



**197165**  
**EMS2-RO-Z-9-24VDC**

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## 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.

### Motor ratings

Max. rating for three-phase motors, 50 - 60 Hz  
AC-53a  
380 V 400 V 415 V [F]  
0.55 - 3 kW

Setting range of overload releases [I]  
1,5 - 6,5 (AC-53a)  
1,5 - 9 (AC-51) A\_x

Actuating voltage  
24 V DC

Connection technique  
Screw terminals

Connection to SmartWire-DT  
no

## TECHNICAL DATA

### General

Standards  
IEC/EN 60947-4-2  
UL508

Ambient temperature  
Storage  
Mn. ambient temperature, storage  
- 40 °C

Ambient temperature  
Storage  
Ambient temperature, storage max.  
+ 80 °C

Ambient temperature  
Open  
Operating ambient temperature min.  
-25 °C

Ambient temperature  
Open  
Operating ambient temperature max.  
+70 °C

Weight  
0.22 kg

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

Terminal capacity  
Screw terminals  
Terminal capacity main cable  
0.2 - 2.5 mm<sup>2</sup>

Terminal capacity  
Screw terminals  
Terminal capacity main cable  
24 - 14 AWG

Terminal capacity  
Screw terminals  
Terminal capacity control circuit cables  
0.14 - 2.5 mm<sup>2</sup>

Terminal capacity  
Screw terminals  
Terminal capacity control circuit cables  
26 - 14 AWG

Terminal capacity  
Screw terminals  
tightening torque  
0.5 - 0.6 Nm

## Main conducting paths

Rated operational voltage [U<sub>e</sub>]  
500 V AC


Operational voltage range  
Operating voltage range min.  
42 V

Operational voltage range  
Operating voltage range max.  
550 V

Rated operational current  
AC-51 [I<sub>e</sub>]  
9 A

Rated operational current  
AC-53a [ $I_n$ ]  
6.5 A

Rated operational current  
AC-53a: Please note possible derating.

Rated operational current  
Setting range of overload releases  [ $I_r$ ]  
1,5 - 6,5 (AC-53a)  
1,5 - 9 (AC-51) A\_x

Release class  
10A CLASS

Heat dissipation [ $P_V$ ]  
1.1 - 14.6 W

## Control section

Rated control voltage [ $U_c$ ]  
24 V DC

Control voltage range  
19,2 - 30 V DC V

Residual ripple on the input voltage  
 5 %

Rated control current [ $I_c$ ]  
40 mA

Actuating circuit (ON, L, R)  
Rated actuation voltage [ $U_c$ ]  
24 V

Actuating circuit (ON, L, R)  
Switching level "Low"  
-3 - +9.6 V DC V

Actuating circuit (ON, L, R)  
Switching level "confirm Off"  
< 5 V DC V

Actuating circuit (ON, L, R)  
Switching level "High"  
19.2 - 30 V DC V

Actuating circuit (ON, L, R)  
Rated actuating current [I<sub>a</sub>]  
5 mA

Relay outputs  
Contacts  
CO = changeover  
1 CO

Rated operational current  
AC-15  
230 V [I<sub>e</sub>]  
3 A

Rated operational current  
DC-13  
24 V [I<sub>e</sub>]  
2 A

## Electromagnetic compatibility (EMC)

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

## Technical safety parameters:

**Notes**  
motor protection

## DESIGN VERIFICATION AS PER IEC/EN 61439

### Technical data for design verification

Rated operational current for specified heat  
dissipation [I<sub>n</sub>]  
9 A

Heat dissipation per pole, current-dependent [ $P_{vid}$ ]  
0 W

Equipment heat dissipation, current-dependent  
[ $P_{vid}$ ]  
14.6 W

Static heat dissipation, non-current-dependent [ $P_{vs}$ ]  
1 W

Heat dissipation capacity [ $P_{diss}$ ]  
0 W

Operating ambient temperature min.  
-25 °C

Operating ambient temperature max.  
+70 °C

If necessary, Allow for 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 Strength of materials and parts  
10.2.3.1 Verification of thermal stability of enclosures  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
10.2.3.2 Verification of resistance of insulating materials to normal heat  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
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 Strength of materials and parts  
10.2.4 Resistance to ultra-violet (UV) radiation  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
10.2.5 Lifting  
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts  
10.2.6 Mechanical impact  
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts  
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 Insulation properties  
10.9.3 Impulse withstand voltage  
Is the panel builder's responsibility.

10.9 Insulation properties  
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) / Mtor starter/Mtor starter combination (EO001037)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Load breakout, motor breakout / Mtor 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  $U_s$  at AC 50HZ  
0 - 0 V

Rated control supply voltage  $U_s$  at AC 60HZ  
0 - 0 V

Rated control supply voltage  $U_s$  at DC  
24 - 24 V



Voltage type for actuating  
DC

Rated operation power at AC-3, 230 V, 3-phase  
1.5 kW

Rated operation power at AC-3, 400 V  
3 kW

Rated power, 460 V, 60 Hz, 3-phase  
0 kW

Rated power, 575 V, 60 Hz, 3-phase  
0 kW

Rated operation current  $I_e$   
9 A

Rated operation current at AC-3, 400 V  
6.5 A

Overload release current setting  
1.5 - 9 A

Rated conditional short-circuit current, type 1, 480  
Y/277 V  
0 A

Rated conditional short-circuit current, type 1, 600  
Y/347 V  
0 A

Rated conditional short-circuit current, type 2, 230  
V  
0 A

Rated conditional short-circuit current, type 2, 400  
V  
0 A

Number of auxiliary contacts as normally open  
contact  
1

Number of auxiliary contacts as normally closed contact  
1

Ambient temperature, upper operating limit  
40 °C

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  
No

Coordination class according to IEC 60947-4-3

Number of indicator lights  
4

External reset possible  
Yes

With fuse  
No

Degree of protection (IP)  
IP20

Degree of protection (NEVA)  
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  
22.5 mm

Height  
106.8 mm

Depth  
113.6 mm

## 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

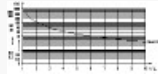
CSA File No.  
UL report applies to both US and Canada

North America Certification  
UL listed, certified by UL for use in Canada

Specially designed for North America  
No

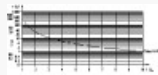
## CHARACTERISTICS

Characteristic curve



Tripping characteristic curve  
CLASS 10  
set motor current  4 A

Characteristic curve



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

Characteristic curve



Electricity derating devices with  $I_b = 9 A$   
 For devices installed with a minimum clearance  
of 20 mm  
 For devices in direct sequence

# DIMENSIONS

