

Specifications



Eaton 119380

Eaton ESR5 Safety relay emergency stop/protective door, 230VAC, 3 enabling paths ESR5-NO-31-230VAC

General specifications

PRODUCT NAME	Eaton ESR5 Safety relay
CATALOG NUMBER	119380
MODEL CODE	ESR5-NO-31-230VAC
EAN	4015081175062
PRODUCT LENGTH/DEPTH	114.5 mm
PRODUCT HEIGHT	99 mm
PRODUCT WIDTH	22.5 mm
PRODUCT WEIGHT	0.181 kg

CERTIFICATIONS	UL 508 IEC/EN 60204 CE IEC 62061 UL Category Control No.: NKCR; NKCR7 IEC 61508, Parts 1-7 UL 2014/30/EU UL File No.: E29184 CSA Class No.: 3211-83; 3211-03 EN 50178 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 Machines 2006/42/EG
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Ambient conditions, mechanical

MOUNTING POSITION	As required
PROOFTEST	240 Months (High Demand) 78 Months (Low Demand)
SWITCHING CAPACITY	In accordance with IEC 60947-5-1, Outputs 0.1 W 5 A at 360 O/h, AC-15 at 230 V, Outputs 5 A at 360 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 - MAX	55 °C
AMBIENT STORAGE TEMPERATURE - MAX	85 °C
AMBIENT OPERATING TEMPERATURE - MIN	-20 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
CLIMATIC PROOFING	Damp heat, constant, to IEC 60068-2-3 Dry heat to IEC 60068-2-2
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 - MAX	55 °C
OPERATING TEMPERATURE - MIN	-20 °C
RELATIVE HUMIDITY	< 75 %

Design verification

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.
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	Does not apply, since the

Electrical rating

INRUSH CURRENT	0.1 - 6 A
POWER SUPPLY CIRCUIT	2.9 W (DC operated) 5.8 W (AC operated 50/60 Hz)
RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX	26.4 V
RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MIN	0 V
RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MAX	230 V
RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MIN	20.4 V
RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MAX	0 V
RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MIN	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 CURRENT	0.7 A, Input data
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 proof, 115 V/230 V, Fuse for control circuit supply, Control circuit
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

AGAINST ELECTRIC SHOCK	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.
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

Features & functions

ELECTRIC CONNECTION TYPE	Screw connection
FEATURES	3 Non-delayed enable current paths Reinforced insulation Safe insulation Automatically/manually monitored start 6 kV between A1-A2 / logic / enable and signal current paths Basic insulation
FITTED WITH:	Feedback circuit Approval according to UL Approval for TÜV Start input Detachable clamps
FUNCTIONS	1-channel 2-channel
MATERIAL	Enclosure: Polyamide (PA), not reinforced Contacts: silver tin oxide, gold plated (AgSnO ₂ , 0.2 µm Au)

General information

CONNECTION TYPE	M3 screw terminals
CURRENT CONSUMPTION	22 mA, AC
DEGREE OF PROTECTION	Installation location: ≥ IP54 Enclosure: IP20 Terminals: IP20 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	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 e, Performance level 230,000 switching cycles, B10d Cat. 4, Category
SAFETY PARAMETER (IEC 62061)	SILCL 3, Safety integrity level claim limit SIL 3, Safety integrity level Cat. 4, Category SIL 3, Safety integrity level, In accordance with IEC 61508 1.89 × 10 ⁻¹⁰ , PFHd, Probability of failure per hour

STOP CATEGORY (IEC 60204)	0
SUITABLE FOR	Module used to safely interrupt electrical circuits Monitoring of position switches Safety relay for monitoring emergency stop and protective door switch Monitoring of emergency-stop circuits
SWITCHING FREQUENCY	Max. 0.5 Hz, Input data
TYPE	• Emergency stop category 0; emergency switching off • Feedback circuit • Protective door
VOLTAGE TYPE	AC

Input/Output

BREAKING POWER	48 W max., inductive load ($\tau = 40$ ms), at 24 V DC
	68 W max., resistive load ($\tau = 0$ ms), at 110 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
	40 W max., inductive load ($\tau = 40$ ms), at 48 V DC
	88 W max., resistive load ($\tau = 0$ ms), at 220 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
	2000 VA, max., resistive load ($\tau = 0$ ms), at 250 V AC

INPUT	∞ ms, Simultaneity for inputs 1/2
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NOMINAL CURRENT	35 A
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NUMBER OF INPUTS	One- and two-channel
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NUMBER OF OUTPUTS (SAFETY RELATED, DELAYED) WITH CONTACT	0
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NUMBER OF OUTPUTS (SAFETY RELATED, UNDELAYED) WITH CONTACT	3
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NUMBER OF OUTPUTS (SIGNALING FUNCTION, DELAYED) WITH CONTACT	0
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NUMBER OF OUTPUTS (SIGNALING FUNCTION, UNDELAYED) WITH CONTACT	1
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PERMISSIBLE TOTAL CABLE RESISTANCE	50 Ω (input and starting circuits for UN)
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PICK-UP TIME	40 ms typ. (at U_e in manual mode)
	300 ms typ. (at U_e in automatic mode)
	40 ms typ. (K1, K2 - for UN manual operation)
	300 ms typ. (K1, K2 - for UN automatic mode)
	330 ms typ. (if actuated via A1)

QUADRATIC SUMMATION CURRENT	72 A ² ($I_{TH}^2 = I_1^2 + I_2^2 + I_3^2$)
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RESET TIME	20 ms (two-channel)
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Terminal capacities

SCREWDRIVER SIZE	2, Terminal screw, Pozidriv screwdriver 0.6 x 3.5 mm, Terminal screws
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STRIPPING LENGTH (MAIN CABLE)	7 mm
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TERMINAL CAPACITY	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
	1 x (0.2 – 2.5) mm ² , solid
	2 x (0.2 – 1) mm ² , solid

TIGHTENING TORQUE	0.6 Nm, Screw terminals
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	Normally 150 ms (single-channel)
RESISTANCE	11 Ω (impedance)
SWITCHING VOLTAGE	250 V
UNINTERRUPTED CURRENT	6 A N/O, Limiting continuous current 5 A N/C, Limiting continuous current

Resources

BROCHURES	eaton-esr5-safety-relay-brochure-br049005en-en-us.pdf
CATALOGUES	eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf
CHARACTERISTIC CURVE	eaton-safety-relays-esr5-safety-relay-characteristic-curve-006.eps
DECLARATIONS OF CONFORMITY	eaton-safety-relay-declaration-of-conformity-uk251137en.pdf eaton-safety-relay-declaration-of-conformity-eu250654en.pdf
DRAWINGS	eaton-safety-relays-relay-esr5-safety-relay-dimensions-002.eps eaton-safety-relays-relay-esr5-safety-relay-3d-drawing-002.eps eaton-general-esr5-safety-relay-symbol.eps
ECAD MODEL	DA-CE-ETN.ESR5-NO-31-230VAC
INSTALLATION INSTRUCTIONS	eaton-safety-relay-esr5-no-31-230vac-il05013032z.pdf
MANUALS AND USER GUIDES	eaton-safety-relay-esr5-no-31-230vac-mn049012en-us.pdf
MCAD MODEL	eaton-safety-relays-mcad-drawings-esr5-no-xx-24vdc.dwg eaton-safety-relays-mcad-3d-models-esr5-no-xx-24vdc.stp

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:
DATE:



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