1" coordination			NZMN3-S500
Terminal capacities			
Cable lengths			
Solid		mm <sup>2</sup>	1 x (70 - 240) 2 x (25 - 240)
Flexible with ferrule		mm <sup>2</sup>	1 x (70 - 240) 2 x (25 - 240)
Stranded		mm <sup>2</sup>	1 x (70 - 150)
Calid as atronded		AVA/C	2 x (25 - 240)
Solid or stranded		AWG	1 x (4 - 500 kcmil) 2 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	21 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		V DC	24 V DC -10 W / 10 W
DC-operated		V DC	24 V DC +10 %/- 10 %
Current consumption 24 V		mA	450
External 24 V		mA	150
External 24 V (no-load)		mA	100
Pick-up voltage		$x U_s$	

Dispose cut voltage	DC anarotad		V DC	21.6. 26.4
DC quertied	DC-operated	11	V DC	21.6 - 26.4
Pickup prima		ΧU <sub>S</sub>		
Pick-up time				
BC spented			V DC	3
Display				
Pospilator supply			ms	100
Pagulatra supoly				
Voltage         U <sub>s</sub> V         24 V DC-118 V/- 10 %           Current consumption         I <sub>e</sub> m/A         1001           Current consumption at peak parformance (close bypasal at 24 V DC         V <sub>ex</sub> A viss           Manual priors         Current inputs         Central supply violage           Analise priors         V <sub>ex</sub> A visit           Current input         v <sub>ex</sub> V <sub>ex</sub> Current input         v <sub>ex</sub> 2           Current input         v <sub>ex</sub> 2           Number         v <sub>ex</sub> 2           Of which programmable         v <sub>ex</sub> 2           Voltage range         v <sub>ex</sub> 2           AC-11 current range         v <sub>ex</sub> 2           Sch St starf function         v <sub>ex</sub> 2           Start stream         v <sub>ex</sub> 2           Accidentation         v <sub>ex</sub> 2           Start voltage in turn-01 voltage)         v <sub>ex</sub> 3           Start voltage in turn-02 voltage, max.         v <sub>ex</sub> 3         3           Schedular voltage, max.         v <sub>ex</sub> 3         3         4           Schedular voltage, max.         v <sub>ex</sub> 4 <th< td=""><td></td><td></td><td>ms</td><td>100</td></th<>			ms	100
	Regulator supply			
Current consumption at peak performance (close bypass) at 24 VOC   Peak   Arms   Strawnal supply voltage	Voltage	$U_s$	V	24 V DC +10 %/- 10 %
Notes   External supply voltage  Aratiog inputs	Current consumption	l <sub>e</sub>	mA	1000
Amalog inputs Number of current inputs  Current input  mA 4 - 20  Current input  mA 4 - 20  Reliev outputs  7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Current consumption at peak performance (close bypass) at 24 V DC	I <sub>Peak</sub>	A/ms	10/150
Mumber of current imputs	Notes			External supply voltage
Current imput	Analog inputs			
Roley outputs	Number of current inputs			1
Roley outputs				
Roley outputs	Current input		mA	4 - 20
Number	Relay outputs			
V AC				2
V AC	of which programmable			2
AC-11 current range			V AC	120 V AC/DC
Soft start function         Ramp times           Acceleration         s           Ramp time, max.         s           Deceleration         s           Start voltage, Entur-off voltage)         %           Start voltage, max.         %           Start voltage, max.         %           Start voltage, max.         %           Start voltage, max.         %           Voltage         %           Kickstart         9           Duration         9           Duration         9           Kickstart Duration 50 Hz max.         ms           50 H2         ms           Kickstart Duration 60 Hz max.         ms           60 H2         ms           Kickstart Duration 60 Hz max.         ms           Fields of application         soft starting of three phase asynchronous motors           3-phase motors         soft starting of three phase asynchronous motors           Sast switching (semiconductor contactor)         soft starting of three phase asynchronous motors           Soft start function         soft starting of three phase asynchronous motors           Fast switching (semiconductor contactor)         cminimum ramp time 1s)           Soft start function         soft starting of three phase asynchronous mot			Α	
