118700
ESR5-NO-21-24VAC-DC

Overview | Specifications | Resources

DELIVERY PROGRAM

Product range
Electronic safety relays

Basic function
Emergency stop; emergency switching off
Protective door
Feedback circuit

Features

Mounting width
22.5 mm

Automatic reset

Operation
single-channel
dual-channel

Supply voltage [U_s]
24 V DC

24 V AC, 50/60 Hz

Approval

Safety related characteristics
Cat. 4
PL e according to EN ISO 13849-1
SILCL 3 according to IEC 62061
SIL 3 according to IEC 61508

Number of enabling paths to EN 60204-1 Stop functions category

Enable current paths to IEC/EN 60204-1 Stop category 0
2

Signal current paths
1

TECHNICAL DATA

General

Intended use
Safety relay for monitoring emergency stop and protective door switch.
Module used to safely interrupt electrical circuits.

Policies List
EMV 2004/108/EG, Maschinen 2006/42/EG

Standards
EN ISO 13849-1:2008,
EN 62061:2005+AC:2010,
EN 61508, Parts 1-7:2001,
EN 50178:1997,
EN 60204-1:2006+A1:2009

Dimensions (W x H x D)
22.5 x 99 x 114.5 mm

Mounting width

22.5 mm

Weight
0,22 kg

Mounting position
As required

Mounting
Top-hat rail IEC/EN 60715, 35 mm

Connection type
M3 screw terminals

Lifespan, mechanical [Operations]
10×10^6

Terminal capacity
Solid
1x (0.2 – 2.5)
2x (0.2 – 1) mm^2

Terminal capacity
Flexible with ferrule
1x (0.25 – 2.5)
2x (0.25 – 1) mm^2

Terminal capacity
Solid or stranded
24 - 12 AWG

Terminal screw
Pozidriv screwdriver
2 Size

Terminal screw
Standard screwdriver
0.6 x 3.5 mm

Terminal screw
Max. tightening torque
0.6 Nm

Stripping length
7 mm

Material
Housing: polyamide PA not reinforced
Contacts: Material: silver tin oxide, gold plated
(AgSnO2, 0.2 µm Au)

Duty factor
100 % DF

Operating conditions
Climatic environmental conditions
Climatic proofing
Cold to EN 60068-2-1
Dry heat to IEC 60068-2-2
Damp heat as per EN 60068-2-3

Operating conditions
Ambient temperature
Operation [ϑ]
-20 - +55 °C

Operating conditions
Ambient temperature
Storage [ϑ]
-40 - +70 °C

Operating conditions
Ambient temperature
Condensation
Non-condensing

Operating conditions
Atmospheric conditions
relative humidity
Max. 75 %

Operating conditions
Atmospheric conditions
Air pressure (operation)
795 - 1080 hPa

Operating conditions
Atmospheric conditions
Altitude [Above sea level]
2000 m

Power loss [P]
5.16 W

Ambient conditions, mechanical

Degree of protection to VDE 0470-1
Enclosures
IP20

Degree of protection to VDE 0470-1
Terminals
IP20

Degree of protection to VDE 0470-1
Degree of Protection
Installation location: ≥ IP54

Degree of protection to VDE 0470-1
B10d [switching cycles]
300000

Protection against direct contact when actuated from front (EN 50274)
Finger and back-of-hand proof

Vibrations (IEC/EN 60068-2-6)
10 - 150 Hz

Amplitude: 0.15 mm

Acceleration: 2 g

Clearance in air and creepage distances
EN 50178, UL 508, CSA C22.2, No. 14-95

Rated impulse withstand voltage [U_{imp}]
6000 V AC

Insulation
Safe isolation
Reinforced insulation

Overvoltage category/pollution degree
III/2

Stop category [according to EN60204-1]
5,05

Technical safety parameters:
Values according to EN ISO 13849-1
Performance level [according to EN ISO 13849-1]
PL e

Technical safety parameters:
Values according to EN ISO 13849-1
Category [according to EN ISO 13849-1]
Kat. 4

Safety integrity level claim limit [in accordance with 62061]
SILCL 3

Safety integrity level [In accordance with IEC 61508]
SIL 3

Probability of failure per hour [PFH_d]
5.05×10^{-10}

Prooftest High Demand
240 Months

Demand level
< 12 Months

Prooftest Low Demand
66 Months

Lifetime
240 Months

Rated operational voltage [U_e]
230 V AC

Rated operational voltage [U_e]
24 V AC, 24 V DC V

Permissible range
0.85 - 1.1 x Ue

Rated insulation voltage [U_i]
250 V AC

Quadratic summation current
72 A^2 ($I_{TH}^2 = I_1^2 + I_2^2$) A^2

Notes

Observe derating curve
□ Engineering

Inrush current
min - max0.025 - 6 A

Minimum switching capacity
0.4 W

Control circuit

Power supply circuit
AC operated 50/60 Hz
3.4 W

Power supply circuit
DC operated
1.6 W

Fuse for control circuit supply
24 V
short-circuit proof

Input data

Rated current
S12, S22:30, S34:45 mA

Current consumption
AC: 140
DC: 65 mA

Voltage at input, starting and feedback circuit
Approx. 24 V DC

Max. resistive load of the cable [R]
□ 50 Ω

Short-circuit current
2.3 A

Pick-up time (K1, K2) for UN automatic mode,
typical [t_A]
100 ms

Pick-up time
at Ue in automatic mode: normally 100 ms

Reset time (K1, K2) for U_N , normally [t_R]
45 (single-channel)
10 (dual-channel) ms

