DATASHEET - EMS2-ROSF-Z-9-24VDC

Reversing starter, 24 V DC, 1,5 - 7 (AC-53a), 9 (AC-51) A, Screw terminals, Controlled stop, PTB 19 ATEX 3000

Powering Business Worldwide

Part no.	**EMS2-ROSF-Z-9-24VDC**
Catalog No.	**192400**
Alternate Catalog No.	**EMS2-ROSF-Z-9-24V**
EL-Nummer (Norway)	**4100373**

Delivery program

Product range			Electronic motor starter
Basic function			Reversing starters (complete devices)
Description			DOL starting Reversing start Motor protection Circuit design: safety output stage with bypass, three-phase disconnect. Controlled stop via additional enable signal terminal up to SIL3/PIe.
Conformity, Approval			
Explosion protection (according to ATEX 94/9/EC)			II (2) G [Ex db] [Ex eb] [Ex pxb] II (2) D [Ex tb] [Ex pb]
EC-prototype test certification			PTB 19 ATEX 3000
Motor ratings			
Max. rating for three-phase motors, 50 - 60 Hz			
AC-53a			
380 V 400 V 415 V	P	kW	0.55 - 3
Setting range of overload releases	I_r	A_x	1,5 - 7 (AC-53a) 1,5 - 9 (AC-51)
Actuating voltage			24 V DC
Connection technique			Screw terminals
Stop Function			Controlled stop
Connection to SmartWire-DT			no

Technical data

General

Standards			IEC/EN 60947-4-2 IEC 61508 ISO 13849 UL508
Ambient temperature			
Storage		°C	
Min. ambient temperature, storage		°C	- 40
Ambient temperature, storage max.		°C	+ 80
Open		°C	
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	+ 70
Weight		kg	0.34
Mounting			Top-hat rail IEC/EN 60715, 35 mm Motorstarter Feeder System Busbar 30 mm Busbar 60 mm
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20
Mounting position			Vertical Motor feeder at bottom
Terminal capacity			
Screw terminals			

Terminal capacity main cable			
		mm^2	0.2 - 2.5
		AWG	24 - 14
Terminal capacity control circuit cables			
		mm^2	0.14 - 2.5
		AWG	26 - 14
tightening torque		N/m	0.5 - 0.6

Main conducting paths

Rated operational voltage	U_e	V AC	500
Operational voltage range		V	
Operating voltage range min.		V	42
Operating voltage range max.		V	550
Rated operational current			
AC-51	I_e	A	9
AC-53a	I_e	A	7
			AC-53a: Please note possible derating.
Setting range of overload releases	I_r	A_x	1,5 - 7 (AC-53a) 1,5 - 9 (AC-51)
Release class		CLASS	10A
Heat dissipation	P_V	W	1 - 12

Control section

Rated control voltage	U_s	V DC	24
Control voltage range		V	19,2 - 30 V DC
Residual ripple on the input voltage		%	≦ 5
Rated control current	I_s	mA	40
Actuating circuit (ON, L, R)			
Rated actuation voltage	U_c	V	24
Switching level "Low"		V	-3 - +9.6 V DC
Switching level "confirm Off"		V	< 5 V DC
Switching level "High"		V	19.2 - 30 V DC
Rated actuating current	I_c	mA	10
Relay outputs			
Contacts			
CO = changeover			1 CO
Rated operational current			
AC-15			
230 V	I_e	A	2
DC-13			
24 V	I_e	A	2

Electromagnetic compatibility (EMC)

Radio interference suppression			EN 55011 EN 61000-6-3, Class A (emitted interference, radiated)

Technical safety parameters:

Notes			Safe switch off. motor protection
Ambient temperature		°C	60
Values according to EN ISO 13849-1			
$MTTF_d$	Years		70 (Sicheres Abschalten) / 60 (Motorschutz)
Performance level	PL		e (Sicheres Abschalten)
Category			3 (Sicheres Abschalten)
Values according to IEC 62061			
			Abschaltzeit [ms]: 200 (Sicheres Abschalten) / Class 10A (Motorschutz) λsd [FIT]: 0 λsu [FIT]: 2884 (Sicheres Abschalten) / 2683 (Motorschutz) λdd [FIT]: 1628 (Sicheres Abschalten) / 1876 (Motorschutz) λdu [FIT]: 13,8 (Sicheres Abschalten) / 17,7 (Motorschutz) SFF [%]: 99,7 (Sicheres Abschalten) / 99,6 (Motorschutz) DC [%]: 99,2 (Sicheres Abschalten) / 99,1 (Motorschutz) PFH_d [FIT]: 13,8 (Sicheres Abschalten)

			SIL 3 (Sicheres Abschalten) / SIL 2 (Motorschutz)

