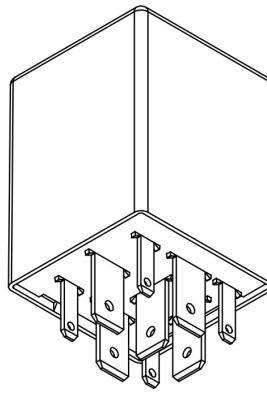


mounting direction



view of plug

## DESCRIPTION

The Micro PLC CAN 4 ANA offers many possible applications with its 5 inputs and outputs. One analog input and four I/Os, the function of which can be individually defined. These inputs/outputs can be used as four analog outputs for current (0-24mA) and voltages (0-10V). Or you can configure them as four analog inputs.

## TECHNICAL SPECIFICATION

|  |   |
|--|---|
| Housing                                      | PA66GF30 plastic  |
| Connector                                    | 9-pin bottom panel  |
| Weight                                       | 28 g  |
| Temperature range (according to ISO 16750-4) | -40 °C to +85 °C  |
| Environmental protection                     | IP 6K8, when watertight socket is used and the mounting direction is correct                              |
| Current consumption                          | 35 mA (at 12 V) 40 mA (at 24 V)   |
| Over-current Protection                      | Current consumption + load current  |
| Total Inputs and outputs                     | 4   |
| Inputs                                       | <b>Configurable as:</b><br>Analog (0...11.4 V/0...33.7 V)<br>Current input (0...24 mA)<br>Frequency input |
| Outputs                                      | <b>Configurable as:</b><br>Constant voltage source<br>Analog voltage output                               |
| Operating voltage                            | 9-32 V  |
| Starting voltage                             | 8 V   |
| Overvoltage protection                       | ≥ 33 V  |
| Undervoltage cut-off                         | ≤ 8 V   |
| Quiescent current                            | 20 µA (at 12 V and 24 V)  |
| Reverse polarity protection                  | Yes   |
| CAN Interfaces                               | Highspeed 2.0 A/B according to ISO 11898-2  |

## REGULATORY APPROVALS AND TESTING

|                  |   |
|------------------|---|
| E1 approval      | ECE R10 05 7522   |
| Electrical tests | Acc. to ISO 16750-2:<br>Short Circuit supply I/O lines<br>Reverse Polarity<br>Interrupt Pin<br>Break plug<br>Jump Start |
|                  | Acc. to ISO 16750-4:<br>Long-term overvoltage at 65 °c<br>Storage Test Tmax and Tmin<br>Operations Test Tmax and Tmin   |
|                  | Acc. to ISO 7637:<br>Car pulses 1 to 4 to ECE R10   |

## SOFTWARE/PROGRAMMING

|                    |   |
|--------------------|---|
| Programming System | <b>MRS Developers Studio</b><br>MRS Developers Studio with built-in functions library, similar programming with FUP. Custom software blocks can be integrated into "C-code". Program memory is sufficient for about 300 basic logic components. |
|--------------------|---|

