



Eaton 118700

Eaton ESR5 Safety relay emergency stop/protective door, 24VDC/AC, 2 enabling paths

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PRODUCT NAME	Eaton ESR5 Safety relay
CATALOG NUMBER	118700
PRODUCT LENGTH/DEPTH	114.5 mm
PRODUCT HEIGHT	99 mm
PRODUCT WIDTH	22.5 mm
PRODUCT WEIGHT	0.165 kg
CERTIFICATIONS	IEC 61508, Parts 1-7 UL UL 508 IEC/EN 60204 UL report applies to both US and Canada UL File No.: E29184 Certified by UL for use in Canada CSA-C22.2 No. 14-95 EN 50178 CE IEC 62061 2014/30/EU CSA Class No.: 3211-83; 3211-03 EN ISO 13849-1 UL Category Control No.: NKCR; NKCR7 Machines 2006/42/EG
CATALOG NOTES	Replacement: ESR5-NO-21-24VDC (EP-401061)

TYPE

- Emergency stop category 0; emergency switching off
- Feedback circuit
- Protective door

MOUNTING METHOD

Rail mounting possible
Top-hat rail fixing
(according to IEC/EN 60715, 35 mm)

OPERATING TEMPERATURE - MAX

55 °C

OPERATING TEMPERATURE - MIN

-20 °C

FEATURES

2 Non-delayed enable current paths
Reinforced insulation
Safe insulation
Automatic reset

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

Meets the product standard's requirements.

CHARACTERISTIC CURVE

[eaton-safety-relays-esr5-safety-relay-characteristic-curve.eps](#)

DECLARATIONS OF CONFORMITY

[eaton-safety-relay-declaration-of-conformity-uk251096en.pdf](#)

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[eaton-safety-relays-esr5-safety-relay-wiring-diagram.eps](#)

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[eaton-safety-relays-esr5-safety-relay-wiring-diagram-002.eps](#)

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[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](#)

[eaton-general-technology-esr5-safety-relay-symbol-002.eps](#)

ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS	
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 according to UL Approval for TÜV Detachable clamps Feedback circuit Start input
POLLUTION DEGREE	2
CLIMATIC PROOFING	Dry heat to IEC 60068-2-2 Cold to EN 60068-2-1 Damp heat, constant, to IEC 60068-2-3
RATED IMPULSE WITHSTAND VOLTAGE	6000 V AC

(UIMP)	
AIR PRESSURE	795 - 1080 hPa (operation)
ALTITUDE	Max. 2000 m
CATEGORY (EN 954-1)	4
	Installation location: $\geq$ IP54
DEGREE OF PROTECTION	Terminals: IP20 Enclosure: IP20 IP20
ENVIRONMENTAL CONDITIONS	Clearance in air and creepage distances according to EN 50178, UL 508, CSA C22.2, No. 14-95 Condensation: Non-condensing
NUMBER OF INPUTS	1-channel
FUNCTIONS	1-channel 2-channel
SAFETY PERFORMANCE LEVEL (EN ISO 13849-1)	Level e
AMBIENT OPERATING TEMPERATURE - MAX	55 °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	30 A
NUMBER OF OUTPUTS (SAFETY RELATED, DELAYED) WITH CONTACT	0
NUMBER OF OUTPUTS (SAFETY RELATED, DELAYED, SEMICONDUCTORS)	0
NUMBER OF OUTPUTS (SAFETY RELATED, UNDELAYED) WITH CONTACT	2
NUMBER OF OUTPUTS	0

(SAFETY RELATED, UNDELAYED, SEMICONDUCTORS)	
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	1
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	24 V
SCREWDRIVER SIZE	2, Terminal screw, Pozidriv screwdriver 0.6 x 3.5 mm, Terminal screws
VOLTAGE TYPE	AC/DC
CONNECTION TYPE	M3 screw terminals
MOUNTING POSITION	As required
BREAKING POWER	144 W max., resistive load ($\tau = 0$ ms), at 24 V DC 1500 VA, max., resistive load ($\tau = 0$ ms), at 250 V AC 35 W max., inductive load ($\tau = 40$ ms), at 220 V DC 48 W max., inductive load ($\tau = 40$ ms), at 24 V DC 288 W max., resistive load ($\tau = 0$ ms), at 48 V DC 35 W max., inductive load ($\tau = 40$ ms), at 110 V DC 40 W max., inductive load ($\tau = 40$ ms), at 48 V DC 77 W max., resistive load (τ = 0 ms), at 110 V DC 88 W max., resistive load (τ = 0 ms), at 220 V DC

