PSR-MC31-2SDO-1DO-24DC-SC - Safety relay module

1015520

https://www.phoenixcontact.com/us/products/1015520

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Safety relay module for safety shut-off mats, switching strips, emergency stop, safety doors, and light grids up to SIL 3, Cat. 4, PL e, 1 or 2-channel operation, automatic or manual start, 2 safe HL outputs, 1 signal output, U_S = 24 V DC, plug-in screw terminal block

Your advantages

- Up to Cat. 4/PL e in accordance with EN ISO 13849-1, SIL 3 in accordance with EN□IEC 62061
- Low housing width of just 12.5 mm
- Cascade input
- Compatible with numerous signal generators
- 1 or 2-channel control
- 2 safe digital outputs, 1 digital signal output

Commercial data

Item number	1015520
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN01
Product key	DNA181
GTIN	4055626496931
Weight per piece (including packing)	142.24 g
Weight per piece (excluding packing)	108.657 g
Customs tariff number	85371098
Country of origin	DE

Technical data

Product properties

Product type	Safety relays
Product family	PSRmini
Application	Emergency stop
	Safety door
	Safety shut-off mats
	Light grid

Insulation characteristics

Protection class	II (EN 50178)

Times

Typical response time	< 200 ms (automatic start)
	< 175 ms (manual, monitored start)
Typ. starting time with U_s	< 200 ms (with U_s when controlled via A1)
Response time	< 10 ms (Take the extension of the response time into consideration if you switch several devices in sequence.)
Restart time	< 250 ms (Boot time)
Recovery time	250 ms (following demand of the safety function)

Electrical properties

Maximum power dissipation for nominal condition	3.1 W (U_B = 30 V , I_{L1} = I_{L2} = 2.4 A)
Nominal operating mode	100% operating factor

Air clearances and creepage distances between the power circuits

Rated insulation voltage	50 V
	50 V AC
Rated surge voltage/insulation	Basic insulation 4 kV between all current paths and housing

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. 54 mA (No load)
Power consumption at U_S	typ. 1.3 W
Inrush current	< 5 A (Δt = 200 µs at U_s)
Filter time	1 ms (For the logic. At A1 in the event of voltage dips at U_s)
Protective circuit	Parallel protection against polarity reversal; Suppressor diode (Provide external protection, see safety notes. Fuse type: 5 A FF)

Input data

Digital: Sensor circuit (S10, S12, S22)

Description of the input	safety-related sensor inputs

	IEC 61131-2 type 3 (S10, S12) PNP (S22)
Number of inputs	3
Input voltage range "0" signal	0 V DC ... 5 V DC (S10, S12)
	S22 open
Input voltage range "1" signal	11 V DC ... 30 V DC (S10, S12)
	0 V ... 0 V (S22)
Input current range "0" signal	0 mA ... 2 mA (S10, S12)
Inrush current	< 10 mA (Typically with U_S at S10/S12, Δt = 500 µs)
	> -5 mA (typ. with U_S at S22, Δt = 500 µs)
Filter time	max. 1.5 ms (Test pulse width of low test pulses)
	Test pulse rate = 5 x Test pulse width
	Does not apply for S22
	Deactivate the switch-on pulses for safety applications.
Concurrence	∞
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	4 mA (S10, S12)
	-4 mA (S22)

Digital: Start circuit (S34, S35)

Description of the input	non-safety-related
Number of inputs	2
Input voltage range "1" signal	19.2 V DC ... 30 V DC
Inrush current	< 10 mA (Typically with U_S, Δt < 100 ms)
Cable length	100 m
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	< 7 mA (Typically with U_S at S34)
	< 5 mA (Typically with U_S at S35)

Digital: External release (S36)

Description of the input	safety-related
	IEC 61131-2 type 3
Number of inputs	1
Input voltage range "0" signal	0 V DC ... 5 V DC
Input voltage range "1" signal	11 V DC ... 30 V DC
Input current range "0" signal	0 mA ... 2 mA
Inrush current	< 10 mA (Δt = 500 µs)
Filter time	max. 1.5 ms (Test pulse width of low test pulses)
	Test pulse rate = 5 x Test pulse width
Max. permissible overall conductor resistance	150 Ω
Protective circuit	Suppressor diode
Current consumption	7 mA