INPUT FEATURES - SUMMARY

| Pin 1, 3                               |                                   |                                  | Pin 5, 8  |                                   |                                  |
|--|-----------------------------------|----------------------------------|---|-----------------------------------|----------------------------------|
|  | Usable as analog or digital input |                                  |   | Usable as analog or digital input |                                  |
|  | Resolution                        | 12 Bit                           |   | Resolution                        | 12 Bit                           |
|  | Accuracy                          | 1% full scale                    |   | Accuracy                          | 1% full scale                    |
| Voltage input<br>0...11.4 V (see "A")  | Input resistance                  | 500 Ω                            | Voltage input<br>0...11.4 V (see "A")   | Input resistance                  | 500 Ω                            |
|  | Input frequency                   | $f_g = 30$ Hz                    |   | Input frequency                   | $f_g = 30$ Hz                    |
|  | Accuracy                          | ± 3 %                            |   | Accuracy                          | ± 3 %                            |
|  | Conversion factor                 | 3 (33 Digits≈ 100 mV, S.5)       |   | Conversion factor                 | 3 (33 Digits≈ 100 mV, S.5)       |
| Voltage input<br>0...33.6 V (see "B")  | Input resistance                  | 500 Ω                            | Voltage input<br>0...33.6 V (see "B")   | Input resistance                  | 500 Ω                            |
|  | Input frequency                   | $f_g = 75$ Hz                    |   | Input frequency                   | $f_g = 75$ Hz                    |
|  | Accuracy                          | ± 3 %                            |   | Accuracy                          | ± 3 %                            |
|  | Conversion factor                 | 8,8 (12 Digits≈ 100 mV, S.5)     |   | Conversion factor                 | 8,8 (12 Digits≈ 100 mV, S.5)     |
| Digital input                          | Input resistance                  | 500 Ω                            | Digital input   | Input resistance                  | 500 Ω                            |
|  | Turn-on threshold (11.4 V)        | 7 V                              |   | Turn-on threshold (11.4 V)        | 7 V                              |
|  | Turn-off threshold (11.4 V)       | 5.5 V                            |   | Turn-off threshold (11.4 V)       | 5.5 V                            |
|  | Turn-on threshold (33.6 V)        | 20.5 V                           |   | Turn-on threshold (33.6 V)        | 20.5 V                           |
|  | Turn-off threshold (33.6 V)       | 15.6 V                           |   | Turn-off threshold (33.6 V)       | 15.6 V                           |
| Current input<br>0...24 mA (see "C")   | Input resistance                  | 500 Ω                            | Current input<br>0...24 mA (see "C")  | Input resistance                  | 500 Ω                            |
|  | Conversion factor                 | ≈0,0175 (580 Digits≈ 10 mA, S.5) |   | Conversion factor                 | ≈0,0175 (580 Digits≈ 10 mA, S.5) |
| Frequency input (see "D") <sup>2</sup> | Input resistance                  | 500 Ω                            | <sup>1</sup> cutoff frequency (-3 dB)<br><sup>2</sup> When programming via C-code, both frequency inputs can be read in parallel. |                                   |                                  |
|  | Accuracy                          | Up to 5 kHz max. ± 3 %           |   |                                   |                                  |
|  | Turn-on threshold (11.4 V)        | 7 V                              |   |                                   |                                  |
|  | Turn-off threshold (11.4 V)       | 5.5 V                            |   |                                   |                                  |
|  | Turn-on threshold (33.6 V)        | 20.5 V                           |   |                                   |                                  |
|  | Turn-off threshold (33.6 V)       | 15.6 V                           |   |                                   |                                  |

CONFIGURATION OF INPUTS

| Desired Configuration                 | Setting via   |
|---------------------------------------|---|
| Voltage input 0-11.4 V AI_NAME        | DO_I_NAME = 0, DO_30V_10V_NAME = 0, PWM_20MA_NAME = 0             |
| Voltage input 0-33.6 V AI_NAME        | DO_I_NAME = 0, DO_30V_10V_NAME = 1, PWM_20MA_NAME = 0             |
| Analog voltage output / current input | Set: DO_I_NAME = 1, PWM_20MA_NAME (0-100% = 0-UB <sub>-3V</sub> ) |
| Current output                        | Set: DO_I_NAME = 0, PWM_20MA_NAME (0-100% = 0-22 mA)              |
| Frequency input (X and C)             | Reading of the input frequency via FREQ_NAME                      |

OUTPUT FEATURES - SUMMARY

**Pin 1,3,5,8**

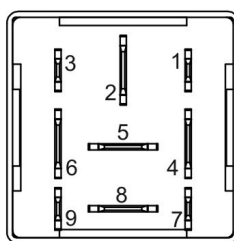
|                             |                       |                   |
|-----------------------------|-----------------------|-------------------|
| Digital, positive switching | Switching voltage     | UB <sub>-3V</sub> |
|                             | Switching current     | 25 mA             |
|                             | Analog voltage output | Deviation ± 3 %   |