Acceleration         s         180           Beamp time, max.         s         180           Deceleration         s         0-60           Start voltage, max.         %         85           Start pedestal         %         85           Start voltage, max.         %         85           Voltage         %         85           Kickstart Voltage, max.         %         100           Voltage         %         100           Kickstart voltage, max.         ms         2000           Duration         ms         2000           Sol Hz         ms         2000           Kickstart Duration 60 Hz max.         ms         2000           Fields of application         ms         2000           Fields of application         soft starting of three-phase asynchronous motors           Fields of application         soft starting of three-phase asynchronous motors           Functions         soft starting of three-phase asynchronous motors           Soft start function         soft starting of three-phase asynchronous motors           Soft start function         soft start function           Four starter         soft start function         soft start function           Current limitation	Soft start function			
Ramp time, max.         s         180           Decoloration         s         0 - 80           Start voltage (= turn-off voltage)         %         85           Start voltage, max.         %         85           Start voltage, max.         %         85           Kickstart         %         85           Kickstart voltage, max.         %         100           Duration         ms         100           Duration Puration Sol Hz max.         ms         2000           Kickstart Duration 60 Hz max.         ms         2000           Fields of application         ms         2000           Fields of application         soft starting of three-phase asynchronous motors         100           3-phase motors         y         (minimum ramp time 1s)           Fountions         y         (minimum ramp time 1s)           Soft start function         y         (minimum ramp time 1s)           Soft start functi	Ramp times			
Deceleration         s         0-60           Start voltage (= turn-off voltage)         %         85           Start voltage, max.         %         85           Start voltage, max.         %         85           Kickstart         Woltage         %           Kickstart voltage, max.         %         100           Duration         ms         2000           50 Hz         ms         2000           Kickstart Duration 50 Hz max.         ms         2000           Fields of application         soft starting of three-phase asynchronous motors           Fields of application         Soft starting of three-phase asynchronous motors           Saphase motors         c/minimum ramp time 1s)           Founttions         External solution required (reversing contactor)           Soft start function         External solution required (reversing contactor)           Suppression of closing transients         —         —           Current limitation         —         —           Owerload monitoring         —         —           Underload monitoring         Faults         10           Suppression of DC components for motors         —         —           Potential isolation between power and control sections         —	Acceleration		s	
Start voltage (= turn-oft voltage)  Start voltage, max.  Voltage  Kickstart  Voltage  Kickstart voltage, max.  Notestart  Voltage  Kickstart voltage, max.  Notestart  Voltage  Kickstart voltage, max.  Notestart Duration 50 Hz max.  Notestart Duration 50 Hz max.  Notestart Duration 50 Hz max.  Notestart Duration 60 Hz max.  Notestart Duration Notestart D	Ramp time, max.		s	180
