

# Safety relays - PSR-SPP- 24DC/ESD/5X1/1X2/300



2981431

<https://www.phoenixcontact.com/us/products/2981431>

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Safety relay for emergency stop and safety door monitoring up to SIL 3 or Cat. 4, PL e (EN ISO 13849), one- or two-channel operation, automatic or manual activation, 3 N/O contacts, 1 N/C contact, 2 N/O contacts with dropout delay of 0.2 s ... 300 s, pluggable Push-in terminal block

## Your advantages

- Maximum of 3 undelayed and 2 dropout delay contacts
- Manually monitored and automatic activation
- Up to Cat. 3/4 and PL d/e according to EN ISO 13849-1, SIL 3 according to IEC 62061, SIL 3 according to IEC 61508
- For emergency stop and safety door monitoring, plus evaluation of light grids
- 1- and 2-channel control
- Adjustable delay time of 0.2 s ... 300 s (24 increments)
- Protective labels to prevent manipulation of the set time (PSR-ESD-300) or electronic protection against manipulation (PSR-ESD-30)

## Commercial Data

Item number	2981431
Packing unit	1 pc
Minimum order quantity	1 pc
Note	Made to Order (non-returnable)
Sales Key	C18
Product Key	DNA131
Catalog Page	Page 230 (C-6-2019)
GTIN	4017918975234
Weight per Piece (including packing)	417.2 g
Weight per Piece (excluding packing)	417.2 g
Customs tariff number	85371098
Country of origin	DE

## Technical Data

### Product properties

Product type	Safety relays
Application	Emergency stop
	Safety door
	Light grid
Mechanical service life	10x 10 <sup>6</sup> cycles
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

### Insulation characteristics

Overvoltage category	III
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### Electrical properties

Maximum power dissipation for nominal condition	3.72 W
Nominal operating mode	100% operating factor
Rated insulation voltage	250 V AC
Rated surge voltage/insulation	Basic insulation 4 kV: between all current paths and housing Safe isolation, reinforced insulation 6 kV: between 13/14, 23/24, 33/34, and the remaining current paths between 13/14, 23/24, 33/34 among one another

### Input data

#### General

Rated control circuit supply voltage $U_S$	24 V DC -15 % / +10 %
Power consumption at $U_S$	typ. 3.72 W
Rated control supply current $I_S$	typ. 155 mA
Inrush current	200 mA (at $U_S$ )
	< 40 mA (with $U_S/I_x$ to S10)
	< 150 mA (with $U_S/I_x$ to S12)
	> -60 mA (with $U_S/I_x$ to S22)
	< 40 mA (with $U_S/I_x$ to S34)
	< 40 mA (with $U_S/I_x$ to S35)
Current consumption	< 40 mA (with $U_S/I_x$ to S10)
	< 50 mA (with $U_S/I_x$ to S12)
	> -40 mA (with $U_S/I_x$ to S22)
	0 mA (with $U_S/I_x$ to S34)
	< 5 mA (with $U_S/I_x$ to S35)
Voltage at input/start and feedback circuit	24 V DC -15 % / +10 %
Filter time	1 ms (at A1 in the event of voltage dips at $U_S$ )
	max. 1.5 ms (at S10, S12; test pulse width)
	7.5 ms (at S10, S12; test pulse rate)
	Test pulse rate = 5 x Test pulse width

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Typical response time	< 600 ms (automatic start)
	< 70 ms (manual start)
Typ. starting time with $U_s$	< 600 ms (when controlled via A1)
Typical release time	< 20 ms (when controlled via S11/S12 and S21/S22)
	< 20 ms (when controlled via A1)
Concurrence	$\infty$
Recovery time	< 1 s
Maximum switching frequency	0.5 Hz
Protective circuit	Surge protection; Suppressor diode
Max. permissible overall conductor resistance	approx. 22 $\Omega$ (Input and start circuits at $U_s$ )
Operating voltage display	1 x green LED
Status display	4 x green LEDs

