

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) |

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| 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) |

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| 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. |

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| 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 (ec1@ss13-27-37-18-19 [ACO304016])

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| 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 |

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|---|--|----|---------|
| 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 |