PIN ASSIGNMENT POWER SUPPLY AND INTERFACES

| Pin | Pin description             | Pin | Pin description |
|-----|-----------------------------|-----|-----------------|
| 2   | Supply voltage              | 7   | CAN - H         |
| 4   | Battery/ignition contact 15 | 9   | CAN - L         |
| 6   | Ground                      |     |                 |

PIN ASSIGNMENT INPUTS AND OUTPUTS

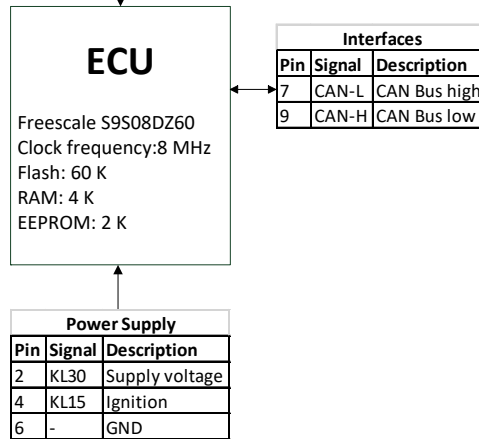
| Pin | Programm signal | Pin description                            | Pin | Programm signal | Pin description             |
|-----|-----------------|--|-----|-----------------|-----------------------------|
| 1   | DI_X            | Digital input X                            | 5   | DI_87A          | Digitale input 87A          |
|     | AI_X            | Analog input X                             |     | AI_87A          | Analog input 87A            |
|     | DO_30V_10V_X    | Range selection 11.4/33.6 V                |     | DO_30V_10V_87A  | Range selection 11.4/33.6 V |
|     | DO_I_X          | Current sink X                             |     | DO_I_87A        | Current sink 87A            |
|     | PWM_20MA_X      | Current output X                           |     | PWM_20MA_87A    | Current output 87A          |
|     | FREQ_X          | Analog voltage output<br>Frequency input X |     |                 | Analog voltage output       |
| 3   | DI_C            | Digital input C                            | 8   | DI_87           | Digital input 87            |
|     | AI_C            | Analog input C                             |     | AI_87           | Analog input 87             |
|     | DO_30V_10V_C    | Range selection 11.4/33.6 V                |     | DO_30V_10V_87   | Range selection 11.4/33.6 V |
|     | DO_I_C          | Current sink C                             |     | DO_I_87         | Current sink 87             |
|     | PWM_20MA_C      | Current output C                           |     | PWM_20MA_87     | Current output 87           |
|     | FREQ_C          | Analog voltage output<br>Frequency input C |     |                 | Analog voltage output       |



