

Contact expansion module, 24VDC/AC, 4 enabling paths off-delayed



Part no. ESR5-VE3-42
118706
EL Number 4133322
(Norway)

General specifications		
Product name		Eaton ESR5 Contact expansion module
Part no.		ESR5-VE3-42
EAN		4015081168460
Product Length/Depth		114.5 millimetre
Product height		99 millimetre
Product width		22.5 millimetre
Product weight		0.173 kilogram
Certifications		UL 508 EN 50178 EN ISO 13849-1 CE Certified by UL for use in Canada CSA-C22.2 No. 14-95 IEC/EN 60204 2014/30/EU IEC 61508, Parts 1-7 UL Category Control No.: NKCR; NKCR7 UL report applies to both US and Canada IEC 62061 UL UL File No.: E29184 CSA Class No.: 3211-83; 3211-03 Machines 2006/42/EG
Product Tradename		ESR5
Product Type		Contact expansion module
Product Sub Type		None
Catalog Notes		The base unit determines the maximum stop category according to IEC 61508 and IEC 60204
Features & Functions		
Electric connection type		Screw connection
Features		Feedback current path Safe insulation 6 kV between input circuit / NC contacts, and enable current paths Basic insulation Reinforced insulation
Fitted with:		Approval for TÜV Detachable clamps Approval according to UL Feedback circuit
Functions		1-channel Time function
Material		Contacts: silver tin oxide, gold plated (AgSnO2, 0.2 µm Au) Enclosure: Polyamide (PA), not reinforced
General information		
Connection type		M3 screw terminals
Current consumption		94 mA, DC 94 mA, AC
Degree of protection		IP20 Installation location: ≥ IP54 Enclosure: IP20 Terminals: IP20
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		Expansion device
Mounting method		Rail mounting possible Top-hat rail fixing (according to IEC/EN 60715, 35 mm)

Mounting width		22.5 mm
Overvoltage category		III
Pollution degree		2
Power loss		Normally 4.52 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)		300,000 switching cycles, B10d PL d, Performance level Cat. 3, Category
Safety parameter (IEC 62061)		SIL 3, Safety integrity level, In accordance with IEC 61508 SILCL 3, Safety integrity level claim limit SILCL 2, Safety integrity level claim limit SIL 2, Safety integrity level, In accordance with IEC 61508 13.5 x 10 ⁻¹⁰ , PFHd, Probability of failure per hour Cat. 3, Category
Stop category (IEC 60204)		1
Suitable for		Safety relay contact expansion block per DIN EN60204-1/VDE 0113 Part 1 for contact multiplication Monitoring of position switches Monitoring of emergency-stop circuits The expansion unit can be used for contact multiplication for emergency stop relays and two-hand controls
Switching frequency		Max. 0.5 Hz, Input data
Type		Contact expansions
Voltage type		DC
Ambient conditions, mechanical		
Mounting position		As required
Proof test		67 Months (Low Demand) 240 Months (High Demand)
Switching capacity		3 A at 3600 O/h, AC-15 at 230 V, Outputs In accordance with IEC 60947-5-1, Outputs 0.4 W 3 A at 3600 O/h, DC-13 at 24 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		Damp heat, constant, to IEC 60068-2-3 Dry heat to IEC 60068-2-2
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		-20 °C
Operating temperature - max		55 °C
Relative humidity		< 75 %
Terminal capacities		
Terminal capacity		1 x (0.2 – 2.5) mm ² , solid 1 x (0.25 – 2.5) mm ² , flexible with ferrule 2 x (0.25 – 1) mm ² , flexible with ferrule 24 - 12 AWG, solid or stranded 2 x (0.2 – 1) mm ² , solid
Stripping length (main cable)		7 mm
Screwdriver size		0.6 x 3.5 mm, Terminal screws 2, Terminal screw, Pozidriv screwdriver
Tightening torque		0.6 Nm, Screw terminals
Electrical rating		
Inrush current		0.025 - 6 A (N/O) 0.025 - 3 A (N/C)

Power supply circuit		2 W (DC operated)
Rated control supply voltage (Us) at AC, 50 Hz - min		0 V
Rated control supply voltage (Us) at AC, 50 Hz - max		26.4 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		0 V
Rated control supply voltage (Us) at DC - max		24 V
Rated insulation voltage (Ui)		250 V
Rated operational voltage		24 V DC (power supply) 230 V AC
Short-circuit protection		Fuse 4 A gL/gG (Signal current paths), For output circuits, External Fuse 10 A gL/gG (Enable current paths), For output circuits, External
Short-circuit protection rating		10A gL/gG, NEOZED (N/O), Output fuse, External, Output data 4A gL/gG, NEOZED (N/C), Output fuse, External, Output data
Input/Output		
Breaking power		1500 VA max., Output data, resistive load ($\tau = 0$ ms), at 250 V AC (for N/C contacts 65 - 66) 288 W max., Output data, resistive load ($\tau = 0$ ms), at 48 V DC (for N/C contacts 65 - 66) 40 W max., Output data, inductive load ($\tau = 40$ ms), at 48 V DC 35 W max., Output data, inductive load ($\tau = 40$ ms), at 110 V DC 144 W max. resistive load ($\tau = 0$ ms), at 24 V DC (for N/C contacts 65 - 66) 33 W max., Output data, inductive load ($\tau = 40$ ms), at 220 V DC 77 W max., Output data, resistive load ($\tau = 0$ ms), at 110 V DC 88 W max., Output data, resistive load ($\tau = 0$ ms), at 220 V DC 48 W max., Output data, inductive load ($\tau = 40$ ms), at 24 V DC
Feedback current path		Delayed feedback current path
Input		∞ ms, Simultaneity for inputs 1/2
Nominal current		84 A
Number of inputs		1-channel
Number of outputs (safety related, delayed) with contact		4
Number of outputs (safety related, undelayed) with contact		0
Number of outputs (signaling function, delayed) with contact		1
Number of outputs (signaling function, undelayed) with contact		0
Off-delay		0.3 - 3 s (± 50 %)
Pick-up time		20 ms typ. (K1, K2 - for UN automatic mode) 20 ms typ. (at U# in automatic mode) 20 ms typ. (K1, K2 - for UN manual operation) 20 ms typ. (at U# in manual mode)
Quadratic summation current		50 A^2 ($I_{TH}^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2$)
Switching voltage		250 V
Uninterrupted current		3 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 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		4.52 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		Expansion 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		1-channel
Power consumption	W	4.52
With start input		No
With muting function		No
With feedback circuit		Yes
Release-delay	s	0 - 0
Type of control voltage 1		DC
Control voltage 1	V	24 - 24
Type of control voltage 2		DC
Control voltage 2	V	24 - 24
Number of outputs, safety related, undelayed, with contact		0
Number of outputs, safety related, delayed, with contact		4
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		1
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	6
Type of safety according to IEC 61496-1		None
Stop category according to IEC 60204		1

Performance level according to EN ISO 13849-1			Level d
SIL according to IEC 61508			3
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