Output data

Digital: 14, 24

Output description	Safety-related digital outputs
	PNP, IEC 61131-2 Type 2
Number of outputs	2
Protective circuit	Freewheeling circuit for inductive loads
Output voltage	≥ 23 V DC (U_s - 1 V)
Leakage current	max. 1 mA (in the safe state)
Ohmic load	min. 12 Ω
Max. capacitive load	max. 10 µF (2.4 A load)
	max. 4.7 µF (1 A load)
Max. inductive load	max. 1 H
Limitation of the voltage induced on circuit interruption	max. 50 V
Output current	max. 2.4 A
Inrush current	max. 4.8 A (Δt = 10 ms)
Min. load current	2 mA
Switching frequency	1 Hz (Resistive, inductive, capacitive)
Output voltage when switched off	< 5 V DC (in the safe state)
Test pulses	< 1 ms (Test pulse width of low test pulses)

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)
Protective circuit	Suppressor diode
Short-circuit protection	Yes

Connection data

Connection technology

pluggable	yes

Conductor connection

Connection method	Screw connection
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section flexible	0.2 mm² ... 2.5 mm²
Conductor cross-section AWG	24 ... 12
Stripping length	7 mm
Screw thread	M3
Tightening torque	0.5 Nm ... 0.6 Nm

Signaling

Status display	3 x green LED

Operating voltage display	1 x green LED
Error indication	1 x red LED

Dimensions

Width	12.5 mm
Height	112.2 mm
Depth	114.5 mm

Material specifications

Housing material	Polyamide

Characteristics

Safety data

Stop category	0

Safety data: EN ISO 13849

Category	4
Performance level (PL)	e

Safety data: IEC 61508 - High 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)	-40 °C ... 70 °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	30g
Vibration (operation)	10 Hz ... 150 Hz, 5g

Approvals

CE

Identification	CE-compliant

Standards and regulations

Air clearances and creepage distances between the power circuits

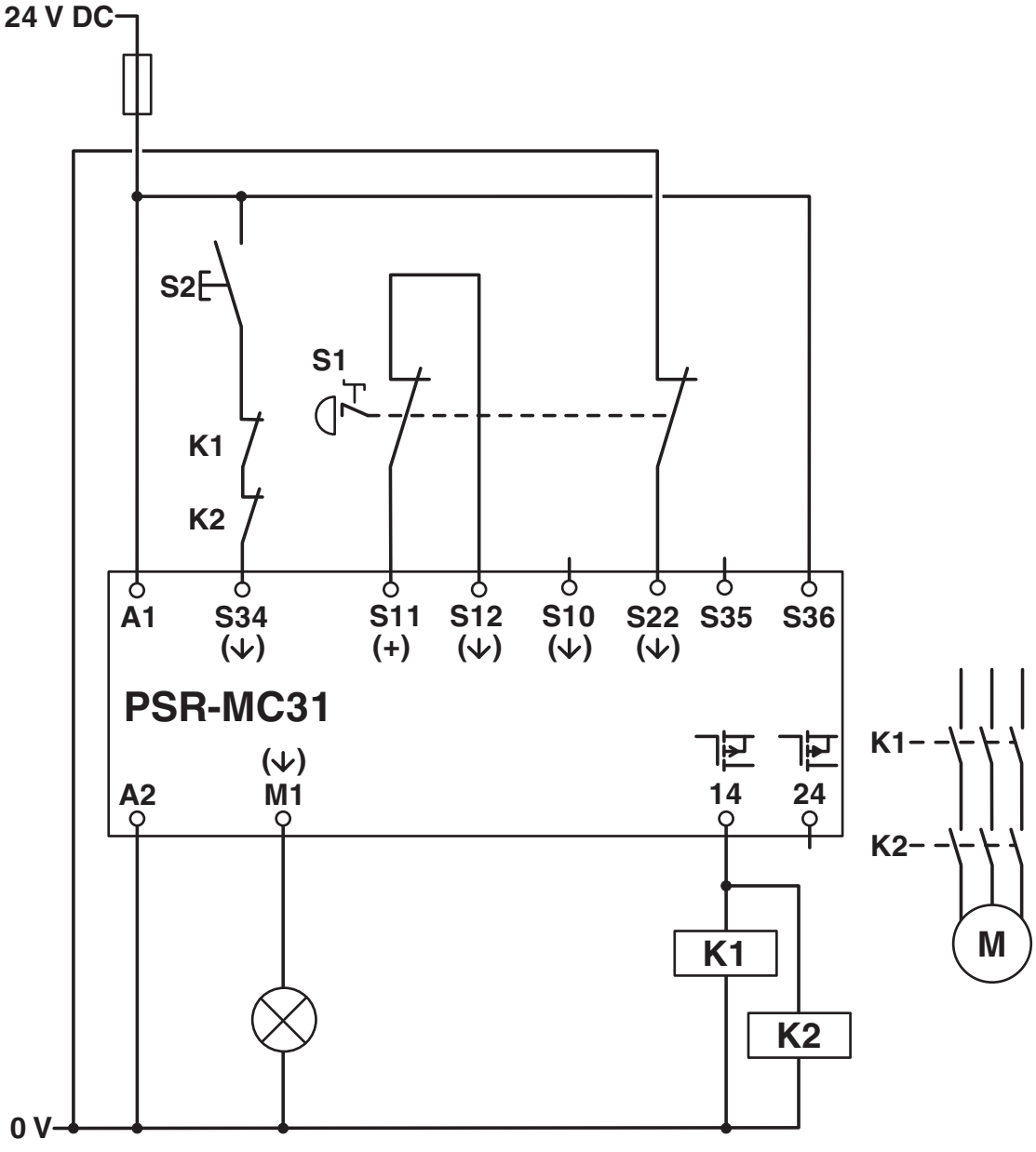
Standards/regulations	DIN EN 50178, EN 60947-5-1