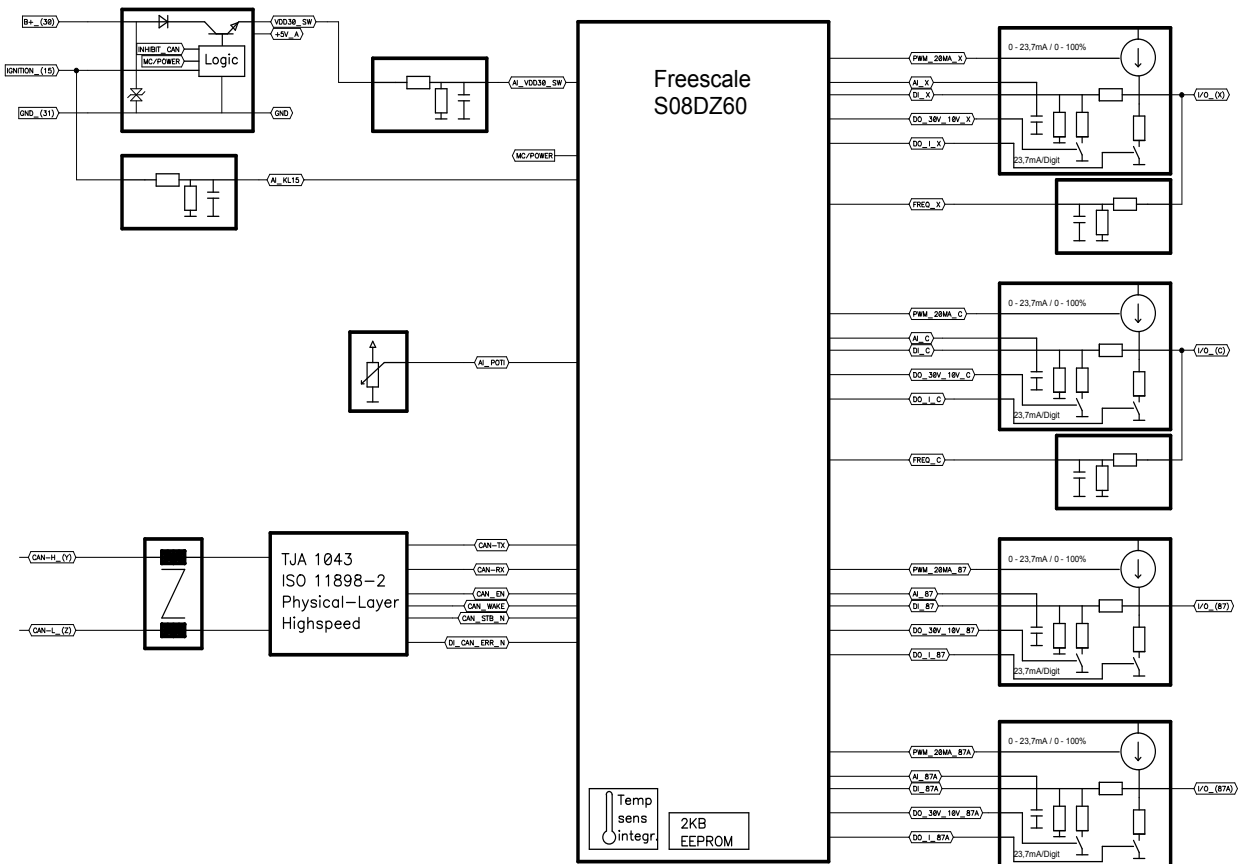
Bottom view

PIN FEATURE MAP

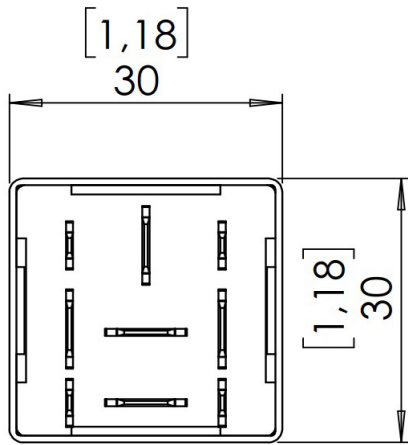
| analog/digital inputs/outputs |               |              |                |              |           |                               |
|-------------------------------|---------------|--------------|----------------|--------------|-----------|-------------------------------|
| Pin                           | Digital Input | Analog Input | Range select   | Current sink | Frequency | Current-/Analogvoltage output |
| 1                             | DI_X          | AI_X         | DO_30V_10V_X   | DO_I_X       | FREQ_X    | PWM_20mA_X                    |
| 3                             | DI_C          | AI_C         | DO_30V_10V_C   | DO_I_C       | FREQ_C    | PWM_20mA_C                    |
| 5                             | DI_87A        | AI_87A       | DO_30V_10V_87A | DO_I_87A     |           | PWM_20mA_87A                  |
| 8                             | DI_87         | AI_87        | DO_30V_10V_87  | DO_I_87      |           | PWM_20mA_87                   |



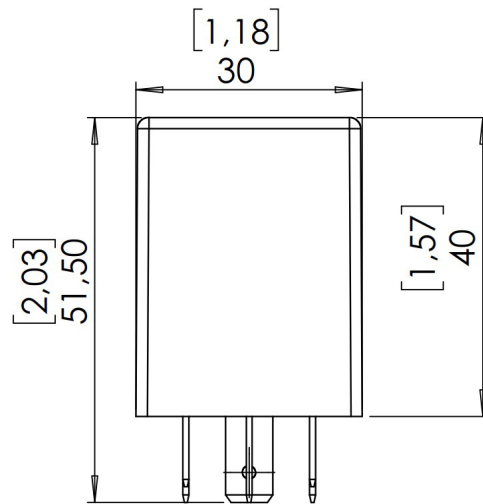
BLOCK FUNCTION DIAGRAM



TECHNICAL DRAWING IN MM [INCH]