OVERVOLTAGE CATEGORY	III
SHORT-CIRCUIT PROTECTION RATING	6A gL/gG, NEOZED (N/C), Output fuse, External, Output data 10A gL/gG, NEOZED (N/O), Output fuse, External, Output data
DUTY FACTOR	100 %
EMITTED INTERFERENCE	According to EN 61000-6-4
CURRENT CONSUMPTION	140 mA, AC 65 mA, DC
MATERIAL	Enclosure: Polyamide (PA), not reinforced Contacts: silver tin oxide, gold plated (AgSnO ₂ , 0.2 μ m Au)
INTERFERENCE IMMUNITY	According to EN 662061_x According to EN-61000-6-2
TIGHTENING TORQUE	0.6 Nm, Screw terminals
MOUNTING WIDTH	22.5 mm
SUITABLE FOR	Monitoring of position switches Safety relay for monitoring emergency stop and protective door switch Monitoring of emergency- stop circuits Module used to safely interrupt electrical circuits
RELATIVE HUMIDITY	< 75 %
LED INDICATOR	Status indication of SmartWire-DT network: Green LED
PICK-UP TIME	100 ms typ. (at U _e in automatic mode) 100 ms typ. (K1, K2 - for UN automatic mode)
LIFESPAN, MECHANICAL	10,000,000 Operations
INPUT	∞ ms, Simultaneity for inputs 1/2
RECOVERY TIME	1000 ms
RESISTANCE	50 Ω (impedance)
INRUSH CURRENT	0.025 - 6 A
MODEL	Basic device
SAFETY TYPE (IEC 61496-1)	None
SHORT-CIRCUIT CURRENT	2.3 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)	300,000 switching cycles, B10d Cat. 4, Category PL e, Performance level
TERMINAL CAPACITY	24 - 12 AWG, solid or stranded 2 x (0.2 – 1) mm ² , solid 1 x (0.2 – 2.5) mm ² , solid 2 x (0.25 – 1) mm ² , flexible with ferrule 1 x (0.25 – 2.5) mm ² , 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	0 s
RELEASE-DELAY - MIN	0 s
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	5.16 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	Approx. 50 Ω (input and starting circuits for UN)
POWER LOSS	Normally 5.16 W
POWER SUPPLY CIRCUIT	1.6 W (DC operated) 3.4 W (AC operated 50/60 Hz)
PROOFTEST	240 Months (High Demand) 66 Months (Low Demand)
QUADRATIC	72 A ² ($I_{TH}^2 = I_1^2 + I_2^2$)

SUMMATION CURRENT	
RATED OPERATIONAL VOLTAGE	Approx. 24 V DC at input, starting and feedback circuit 230 V AC 24 V AC/DC (power supply)
RESET TIME	Normally 10 ms (dual-channel) 45 ms (single-channel)
SAFETY PARAMETER (IEC 62061)	SIL 3, Safety integrity level SIL 3, Safety integrity level, In accordance with IEC 61508 Cat. 4, Category SILCL 3, Safety integrity level claim limit 5.05 x 10 ⁻¹⁰ , PFHd, Probability of failure per hour
UNINTERRUPTED CURRENT	6 A N/O, Limiting continuous current 6 A N/C, Limiting continuous current
SHORT-CIRCUIT PROTECTION	Short-circuit proof, 24 V, Fuse for control circuit supply, Control circuit Fuse 6 A gL/gG, For output circuits, External
STOP CATEGORY (IEC 60204)	0
SWITCHING CAPACITY	3 A at 3600 O/h, AC-15 at 230 V, Outputs 4 A at 360 O/h, DC-13 at 24 V, Outputs 2.5 A at 3600 O/h, DC-13 at 24 V, Outputs 0.4 W In accordance with IEC 60947-5-1, Outputs 4 A at 360 O/h, AC-15 at 230 V, Outputs
SWITCHING FREQUENCY	Max. 0.5 Hz, Input data
POWER CONSUMPTION	5.16 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	AC/DC
CONTROL VOLTAGE 2	AC/DC

TYPE	
VOLTAGE TYPE OF SUPPLY VOLTAGE	AC/DC
VOLTAGE TYPE OF OPERATING VOLTAGE	AC/DC
RATED SWITCH CURRENT	4 A
SUPPLY VOLTAGE AT AC, 50 HZ - MIN	24 V
SUPPLY VOLTAGE AT AC, 50 HZ - MAX	24 V
SUPPLY VOLTAGE AT AC, 60 HZ - MIN	24 V
SUPPLY VOLTAGE AT AC, 60 HZ - MAX	24 V
SUPPLY VOLTAGE AT DC - MIN	24 V
SUPPLY VOLTAGE AT DC - MAX	24 V
OPERATING VOLTAGE AT AC, 50 HZ - MIN	24 V
OPERATING VOLTAGE AT AC, 50 HZ - MAX	24 V
OPERATING VOLTAGE AT AC, 60 HZ - MIN	24 V
OPERATING VOLTAGE AT AC, 60 HZ - MAX	24 V
OPERATING VOLTAGE AT DC - MIN	24 V
OPERATING VOLTAGE AT DC - MAX	24 V
