PSR-MC35-2NO-1DO-24DC-EXI-SP - Safety relays

1332281

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Safety relay for emergency stop switch up to SIL 3, Cat. 4, PL e, 2 intrinsically safe inputs up to zone 0, 2 enabling current paths, automatic or manual, monitored start, plug-in push-in terminal block, U_S = 24 V DC

Product description

The PSR-MC35-Exi has two intrinsically safe inputs in accordance with EN 60079-11 and is used to monitor one- or two-channel signal generators, such as emergency stops or safety door switches, which may be located in zone 0 of the potentially explosive area, for example. The safety relay itself can be used in the potentially explosive area of zone 2, provided it is installed in a suitable control or distribution box. The ambient temperatures may be up to 70°C. To be suitable for use under these extreme conditions, the PSR-MC35-Exi is equipped with a painted PCB. With its SIL 3 or PL e certification, the safety relay also meets the highest requirements for the safety of machinery and, with its small overall width of just 17.5 mm, also takes up very little space

Your advantages

- Intrinsically safe inputs for connecting e.g., emergency stop applications up to zone 0 (gas) of the potentially explosive area
- Suitable for installation in zone 2 potentially explosive areas
- Extended temperature range of up to 60°C
- Increased corrosion protection through protective coating on the PCB
- Suitable up to category 4, PL e (EN ISO 13849-1), SIL 3 (EN IEC 62061)
- Housing width: 17.5 mm

Commercial data

Item number	1332281
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01

Product key	DNA181
GTIN	4063151634155
Weight per piece (including packing)	240 g
Weight per piece (excluding packing)	138.68 g
Customs tariff number	85371098
Country of origin	DE

Technical data

Product properties

Product type	Safety relays
Product family	PSRmini
Relay type	Electromechanical relay with force-guided contacts in accordance with IEC/EN 61810-3

Insulation characteristics

Overvoltage category	II
Degree of pollution	2

Times

Typical response time	< 100 ms (manual, monitored start)
	< 100 ms (automatic start)
Typ. starting time with U_s	< 100 ms (when controlled via A1)
Typical release time	< 20 ms (on demand via the sensor circuit)
	< 20 ms (on demand via A1)
Restart time	< 1 s (Boot time, after switching on the supply voltage)
Recovery time	1 s (following demand of the safety function)
	500 ms (Availability time after activating the sensor circuit during manual start)
Start pulse length	≥ 500 ms (manual start)

Electrical properties

Maximum power dissipation for nominal condition	7.82 W (U_S = 30 V, I_{REL}^2 = 72 A², $U_{ContactVoltageDrop}$ = 0.2 V, $P_{Total\ max}$ = 1.42 W + 6.2 W)
Nominal operating mode	100% operating factor
Rated insulation voltage	320 V
Rated surge voltage/insulation	See data sheet, section “Insulation coordination”.

Supply

Designation	A1/A2
Rated control circuit supply voltage U_S	19.2 V DC ... 30 V DC
Rated control circuit supply voltage U_S	24 V DC -20 % / +25 % (provide external protection)
Rated control supply current I_S	typ. 55 mA
Inrush current	typ. 6 A (Δt = 200 µs, at U_S)
Filter time	1 ms (at A1 in the event of voltage dips at U_s)
Power consumption at U_D	typ. 1.32 W
Protective circuit	Serial protection against polarity reversal
	Suppressor diode

Input data

Digital: Sensor circuit (S12, S22)

Description of the input	safety-related sensor inputs

Number of inputs	2
Input voltage range "1" signal	5 V ... 9 V (S12)
	1 V ... 2.5 V (S22)
Inrush current	< 4 mA (Δt = 500 µs at U_s)
Filter time	High test pulses and low test pulses are not permitted
Concurrence	∞
Max. permissible overall conductor resistance	200 Ω
Protective circuit	Suppressor diode
Current consumption	< 4 mA (typ. with U_S)

Digital: Start circuit (S34, S35)

Description of the input	non-safety-related
	NPN
Number of inputs	2
Input voltage range "1" signal	5 V ... 9 V
Inrush current	< 4 mA (typ. with U_S, Δt ≤ ms)
Filter time	High test pulses and low test pulses are not permitted
Concurrence	∞
Max. permissible overall conductor resistance	200 Ω
Protective circuit	Suppressor diode
Current consumption	< 4 mA (typ. with U_S)

