

Specifications



Photo is representative



Eaton 153152

Eaton ESR5 Safety relay emergency stop/protective door, 230VAC, 3 enabling paths ESR5-NOS-31-230VAC

General specifications

PRODUCT NAME	Eaton ESR5 Safety relay
CATALOG NUMBER	153152
MODEL CODE	ESR5-NOS-31-230VAC
EAN	4015081497485
PRODUCT LENGTH/DEPTH	114.5 mm
PRODUCT HEIGHT	99 mm
PRODUCT WIDTH	22.5 mm
PRODUCT WEIGHT	0.177 kg

UL File No.: E29184
2014/30/EU
CSA-C22.2 No. 14-95
UL 508
EN 50156-1
UL report applies to both
US and Canada
UL Category Control No.:
NKCR; NKCR7
CE
Certified by UL for use in
Canada
CSA Class No.: 3211-83;
3211-03
EN 50178
IEC/EN 60204
UL
EN ISO 13849-1
IEC 61508, Parts 1-7
IEC 62061
Machines 2006/42/EG

CERTIFICATIONS

Ambient conditions, mechanical

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)

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	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 - MAX	55 °C
OPERATING TEMPERATURE - MIN	-25 °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
RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX	230 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 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

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	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 ₂ , 0.2 µm Au) Enclosure: Polyamide (PA), not reinforced

General information

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 ⁻¹⁰ , PFHd, Probability of failure per hour
STOP CATEGORY (IEC)	0

60204)

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

Input/Output

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	∞ ms, Simultaneity for inputs 1/2
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NUMBER OF INPUTS	1-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 (SIGNALLING FUNCTION, DELAYED) WITH CONTACT	0
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NUMBER OF OUTPUTS (SIGNALLING 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	50 ms typ. (K1, K2 - for UN manual operation) 300 ms typ. (at U_e 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_e in manual mode)

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 (on actuation via S11/S12)
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Terminal capacities

SCREWDRIVER SIZE	2, Terminal screw, Pozidriv screwdriver 3.5 x 0.6 mm, Terminal screw
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STRIPPING LENGTH (MAIN CABLE)	7 mm
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TERMINAL CAPACITY	24 - 12 AWG, solid or stranded 2 x (0.2 - 1) mm ² , solid 2 x (0.25 - 1) mm ² , flexible with ferrule 1 x (0.2 - 2.5) mm ² , solid 1 x (0.25 - 2.5) mm ² , flexible with ferrule
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TIGHTENING TORQUE	0.6 Nm, Screw terminals
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	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

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-007.eps
DECLARATIONS OF CONFORMITY	eaton-safety-relay-declaration-of-conformity-uk251139en.pdf eaton-safety-relay-declaration-of-conformity-eu250656en.pdf
DRAWINGS	eaton-safety-relays-relay-esr5-safety-relay-dimensions-002.eps eaton-general-esr5-safety-relay-symbol.eps eaton-safety-relays-relay-esr5-safety-relay-3d-drawing.eps
ECAD MODEL	ETN.ESR5-NOS-31-230VAC
INSTALLATION INSTRUCTIONS	eaton-safety-relay-esr5-nos-31-230vac-il05013039z.pdf
MANUALS AND USER GUIDES	eaton-safety-relay-esr5-nos-31-230vac-mn049013en-us.pdf
MCAD MODEL	eaton-safety-relays-mcad-drawings-esr5-no-41-24vdc.dwg eaton-safety-relays-3d-models-esr5-no-41-24vdc.stp

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:
DATE:



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