Reversing starter 9A, emergency stop

Part no.	**EMS-ROS-T-9-24VDC**
Article no.	**169789**
Catalog No.	**EMS-ROS-T-9-24VDC**

Powering Business Worldwide

Delivery program

Product range			Electronic motor starter
Basic function			Reversing starters (complete devices)
Description			DOL starting Reversing start Motor protection Emergency-stop actuator Circuit design: safety output stage with bypass, three-phase disconnect.
Conformity, Approval			
Explosion protection (according to ATEX 94/9/EC)			II (2) G [Ex e] [Ex d] [Ex px] II (2) D [Ex t] [Ex p]
EC-prototype test certification			PTB 13 ATEX 3003
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 - 6,5 (AC-53a) 9 (AC-51)
Actuating voltage			24 V DC
Connection technique			Push in terminals
Stop Function			Controlled stop
Connection to SmartWire-DT			no

Technical data

General

Standards			IEC/EN 60947-4-2 UL508
Dimensions			
Width		mm	30
Height		mm	157
Depth		mm	123.5
Weight		kg	0.3
Mounting			Top-hat rail IEC/EN 60715, 35 mm
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20
Mounting position			Vertical Motor feeder at bottom
Lifespan, electrical	Operations		3×10^7
Max. switching frequency		Operations/h	7200 (pulse pause time 50:50)
Terminal capacity			
Solid		mm^2	1 x (0.75 - 2.5) 1 x AWG20 - 14
flexible, with ferrule		mm^2	2 x (0,75 - 2,5) 1 x AWG20 - 14
Notes			Minimum length 10 mm.
flexible, with twin ferrule		mm^2	2 x (0,75 - 1,5) 2 x AWG20 - 16
Notes			Minimum length 10 mm.

Climatic environmental conditions

Operating ambient temperature		°C	-25 - +60, in accordance with IEC 60068-2-1
Condensation			Take appropriate measures to prevent condensation
Storage	ϑ	°C	-40 - +80

Main conducting paths

Rated impulse withstand voltage	U_{imp}	V AC	6000
Overvoltage category/pollution degree			III/2
Rated operational voltage	U_e	V	42 - 550
Rated operational current			
AC-51	I_e	A	1.20 - 9
AC-53a	I_e	A	1.20 - 6.5
Heat dissipation	P_V	W	3.3 - 14.6
Static heat dissipation, non-current-dependent	P_{vs}	W	1
Basic insulation to IEC/EN60947-1			
Between supply, control, and switching voltages		V AC	500
between feedback signal output and switch voltage		V AC	500
Safe isolation to IEC/EN60947-1			
Between supply, control, and switching voltages		V AC	≤ 300
between feedback signal output and switch voltage		V AC	≤ 300
Safe isolation to EN 50178			
Between supply, control, and switching voltages		V AC	500
between feedback signal output and switch voltage		V AC	500
Current measurement			
Setting range of overload releases	I_r	A_x	1,5 - 6,5 (AC-53a) 9 (AC-51)
Release class		CLASS	10 (Ir ≤ 4 A) 10A (Ir > 4 A)
Recovery time	t_W	min.	2 (manual startup) 20 (automatic restart)
Balance monitoring			
Magnitude $I_{max} > I_{rated}$ $((I_{max} - I_{min})/I_{max})$		%	If ≥ 33, pick-up time of 120 s If ≥ 67, pick-up time of 1.8 s
Magnitude $I_{max} < I_{rated}$ $((I_{max} - I_{min})/I_{rated})$		%	If ≥ 33, pick-up time of 120 s If ≥ 67, pick-up time of 1.8 s
Stall protection			
Pick-up time I (L1) or I (L3)		A	45
Pick-up time		S	2
Short-circuit rating			
Type “1” coordination			
Short-circuit protective device			50 kA, 500 V AC: Fuse 16 A gG/gL 50 kA, 415 V AC: PKM0-4 15 kA, 415 V AC: PKM0-6,3

Control section

Input data			
Supply voltage	U_{AUX}	V DC	A1 - A2: 24 (-20 - +25 %)
Residual ripple on the input voltage		%	≤ 5
Supply voltage "confirm Off"	U_{AUX}	V DC	< 5
Input current		mA	40
Note on input current			without feedback signal
Actuating circuit (ON, L, R)			
Switching level "Low"		V DC	-3 - +9.6
Switching level "confirm Off"		V DC	< 5
Switching level "High"		V DC	19.2 - 30
Input current		mA	5
Feedback outputs			

Notes			Contacts 95, 96 or 98
Contacts			
CO = changeover			1 CO
Rated operational voltage	U_e	V AC/DC	250
Rated operational current			
AC-15			
230 V	I_e	A	3
DC-13			
24 V	I_e	A	2

Electromagnetic compatibility (EMC)