## Output data

Contact type	5 enabling current paths
	1 signaling current path
Contact material	AgSnO <sub>2</sub>
Maximum switching voltage	250 V AC/DC (Observe the load curve)
Minimum switching voltage	5 V AC/DC
Limiting continuous current	6 A (N/O contact, pay attention to the derating)
	6 A (N/C contact)
Maximum inrush current	20 A ( $\Delta t \leq 100$ ms, undelayed contacts)
	8 A (delayed contacts)
Inrush current, minimum	10 mA
Sq. Total current	55 A <sup>2</sup> (observe derating)
Interrupting rating (ohmic load) max.	144 W (24 V DC, $\tau = 0$ ms)
	288 W (48 V DC, $\tau = 0$ ms)
	110 W (110 V DC, $\tau = 0$ ms, delayed contacts: 77 W)
	88 W (220 V DC, $\tau = 0$ ms)
	1500 VA (250 V AC, $\tau = 0$ ms, delayed contacts: 2000 VA)
Maximum interrupting rating (inductive load)	42 W (24 V DC, $\tau = 40$ ms, delayed contacts: 48 W)
	42 W (48 V DC, $\tau = 40$ ms, delayed contacts: 40 W)
	42 W (110 V DC, $\tau = 40$ ms, delayed contacts: 35 W)
	42 W (220 V DC, $\tau = 40$ ms, delayed contacts: 33 W)
Switching capacity min.	50 mW
Switching capacity (360/h cycles)	4 A (24 V DC)
	4 A (230 V AC)
Switching capacity (3600/h cycles)	2.5 A (24 V (DC13))
	3 A (230 V (AC15))
Output fuse	10 A gL/gG (N/O contact)
	6 A gL/gG (N/C contact)

## Connection data

Connection technology

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pluggable	yes
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## Conductor connection

Connection method	Push-in connection
Conductor cross section solid	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> (only together with CRIMPFOX 6)
Conductor cross-section AWG	24 ... 16

## Dimensions

Width	45 mm
Height	112 mm
Depth	114.5 mm

## Material specifications

Housing material	PBT
Housing color	yellow

## Characteristics

### Safety data

Stop category	0
	1

### Safety data: EN ISO 13849

Category	4 (Undelayed contacts) 3 (delayed contacts)
Performance level (PL)	e (for delayed contacts PL d)

### Safety data: IEC 61508 - High demand

Equipment type	Type A
Safety Integrity Level (SIL)	3 (for delayed contacts SIL 2)
Probability of a hazardous failure per hour (PFH <sub>D</sub> )	1.89 x 10 <sup>-9</sup>
Proof test interval	240 Months
Duration of use	240 Months

### Safety data: IEC 61508 - Low demand

Equipment type	Type A
Safety Integrity Level (SIL)	3 (for delayed contacts SIL 2)
Probability of a hazardous failure on demand (PFD <sub>AVG</sub> )	1.43 x 10 <sup>-4</sup>
Proof test interval	19 Months
Duration of use	240 Months

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54

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Ambient temperature (operation)	-20 °C ... 55 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Maximum altitude	≤ 2000 m (Above sea level)
Max. permissible humidity (storage/transport)	75 % (on average, 85% infrequently, non-condensing)
Max. permissible relative humidity (operation)	75 % (on average, 85% infrequently, non-condensing)
Shock	15g
Vibration (operation)	10 Hz ... 150 Hz, 2g

## Approval data

CE

Certificate	CE-compliant
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## Standards and regulations

Air clearances and creepage distances between the power circuits

Standards/regulations	DIN EN 50178/VDE 0160
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## Mounting

