Specifications

Eaton 118705

Eaton ESR5 Safety relay emergency stop/protective door/light curtain, 24 V DC, 4 enabling paths(2del.)

General specifications	
PRODUCT NAME	Eaton ESR5 Safety relay
CATALOG NUMBER	118705
PRODUCT LENGTH/DEPTH	114.5 mm
PRODUCT HEIGHT	99 mm
PRODUCT WIDTH	22.5 mm
PRODUCT WEIGHT	0.171 kg
CERTIFICATIONS	EN ISO 13849-1 CE CSA Class No.: 3211-83; 3211-03 IEC 61508, Parts 1-7 UL File No.: E29184 UL 508 UL report applies to both US and Canada IEC/EN 60204 EN 50178 Certified by UL for use in Canada IEC 62061 2014/30/EU CSA-C22.2 No. 14-95 UL Category Control No.: NKCR; NKCR7 UL Machines 2006/42/EG

Powering Business Worldwide

Product specifications

TYPE	• Emergency stop category 1; emergency switching off • Feedback circuit • Light curtain • Protective door
MOUNTING METHOD	Top-hat rail fixing (according to IEC/EN 60715, 35 mm) Rail mounting possible
OPERATING TEMPERATURE - MAX	45 °C
OPERATING TEMPERATURE - MIN	-20 °C
FEATURES	Automatic start Manual start Basic insulation 2 Non-delayed enable current paths
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	Meets the product

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-005.eps
DECLARATIONS OF CONFORMITY	eaton-safety-relay-declaration-of-conformity-eu250657en.pdf eaton-safety-relay-declaration-of-conformity-uk251140en.pdf
DRAWINGS	eaton-safety-relays-relay-esr5-safety-relay-dimensions-002.eps eaton-general-esr5-safety-relay-symbol-002.eps eaton-safety-relays-relay-esr5-safety-relay-3d-drawing.eps eaton-general-esr5-safety-relay-symbol.eps
ECAD MODEL	DA-CE-ETN.ESR5-NV3-30
INSTALLATION INSTRUCTIONS	IL05013033Z
MANUALS AND USER GUIDES	MN049010_EN
MCAD MODEL	eaton-esr5_nv3_30_ve3-42-drawing.dwg eaton-esr5_nv3_30_ve3-42-3d-model.stp
WIRING DIAGRAMS	eaton-safety-relays-esr5-safety-relay-wiring-diagram-013.eps eaton-safety-relays-esr5-safety-relay-wiring-diagram-014.eps eaton-safety-relays-esr5-safety-relay-wiring-diagram-015.eps

INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS	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.
ELECTRIC CONNECTION TYPE	Screw connection
FITTED WITH:	Approval for TÜV Start input Selectable cross-circuit detection Detachable clamps Feedback circuit Approval according to UL
POLLUTION DEGREE	2
CLIMATIC PROOFING	Dry heat to IEC 60068-2-2 Damp heat, constant, to IEC 60068-2-3 Cold to EN 60068-2-1

RATED IMPULSE WITHSTAND VOLTAGE (UIMP)	4000 V AC
AIR PRESSURE	795 - 1080 hPa (operation)
ALTITUDE	Max. 2000 m
CATEGORY (EN 954-1)	4
DEGREE OF PROTECTION	Terminals: IP20 IP20 Installation location: ≥ IP54 Enclosure: IP20
ENVIRONMENTAL CONDITIONS	Clearance in air and creepage distances according to EN 60947-1, UL 508, CSA C22.2, No. 14-95 Condensation: Non-condensing
NUMBER OF INPUTS	One- and two-channel
FUNCTIONS	1-channel 2-channel Time function
SAFETY PERFORMANCE LEVEL (EN ISO 13849-1)	Level e
AMBIENT OPERATING TEMPERATURE - MAX	45 °C
AMBIENT OPERATING TEMPERATURE - MIN	-20 °C
AMBIENT STORAGE TEMPERATURE - MAX	70 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID	0 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
LIFETIME	240 month
NOMINAL CURRENT	3.5 A
NUMBER OF OUTPUTS (SAFETY RELATED, DELAYED) WITH CONTACT	2
NUMBER OF OUTPUTS (SAFETY RELATED, DELAYED, SEMICONDUCTORS)	0
NUMBER OF OUTPUTS	2