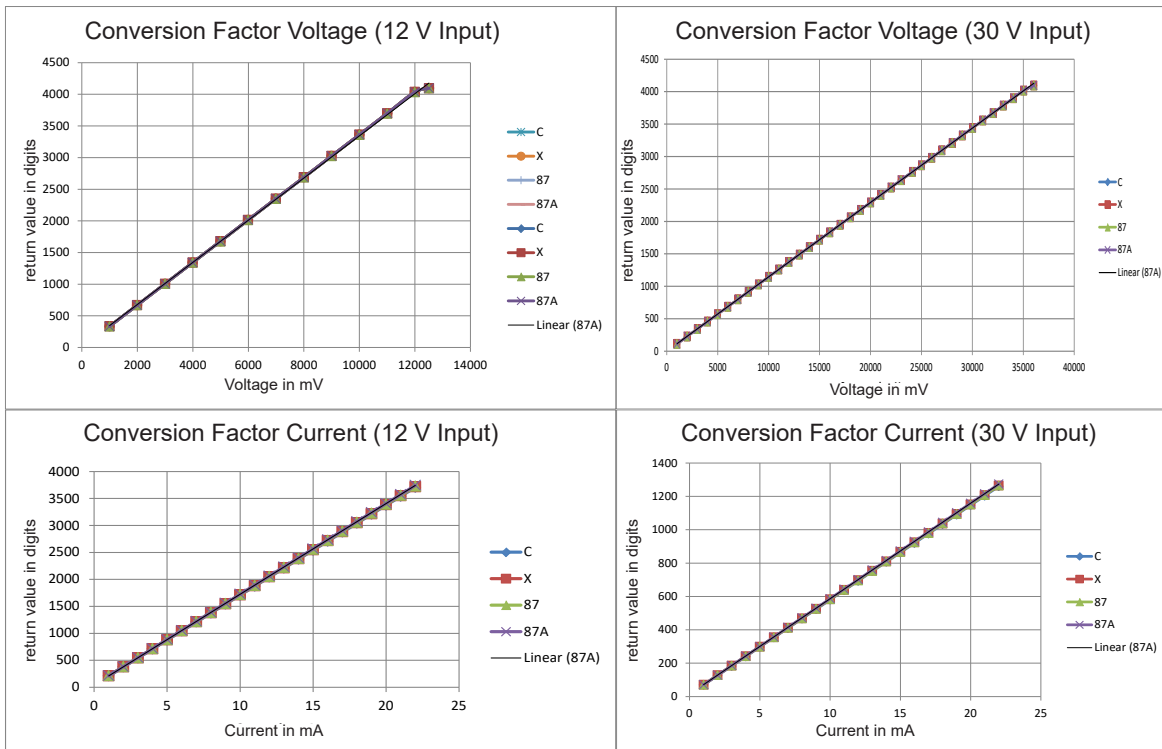


Bottom view



Side view

CONVERSION FACTOR



## ASSEMBLY OPTIONS AND ORDER INFORMATION

| Order number         | Pin numbering of the inputs |              |              |                | CAN Bus    |           | Remarks |
|----------------------|-----------------------------|--------------|--------------|----------------|------------|-----------|---------|
|                      | A<br>Voltage                | B<br>Voltage | C<br>Current | D<br>Frequency | High-Speed | Low-Speed |         |
|                      | 0 – 11.4 V                  | 0 – 33.6 V   | 0 - 24 mA    | 0 - 5.5 kHz    |            |           |         |
| <b>1.112.300.00</b>  | 1,3,5,8                     | 1,3,5,8      | 1,3,5,8      | 1,3            | X          |           |         |
| <b>1.112P.300.00</b> | 1,3,5,8                     | 1,3,5,8      | 1,3,5,8      | 1,3            | X          |           | CANopen |

