

Safety relays for emergency stop/protective door/light curtain monitoring, 24VDC, off-delayed, 0-300 sec.



Part no. ESR5-NV3-300
171858
EL Number 4560876
(Norway)

General specifications		
Product name		Eaton ESR5 Safety relay
Part no.		ESR5-NV3-300
EAN		4015081684298
Product Length/Depth		114.5 millimetre
Product height		99 millimetre
Product width		45 millimetre
Product weight		0.472 kilogram
Compliances		Contact Manufacturer
Certifications		IEC/EN 60204 CSA Class No.: 3211-83; 3211-03 UL 508 IEC 61508, Parts 1-7 CE EN 50178 UL UL File No.: E29184 IEC 62061 UL Category Control No.: NKCR; NKCR7 UL report applies to both US and Canada CSA-C22.2 No. 14-95 EN ISO 13849-1 Certified by UL for use in Canada 2014/30/EU Machines 2006/42/EG
Product Tradename		ESR5
Product Type		Safety relay
Product Sub Type		None
Features & Functions		
Electric connection type		Screw connection
Features		Safe insulation 3 Non-delayed enable current paths Monitored reset Automatic start 6 kV between the enable current paths (13/14, 23/24, 33/34) and the remaining rungs, as well as between 13/14, 23/24, 33/34 in relation to each other Manual start Reinforced insulation Basic insulation
Fitted with:		Feedback circuit Start input Approval according to UL Detachable clamps Approval for TÜV
Functions		1-channel 2-channel
General information		
Connection type		M3 screw terminals
Current consumption		155 mA, DC
Degree of protection		Installation location: ≥ IP54 Enclosure: IP20 Terminals: IP20 IP20
Emitted interference		According to EN 61000-6-4
Interference immunity		According to EN 61000-6-2
LED indicator		Status indication of SmartWire-DT network: Green LED
Lifespan, mechanical		10,000,000 Operations
Model		Basic device
Mounting method		Rail mounting possible Top-hat rail fixing (according to IEC/EN 60715, 35 mm)

Mounting width		45 mm
Overvoltage category		III
Pollution degree		2
Power loss		Normally 5.43 W
Product category		Electronic safety relays
Protection		Finger and back-of-hand proof, Protection against direct contact when actuated from front (EN 50274)
Rated impulse withstand voltage (Uimp)		4000 V AC
Recovery time		1000 ms
Safety parameter (EN ISO 13849-1)		PL e, Performance level Cat. 4, Category 300,000 switching cycles, B10d
Safety parameter (IEC 62061)		SILCL 3, Safety integrity level claim limit 3.6 x 10 ⁻¹⁰ , PFHd, Probability of failure per hour Off-delay contacts, SILCL 2 as per IEC 62061 SIL 3, Safety integrity level, In accordance with IEC 61508 Cat. 4, Category Non-time-delay contacts, SILCL 3 as per IEC 62061 and SIL 3 as per IEC 61508
Stop category (IEC 60204)		0 + 1
Suitable for		Monitoring of emergency-stop circuits Module used to safely interrupt electrical circuits Monitoring of position switches Safety relay for monitoring emergency stop and protective door switch
Switching frequency		Max. 0.5 Hz, Input data
Type		Emergency stop category 1; emergency switching off Light curtain Protective door
Voltage type		DC
Ambient conditions, mechanical		
Mounting position		As required
Proof test		240 Months (High Demand) 19 Months (Low Demand)
Switching capacity		3 A at 3600 O/h, AC-15 at 230 V, Outputs 2.5 A at 3600 O/h, DC-13 at 24 V, Outputs 0.4 W In accordance with IEC 60947-5-1, Outputs 4 A at 360 O/h, AC-15 at 230 V, Outputs
Vibration resistance		10 - 150 Hz, Amplitude: 0.15 mm, Acceleration: 2 g, (IEC/EN 60068-2-6)
Climatic environmental conditions		
Air pressure		795 - 1080 hPa (operation)
Altitude		Max. 2000 m
Ambient operating temperature - min		-20 °C
Ambient operating temperature - max		55 °C
Ambient storage temperature - min		-40 °C
Ambient storage temperature - max		70 °C
Climatic proofing		Cold to EN 60068-2-1 Dry heat to IEC 60068-2-2 Damp heat, constant, to IEC 60068-2-3
Environmental conditions		Clearance in air and creepage distances according to EN 50178, UL 508, CSA C22.2, No. 14-95 Condensation: Non-condensing
Operating temperature - min		-20 °C
Operating temperature - max		55 °C
Relative humidity		< 75 %
Terminal capacities		
Terminal capacity		1 x (0.2 – 2.5) mm ² , solid 2 x (0.2 – 1) mm ² , solid 2 x (0.25 – 1) mm ² , flexible with ferrule 1 x (0.25 – 2.5) mm ² , flexible with ferrule 24 - 12 AWG, solid or stranded
Stripping length (main cable)		7 mm
Screwdriver size		2, Terminal screw, Pozidriv screwdriver 0.6 x 3.5 mm, Terminal screws
Tightening torque		0.6 Nm, Screw terminals
Electrical rating		
Inrush current		0.025 - 6 A