(SAFETY RELATED, UNDELAYED) WITH CONTACT	
NUMBER OF OUTPUTS (SAFETY RELATED, UNDELAYED, SEMICONDUCTORS)	0
NUMBER OF OUTPUTS (SIGNALING FUNCTION, DELAYED) WITH CONTACT	0
NUMBER OF OUTPUTS (SIGNALING FUNCTION, DELAYED, SEMICONDUCTORS)	0
NUMBER OF OUTPUTS (SIGNALING FUNCTION, UNDELAYED) WITH CONTACT	0
NUMBER OF OUTPUTS (SIGNALING FUNCTION, UNDELAYED, SEMICONDUCTORS)	0
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	26.4 V
SCREWDRIVER SIZE	0.6 x 3.5 mm, Terminal screws 2, Terminal screw, Pozidriv screwdriver
VOLTAGE TYPE	DC
CONNECTION TYPE	M3 screw terminals
MOUNTING POSITION	As required
BREAKING POWER	144 W max., resistive load (τ = 0 ms), at 24 V DC 42 W max., inductive load (τ = 40 ms), at 24 V DC 88 W max., resistive load (τ = 0 ms), at 220 V DC 1500 VA, max., resistive load (τ = 0 ms), at 250 V AC 23 W max., inductive load (τ = 40 ms), at 220 V DC 288 W max., resistive load (τ = 0 ms), at 48 V DC 33 W max., inductive load (τ = 40 ms), at 48 V DC

	25 W max., inductive load (τ = 40 ms), at 110 V DC 90 W max., resistive load (τ = 0 ms), at 110 V DC
OVERVOLTAGE CATEGORY	III
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
DUTY FACTOR	100 %
OFF-DELAY	0.1 - 30 s (± 40 %, K3, K4 adjustable)
EMITTED INTERFERENCE	According to EN 61000-6-4
CURRENT CONSUMPTION	75 mA, DC
MATERIAL	Contacts: silver tin oxide, gold plated (AgSnO2, 0.2 µ m Au) Enclosure: Polyamide (PA), not reinforced
INTERFERENCE IMMUNITY	According to EN-61000-6-2 According to EN 662061_x
TIGHTENING TORQUE	0.6 Nm, Screw terminals
MOUNTING WIDTH	22.5 mm
SUITABLE FOR	Monitoring of position switches Module used to safely interrupt electrical circuits Safety relay for monitoring emergency stop and protective door switch Monitoring of optoelectronic protection equipment Monitoring of emergency-stop circuits Safety position switch with mechanical securing action LS-S...MT-ZBZ
RELATIVE HUMIDITY	< 75 %
LED INDICATOR	Status indication of SmartWire-DT network: Green LED
PICK-UP TIME	150 ms typ. (at U_e in automatic mode) 150 ms typ. (controlled start, K1, K2 - for UN manual operation) 150 ms typ. (controlled start, K1, K2 - for UN

	automatic mode) 150 ms typ. (at U_e in manual mode)
LIFESPAN, MECHANICAL	10,000,000 Operations
INPUT	∞ ms, Simultaneity for inputs 1/2
RECOVERY TIME	330 ms (restart)
RESISTANCE	500 Ω (impedance)
INRUSH CURRENT	0.025 - 6 A
MODEL	Basic device
SAFETY TYPE (IEC 61496-1)	None
SHORT-CIRCUIT CURRENT	0.1 A, Input data
VIBRATION RESISTANCE	10 - 150 Hz, Amplitude: 0.15 mm, Acceleration: 2 g, (IEC/EN 60068-2-6)
SAFETY PARAMETER (EN ISO 13849-1)	400,000 switching cycles, B10d Cat. 4, Category PL e, Performance level
TERMINAL CAPACITY	2 x (0.2 – 1) mm², solid 24 - 12 AWG, solid or stranded 1 x (0.2 – 2.5) mm², solid 2 x (0.25 – 1) mm², flexible with ferrule 1 x (0.25 – 2.5) mm², flexible with ferrule
RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MIN	20.4 V
RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MAX	24 V
RATED CONTROL SUPPLY VOLTAGE (US) AT DC - MIN	0 V
RATED INSULATION VOLTAGE (UI)	250 V
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	0 A
RELEASE-DELAY - MAX	30 s
RELEASE-DELAY - MIN	0.1 s
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	7.8 W
STRIPPING LENGTH (MAIN CABLE)	7 mm
SWITCHING VOLTAGE	250 V