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	9
Heat dissipation per pole, current-dependent	P_{vid}	W	0
Equipment heat dissipation, current-dependent	P_{vid}	W	13
Static heat dissipation, non-current-dependent	P_{vs}	W	2
Heat dissipation capacity	P_{diss}	W	0
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	70
			Please observe > 55 °C derating
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

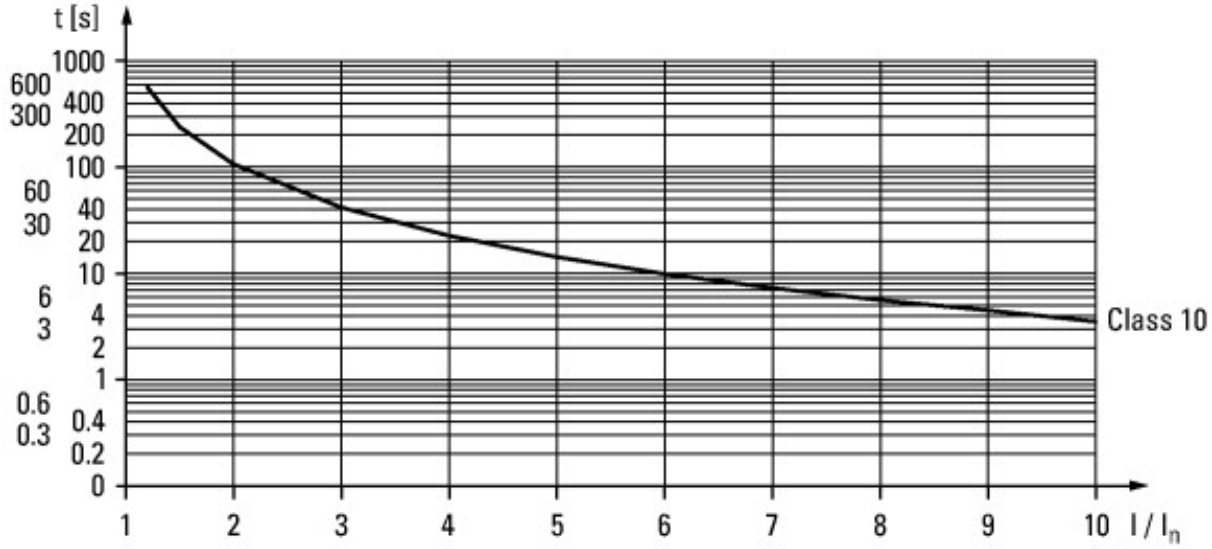
Low-voltage industrial components (EG000017) / Motor starter/Motor starter combination (EC001037)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Motor starter combination (ecl@ss10.0.1-27-37-09-05 [AJZ718013])			
Kind of motor starter			Reversing starter
With short-circuit release			No
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
Rated operation power at AC-3, 230 V, 3-phase		kW	1.5
Rated operation power at AC-3, 400 V		kW	3
Rated power, 460 V, 60 Hz, 3-phase		kW	0
Rated power, 575 V, 60 Hz, 3-phase		kW	0
Rated operation current Ie		A	9

Rated operation current at AC-3, 400 V	A	7
Overload release current setting	A	1.5 - 9
Rated conditional short-circuit current, type 1, 480 Y/277 V	A	0
Rated conditional short-circuit current, type 1, 600 Y/347 V	A	0
Rated conditional short-circuit current, type 2, 230 V	A	0
Rated conditional short-circuit current, type 2, 400 V	A	0
Number of auxiliary contacts as normally open contact		1
Number of auxiliary contacts as normally closed contact		1
Ambient temperature, upper operating limit	°C	40
Temperature compensated overload protection		Yes
Release class		CLASS 10
Type of electrical connection of main circuit		Screw connection
Type of electrical connection for auxiliary- and control current circuit		Screw connection
Rail mounting possible		Yes
With transformer		No
Number of command positions		
Suitable for emergency stop		Yes
Coordination class according to IEC 60947-4-3		
Number of indicator lights		4
External reset possible		Yes
With fuse		Yes
Degree of protection (IP)		IP20
Degree of protection (NEMA)		Other
Supporting protocol for TCP/IP		No
Supporting protocol for PROFIBUS		No
Supporting protocol for CAN		No
Supporting protocol for INTERBUS		No
Supporting protocol for ASI		No
Supporting protocol for MODBUS		No
Supporting protocol for Data-Highway		No
Supporting protocol for DeviceNet		No
Supporting protocol for SUCONET		No
Supporting protocol for LON		No
Supporting protocol for PROFINET IO		No
Supporting protocol for PROFINET CBA		No
Supporting protocol for SERCOS		No
Supporting protocol for Foundation Fieldbus		No
Supporting protocol for EtherNet/IP		No
Supporting protocol for AS-Interface Safety at Work		No
Supporting protocol for DeviceNet Safety		No
Supporting protocol for INTERBUS-Safety		No
Supporting protocol for PROFIsafe		No
Supporting protocol for SafetyBUS p		No
Supporting protocol for other bus systems		No
Width	mm	22.5
Height	mm	167.4
Depth	mm	125