Output data

Relay: Enabling current path (13/14, 23/24)

Output description	2 N/O contacts each in series, safety-related, floating
Number of outputs	2 (undelayed)
Contact switching type	2 enabling current paths
Contact material	$AgSnO_2$
Switching voltage	min. 12 V
	max. 250 V AC/DC (See section “Relay data”)
Switching power	min. 60 mW
Inrush current	min. 3 mA
	max. 6 A
Switching capacity	4 A (24 V (DC13))
	2 A (230 V (AC15))
Limiting continuous current	6 A
Sq. Total current	72 A^2 (observe derating)
Switching frequency	0.1 Hz
Mechanical service life	10x 10^6 cycles
Output fuse	6 A gL/gG
	4 A gL/gG (for low-demand applications)

Signal: M1

Output description	PNP

	non-safety-related
Number of outputs	1
Voltage	approx. 22 V DC (U_s - 2 V)
Current	max. 100 mA
Maximum inrush current	500 mA (Δt = 1 ms at U_s)
Ohmic load	min. 220 Ω
Protective circuit	Suppressor diode
Short-circuit protection	Yes
Output fuse	≤ 200 mA Slow-blow (For applications with requirements regarding the “ia” type of protection, see Section “Installation in potentially explosive areas”)

Connection data

Connection technology

pluggable	yes

Conductor connection

Connection method	Push-in connection
Conductor cross-section rigid	0.2 mm² ... 1.5 mm²
Conductor cross-section flexible	0.2 mm² ... 1.5 mm²
Conductor cross-section, flexible, with ferrule, with plastic sleeve	0.25 mm² ... 1.5 mm² (only together with CRIMPFOX 6)
Conductor cross-section, flexible, with ferrule, without plastic sleeve	0.25 mm² ... 1.5 mm² (only together with CRIMPFOX 6)
Conductor cross-section AWG	24 ... 16
Stripping length	8 mm

Ex data

Safety data: Intrinsically safe connections (S11, S12, S21, S22, S34, S35)/Ex i parameters

Note	Safety characteristics in accordance with ATEX and IECEx (IEC 60079-1)
Max. internal inductance L_i	negligible
Max. internal capacitance C_i	200 nF
Max. output voltage U_o	11.5 V
Max. output current I_o	100 mA
Max. output power P_o	285 mW
Safety-related maximum voltage U_m	63 V AC (A1/A2, M1)
	90 V DC (A1/A2, M1)
	250 V AC (13/14, 23/24)
	125 V DC (13/14, 23/24)
I (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	0.3 mH / 47.8 µF
IIA (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	0.25 mH / 45.8 µF
IIB (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	0.12 mH / 11 µF

IIC (simple circuit): Max. external inductivity L_o / Max. external capacitance C_o	0.03 mH / 1.44 µF

Signaling

Status display	4 x LED (green)
Operating voltage display	1 x green LED (PWR)

Dimensions

Width	17.5 mm
Height	116.6 mm
Depth	114.5 mm

Material specifications

Color (Housing)	yellow (RAL 1018)
Housing material	PA

Characteristics

Safety data

Stop category (EN 60204-1)	0

Safety data: EN ISO 13849

Performance level (PL)	e (2 A AC15, 8760 switching cycles/year; 4 A DC13, 8760 switching cycles/year)

Safety data: IEC 61508 - High demand

Safety Integrity Level (SIL)	3

Safety data: IEC 61508 - Low demand

Safety Integrity Level (SIL)	3

Safety data: EN IEC 62061

Safety Integrity Level (SIL)	3

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Ambient temperature (operation)	-20 °C ... 60 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °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, amplitude 0.15 mm, 2g

Approvals

ATEX

Identification	II 3(1) G Ex ec nC [ia Ga] IIC T4 Gc
	II (1) G [Ex ia Ga] IIC
	II (1) D [Ex ia Da] IIIC
	I (M1) [Ex ia Ma] I
Certificate	UL 25 ATEX 3448 X

IECEx

Identification	Ex ec nC [ia Ga] IIC T4 Gc
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	[Ex ia Ma] I
Certificate	IECEx ULD 25.0025X

