Specifications

Eaton EP-401062

Catalog Number: EP-401062

Eaton ESR5 Single/Dual Channel Safety Relay, 3 Enabling + 1 Signaling Path, 24V DC



General specifications

Product Name
Eaton ESR5 Safety relay

Catalog Number
EP-401062

Model Code
ESR5-NO-31-24VDC

EAN
4015082965143

Product Length/Depth
114.5 mm

Product Height
99 mm

Product Width
22.5 mm

Product Weight
0.164 kg

Compliances
EMC Directive: 2004/108/EC

Certifications
EN ISO 13849-1
EN 62061
IEC 61508, Parts 1-7
EN 50178
EN 60204-1
Machines 2006/42/EG
UL File No.: E29184
UL Category Control No.: NKCR; NKCR7

UL report applies to both US and Canada
CSA Class No.: 3211-83; 3211-03
North America (UL listed, certified by UL for use in Canada)

Powering Business Worldwide

Product specifications

Mounting method

Rail mounting possible

Top-hat rail fixing (according to IEC/EN 60715, 35 mm)

Operating temperature - max

55 °C

Operating temperature - min

-20 °C

Features

Basic insulation

Safe insulation

Reinforced insulation

6 kV between A1-A2 / logic / enable and signal current paths

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.

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 Resist. of insul. mat. to abnormal heat/fire by internal elect. 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

Resources

Brochures

eaton-esr5-safety-relay-brochure-br049005en-en-us.pdf

Catalogs

eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf

Declarations of conformity

DA-DC-00004980.pdf

DA-DC-00004970.pdf

Drawings

eaton-safety-relais-ESR5-dimension-2131DIM-5.eps

Installation instructions

eaton-safety-relay-esr5-no-31-24vdc-instruction-leaflet-il049014zu.pdf

Manuals and user guides

eaton-safety-relay-esr5-no-31-24vdc-manual-mn049018en-en-us.pdf

mCAD model

eaton-esr5_no_xx_24vdc-drawing.dwg

esr5_no21_no31_24v.stp

esr5_no21_no31_24v.dwg

eaton-cadenas-side_view-esr5_no21_no31_24v_side.pra

eaton-cadenas-path-safety-esr5_no21_no31_24v.3db

eaton-esr5_no_xx_24vdc-3d-model.stp

eaton-cadenas-front_view-esr5_no21_no31_24v_front.pra

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.

10.9.2 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.

Electric connection type

Screw connection

Fitted with:

Detachable clamps
Start input
Feedback circuit
Approval according to UL
Approval for TÜV

Pollution degree

2

Climatic proofing

Cold to EN 60068-2-1

Dry heat to IEC 60068-2-2

Damp heat, constant, to IEC 60068-2-3

Rated impulse withstand voltage (Uimp)

4000 V AC

Air pressure

795 - 1080 hPa (operation)

Altitude

Max. 2000 m

Degree of protection

IP20

Installation location: ≥ IP54

Terminals: IP20

Enclosure: IP20

Environmental conditions

Clearance in air and creepage distances according to EN 50178,

UL 508, CSA C22.2, No. 14-95

Condensation: Non-condensing

Number of inputs

One- and two-channel

Safety performance level (EN ISO 13849-1)

Level e

Ambient operating temperature - max

55 °C

Ambient operating temperature - min

-20 °C

Ambient storage temperature - max

70 °C

Ambient storage temperature - min

-40 °C

Lifetime

240 month

Number of outputs (safety related, delayed) with contact

0

Number of outputs (safety related, delayed, semiconductors)

0

Number of outputs (safety related, undelayed) with contact

3

Number of outputs (safety related, undelayed, semiconductors)

0

Number of outputs (signaling function, delayed) with contact

0

Number of outputs (signaling function, delayed, semiconductors)

0

Number of outputs (signaling function, undelayed) with contact

1

Number of outputs (signaling function, undelayed, semiconductors)