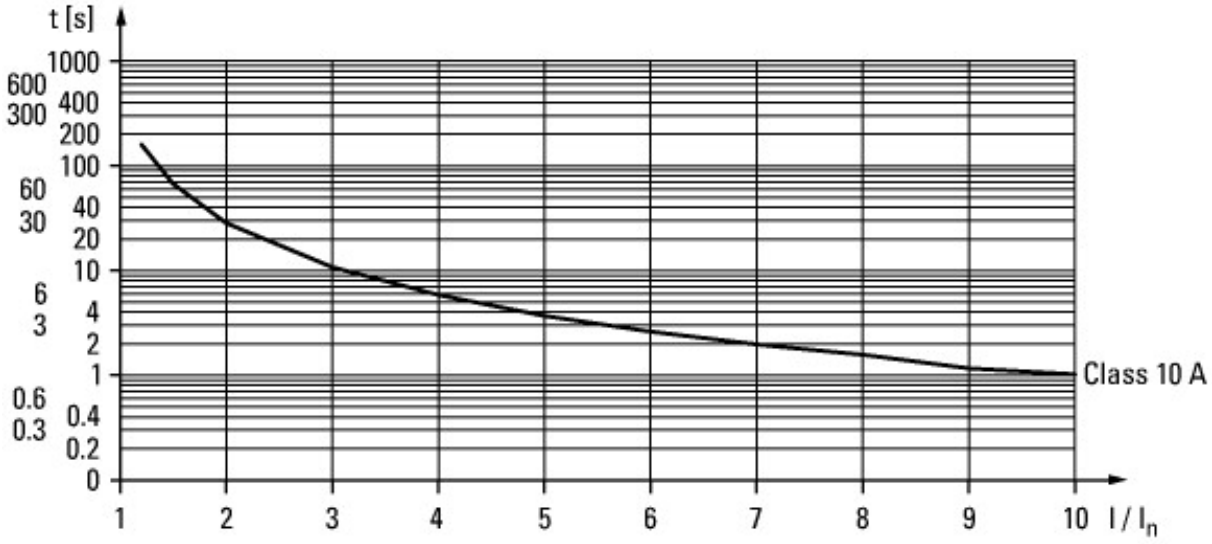
Approvals

Product Standards		UL 60947-4-1; CSA C22.2 No. 60947-4-1-14; CE marking
UL File No.		E29096
UL Category Control No.		NLDX, NLDX7
CSA File No.		UL report applies to both US and Canada
North America Certification		UL listed, certified by UL for use in Canada
Specially designed for North America		No