Rated control supply voltage (Us) at AC, 50 Hz - min		0 V
Rated control supply voltage (Us) at AC, 50 Hz - max		230 V
Rated control supply voltage (Us) at AC, 60 Hz - min		20.4 V
Rated control supply voltage (Us) at AC, 60 Hz - max		26.4 V
Rated control supply voltage (Us) at DC - min		24 V
Rated control supply voltage (Us) at DC - max		24 V
Rated insulation voltage (Ui)		250 V
Rated operational voltage		Approx. 24 V DC at input, starting and feedback circuit 230 V AC 24 V DC (power supply)
Short-circuit protection		Non-time-delay 6-A fast-blow fuse, For output circuits, External Time-delay 10-A gL/gG Neozed fuse, For output circuits, External
Short-circuit protection rating		6 A (non-delayed), Output fuse, Output data 10A gL/gG, NEOZED (delayed), Output fuse, External, Output data
Input/Output		
Breaking power		33 W max., inductive load ($\tau = 40$ ms), at 220 V DC 1500 VA, max., resistive load ($\tau = 0$ ms), at 250 V AC 144 W max., resistive load ($\tau = 0$ ms), at 24 V DC 288 W max., resistive load ($\tau = 0$ ms), at 48 V DC 40 W max., inductive load ($\tau = 40$ ms), at 48 V DC 35 W max., inductive load ($\tau = 40$ ms), at 110 V DC 42 W max., inductive load ($\tau = 40$ ms), at 24 V DC 88 W max., resistive load ($\tau = 0$ ms), at 220 V DC 77 W max., resistive load ($\tau = 0$ ms), at 110 V DC
Input		∞ ms, Simultaneity for inputs 1/2
Number of inputs		One- and two-channel
Number of outputs (safety related, delayed) with contact		2
Number of outputs (safety related, undelayed) with contact		3
Number of outputs (signaling function, delayed) with contact		0
Number of outputs (signaling function, undelayed) with contact		1
Off-delay		0.2 - 300 s (± 40 %, K3, K4 adjustable)
Permissible total cable resistance		22 Ω (input and starting circuits for UN)
Pick-up time		600 ms typ. (at U# in automatic mode) 70 ms typ. (at U# in manual mode) 600 ms typ. (K1, K2 - for UN automatic mode) 70 ms typ. (K1, K2 - for UN manual operation)
Quadratic summation current		55 A ² ($I_{TH}^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2 + I_5^2$)
Reset time		20 ms (non-delayed contacts)
Switching voltage		250 V
Uninterrupted current		6 A N/C, Limiting continuous current 6 A N/O, Limiting continuous current
Design verification		
Equipment heat dissipation, current-dependent Pvid		0 W
Heat dissipation capacity Pdiss		0 W
Heat dissipation per pole, current-dependent Pvid		0 W
Rated operational current for specified heat dissipation (In)		0 A
Static heat dissipation, non-current-dependent Pvs		5.43 W
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		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.
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 9.0

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@ss13-27-37-18-19 [ACO304016])		
Model		Basic device
Rail mounting possible		Yes
With detachable clamps		Yes
Type of electric connection		Screw connection
Voltage type (supply voltage)		DC
Supply voltage AC 50 Hz	V	0 - 0
Supply voltage AC 60 Hz	V	0 - 0
Supply voltage DC	V	24 - 24
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
Evaluation inputs		One- and two-channel
Power consumption	W	5.43
With start input		Yes
With muting function		No
With feedback circuit		Yes
Release-delay	s	0.2 - 300
Type of control voltage 1		DC
Control voltage 1	V	24 - 24
Type of control voltage 2		AC
Control voltage 2	V	24 - 24
Number of outputs, safety related, undelayed, with contact		3
Number of outputs, safety related, delayed, with contact		2
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
Voltage type (operating voltage)		DC
Operating voltage AC 50 Hz	V	0 - 0
Operating voltage AC 60 Hz	V	0 - 0
Operating voltage DC	V	24 - 24
Rated switch current	A	4
Type of safety according to IEC 61496-1		None
Stop category according to IEC 60204		0 + 1
Performance level according to EN ISO 13849-1		Level e
SIL according to IEC 61508		3

With approval for BG BIA			No
With approval according to UL			Yes
Width		mm	45
Height		mm	99
Depth		mm	114.5
With approval for TÜV			Yes