



Eaton 118701

Eaton ESR5 Safety relay emergency stop/protective door, 24VDC/AC, 4 enabling paths

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PRODUCT NAME	Eaton ESR5 Safety relay
CATALOG NUMBER	118701
PRODUCT LENGTH/DEPTH	114.5 mm
PRODUCT HEIGHT	99 mm
PRODUCT WIDTH	22.5 mm
PRODUCT WEIGHT	0.218 kg
CERTIFICATIONS	UL Category Control No.: NKCR; NKCR7 Certified by UL for use in Canada CSA-C22.2 No. 14-95 IEC 62061 UL CSA Class No.: 3211-83; 3211-03 UL File No.: E29184 IEC 61508, Parts 1-7 EN ISO 13849-1 EN 50178 2014/30/EU IEC/EN 60204 CE UL 508 UL report applies to both US and Canada Machines 2006/42/EG
CATALOG NOTES	Replacement: ESR5-NO-41-24VDC (EP-401060)

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

4 Non-delayed enable current paths
Automatic start
Reinforced insulation
6 kV between input circuit / NC contacts, and enable current paths
Manual start
Safe insulation
Basic insulation

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

Meets the product standard's requirements.

CHARACTERISTIC CURVE

[eaton-safety-relays-esr5-safety-relay-characteristic-curve-009.eps](#)

DECLARATIONS OF CONFORMITY

[eaton-safety-relay-declaration-of-conformity-uk251138en.pdf](#)

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INSULATING MATERIALS TO NORMAL HEAT	
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.
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:	Feedback circuit Approval for TÜV Detachable clamps Start input Approval according to UL
POLLUTION DEGREE	2
CLIMATIC PROOFING	Dry heat to IEC 60068-2-2 Damp heat, constant, to

	IEC 60068-2-3
RATED IMPULSE WITHSTAND VOLTAGE (UIMP)	4000 V AC
AIR PRESSURE	795 - 1080 hPa (operation)
ALTITUDE	Max. 2000 m
CATEGORY (EN 954-1)	1
DEGREE OF PROTECTION	IP20 Installation location: \geq IP54 Terminals: IP20 Enclosure: 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	One- and two-channel
FUNCTIONS	1-channel
SAFETY PERFORMANCE LEVEL (EN ISO 13849-1)	Level c
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
NOMINAL CURRENT	65 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	4

NUMBER OF OUTPUTS (SAFETY RELATED, UNDELAYED, SEMICONDUCTORS)	0
NUMBER OF OUTPUTS (SIGNALLING FUNCTION, DELAYED) WITH CONTACT	0
NUMBER OF OUTPUTS (SIGNALLING FUNCTION, DELAYED, SEMICONDUCTORS)	0
NUMBER OF OUTPUTS (SIGNALLING FUNCTION, UNDELAYED) WITH CONTACT	1
NUMBER OF OUTPUTS (SIGNALLING 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	0.6 x 3.5 mm, Terminal screws 2, Terminal screw, Pozidriv screwdriver
VOLTAGE TYPE	AC/DC
CONNECTION TYPE	M3 screw terminals
MOUNTING POSITION	As required
BREAKING POWER	1500 VA, max., resistive load ($\tau = 0$ ms), at 250 V AC 42 W max., inductive load ($\tau = 40$ ms), at 24 V DC 88 W max., resistive load (τ = 0 ms), at 220 V DC 288 W max., resistive load ($\tau = 0$ ms), at 48 V DC 144 W max., resistive load ($\tau = 0$ ms), at 24 V DC 42 W max., inductive load ($\tau = 40$ ms), at 220 V DC 42 W max., inductive load ($\tau = 40$ ms), at 48 V DC 110 W max., resistive load ($\tau = 0$ ms), at 110 V DC 42 W max., inductive load ($\tau = 40$ ms), at 110 V DC

OVERVOLTAGE CATEGORY	III
SHORT-CIRCUIT PROTECTION RATING	6 A, Output fuse, 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 μm Au)
INTERFERENCE IMMUNITY	According to EN 61000-6-2
TIGHTENING TORQUE	0.6 Nm, Screw terminals
MOUNTING WIDTH	22.5 mm
SUITABLE FOR	Module used to safely interrupt electrical circuits Monitoring of position switches Monitoring of emergency-stop circuits Safety relay for monitoring emergency stop and protective door switch
RELATIVE HUMIDITY	< 75 %
LED INDICATOR	Status indication of SmartWire-DT network: Green LED
PICK-UP TIME	65 ms typ. (K1, K2 - for UN automatic mode) 20 ms typ.
LIFESPAN, MECHANICAL	10,000,000 Operations
INPUT	∞ ms, Simultaneity for inputs 1/2
RECOVERY TIME	1000 ms
RESISTANCE	22 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)	PL c, Performance level Cat. 1, Category 230,000 switching cycles, B10d PL e possible only with the

	aid of fault exclusions
TERMINAL CAPACITY	2 x (0.2 – 1) 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 1 x (0.2 – 2.5) mm ² , solid
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)	1
PERMISSIBLE TOTAL CABLE RESISTANCE	22 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) 167 Months (Low Demand)
QUADRATIC SUMMATION CURRENT	72 A ² ($I_{TH}^2 = I_1^2 + I_2^2 + I_3^2$ + I_4^2)

	24 V AC/DC (power supply)
RATED OPERATIONAL VOLTAGE	230 V AC Approx. 24 V DC at input, starting and feedback circuit
RESET TIME	45 ms
SAFETY PARAMETER (IEC 62061)	SIL 1, Safety integrity level, In accordance with IEC 61508 SILCL 1, Safety integrity level claim limit Cat. 1, Category 4.05 x 10 ⁻¹⁰ , PFHd, Probability of failure per hour
UNINTERRUPTED CURRENT	6 A N/O, Limiting continuous current 3 A N/C, Limiting continuous current
SHORT-CIRCUIT PROTECTION	Short-circuit proof, 24 V, Fuse for control circuit supply, Control circuit Miniature circuit-breaker with characteristic C: 24 V AC/DC 6 A, For output circuits, External 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 0.4 W 4 A at 360 O/h, AC-15 at 230 V, Outputs In accordance with IEC 60947-5-1, 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
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 TYPE	AC/DC
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

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:



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