

Safety relay emergency stop/protective door, 230VAC, 3 enabling paths



**Part no.** ESR5-NOS-31-230VAC  
**153152**  
**EL Number** 4560866  
**(Norway)**

Product name	Eaton ESR5 Safety relay
Part no.	ESR5-NOS-31-230VAC
EAN	4015081497485
Product Length/Depth	114.5 millimetre
Product height	99 millimetre
Product width	22.5 millimetre
Product weight	0.177 kilogram
Certifications	EN 50178 UL File No.: E29184 UL EN ISO 13849-1 CE EN 50156-1 IEC 62061 2014/30/EU UL report applies to both US and Canada UL 508 CSA-C22.2 No. 14-95 UL Category Control No.: NKCR; NKCR7 CSA Class No.: 3211-83; 3211-03 IEC/EN 60204 IEC 61508, Parts 1-7 Certified by UL for use in Canada Machines 2006/42/EG
Product Tradename	ESR5
Product Type	Safety relay
Product Sub Type	None
Electric connection type	Screw connection
Features	6 kV between A1-A2 / logic / enable and signal current paths Reinforced insulation 3 Non-delayed enable current paths Safe insulation Basic insulation Automatically/manually monitored start
Fitted with:	Feedback circuit Approval for TÜV Start input Approval according to UL Detachable clamps
Functions	1-channel
Material	Contacts: silver tin oxide, gold plated (AgSnO <sub>2</sub> , 0.2 µm Au) Enclosure: Polyamide (PA), not reinforced
Connection type	M3 screw terminals
Current consumption	22 mA, DC
Degree of protection	Terminals: IP20 Enclosure: IP20 IP20 Installation location: ≥ IP54
Duty factor	100 %
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	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
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 c, Performance level 300,000 switching cycles, B10d Cat. 1, Category
Safety parameter (IEC 62061)		Cat. 1, Category SILCL 1, Safety integrity level claim limit SIL 1, Safety integrity level, In accordance with IEC 61508 2.42 x 10 <sup>-10</sup> , PFHd, Probability of failure per hour
Stop category (IEC 60204)		0
Suitable for		Monitoring of emergency-stop circuits Module used to safely interrupt electrical circuits Safety relay for monitoring emergency stop and protective door switch Monitoring of position switches
Switching frequency		Max. 0.5 Hz, Input data
Type		Emergency stop category 0; emergency switching off Protective door
Voltage type		AC
Mounting position		As required
Switching capacity		0.01 W In accordance with IEC 60947-5-1, Outputs
Vibration resistance		10 - 150 Hz, Amplitude: 0.15 mm, Acceleration: 2 g, (IEC/EN 60068-2-6)
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		85 °C
Climatic proofing		Dry heat to IEC 60068-2-2 Cold to EN 60068-2-1 Damp heat, constant, to IEC 60068-2-3
Environmental conditions		Condensation: Non-condensing Clearance in air and creepage distances according to EN 50178, UL 508, CSA C22.2, No. 14-95
Operating temperature - min		-25 °C
Operating temperature - max		55 °C
Relative humidity		< 75 %
Terminal capacity		24 - 12 AWG, solid or stranded 2 x (0.2 – 1) mm <sup>2</sup> , solid 2 x (0.25 – 1) mm <sup>2</sup> , flexible with ferrule 1 x (0.2 – 2.5) mm <sup>2</sup> , solid 1 x (0.25 – 2.5) mm <sup>2</sup> , flexible with ferrule
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
Inrush current		0.1 - 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		230 V
Rated control supply voltage (Us) at DC - min		0 V
Rated control supply voltage (Us) at DC - max		0 V

Rated insulation voltage (Ui)		250 V
Rated operational voltage		230 V AC (power supply) 230 V AC Approx. 24 V DC at input, starting and feedback circuit
Short-circuit protection		Fuse 10 A gL/gG (Enable current paths), For output circuits, External Fuse 6 A gL/gG (Signal current paths), For output circuits, External
Short-circuit protection rating		10A gL/gG, NEOZED (N/O), Output fuse, External, Output data 6A gL/gG, NEOZED (N/C), Output fuse, External, Output data
Breaking power		88 W max., resistive load ( $\tau = 0$ ms), at 220 V DC 40 W max., inductive load ( $\tau = 40$ ms), at 48 V DC 2000 VA, max., resistive load ( $\tau = 0$ ms), at 250 V AC 48 W max., inductive load ( $\tau = 40$ ms), at 24 V DC 35 W max., inductive load ( $\tau = 40$ ms), at 110 V DC 144 W max., resistive load ( $\tau = 0$ ms), at 24 V DC 33 W max., inductive load ( $\tau = 40$ ms), at 220 V DC 230 W max., resistive load ( $\tau = 0$ ms), at 48 V DC 68 W max., resistive load ( $\tau = 0$ ms), at 110 V DC
Input		$\infty$ ms, Simultaneity for inputs 1/2
Number of inputs		1-channel
Number of outputs (safety related, delayed) with contact		0
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
Permissible total cable resistance		50 $\Omega$ (input and starting circuits for UN)
Pick-up time		50 ms typ. (K1, K2 - for UN manual operation) 300 ms typ. (at U# in automatic mode) 330 ms typ. (if actuated via A1 or S11/S12) 300 ms typ. (K1, K2 - for UN automatic mode) 50 ms typ. (at U# in manual mode)
Quadratic summation current		72 A <sup>2</sup> ( $I_{TH}^2 = I_1^2 + I_2^2 + I_3^2$ )
Reset time		20 ms (on actuation via S11/S12) Normally 150 ms (on actuation via A1)
Switching voltage		250 V
Uninterrupted current		5 A N/C, Limiting continuous current 6 A N/O, Limiting continuous current
Equipment heat dissipation, current-dependent Pvid		0 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		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 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		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 $U_s$ at AC 50HZ	V	0 - 230
Rated control supply voltage $U_s$ at AC 60HZ	V	20.4 - 230
Rated control supply voltage $U_s$ at DC	V	0 - 0
Voltage type for actuating		AC
With detachable clamps		Yes
Evaluation inputs		1-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		3
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
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 c
SIL according to IEC 61508		1
With approval for BG BIA		No
With approval according to UL		Yes
Width	mm	22.5
Height	mm	99
Depth	mm	114.5
With approval for TÜV		Yes