192397
EMS2-DOS-T-9-24VDC

Overview
Specifications
Resources

DELIVERY PROGRAM

Product range
Electronic motor starter

Basic function
DOL starters (complete devices)

Description
DOL starting
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 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]
0.55 - 3 kW

Setting range of overload releases [Ir]
1,5 - 7 (AC-53a)
1,5 - 9 (AC-51) A_x

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
IEC 61508
ISO 13849
UL508

Ambient temperature
Storage
Min. 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, EN 50178, VBG 4)
IP20

Mounting position
Vertical
Motor feeder at bottom

Terminal capacity
Push-in terminals
0.2 - 2.5 mm^2

Terminal capacity
Push-in terminals
24 - 14 AWG

Main conducting paths

Rated operational voltage [U_e]
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_e]
9 A

Rated operational current
AC-53a [I_e]
7 A

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

Rated operational current
Setting range of overload releases [I_r]
1,5 - 7 (AC-53a)
1,5 - 9 (AC-51) A_x

Release class
10A CLASS

Heat dissipation [P_V]
1 - 12 W

Control section

Rated control voltage [U_s]
24 V DC

Control voltage range
19,2 - 30 V DC V

Residual ripple on the input voltage
□ 5 %

Rated control current [I_s]
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_c]
10 mA

Relay outputs
Contacts
CO = changeover
1 CO

Rated operational current
AC-15
230 V [I_e]
2 A

Rated operational current
DC-13
24 V [I_e]
2 A

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
60 °C

Values according to EN ISO 13849-1
$MTTF_d$ [Years]
70 (Sicheres Abschalten) / 60 (Motorschutz)

Values according to EN ISO 13849-1
Performance level [PL]
e (Sicheres Abschalten)

Values according to EN ISO 13849-1
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]
9 A

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

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

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

Heat dissipation capacity [P_{diss}]
0 W

Operating ambient temperature min.
-25 °C

Operating ambient temperature max.

+70 °C

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 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) / 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
Direct starter

With short-circuit release
No

Rated control supply voltage Us at AC 50HZ
0 - 0 V

Rated control supply voltage Us at AC 60HZ
0 - 0 V

Rated control supply voltage Us 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 Ie

9 A

Rated operation current at AC-3, 400 V
7 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
Spring clamp connection

Type of electrical connection for auxiliary- and control current circuit

Spring clamp 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
3

External reset possible
Yes

With fuse
No

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
22.5 mm

Height
110.8 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.
E338590

UL Category Control No.
NLDX, NLDX7

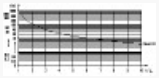
CSA File No.
UL report applies to both US and Canada

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

Specially designed for North America
No

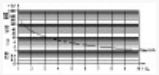
CHARACTERISTICS

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_e = 9 A
□ For devices installed with a minimum clearance of 20 mm
□ For devices in direct sequence

DIMENSIONS