PRODUCT CATEGORY	Electronic safety relays
PROTECTION	Finger and back-of-hand proof, Protection against direct contact when actuated from front (EN 50274)
SIL (IEC 61508)	3
PERMISSIBLE TOTAL CABLE RESISTANCE	500 Ω (input and starting circuits for UN)
POWER LOSS	Normally 7.8 W
POWER SUPPLY CIRCUIT	1.8 W (DC operated)
PROOFTEST	240 Months (High Demand)
QUADRATIC SUMMATION CURRENT	55 A^2 ($ITH^2 = I1^2 + I2^2 + I3^2 + I4^2 + I5^2$)
RATED OPERATIONAL VOLTAGE	24 V DC (power supply) Approx. 24 V DC at input, starting and feedback circuit 230 V AC
RESET TIME	Normally 100 ms (delayed contacts) 20 ms (non-delayed contacts)
SAFETY PARAMETER (IEC 62061)	SIL 3 only for high demand requirements, Safety integrity level Cat. 4, Category 18 x 10-10, PFHd, Probability of failure per hour SIL 3, Safety integrity level SILCL 3, Safety integrity level claim limit SIL 3, Safety integrity level, In accordance with IEC 61508
UNINTERRUPTED CURRENT	6 A N/O, Limiting continuous current 6 A N/C, Limiting continuous current
SHORT-CIRCUIT PROTECTION	Fuse 10 A gL/gG NEOZED, For output circuits, External
STOP CATEGORY (IEC 60204)	0 1
SWITCHING CAPACITY	3 A at 3600 O/h, DC-13 at 24 V, Outputs 5 A at 3600 O/h, AC-15 at 230 V, Outputs 0.4 W In accordance with IEC 60947-5-1, Outputs
SWITCHING FREQUENCY	Max. 0.5 Hz, Input data

POWER CONSUMPTION	7.8 W
CONTROL VOLTAGE 1 - MIN	24 V
CONTROL VOLTAGE 1 - MAX	24 V
CONTROL VOLTAGE 2 - MIN	24 V
CONTROL VOLTAGE 2 - MAX	24 V
CONTROL VOLTAGE 1 TYPE	DC
CONTROL VOLTAGE 2 TYPE	DC
VOLTAGE TYPE OF SUPPLY VOLTAGE	AC
VOLTAGE TYPE OF OPERATING VOLTAGE	DC
RATED SWITCH CURRENT	5 A
SUPPLY VOLTAGE AT AC, 50 HZ - MIN	0 V
SUPPLY VOLTAGE AT AC, 50 HZ - MAX	0 V
SUPPLY VOLTAGE AT AC, 60 HZ - MIN	0 V
SUPPLY VOLTAGE AT AC, 60 HZ - MAX	0 V
SUPPLY VOLTAGE AT DC - MIN	24 V
SUPPLY VOLTAGE AT DC - MAX	24 V
OPERATING VOLTAGE AT AC, 50 HZ - MIN	0 V
OPERATING VOLTAGE AT AC, 50 HZ - MAX	0 V
OPERATING VOLTAGE AT AC, 60 HZ - MIN	0 V
OPERATING VOLTAGE AT AC, 60 HZ - MAX	0 V
OPERATING VOLTAGE AT DC - MIN	24 V
OPERATING VOLTAGE AT DC - MAX	24 V

PROJECT NAME:	
PROJECT NUMBER:	
PREPARED BY:	
DATE:	

Eaton Corporation plc
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com

Follow us on social media to get the latest product and support information.