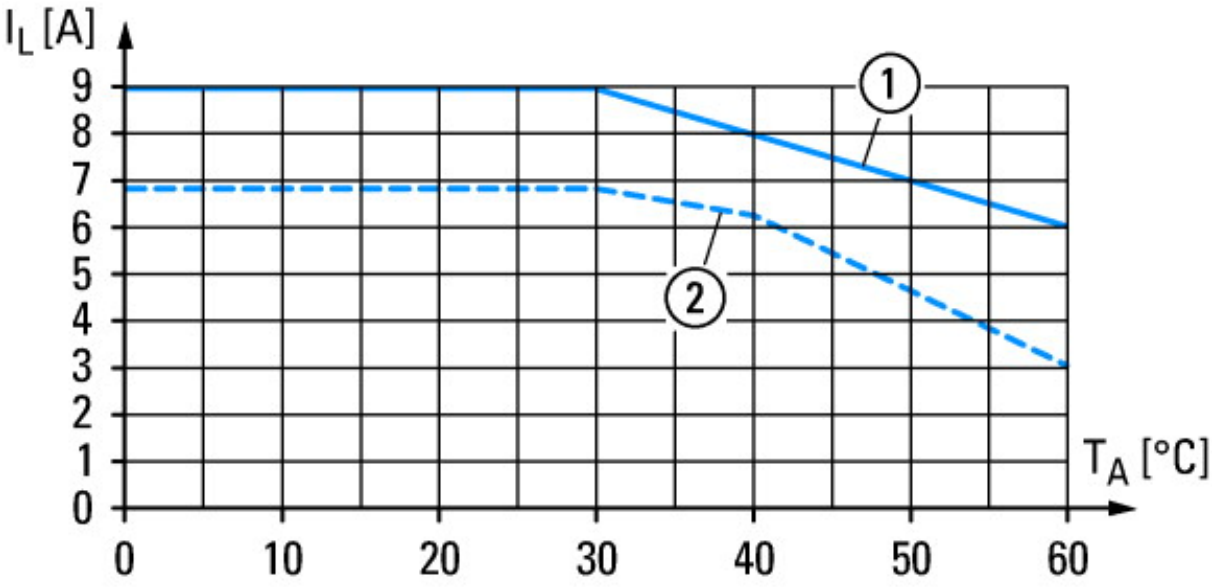
Characteristics



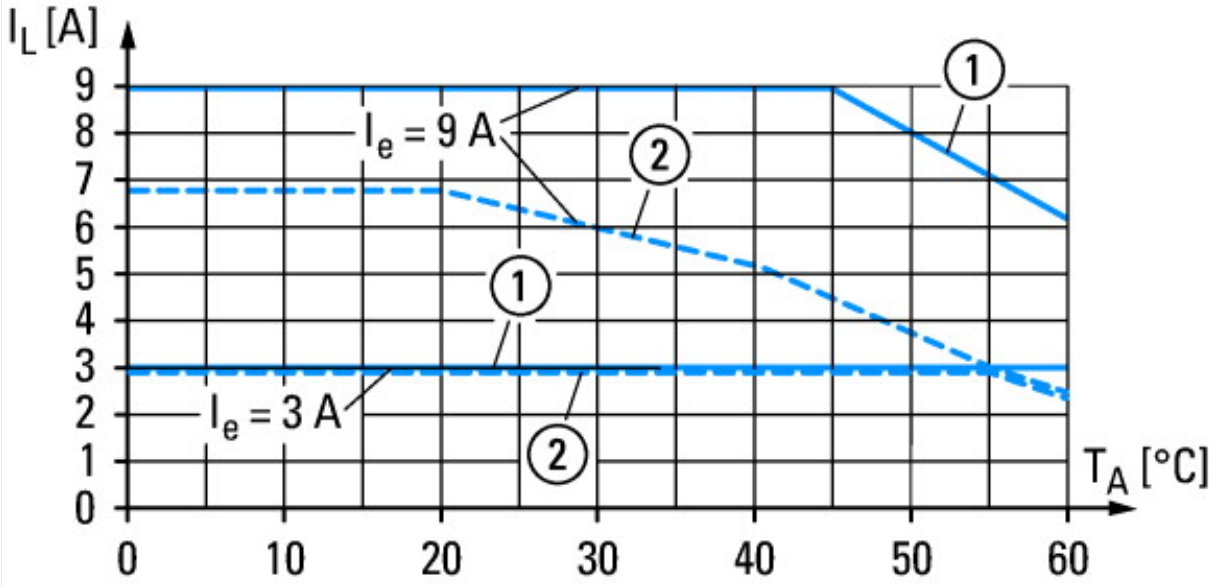
Tripping characteristic curve
CLASS 10
set motor current ≦ 4 A



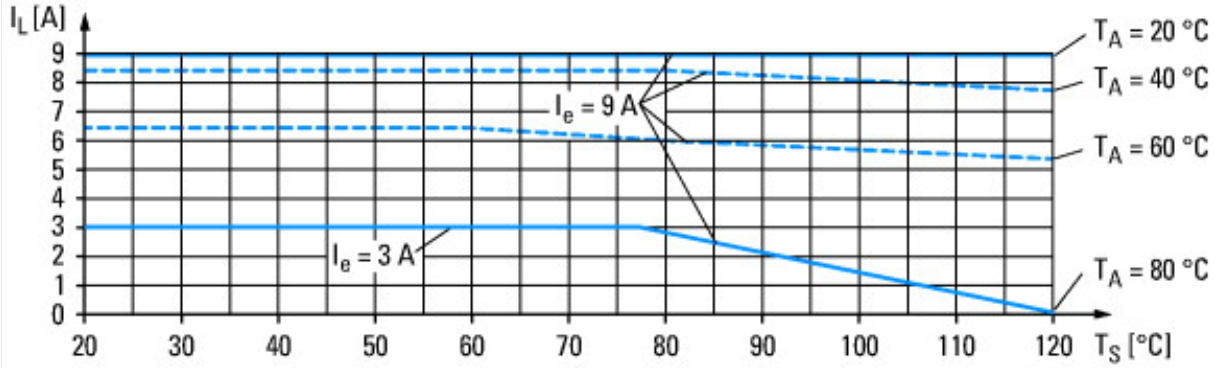
Tripping characteristic curve
CLASS 10A
set motor current > 4 A



Electricity derating devices with I_e = 9 A
① For devices installed with a minimum clearance of 20 mm
② For devices in direct sequence



Electricity derating devices with EMS2-XTH adapter
① For devices installed with a minimum clearance of 20 mm
② For devices in direct sequence



Electricity derating devices with EMS2-XBB or MSFS adapter
Devices with I_e = 9 A that are installed with a minimum clearance of 20 mm.
T_S = temperature of busbar
T_A = ambient temperature in switch cabinet

Dimensions