0

Screwdriver size

2, Terminal screw, Pozidriv screwdriver

0.6 x 3.5 mm, Terminal screws

Connection type

M3 screw terminals

Mounting position

As required

Breaking power

144 W max., resistive load (τ = 0 ms), at 24 V DC

288 W max., resistive load (τ = 0 ms), at 48 V DC

110 W max., resistive load (τ = 0 ms), at 110 V DC

88 W max., resistive load (τ = 0 ms), at 220 V DC

1500 VA, max., resistive load (τ = 0 ms), at 250 V AC

48 W max., inductive load (τ = 40 ms), at 24 V DC

40 W max., inductive load (τ = 40 ms), at 48 V DC

35 W max., inductive load (τ = 40 ms), at 110 V DC

35 W max., inductive load (τ = 40 ms), at 220 V DC

Overvoltage category

III

Emitted interference

According to EN 61000-6-4

Current consumption

70 mA, DC

Material

Enclosure: Polyamide (PA), not reinforced

Contacts: silver tin oxide, gold plated (AgSnO2, 0.2 µm Au)

Interference immunity

According to EN-61000-6-2

According to EN 662061_x

Tightening torque

0.6 Nm, Screw terminals

Mounting width

22.5 mm

Suitable for

Monitoring of position switches
Monitoring of emergency-stop circuits
Monitoring of magnetic switches
monitoring of proximity switches
monitoring of tactile sensors
monitoring of valves

Relative humidity

< 75 %

Lifespan, mechanical

10,000,000 Operations

Input

∞ ms, Simultaneity for inputs 1/2

Recovery time

1000 ms

Resistance

50 Ω (impedance)

Inrush current

0.01 - 20 (Δt 100 ms)

Model

Basic device

Safety type (IEC 61496-1)

None

Short-circuit current

2.3 A, Input data

Vibration resistance

10 - 150 Hz, Amplitude: 0.15 mm, Acceleration: 2 g, (IEC/EN 60068-2-6)

Safety parameter (EN ISO 13849-1)

300,000 switching cycles, B10d
Cat. 4, Category
PL e, Performance level

Terminal capacity

1 x (0.2 – 2.5) mm², solid
2 x (0.2 – 1) mm², solid

1 x (0.25 – 2.5) mm², flexible with ferrule

2 x (0.25 – 1) mm², flexible with ferrule

24 - 12 AWG, solid or stranded

Rated control supply voltage (Us) at DC - max

26.4 VDC

Rated control supply voltage (Us) at DC - min

20.4 VDC

Rated insulation voltage (Ui)

250 V

Release-delay - max

0 s

Release-delay - min

0 s

Static heat dissipation, non-current-dependent Pvs

5.16 W

Stripping length (main cable)

7 mm

Protection

Finger and back-of-hand proof, Protection against direct contact

when actuated from front (EN 50274)

SIL (IEC 61508)

3

Permissible total cable resistance

Approx. 50 Ω (input and starting circuits for UN)

Power loss

Normally 5.16 W

Prooftest

66 Months (Low Demand)

240 Months (High Demand)

Quadratic summation current

72 A^2 ($ITH^2 = I1^2 + I2^2 + I3^2$)

Rated operational voltage

24 V DC (power supply)

Reset time

Normally 20 ms

Safety parameter (IEC 62061)

SIL 3, Safety integrity level, In accordance with IEC 61508

5.05 x 10-10, PFHd, Probability of failure per hour

Uninterrupted current

6 A N/O, Limiting continuous current

6 A N/C, Limiting continuous current

Stop category (IEC 60204)

0

Switching capacity

In accordance with IEC 60947-5-1, Outputs

4 A at 360 O/h, AC-15 at 230 V, Outputs

3 A at 3600 O/h, AC-15 at 230 V, Outputs

4 A at 360 O/h, DC-13 at 24 V, Outputs

2.5 A at 3600 O/h, DC-13 at 24 V, Outputs

0.1 W

Switching frequency

Max. 0.5 Hz, Input data

Power consumption

1.68 W

Control voltage 1 - min

24 VDC

Control voltage 1 - max

26.4 VDC

Control voltage 1 type

DC

Voltage type of supply voltage

DC

Voltage type of operating voltage

DC

Rated switch current

6 A

Supply voltage at AC, 50 Hz - min

0 V

Supply voltage at AC, 50 Hz - max

0 V

Supply voltage at AC, 60 Hz - min

0 V

Supply voltage at AC, 60 Hz - max

0 V

Supply voltage at DC - min

0 V

Supply voltage at DC - max

24 V

Operating voltage at DC - min

24 V

Operating voltage at DC - max

26.4 V

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