UL, USA/Canada

Identification	cULus
Certificate	E140324

UL, USA/Canada

Identification	Class I, Zone 2, AEx ec nC IIC T4
	Class I, Zone 2, Ex ec nC IIC Gc T4 X
Certificate	E360692

CE

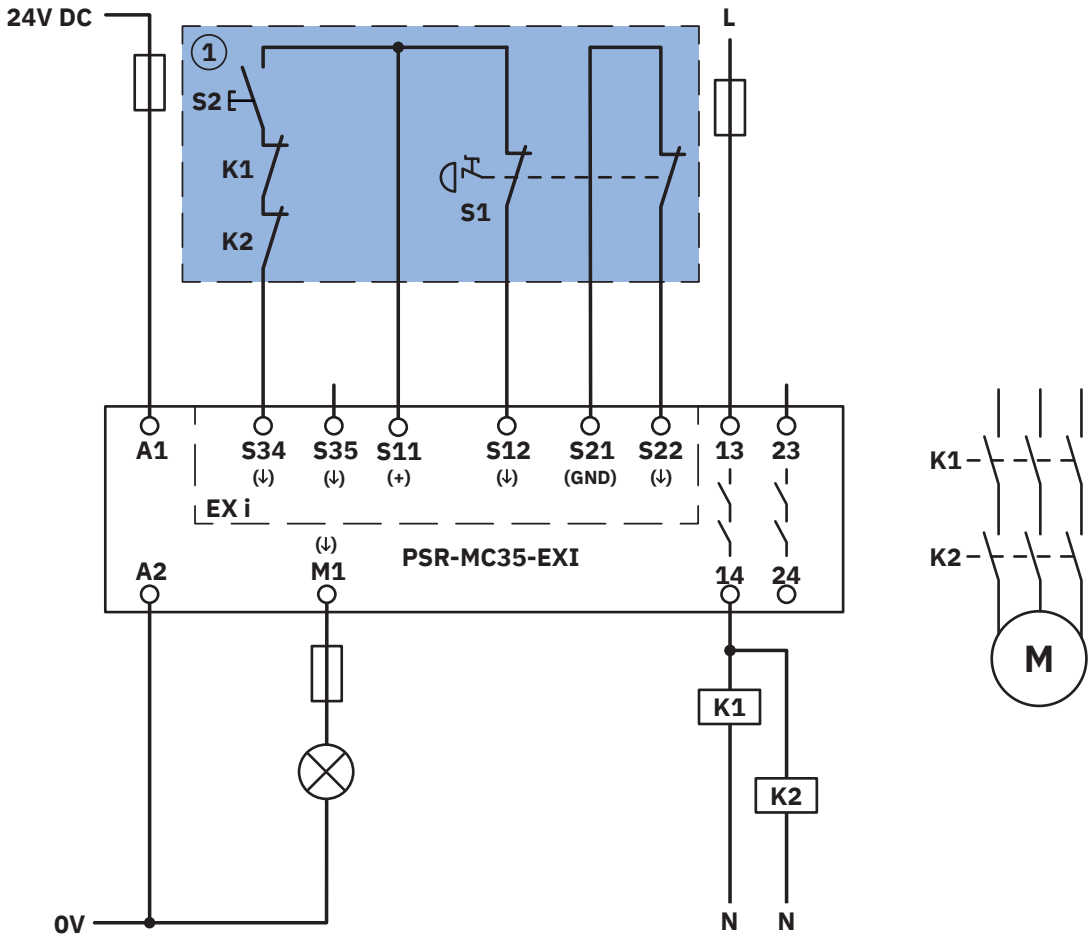
Identification	CE-compliant

Mounting

Mounting type	DIN rail mounting
Assembly note	See derating curve
Mounting position	vertical or horizontal

Drawings

Circuit diagram



Emergency stop monitoring/manual, monitored start

Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/1332281

Functional Safety
Approval ID: 44 205 15124327

Functional Safety
Approval ID: 44 780 15124327

cULus Listed
Approval ID: E140324

ATEX
Approval ID: UL 25 ATEX 3448X

cULus Listed
Approval ID: E360692

Classifications

ECLASS

ECLASS-13.0	27371819
ECLASS-15.0	27371819
ECLASS-15.0 ASSET	27250101

ETIM

ETIM 10.0	EC001449

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(a)-I, 7(c)-I

China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)

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