Electrostatic discharge (ESD)			
applied standard			IEC EN 61000-4-2, Level 3
Air discharge		kV	8
Contact discharge		kV	6
Electromagnetic fields (RFI)			
applied standard			IEC/EN 61000-4-3
		V/m	800 - 1000 MHz: 10 1.4 - 2 GHz: 10 2.0 - 2.7 GHz: 3
Radio interference suppression			EN 55011, Class A (emitted interference, line-conducted) EN 61000-6-3, Class A (emitted interference, radiated)
Note on use			This product is designed for operation in industrial environments (environment 2). The use in residential environments (environment 1) could cause electrical interference so that addition suppression must be planned.
Burst		kV	2 IEC/EN 61000-4-4, level 3
power pulses (Surge)			1 kV (symmetrical) 2 kV (asymmetrical) according to IEC/EN 61000-4-5
Immunity to line-conducted interference to (IEC/EN 61000-4-6)		V	10

Technical safety parameters:

Notes			Safe switch off. See Safety manual PU05907001Z.
Ambient temperature		°C	40
Values according to EN ISO 13849-1			
$MTTF_d$	Years		420
Performance level	PL		e
Category			3
Values according to IEC 62061			
			λsd [FIT]: 49 λsu [FIT]: 1818 λdd [FIT]: 269 λdu [FIT]: 2,7 SFF [%]: 99,8 DCS [%]: 2,6 DC [%]: 99 PFH [1/h]: 2,7 x 10^{-9} SIL: 3

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	6.5
Heat dissipation per pole, current-dependent	P_{vid}	W	2.1
Equipment heat dissipation, current-dependent	P_{vid}	W	6.3
Static heat dissipation, non-current-dependent	P_{vs}	W	1
Heat dissipation capacity	P_{diss}	W	0
Operating ambient temperature min.		°C	-25
Operating ambient temperature max.		°C	60
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 6.0

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@ss8.1-27-37-09-05 [AJZ718010])

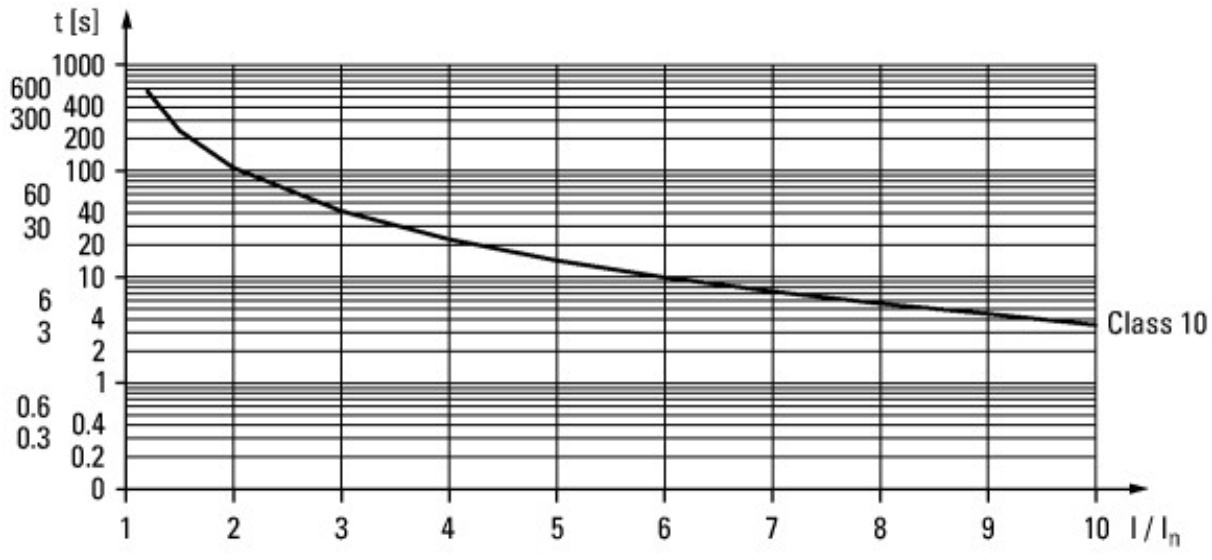
Kind of motor starter			Reversing starter
With short-circuit release			No
Rated control supply voltage Us at AC 50HZ		V	0 - 0
Rated control supply voltage Us at AC 60HZ		V	0 - 0
Rated control supply voltage Us at DC		V	24 - 24
Voltage type for actuating			DC
Rated operation power at AC-3, 230 V, 3-phase		kW	1.5
Rated operation power at AC-3, 400 V		kW	3
Rated power, 460 V, 60 Hz, 3-phase		kW	2.2
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	6.5
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			Spring clamp connection
Type of electrical connection for auxiliary- and control current circuit			Spring clamp connection
Rail mounting possible			Yes
Degree of protection (IP)			IP20
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

