

**Safety relay emergency stop/protective door/light curtain monitoring
with wide range input, 24 V-230 VDC/AC**

**Part no. ESR5-NO-31-UC
191796**

General specifications		
Product name		Eaton ESR5 Safety relay
Part no.		ESR5-NO-31-UC
EAN		4015081923151
Product Length/Depth		114.5 millimetre
Product height		113 millimetre
Product width		22.5 millimetre
Product weight		0.17 kilogram
Certifications		IEC 61508, Parts 1-7 2014/30/EU UL Certified by UL for use in Canada UL report applies to both US and Canada IEC 62061 CE UL File No.: E29184 IEC/EN 60947-5-1 EN ISO 13849-1 EN 50156-1 CSA-C22.2 No. 14-95 UL 508 Machines 2006/42/EG
Product Tradename		ESR5
Product Type		Safety relay
Product Sub Type		None
Features & Functions		
Electric connection type		Screw connection
Features		Start button monitoring 4 kV basic insulation between all current paths and enclosure 4 kV basic insulation between 23/24 and 33/34 enable signal current paths and 41/42 signaling current path Manual start 3 Non-delayed enable current paths Safe insulation Automatic start 6 kV reinforced insulation between all other current paths
Fitted with:		Detachable clamps Approval according to UL Start input Feedback circuit
Functions		2-channel 1-channel
General information		
Connection type		M3 screw terminals
Degree of protection		Terminals: IP20 Installation location: ≥ IP54 IP20 Enclosure: IP20
LED indicator		Status indication of SmartWire-DT network: Green LED
Lifetime		240 mo
Model		Basic device
Mounting method		Top-hat rail fixing (according to IEC/EN 60715, 35 mm) Rail mounting possible
Mounting width		22.5 mm
Overvoltage category		III
Pollution degree		2
Product category		Electronic safety relays
Safety parameter (EN ISO 13849-1)		Cat. 4, Category PL e, Performance level
Safety parameter (IEC 62061)		Cat. 4, Category SIL 3, Safety integrity level, In accordance with IEC 61508

		10 x 10 ⁻¹⁰ , PFHd, Probability of failure per hour SILCL 3, Safety integrity level claim limit SIL 3, Safety integrity level
Stop category (IEC 60204)		0
Suitable for		Monitoring of magnetic switches Monitoring of emergency-stop circuits If the sensor circuit is interrupted, the safety relay switches to safe mode Module used to safely interrupt electrical circuits Monitoring of optoelectronic protection equipment Safety relay for monitoring one or two-channel signal generators and control of actuators
Switching frequency		Max. 1 Hz, Input data
Type		Emergency stop category 0; emergency switching off Feedback circuit Light curtain Protective door
Voltage type		AC/DC
Ambient conditions, mechanical		
Mounting position		As required
Prooftest		56 Months (Low Demand) 240 Months (High Demand)
Switching capacity		0.05 W 5 A, DC-13 at 24 V, Outputs
Climatic environmental conditions		
Air pressure		795 - 1080 hPa (operation)
Altitude		Max. 2000 m
Ambient operating temperature - min		-40 °C
Ambient operating temperature - max		55 °C
Ambient storage temperature - min		-40 °C
Ambient storage temperature - max		85 °C
Environmental conditions		Condensation: Non-condensing
Operating temperature - min		-40 °C
Operating temperature - max		55 °C
Relative humidity		< 75 %
Electrical rating		
Rated control supply voltage (Us) at AC, 50 Hz - min		24 V
Rated control supply voltage (Us) at AC, 50 Hz - max		230 V
Rated control supply voltage (Us) at AC, 60 Hz - min		24 V
Rated control supply voltage (Us) at AC, 60 Hz - max		230 V
Rated control supply voltage (Us) at DC - min		24 V
Rated control supply voltage (Us) at DC - max		230 V
Rated insulation voltage (Ui)		250 V
Rated operational voltage		230 V AC
Short-circuit protection		6 A gL/gG, For output circuits, External
Input/Output		
Breaking power		40 W max., inductive load (τ = 40 ms), at 48 V DC 35 W max., inductive load (τ = 40 ms), at 110 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 33 W max., inductive load (τ = 40 ms), at 220 V DC
Input		∞ ms, Simultaneity for inputs 1/2
Number of inputs		One- and two-channel
Number of outputs (safety related, delayed) with contact		0
Number of outputs (safety related, undelayed) with contact		0
Number of outputs (signaling function, delayed) with contact		0
Number of outputs (signaling function, undelayed) with contact		0
Pick-up time		< 100 ms typ. (at U# in manual mode) < 150 ms typ. (at U# in automatic mode)
Quadratic summation current		72 A ² (I _{TH} ² = I ₁ ² + I ₂ ² + I _n ²)
Reset time		Normally < 20 ms (when driven via the sensor circuits)
Uninterrupted current		6 A N/O, Limiting continuous current
Design verification		

Equipment heat dissipation, current-dependent Pvid		2.7 W
Heat dissipation capacity Pdis		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		2.9 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 8.0

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		No
Suitable for monitoring of emergency-stop circuits		Yes
Suitable for monitoring of valves		No
Suitable for monitoring of optoelectronic protection equipment		Yes
Suitable for monitoring of tactile sensors		No
Suitable for monitoring of magnetic switches		Yes
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	V	24 - 230
Rated control supply voltage Us at AC 60HZ	V	24 - 230
Rated control supply voltage Us at DC	V	24 - 230
Voltage type for actuating		AC/DC
With detachable clamps		Yes
Evaluation inputs		One- and two-channel
With start input		Yes
With muting function		No
With feedback circuit		Yes
Release-delay	s	0 - 0
Number of outputs, safety related, undelayed, with contact		0
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			0
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
Type of safety according to IEC 61496-1			None
Stop category according to IEC 60204			0
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	22.5
Height		mm	113
Depth		mm	114.5
With approval for TÜV			No