Start voltage, max.  Start voltage, max.  Start voltage, max.  Voltage  Kickstart voltage, max.  Voltage  Kickstart voltage, max.  So Hz  Kickstart Duration  So Hz  Kickstart Duration 50 Hz max.  Butter to pration 50 Hz max.  So Hz  Kickstart Duration 50 Hz max.  Butter to pration 50 Hz max.  So Hz  Kickstart Duration 60 Hz max.  Butter to pration 60 Hz max.  So Hz  Kickstart Duration 60 Hz max.  Solf starting of three-phase asynchronous motors  3-phase motors  Fields of application  3-phase motors  Fast whiching (semiconductor contactor)  Soft start function  Fast swhiching (semiconductor contactor)  Soft start function  Fast swhiching (semiconductor contactor)  Soft start function  Current limitation  V  Querload monitoring  Faults  10  Querload monitoring  Faults  Faults in Current functions  Faults in Current functions  Faults in Current functions  V  Potential isolation between power and control sections	Deceleration		s	0 - 60
Start pedestal % Start voltage, max. % 85  Kickstart  Voltage % Kickstart voltage, max. % 100  Duration	Start voltage (= turn-off voltage)		%	
Start voltage, max.  Kickstart Voltage  Kickstart voltage, max.  Notage  Kickstart voltage, max.  Notage  Kickstart voltage, max.  Notage  Kickstart Duration 50 Hz max.  Notage  Kickstart Duration 50 Hz max.  Notage  Kickstart Duration 60 Hz max.  Notage  No	Start voltage, max.		%	85
Kickstart       %       Contain	Start pedestal		%	
Voltage Kickstart voltage, max.  Duration  50 Hz  Kickstart Duration 50 Hz max.  Kickstart Duration 50 Hz max.  Kickstart Duration 60 Hz max.  Kickstart Duration 60 Hz max.  ms  2000  Fields of application  Fields of application  3-phase motors  Functions  Fast switching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Fault memory  Suppression of DC components for motors  Potential isolation between power and control sections  100  100  100  100  100  100  100  1	Start voltage, max.		%	85
Kickstart voltage, max.  Duration  50 Hz  Kickstart Duration 50 Hz max.  Kickstart Duration 50 Hz max.  Ms  Kickstart Duration 60 Hz max.  Ms  Kickstart Duration 60 Hz max.  Ms  Soft starting of three-phase asynchronous motors  3-phase motors  Fields of application  3-phase motors  Functions  Fast switching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Fault memory  Suppression of DC components for motors  Potential isolation between power and control sections    Ms	Kickstart			
Duration  50 Hz  Kickstart Duration 50 Hz max.  60 Hz  Kickstart Duration 60 Hz max.  ms  2000  fields of application  Fields of spilication  Fields of application  Fields of applicat	Voltage		%	
Solition	Kickstart voltage, max.		%	100
Kickstart Duration 50 Hz max. ms 2000  Kickstart Duration 60 Hz max. ms 2000  Fields of application  Fields of application  Fields of application  Soft starting of three-phase asynchronous motors  3-phase motors  Frunctions  Fast switching (semiconductor contactor)	Duration			
Kickstart Duration 60 Hz max.  Fields of application  Fields of application  Fields of application  Soft starting of three-phase asynchronous motors  3-phase motors  Functions  Fasts witching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Fault memory  Potential isolation between power and control sections  ms  2000  Soft starting of three-phase asynchronous motors  - (minimum ramp time 1s)	50 Hz		ms	
Kickstart Duration 60 Hz max.  Fields of application  Fields of application  Soft starting of three-phase asynchronous motors	Kickstart Duration 50 Hz max.		ms	2000
Fields of application Fields of application  3-phase motors  Functions  Fast switching (semiconductor contactor)  Soft starting of three-phase asynchronous motors  - (minimum ramp time 1s)  - (minimum	60 Hz		ms	
Fields of application Fields of application  3-phase motors  Functions  Fast switching (semiconductor contactor)  Soft starting of three-phase asynchronous motors  - (minimum ramp time 1s)  - (minimum				2000
Fields of application  3-phase motors  Functions  Fast switching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Faults  Suppression of DC components for motors  Potential isolation between power and control sections  Soft starting of three-phase asynchronous motors   I was presented as synchronous motors  I minimum ramp time 1s)  Faults of treversing contactor)  Faults  Suppression of Cosing transients  Faults  Faults  Faults  Overload monitoring  Faults  Faul	Fields of application			