Approvals

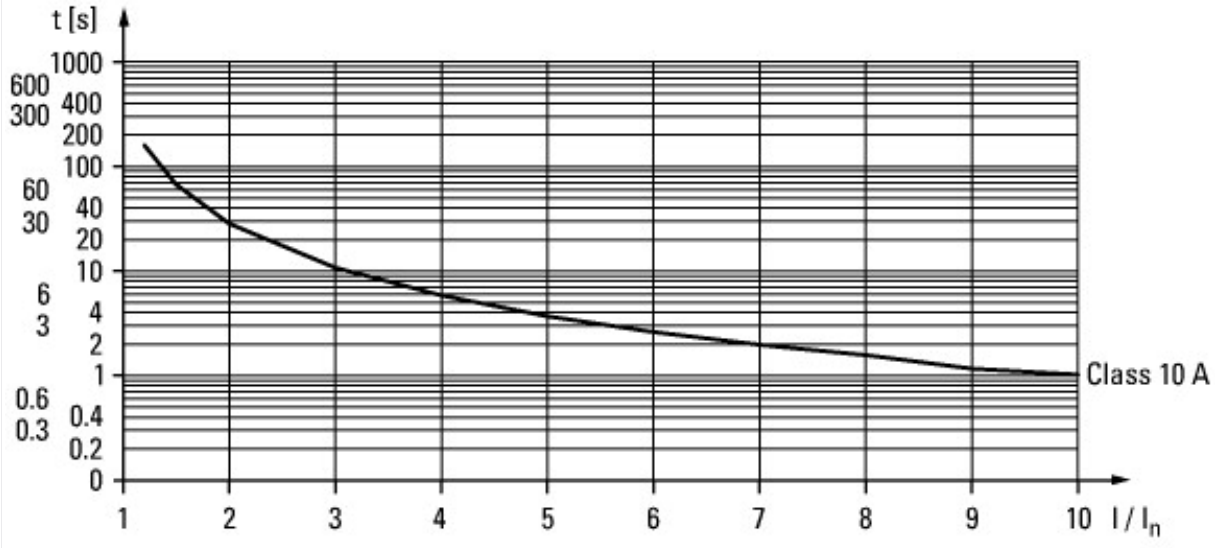
Product Standards	IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14; CE marking
UL File No.	E29096
UL Category Control No.	NLDX, NLDX7
CSA File No.	UL report applies to both US and Canada
North America Certification	UL listed, certified by UL for use in Canada
Specially designed for North America	No

