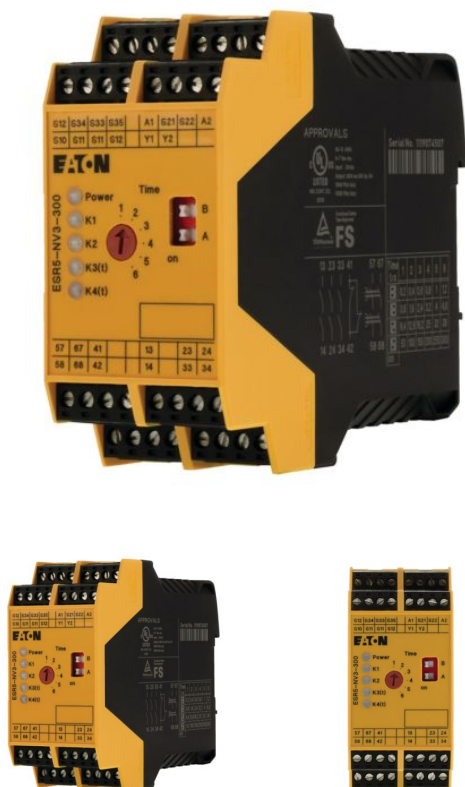


Specifications



Eaton 171858

Eaton ESR5 Safety relays for emergency stop/protective door/light curtain monitoring, 24VDC, off-delayed, 0-300 sec.

General specifications

PRODUCT NAME Eaton ESR5 Safety relay

CATALOG NUMBER 171858

MODEL CODE ESR5-NV3-300

EAN 4015081684298

PRODUCT LENGTH/DEPTH 114.5 mm

PRODUCT HEIGHT 99 mm

PRODUCT WIDTH 45 mm

PRODUCT WEIGHT 0.472 kg

CERTIFICATIONS

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

Ambient conditions, mechanical

MOUNTING POSITION	As required
PROOFTEST	240 Months (High Demand) 19 Months (Low Demand)
SWITCHING CAPACITY	3 A at 3600 O/h, AC-15 at 230 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
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	70 °C
AMBIENT OPERATING TEMPERATURE - MIN	-20 °C
AMBIENT STORAGE TEMPERATURE - MIN	-40 °C
CLIMATIC PROOFING	Cold to EN 60068-2-1 Dry heat to IEC 60068-2-2 Damp heat, constant, to IEC 60068-2-3
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	0.025 - 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	26.4 V
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	24 V
RATED INSULATION VOLTAGE (UI)	250 V
RATED OPERATIONAL VOLTAGE	Approx. 24 V DC at input, starting and feedback circuit 230 V AC 24 V DC (power supply)
SHORT-CIRCUIT PROTECTION	Non-time-delay 6-A fast-blow fuse, For output circuits, External Time-delay 10-A gL/gG Neozed fuse, For output circuits, External
SHORT-CIRCUIT PROTECTION RATING	6 A (non-delayed), Output fuse, Output data 10A gL/gG, NEOZED (delayed), 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	Safe insulation 3 Non-delayed enable current paths Monitored reset Automatic start 6 kV between the enable current paths (13/14, 23/24, 33/34) and the remaining rungs, as well as between 13/14, 23/24, 33/34 in relation to each other Manual start Reinforced insulation Basic insulation
FITTED WITH:	Feedback circuit Start input Approval according to UL Detachable clamps Approval for TÜV
FUNCTIONS	1-channel 2-channel

General information

CONNECTION TYPE	M3 screw terminals
CURRENT CONSUMPTION	155 mA, DC
DEGREE OF PROTECTION	Installation location: $\geq$ IP54 Enclosure: IP20 Terminals: IP20 IP20
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	Rail mounting possible Top-hat rail fixing (according to IEC/EN 60715, 35 mm)
MOUNTING WIDTH	45 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 Cat. 4, Category 300,000 switching cycles, B10d
SAFETY PARAMETER (IEC 62061)	SILCL 3, Safety integrity level claim limit 3.6 x 10 ⁻¹⁰ , PFHd, Probability of failure per hour Off-delay contacts, SILCL 2 as per IEC 62061 SIL 3, Safety integrity level, In accordance with IEC 61508 Cat. 4, Category