Recovery time [t_W]
Approx. 1000 ms

Simultaneity for inputs 1/2 [t_{sync}]
∞ ms

Maximum permissible total cable resistance (input and starting circuits for UN) [R_L]
approx. 50 Ω

Maximum switching frequency
0.5 Hz

Status indication
Green LED

Output data

Contact type
Non-delayed enable current paths
2

Contact type
Delayed signal current path
1

Switching voltage
min – max15 - 250 V AC
15 - 250 V DC

Limiting continuous current
perN/O: 6
N/C: 6 A

Short-circuit protection for output circuits, external
Fuse 6 A gL/gG

Output fuse

NEOZED (N/O)
10 gL/gG

Output fuse
NEOZED (N/C)
6 gL/gG

Maximum breaking power
Resistive load (τ = 0 ms)
24 V DC
144 W

Maximum breaking power
Resistive load (τ = 0 ms)
48 V DC
288 W

Maximum breaking power
Resistive load (τ = 0 ms)
110 V DC
77 W

Maximum breaking power
Resistive load (τ = 0 ms)
220 V DC
88 W

Maximum breaking power
Resistive load (τ = 0 ms)
250 V AC
1500 VA

Maximum breaking power
Inductive load (τ = 40 ms)
24 V DC
48 W

Maximum breaking power
Inductive load (τ = 40 ms)
48 V DC
40 W

Maximum breaking power
Inductive load (τ = 40 ms)
110 V DC
35 W

Maximum breaking power
Inductive load (τ = 40 ms)
220 V DC

35 W

Switching capacity
In accordance with IEC 60947-5-1

Switching capacity
AC-15
230 V
4 A bei 360 S/h
3 A bei 3600S/h A

Switching capacity
DC-13
24 V
4 A bei 360 S/h
2.5 A bei 3600S/h A

Further information (flip catalog)
description

Electromagnetic compatibility (EMC)

Emitted interference
In accordance with EN 61000-6-4

Interference immunity
In accordance with EN 61000-6-2
EN 662061_x

DESIGN VERIFICATION AS PER IEC/EN 61439

Technical data for design verification

Rated operational current for specified heat dissipation [I_n]
0 A

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

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

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

Heat dissipation capacity [P_{diss}]
0 W

Operating ambient temperature min.
-20 °C

Operating ambient temperature max.
+55 °C

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

Relays (EG000019) / Device for monitoring of safety-related circuits (EC001449)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Monitoring equipment (low-voltage switch technology) / Device for monitoring of safety-related circuits (ecl@ss10.0.1-27-37-18-19 [ACO304011])

Model
Basic device

Suitable for monitoring of position switches
Yes

Suitable for monitoring of emergency-stop circuits
Yes

Suitable for monitoring of valves
No

Suitable for monitoring of optoelectronic protection equipment
No

Suitable for monitoring of tactile sensors
No

Suitable for monitoring of magnetic switches
No

Suitable for monitoring of proximity switches

No

Type of electric connection
Screw connection

Rail mounting possible
Yes

Rated control supply voltage Us at AC 50HZ
0 - 26.4 V

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

Rated control supply voltage Us at DC
0 - 0 V

Voltage type for actuating
AC/DC

With detachable clamps
Yes

Evaluation inputs
1-channel

With start input
Yes

With muting function
No

With feedback circuit
Yes

Release-delay
0 - 0 s

Number of outputs, safety related, undelayed, with contact
2

Number of outputs, safety related, delayed, with contact

0

Number of outputs, safety related, undelayed, semiconductors
0

Number of outputs, safety related, delayed, semiconductors
0

Number of outputs, signalling function, undelayed, with contact
1

Number of outputs, signalling function, delayed, with contact
0

Number of outputs, signalling function, undelayed, semiconductors
0

Number of outputs, signalling function, delayed, semiconductors
0

Category according to EN 954-1
4

Type of safety acc. IEC 61496-1
None

Stop category acc. IEC 60204
0

Performance level acc. EN ISO 13849-1
Level e

SIL according to IEC 61508
3

With approval for TÜV
Yes

With approval for BG BIA
No

With approval according to UL
Yes

Width
22.5 mm

Height
99 mm

Depth
114.5 mm

APPROVALS

Product Standards
IEC/EN see Technical Data; UL 508; CSA-C22.2 No. 14-95; CE marking

UL File No.
E29184

UL Category Control No.
NKCR; NKCR7

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

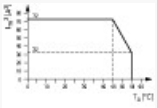
CSA Class No.
3211-83; 3211-03

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

Degree of Protection
IEC: IP20, UL/CSA Type: -

CHARACTERISTICS

Characteristic curve



Derating curve

DIMENSIONS