Characteristics

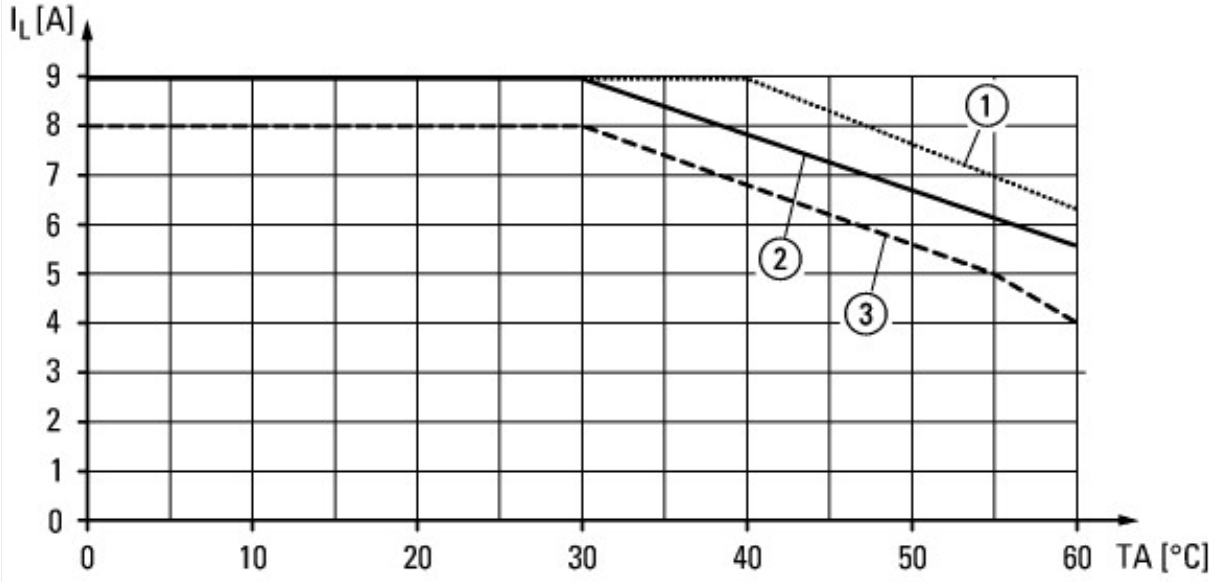


Tripping characteristics
CLASS 10

set motor current 4 A



Tripping characteristics
CLASS 10A
set motor current > 4 A



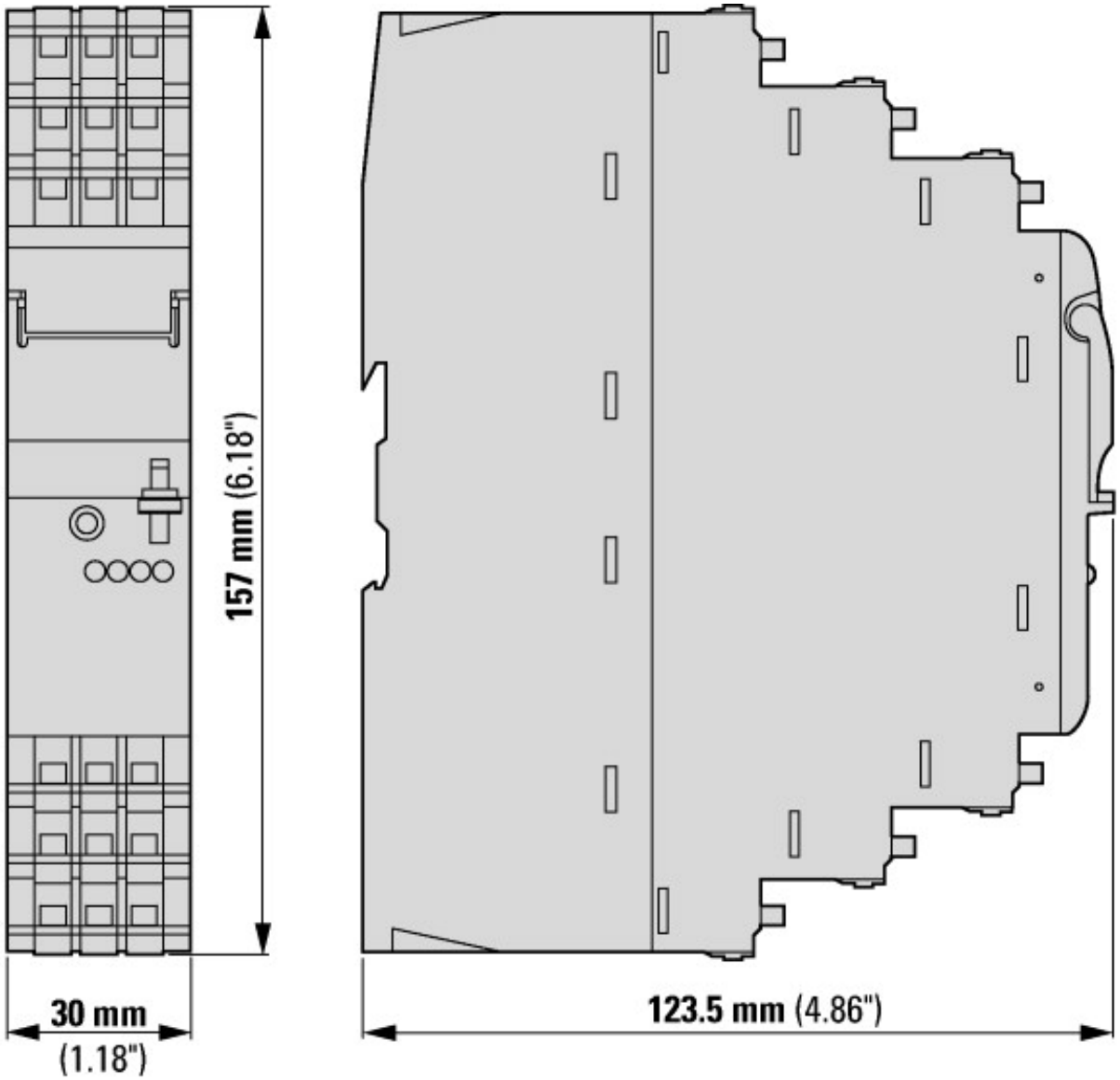
Current derating

① Single device

② connected in series with 30 mm clearance

③ connected in series without clearance

Dimensions



Additional product information (links)

IL03407198Z Electronic motor starter EMS	
IL03407198Z Electronic motor starter EMS	ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407198Z2015_03.pdf
MN03407009Z EMS electronic motor starter	
MN03407009Z EMS electronic motor starter - Deutsch / English	ftp://ftp.moeller.net/DOCUMENTATION/AWB_MANUALS/MN03407009Z_DE_EN.pdf
Produktinformation EMS, Hinweise zur Projektierung	http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_1040938_de.pdf