	Non-time-delay contacts, SILCL 3 as per IEC 62061 and SIL 3 as per IEC 61508
STOP CATEGORY (IEC 60204)	0 + 1
SUITABLE FOR	Monitoring of emergency-stop circuits Module used to safely interrupt electrical circuits Monitoring of position switches Safety relay for monitoring emergency stop and protective door switch
SWITCHING FREQUENCY	Max. 0.5 Hz, Input data
TYPE	• Emergency stop category 1; emergency switching off • Light curtain • Protective door
VOLTAGE TYPE	DC

Input/Output

33 W max., inductive load ($\tau = 40$ ms), at 220 V DC
1500 VA, max., resistive load ($\tau = 0$ ms), at 250 V AC

BREAKING POWER

144 W max., resistive load ($\tau = 0$ ms), at 24 V DC
288 W max., resistive load ($\tau = 0$ ms), at 48 V DC
40 W max., inductive load ($\tau = 40$ ms), at 48 V DC
35 W max., inductive load ($\tau = 40$ ms), at 110 V DC
42 W max., inductive load ($\tau = 40$ ms), at 24 V DC
88 W max., resistive load ($\tau = 0$ ms), at 220 V DC
77 W max., resistive load ($\tau = 0$ ms), at 110 V DC

INPUT

∞ ms, Simultaneity for inputs 1/2

NUMBER OF INPUTS

One- and two-channel

NUMBER OF OUTPUTS (SAFETY RELATED, DELAYED) WITH CONTACT

2

NUMBER OF OUTPUTS (SAFETY RELATED, UNDELAYED) WITH CONTACT

3

NUMBER OF OUTPUTS (SIGNALLING FUNCTION, DELAYED) WITH CONTACT

0

NUMBER OF OUTPUTS (SIGNALLING FUNCTION, UNDELAYED) WITH CONTACT

1

OFF-DELAY

0.2 - 300 s (± 40 %, K3, K4 adjustable)

PERMISSIBLE TOTAL CABLE RESISTANCE

22 Ω (input and starting circuits for UN)

PICK-UP TIME

600 ms typ. (at U_e in automatic mode)
70 ms typ. (at U_e in manual mode)
600 ms typ. (K1, K2 - for UN automatic mode)
70 ms typ. (K1, K2 - for UN manual operation)

QUADRATIC SUMMATION CURRENT

55 A² ($I_{TH}^2 = I_1^2 + I_2^2 + I_3^2 + I_4^2 + I_5^2$)

RESET TIME

20 ms (non-delayed)

Terminal capacities

SCREWDRIVER SIZE

2, Terminal screw, Pozidriv screwdriver
3.5 x 0.6 mm, Terminal screw

STRIPPING LENGTH (MAIN CABLE)

7 mm

TERMINAL CAPACITY

1 x (0.2 - 2.5) mm², solid
2 x (0.2 - 1) mm², solid
2 x (0.25 - 1) mm², flexible with ferrule
1 x (0.25 - 2.5) mm², flexible with ferrule
24 - 12 AWG, solid or stranded

TIGHTENING TORQUE

0.6 Nm, Screw terminals

	contacts)
SWITCHING VOLTAGE	250 V
UNINTERRUPTED CURRENT	6 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
DECLARATIONS OF CONFORMITY	eaton-safety-relay-declaration-of-conformity-uk251141en.pdf eaton-safety-relay-declaration-of-conformity-eu250658en.pdf
DRAWINGS	eaton-safety-relays-relay-esr5-safety-relay-dimensions.eps eaton-safety-relays-relay-esr5-safety-relay-3d-drawing-002.eps eaton-general-esr5-safety-relay-symbol.eps
ECAD MODEL	ETN.ESR5-NV3-300
INSTALLATION INSTRUCTIONS	eaton-safety-relay-esr5-nv3-300-il049001z.pdf
MANUALS AND USER GUIDES	eaton-safety-relay-esr5-nv3-300-mn049006en-us.pdf eaton-safety-relay-esr5-nv3-300-mn049006de-de.pdf
MCAD MODEL	eaton-esr5_nv3_300-3d-model.stp eaton-safety-relays-mcad-drawings-esr5-nv3-300.dwg

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:
DATE:



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