

## Datasheet - PROTECT-PE-02

Input expander / PROTECT-PE



Preferred typ



(Minor differences between the printed image and the original product may exist!)

- Input expander
- Possibility to connect up to 4 sensors with non-isolated signals, e.g. the CSS products from Schmersal as well as AOPD's (only PROTECT-PE-02)
- Input for up to 4 sensors per interface e.g.: magnetic safety switches type BNS, emergency stop devices, interlocking devices and others
- 2 safety contacts
- Signalling output for each sensor (monitoring of both circuits of the sensors) and all sensors (Y5, group signal)

### Ordering details

Product type description	PROTECT-PE-02
Article number	101210948
EAN Code	4030661395555
eCl@ss	27-37-19-01

### Approval

Approval



### Classification

Standards	EN ISO 13849-1, IEC 61508, EN 60947-5-1
PL	up d (STOP 0)
Control category	up 3 (STOP 0)
DC	> 60% (STOP 0)
CCF	> 65 points
PFH value	$\leq 2 \times 10^{-7}/h$ (STOP 1)
- notice	up to max. 36.500 switching cycles/year and at max. 60% contact load
SIL	up 2 (STOP 0)
Mission time	20 Years
- notice	The PFH value is applicable for the combinations listed in the table for

contact load (K) (current through enabling paths) and switching cycle number (n-op/y).


In case of 365 operating days per year and a 24-hour operation, this results in the specified switching cycle times (t-cycle) for the relay contacts.

Diverging applications on request.

K	n-op/y	t-cycle
20 %	525.600	1,0 min
40 %	210.240	2,5 min
60 %	75.067	7,0 min
80 %	30.918	17,0 min
100 %	12.223	43,0 min

## Global Properties

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Permanent light	PROTECT-PE
Standards	IEC/EN 60204-1, EN 60947-5-1, EN ISO 13849-1, IEC 61508
Compliance with the Directives (Y/N) 	Yes
Climatic stress	EN 60068-2-78
Mounting	snaps onto standard DIN rail to EN 60715
Terminal designations	IEC/EN 60947-1
Materials	
- Material of the housings	Plastic, glass-fibre reinforced thermoplastic, ventilated
Weight	220
Start conditions	Automatic
Start input (Y/N)	No
Feedback circuit (Y/N)	No
Start-up test (Y/N)	No
Automatic reset function (Y/N)	Yes
Reset with edge detection (Y/N)	No
Pull-in delay	
- ON delay with automatic start	typ. 10 ms
Drop-out delay	
- Drop-out delay in case of power failure	≤ 60
- Drop-out delay in case of emergency stop	≤ 10

## Mechanical data

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Connection type	Cage clamps
Cable section	
- Min. Cable section	0,08
- Max. Cable section	2.5
Pre-wired cable	rigid or flexible
Detachable terminals (Y/N)	No
Mechanical life	10.000.000 operations
Electrical lifetime	Derating curve available on request
restistance to shock	30 g / 11 ms
Resistance to vibration To EN 60068-2-6	10...55 HZ, Amplitude 0,35 mm, ± 15 %

## Ambient conditions

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Ambient temperature	
- Min. environmental temperature	-25
- Max. environmental temperature	+55
Storage and transport temperature	
- Min. Storage and transport temperature	-40
- Max. Storage and transport temperature	+85
Protection class	

- Protection class-Enclosure	IP20
- Protection class-Terminals	IP20
- Protection class-Clearance	IP20
Air clearances and creepage distances To IEC/EN 60664-1	
- Rated impulse withstand voltage $U_{imp}$	4 kV
- Overvoltage category	III To VDE 0110
- Degree of pollution	2 To VDE 0110

## Electromagnetic compatibility (EMC)

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EMC rating	conforming to EMC Directive
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## Electrical data

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Rated DC voltage for controls	
- Max. rated DC voltage for controls	21.1
- Max. rated DC voltage for controls	28.8
Rated AC voltage for controls, 50 Hz	
- Min. rated AC voltage for controls, 50 Hz	21.1
- Max. rated AC voltage for controls, 50 Hz	26.4
Rated AC voltage for controls, 60 Hz	
- Min. rated AC voltage for controls, 60 Hz	21.1
- Max. rated AC voltage for controls, 60 Hz	26.4
Contact resistance	max. 100 mΩ
Power consumption	max. 1.7 W; plus signalling outputs Y1...Y5
Type of actuation	DC
Rated operating voltage $U_e$	24 VDC -12% / +20%, residual ripple max. 10%
Operating current $I_e$	0,075 A; plus signalling outputs Y1...Y5
Electronic protection (Y/N)	Yes
Fuse rating for the operating voltage	Internal electronic trip, tripping current > 0,3 A
Current and tension on control circuits	24 VDC, 10 mA

## Inputs

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### Monitored inputs

- Short-circuit recognition (Y/N)	optional
- Wire breakage detection (Y/N)	Yes
- Earth connection detection (Y/N)	Yes
Number of shutters	0
Number of openers	2
Input resistance	approx. 2900 Ω at GND or at $U_e$
Input signal "1"	19 - 28.8 VDC
Input signal "0"	0 - 1 VDC
Conduction resistance	max. 40 Ω

