

## Safety device - PSR-MC31-2SDO-1DO-24DC-SC - 1015520

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

### Your advantages

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



### Key Commercial Data

Packing unit	1 pc
GTIN	
GTIN	4055626496931
Weight per Piece (excluding packing)	140.000 g
Custom tariff number	85371098
Country of origin	Germany

### Technical data

#### Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
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#### Dimensions

Width	12.5 mm
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## Technical data

### Dimensions

Height	112.2 mm
Depth	114.5 mm

### Ambient conditions

Ambient temperature (operation)	-40 °C ... 70 °C (observe derating)
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Max. permissible relative humidity (operation)	75 % (on average, 85% infrequently, non-condensing)
Max. permissible humidity (storage/transport)	75 % (on average, 85% infrequently, non-condensing)
Maximum altitude	≤ 2000 m (Above sea level)

### Power supply

Designation	A1/A2
Rated control circuit supply voltage $U_s$	24 V DC -20 % / +25 % (provide external protection)
	19.2 V DC ... 30 V DC
Rated control supply current $I_s$	typ. 54 mA (No load)
Power consumption at $U_s$	typ. 1.3 W
Inrush current	< 5 A ( $\Delta t = 200 \mu s$ 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

### Digital inputs

Input name	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, $\Delta t = 500 \mu s$ )
	> -5 mA (typ. with $U_s$ at S22, $\Delta t = 500 \mu s$ )
Current consumption	4 mA (S10, S12)
	-4 mA (S22)
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

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## Technical data

### Digital inputs

	Deactivate the switch-on pulses for safety applications.
Max. permissible overall conductor resistance	150 $\Omega$
Concurrence	$\infty$
Protective circuit/component	Suppressor diode

### 2. Digital inputs

Input name	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 $U_s$ , $\Delta t < 100$ ms)
Current consumption	< 7 mA (Typically with $U_s$ at S34)
	< 5 mA (Typically with $U_s$ at S35)
Max. permissible overall conductor resistance	150 $\Omega$
Cable length	100 m
Protective circuit/component	Suppressor diode

### 3. Digital inputs

Input name	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
Current consumption	7 mA
Protective circuit/component	Suppressor diode

### Digital outputs

Output name	14, 24
Output description	Safety-related digital outputs
	PNP, IEC 61131-2 Type 2
Number of outputs	2
Output voltage	$\geq 23$ V DC ( $U_s - 1$ V)
Output current	max. 2.4 A
Inrush current	max. 4.8 A ( $\Delta t = 10$ ms)
Output voltage when switched off	< 5 V DC (in the safe state)
Leakage current	max. 1 mA (in the safe state)

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## Technical data

### Digital outputs

Ohmic load	min. 12 $\Omega$
Max. capacitive load	max. 10 $\mu$ F (2.4 A load)
	max. 4.7 $\mu$ F (1 A load)
Max. inductive load	max. 1 H
Min. load current	2 mA
Switching frequency	1 Hz (Resistive, inductive, capacitive)
Test pulses	< 120 $\mu$ s (Test pulse width of low test pulses)
Type of protection	Freewheeling circuit for inductive loads
Limitation of the voltage induced on circuit interruption	max. 50 V

### Alarm outputs

Designation	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 ( $\Delta t = 1$ ms at $U_s$ )
Protective circuit/component	Suppressor diode
Short-circuit protection	Yes

### Times

Typical pickup time at $U_s$	< 200 ms (with $U_s$ when controlled via A1)
Typical response time at $U_s$	< 200 ms (automatic start)
	< 175 ms (manual, monitored start)
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)

### General

Nominal operating mode	100% operating factor
Net weight	108.657 g
Mounting position	vertical or horizontal
Mounting type	DIN rail mounting
Assembly instructions	See derating curve
Degree of protection	IP20
Min. degree of protection of inst. location	IP54
Protection class	II (EN 50178)

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## Technical data

### General

Housing material	Polyamide
Housing color	yellow
Operating voltage display	1 x green LED
Status display	3 x green LED
Indication	1 x red LED

### Connection data

Connection method	Screw connection
pluggable	Yes
Conductor cross section solid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12
Stripping length	7 mm
Screw thread	M3
Torque	0.5 Nm ... 0.6 Nm

### Safety-related characteristic data

Stop category in accordance with IEC 60204	0
Designation	IEC 61508 - High demand
Safety Integrity Level (SIL)	3
Designation	EN ISO 13849
Performance level (PL)	e
Category	4
Designation	EN 62061
Safety Integrity Level (SIL)	3

### Standards and Regulations

Designation	Air clearances and creepage distances between the power circuits
Standards/regulations	DIN EN 50178, EN 60947-5-1
Rated insulation voltage	50 V
	50 V AC
Rated surge voltage/insulation	Basic insulation 4 kV between all current paths and housing
Degree of pollution	2
Overvoltage category	III
Shock	30g
Vibration (operation)	10 Hz ... 150 Hz, 5g
Conformance	CE-compliant

### Environmental Product Compliance

Safety device - PSR-MC31-2SDO-1DO-24DC-SC - 1015520

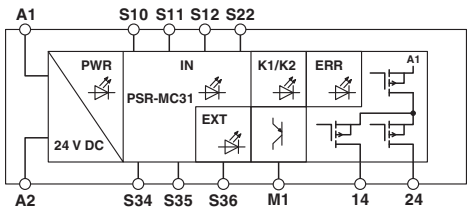
Technical data

Environmental Product Compliance

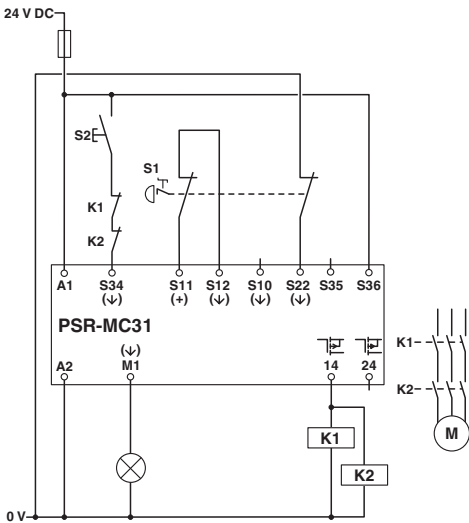
REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

Drawings

Block diagram



Circuit diagram



Classifications

eCl@ss

eCl@ss 10.0.1	27371819
eCl@ss 11.0	27371819
eCl@ss 9.0	27371819

ETIM

ETIM 6.0	EC001449
ETIM 7.0	EC001449

Approvals

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## Approvals

### Approvals

UL Listed / cUL Listed / Functional Safety / Functional Safety / cULus Listed

### Ex Approvals

### Approval details

UL Listed		<a href="http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm</a>	FILE E 140324
cUL Listed		<a href="http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm</a>	FILE E 140324
Functional Safety			44-205-15124315
Functional Safety			44-780-15124315
cULus Listed			

## Accessories

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### Coding element

Coding profile - CP-MSTB - 1734634



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

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### Accessories

Coding section - CR-MSTB - 1734401



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