Mounting type	DIN rail mounting
Mounting position	any

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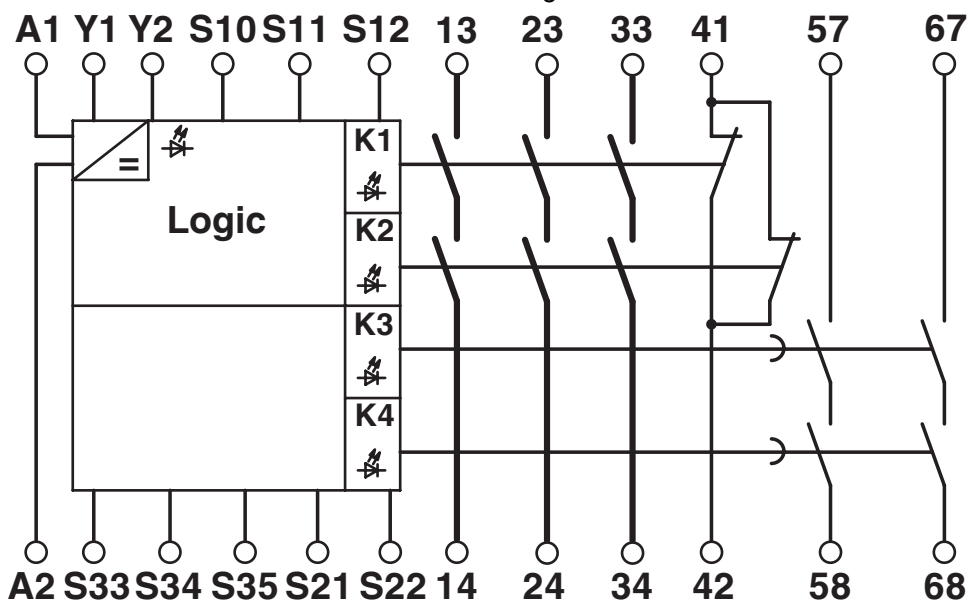


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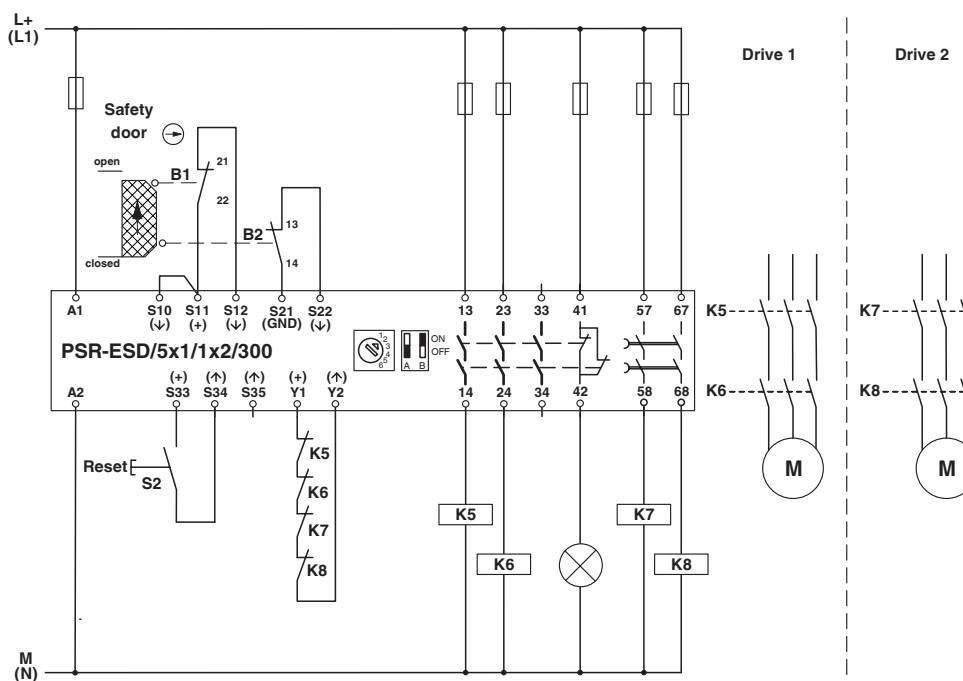
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## Drawings

Circuit diagram



Circuit diagram



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## Approvals



**EAC**

Approval ID: TR\_TS\_D\_00573\_c



**UL Listed**

Approval ID: FILE E 140324



**cUL Listed**

Approval ID: FILE E 140324



**Functional Safety**

Approval ID: 01/205/5347.03/21

**cULus Listed**

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## Classifications

### ECLASS

ECLASS-9.0	27371819
ECLASS-10.0.1	27371819
ECLASS-11.0	27371819

### ETIM

ETIM 8.0	EC001449
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### UNSPSC

UNSPSC 21.0	39122200
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## Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads"

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