

## Safety device - PSR-MM30-2NO-2DO-24DC-SP - 2702358

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Two-channel zero-speed and over-speed safety relays up to SIL 3, Cat. 4, PL e, 2 safe relay outputs, suitable for connecting HTL, TTL or sine/cosine encoders as well as proximity switches, plug-in spring-cage terminal block, width: 22.5 mm



### Key Commercial Data

|                                      |                                                                                                         |
|--------------------------------------|---------------------------------------------------------------------------------------------------------|
| Packing unit                         | 1 pc                                                                                                    |
| GTIN                                 | <br>4 055626 133232 |
| GTIN                                 | 4055626133232                                                                                           |
| Weight per Piece (excluding packing) | 190.900 g                                                                                               |
| Sales Key                            | DNA242                                                                                                  |

### Technical data

#### Note

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

#### Dimensions

|        |          |
|--------|----------|
| Width  | 22.5 mm  |
| Height | 117.5 mm |
| Depth  | 114.5 mm |

#### Ambient conditions

|                                                |                                                     |
|------------------------------------------------|-----------------------------------------------------|
| Ambient temperature (operation)                | -40 °C ... 55 °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

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## Technical data

### Power supply

|                                            |                                                                   |
|--------------------------------------------|-------------------------------------------------------------------|
| Designation                                | A1/A2                                                             |
| Rated control circuit supply voltage $U_s$ | 24 V DC -15 % / +10 %                                             |
| Rated control supply current $I_s$         | typ. 74 mA                                                        |
| Power consumption at $U_s$                 | typ. 1.78 W                                                       |
| Inrush current                             | < 18 A ( $\Delta t = 500 \mu s$ at $U_s$ )                        |
| Filter time                                | 2 ms (at A1 in the event of voltage dips at $U_s$ )               |
| Protective circuit                         | Serial protection against polarity reversal 33 V suppressor diode |

### Digital inputs

|                                               |                                                                                        |
|-----------------------------------------------|----------------------------------------------------------------------------------------|
| Input name                                    | Operating mode and monitoring inputs                                                   |
| Description of the input                      | NPN, IEC 61131-2, type 1                                                               |
| Number of inputs                              | 1 (Non-safety-related start input: S34)                                                |
|                                               | 3 (Safety-related operating mode inputs: I1, I2, I3)                                   |
|                                               | 2 (Safety-related monitoring inputs: MI1, MI2)                                         |
| Input voltage range "0" signal                | 0 V DC ... 5 V DC                                                                      |
| Input voltage range "1" signal                | 15 V DC ... 30 V DC                                                                    |
| Input current range "0" signal                | 0 mA ... 1.5 mA                                                                        |
| Inrush current                                | < 5 mA                                                                                 |
| Current consumption                           | typ. 4 mA (at $U_s$ )                                                                  |
| Filter time                                   | max. 2 ms (Test pulse width; low test pulses for operating mode and monitoring inputs) |
|                                               | Test pulse rate = 5 x Test pulse width                                                 |
| Max. permissible overall conductor resistance | 150 $\Omega$                                                                           |
| Discrepancy time                              | 2 s (I1, I2, I3)                                                                       |
|                                               | 2.5 s (MI1, MI2)                                                                       |
| Protective circuit/component                  | 33 V suppressor diode                                                                  |

### Measuring inputs

|                                               |                                                            |
|-----------------------------------------------|------------------------------------------------------------|
| Input name                                    | Proximity switch inputs                                    |
| Description of the input                      | NPN, IEC 61131-2, type 1                                   |
| Number of inputs                              | 2 (Safety-related proximity switch inputs: IN1 IN2)        |
| Precision                                     | $\pm 2 \%$ (in reference to the parameterized limit value) |
| Inrush current                                | < 12 mA                                                    |
| Current consumption                           | typ. 10 mA (at $U_s$ )                                     |
| Input voltage range "0" signal                | 0 V DC ... 5 V DC                                          |
| Input voltage range "1" signal                | 15 V DC ... 30 V DC                                        |
| Input current range "0" signal                | 0 mA ... 1.5 mA                                            |
| Max. permissible overall conductor resistance | 150 $\Omega$                                               |
| Limit frequency                               | max. 2 kHz (Minimum pulse duration: 2 $\mu s$ )            |
| Protective circuit                            | 33 V suppressor diode                                      |
| Input name                                    | Encoder input                                              |
| Description of the input                      | TTL, HTL, Sin/Cos                                          |