Mounting

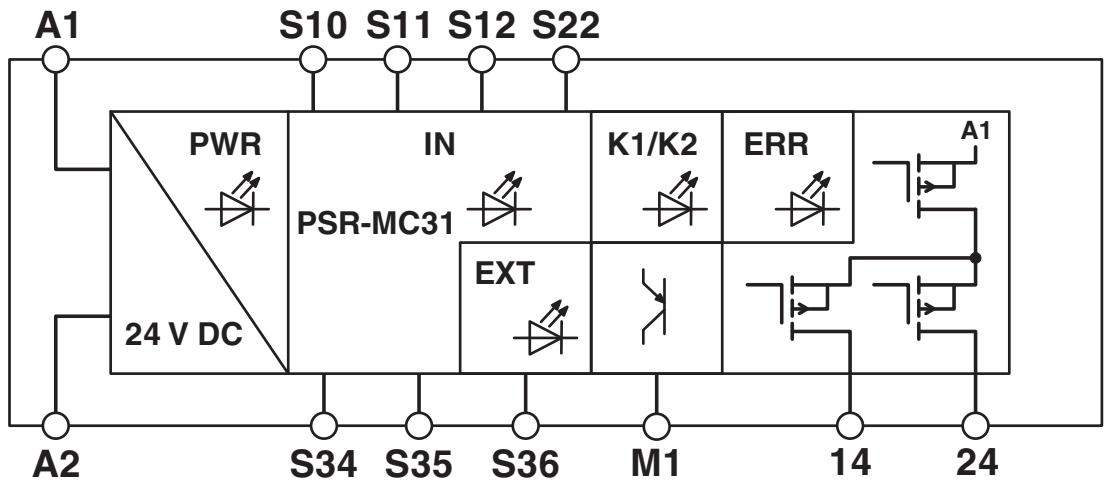
Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Mounting position	vertical or horizontal
Connection method	Screw connection

Drawings

Circuit diagram



Block diagram



Block diagram

Approvals

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UL Listed
Approval ID: FILE E 140324

cUL Listed
Approval ID: FILE E 140324

Functional Safety
Approval ID: 44-780-15124315

Functional Safety
Approval ID: 44-205-15124315

cULus Listed

Classifications

ECLASS

ECLASS-11.0	27371819
ECLASS-12.0	27371819
ECLASS-13.0	27371819

ETIM

ETIM 8.0	EC001449

UNSPSC

UNSPSC 21.0	39122200

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”

Accessories

CP-MSTB - Coding profile

1734634

https://www.phoenixcontact.com/us/products/1734634

Coding profile, is inserted into the slot on the plug or inverted header, red insulating material

CR-MSTB - Coding section

1734401

https://www.phoenixcontact.com/us/products/1734401

Coding section, inserted into the recess in the header or the inverted plug, red insulating material

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CRIMPFOX 6 - Crimping pliers

1212034

https://www.phoenixcontact.com/us/products/1212034

Crimping pliers, for ferrules without insulating collar according to DIN 46228 Part 1 and ferrules with insulating collar according to DIN 46228 Part 4, 0.25 mm^2 ... 6.0 mm^2, lateral entry, trapezoidal crimp

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