3-phase motors  Functions  Fast switching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Fault memory  Fault memory  Potential isolation between power and control sections   - (minimum ramp time 1s)  - (minimum r				Soft starting of three-phase asynchronous motors
Functions Fast switching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Fault memory  Fault memory  Found to Components for motors  Potential isolation between power and control sections  Found to Components for motors  Potential isolation between power and control sections  - (minimum ramp time 1s)  - (minimum ram				
Fast switching (semiconductor contactor)  Soft start function  Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Fault memory  Suppression of DC components for motors  Potential isolation between power and control sections  - (minimum ramp time 1s)  - (minimum ra	Functions			
Reversing starter  Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Faults  Suppression of DC components for motors  Potential isolation between power and control sections  External solution required (reversing contactor)	Fast switching (semiconductor contactor)			- (minimum ramp time 1s)
Suppression of closing transients  Current limitation  Overload monitoring  Underload monitoring  Faults memory  Suppression of DC components for motors  Potential isolation between power and control sections	Soft start function			/
Current limitation  Overload monitoring  Underload monitoring  Faults  Foult memory  Suppression of DC components for motors  Potential isolation between power and control sections	Reversing starter			External solution required (reversing contactor)
Overload monitoring Underload monitoring  Fault memory  Suppression of DC components for motors  Potential isolation between power and control sections  Y  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of the suppression of DC components for motors  The substitute of	Suppression of closing transients			✓
Underload monitoring Faults memory Faults 10 Suppression of DC components for motors Potential isolation between power and control sections  Faults 10  ✓	Current limitation			/
Underload monitoring Faults memory Faults 10 Suppression of DC components for motors Potential isolation between power and control sections  Faults 10  ✓	Overload monitoring			✓
Fault memory  Suppression of DC components for motors  Potential isolation between power and control sections  Faults	Underload monitoring			/
Suppression of DC components for motors  Potential isolation between power and control sections	Fault memory		Faults	10
Potential isolation between power and control sections	Suppression of DC components for motors			✓
	Potential isolation between power and control sections			/
Communication Interfaces Modbus RTII				
THOUSE HID	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	420
Heat dissipation per pole, current-dependent	P <sub>vid</sub>	W	0
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	92
Static heat dissipation, non-current-dependent	P <sub>vs</sub>	W	92
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 switchgear must be observed.
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 (ect@ss10.0.1-27-37-09-07 [AC0300011])

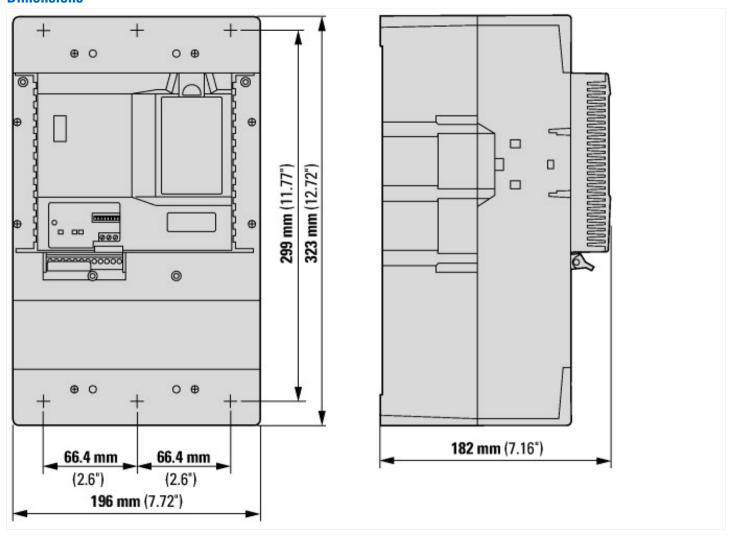
(ecl@ss10.0.1-27-37-09-07 [ACO300011])		Survey motor broadout/ commondation motor controller or controller
Rated operation current le at 40 °C Tu	Α	420
Rated operating voltage Ue	V	200 - 600
Rated power three-phase motor, inline, at 230 V	kW	132
Rated power three-phase motor, inline, at 400 V	kW	200
Rated power three-phase motor, inside delta, at 230 V	kW	200
Rated power three-phase motor, inside delta, at 400 V	kW	400
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 http://www.eaton.eu/Europe/Electrical/ProductsServices/AutomationControl/SwitchingProtectingDrivingMotors/SoftStarters/S811/index.htm#tabs-4