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### Measuring inputs

|                                               |                                                           |
|-----------------------------------------------|-----------------------------------------------------------|
| Number of inputs                              | 1 (Safety-related encoder input, RJ45)                    |
| Precision                                     | $\pm 2\%$ (in reference to the parameterized limit value) |
| Current consumption                           | $< 3\text{ mA}$ (Per track for $U_S$ )                    |
| Max. permissible overall conductor resistance | $150\ \Omega$                                             |
| Limit frequency                               | max. 400 kHz                                              |
|                                               | max. 250 kHz For active diagnostic safety encoder         |
| HTL signal form                               | 0 V DC ... 3 V DC (Low)                                   |
|                                               | 12 V DC ... 30 V DC (High)                                |
| TTL signal form                               | 0 V DC ... 0.9 V DC (Low)                                 |
|                                               | 2.5 V DC ... 5 V DC (High)                                |
| Sine/cosine signal form                       | 2 V DC ... 3 V DC (1 $V_{pp}$ differential signal)        |

### Relay outputs: enabling current path

|                                               |                                                       |
|-----------------------------------------------|-------------------------------------------------------|
| Output name                                   | Enabling current path                                 |
| Output description                            | 2 NO contacts each in series, without delay, floating |
| Number of outputs                             | 2 (safety-related N/O contacts: 13/14, 23/24)         |
| Contact type                                  | 2 enabling current paths                              |
| Contact material                              | AgSnO <sub>2</sub>                                    |
| Switching voltage                             | min. 12 V AC/DC                                       |
|                                               | max. 250 V AC/DC (Observe the load curve)             |
| Limiting continuous current                   | 6 A                                                   |
| Inrush current                                | min. 3 mA                                             |
|                                               | max. 6 A                                              |
| Sq. Total current                             | $72\text{ A}^2$ (observe derating)                    |
| Switching capacity                            | min. 60 mW                                            |
| Switching frequency                           | max. 0.5 Hz                                           |
| Mechanical service life                       | $10 \times 10^6$ cycles                               |
| Switching capacity according to IEC 60947-5-1 | 4 A (24 V (DC13))                                     |
|                                               | 5 A (250 V (AC15))                                    |
| Output fuse                                   | 6 A gL/gG                                             |

### Alarm outputs

|                              |                                                 |
|------------------------------|-------------------------------------------------|
| Output description           | PNP                                             |
| Number of outputs            | 2 (Non-safety-related signal outputs: MO1, MO2) |
| Voltage                      | approx. 22 V DC ( $U_S - 2\text{ V}$ )          |
| Current                      | max. 100 mA                                     |
| Maximum inrush current       | 500 mA ( $\Delta t = 1\text{ ms}$ at $U_S$ )    |
| Protective circuit/component | 33 V suppressor diode                           |
| Short-circuit protection     | no                                              |

### Times

|                                |                                         |
|--------------------------------|-----------------------------------------|
| Typical response time at $U_S$ | $< 200\text{ ms}$ (For $U_S$ autostart) |
|--------------------------------|-----------------------------------------|

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## Technical data

### Times

|                  |                                                                             |
|------------------|-----------------------------------------------------------------------------|
|                  | < 150 ms (For U <sub>s</sub> manual, monitored start)                       |
| Delay time range | 0 s ... 10 s ±10 % (Adjustable switch-on delay for downtime contacts 23/24) |
| Restart time     | < 1 s (Boot time)                                                           |
| Recovery time    | < 1 s                                                                       |

### General

|                                             |                                                                                                    |
|---------------------------------------------|----------------------------------------------------------------------------------------------------|
| Relay type                                  | Electromechanical relay with forcibly guided contacts in accordance with IEC/EN 61810-3 (EN 50205) |
| Nominal operating mode                      | 100% operating factor                                                                              |
| Net weight                                  | 190.9 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                                                                                               |
| Housing material                            | PBT                                                                                                |
| Housing color                               | yellow                                                                                             |
| Operating voltage display                   | 1 x green LED (PWR)                                                                                |
| Status display                              | 2x LED green (OUT1, OUT2)                                                                          |

### Connection data

|                                       |                        |
|---------------------------------------|------------------------|
| Connection method                     | Spring-cage connection |
| pluggable                             | Yes                    |
| Conductor cross section solid min.    | 0.2 mm <sup>2</sup>    |
| Conductor cross section solid max.    | 1.5 mm <sup>2</sup>    |
| Conductor cross section flexible min. | 0.2 mm <sup>2</sup>    |
| Conductor cross section flexible max. | 1.5 mm <sup>2</sup>    |
| Conductor cross section AWG min.      | 24                     |
| Conductor cross section AWG max.      | 16                     |
| Stripping length                      | 8 mm                   |