## Outputs

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Stop category	0
Number of safety contacts	0
Number of auxiliary contacts	2 (13-14; 23- 24)
Number of signalling outputs	7 ( Y1-Y5)
Switching capacity	
- Switching capacity of the safety contacts	max. 24 VDC, 2 A ohmic (inductive in case of appropriate protective wiring)

- Switching capacity of the signaling/diagnostic outputs	24 VDC / 100 mA
Fuse rating	
- Protection of the safety contacts	2 A slow blow
- Fuse rating for the signaling/diagnostic outputs	Internal electronic trip, tripping current > 0,75 A
Utilisation category To EN 60947-5-1	DC-13: 24 V / 2 A
Number of undelayed semi-conductor outputs with signaling function	0
Number of undelayed outputs with signaling function (with contact)	9
Number of delayed semi-conductor outputs with signaling function.	0
Number of delayed outputs with signalling function (with contact).	0
Number of secure undelayed semi-conductor outputs with signaling function	0
Number of secure, undelayed outputs with signaling function, with contact.	0
Number of secure, delayed semi-conductor outputs with signaling function	0
Number of secure, delayed outputs with signaling function (with contact).	0
Outputs with antivalent safety contacts (Y/N)	No





### LED switching conditions display

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LED switching conditions display (Y/N)	Yes
Number of LED's	6
LED switching conditions display	
- The integrated LEDs indicate the following operating states.	
- Position relay K2	
- Position relay K3	
- Position relay K1	
- Position relay K4	
- Internal operating voltage Ui	
- LED's or signalling outputs signalise an opened protective device or emergency stops.	
- Monitoring effected on both contact circuits of the sensor.	
- When the safety guard or the emergency stop circuit is opened, a 24V signal is switched at each output concerned (Y1...Y5) and the assigned LED is lit.	

### Miscellaneous data

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Applications	 Emergency-Stop button
	 Pull-wire emergency stop switches
	 Guard system
	 Safety sensor
	 Safety light curtain

### Dimensions

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Dimensions	
- Width	65.5 mm
- Height	126 mm
- Depth	61 mm

### notice

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Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

## notice - Wiring example

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Start level: Depends on the wiring of the safety relay module.

Sensor level: 2-channel control of magnetic safety switches according to EN 60947-5-3

Output level: 2-channel control of a downstream safety relay module

The control recognises cross-short, cable break and earth leakages in the monitoring circuit.

If the inputs S1, S3, S5 and S7 are not used, they have to be bridged to +

If the inputs S2, S4, S6 and S8 are not used, they have to be bridged to -

The safety relay modules must be suitable for signal processing for single or dual-channel floating NC-contacts

Start and actuator configuration has to be effected in accordance with the data sheet

The wiring diagram is shown with guard doors closed and in de-energised condition.

## Keywords

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Keywords PROTECT

## Ordering code

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PROTECT-PE-(1)-(2)

(1)	
02	2 Opener (NC)
11	1 Normally open contact (NO) / 1 Opener (NC)
-AN	with antivalent output contacts
(2)	
without	Cage clamps
SK	Screw connection, plug-in

## Documents

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**Operating instructions and Declaration of conformity** (de) 543 kB, 14.07.2016

Code: mrl\_protect-pe\_de

**Operating instructions and Declaration of conformity** (jp) 629 kB, 17.10.2016

Code: mrl\_protect-pe\_jp

**Operating instructions and Declaration of conformity** (en) 533 kB, 14.07.2016

Code: mrl\_protect-pe\_en

**Operating instructions and Declaration of conformity** (it) 456 kB, 25.07.2016

Code: mrl\_protect-pe\_it

**Operating instructions and Declaration of conformity** (da) 469 kB, 15.10.2015

Code: mrl\_protect-pe\_da

**Operating instructions and Declaration of conformity** (pl) 480 kB, 22.11.2016

Code: mrl\_protect-pe\_pl

**Operating instructions and Declaration of conformity** (es) 457 kB, 20.07.2016

Code: mrl\_protect-pe\_es

**Operating instructions and Declaration of conformity** (cs) 475 kB, 24.02.2016

Code: mrl\_protect-pe\_cs

**Operating instructions and Declaration of conformity (fr)** 463 kB, 17.02.2014

Code: mrl\_protect-pe\_fr

**Operating instructions and Declaration of conformity (nl)** 471 kB, 29.06.2018

Code: mrl\_protect-pe\_nl

**Operating instructions and Declaration of conformity (pt)** 473 kB, 12.04.2017

Code: mrl\_protect-pe\_pt

**CCC certification (cn)** 1 MB, 14.03.2014

Code: q\_prop01

**CCC certification (en)** 1 MB, 14.03.2014

Code: q\_prop02

## Images

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The data and values have been checked thoroughly. Technical modifications and errors excepted.

Generiert am 13.02.2019 - 13:08:48h Kasbase 3.3.0.F.64l