### Safety-related characteristic data

|                                             |                                          |
|---------------------------------------------|------------------------------------------|
| Stop category                               | 0                                        |
| Designation                                 | IEC 61508 - High demand                  |
| Safety Integrity Level (SIL)                | 3                                        |
| Designation                                 | EN ISO 13849                             |
| Performance level (PL)                      | e (6 A DC1, 17520 switching cycles/year) |
| Category                                    | 4                                        |
| Designation                                 | EN 62061                                 |
| Safety Integrity Level Claim Limit (SIL CL) | 3                                        |

### Standards and Regulations

|             |                                                                  |
|-------------|------------------------------------------------------------------|
| Designation | Air clearances and creepage distances between the power circuits |
|-------------|------------------------------------------------------------------|

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## Technical data

### Standards and Regulations

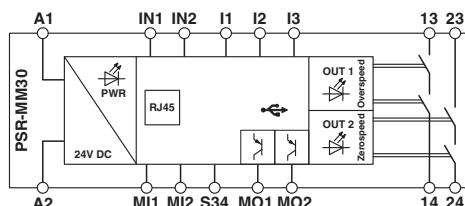
|                                |                                                                                                                                                                                  |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards/regulations          | DIN EN 50178, EN 60947-5-1                                                                                                                                                       |
| 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 input circuit (A1/A2, I1, I2, I3, MI1, MI2, IN1, IN2, S34, MO1, MO2, RJ45, USB) and the enabling current paths (13/14, 23/24) |
| Degree of pollution            | 2                                                                                                                                                                                |
| Overvoltage category           | III                                                                                                                                                                              |
| Shock                          | 15g                                                                                                                                                                              |
| Vibration (operation)          | 10 Hz ... 150 Hz, 2g                                                                                                                                                             |

### Environmental Product Compliance

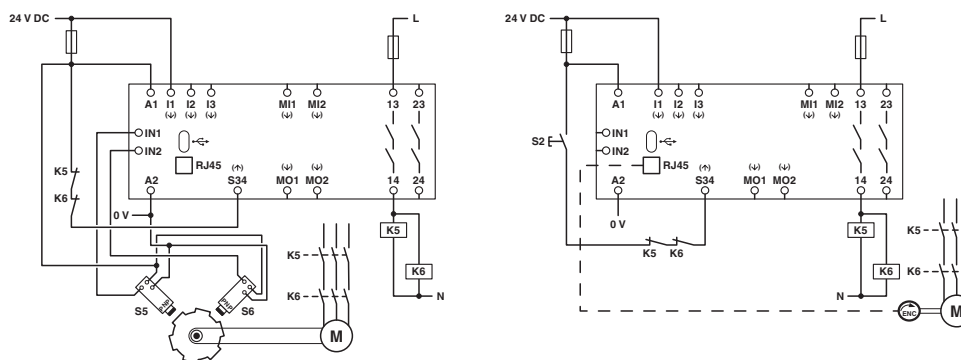
|            |                                                         |
|------------|---------------------------------------------------------|
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e |
|            | No hazardous substances above threshold values          |

## Drawings

Block diagram



Circuit diagram



## Classifications

eCl@ss

|            |          |
|------------|----------|
| eCl@ss 4.0 | 27371102 |
| eCl@ss 4.1 | 27371102 |
| eCl@ss 5.0 | 27371901 |

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### Classifications

#### eCl@ss

|            |          |
|------------|----------|
| eCl@ss 5.1 | 27371901 |
| eCl@ss 6.0 | 27371800 |
| eCl@ss 7.0 | 27371811 |
| eCl@ss 8.0 | 27371811 |
| eCl@ss 9.0 | 27371811 |

#### ETIM

|          |          |
|----------|----------|
| ETIM 3.0 | EC001449 |
| ETIM 4.0 | EC001449 |
| ETIM 5.0 | EC001448 |
| ETIM 6.0 | EC001448 |
| ETIM 7.0 | EC001448 |

#### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 30211901 |
| UNSPSC 7.0901 | 39121501 |
| UNSPSC 11     | 39121501 |
| UNSPSC 12.01  | 39121501 |
| UNSPSC 13.2   | 39122331 |

### Approvals

#### 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/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 140324 |
|-----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|

|            |                                                                                     |                                                                                                                                                       |               |
|------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| cUL Listed |  | <a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a> | FILE E 140324 |
|------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|

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### Approvals

|                   |                                                                                   |                    |
|-------------------|-----------------------------------------------------------------------------------|--------------------|
| Functional Safety |  | 968/FSP 1755.00/19 |
| Functional Safety |  | 01/205/5690.00/19  |
| cULus Listed      |  |                    |

### Accessories

#### Accessories

##### Programming cable

Connecting cable - CAB-USB A/MICRO USB B/2,0M - 2701626



Connecting cable, for connecting the controller to a PC for PC Worx and LOGIC+, USB A to micro USB B, 2 m in length.