## ACCESSORIES

| Description   | Order number |
|---|--------------|
| Programming tool MRS Developers Studio              | 1.100.100.09 |
| Cable set to programm CAN 4 ANA                     | 109446       |
| Socket ST FL 9-pin 5x6.3 / 4x2.8                    | 1.017.002.00 |
| Socket package watertight 40 mm                     | 114265       |
| FASTON terminal 6.3 mm 1.5-2.5 mm <sup>2</sup>      | 103064       |
| FASTON terminal 6.3 mm 1.0 mm <sup>2</sup>          | 102355       |
| FASTON terminal 2.8 mm 0.5-1.0 mm <sup>2</sup>      | 105292       |
| Housing bracket                                     | 1.017.08.00  |
| PCAN-USB Interface                                  | 105358       |
| Cabel FLRY 2 x 0.5 mm <sup>2</sup> white/green SL20 | 113085       |

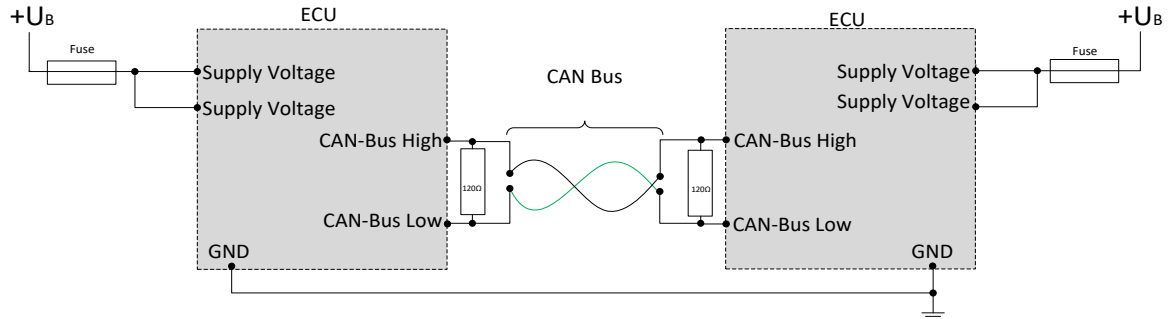


## MANUFACTURER

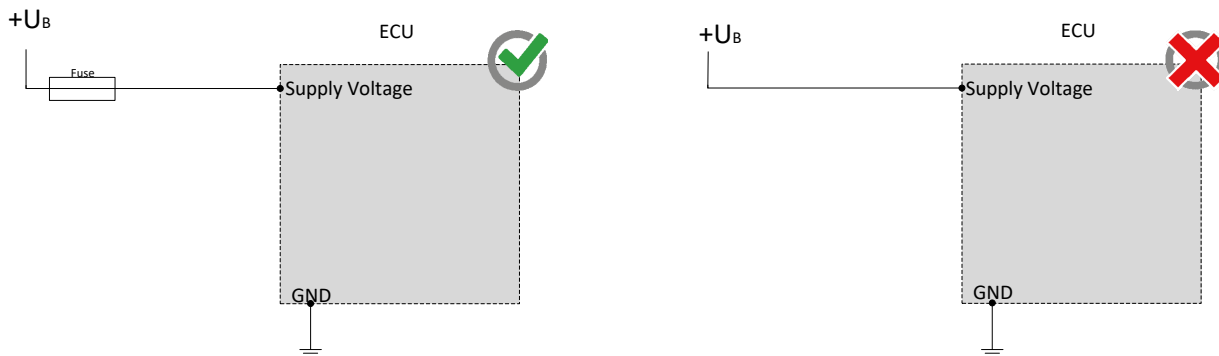
MRS Electronic GmbH & Co. KG  
 Klaus-Gutsch-Str. 7  
 78628 Rottweil  
 Germany

NOTES ON WIRING AND CABLE ROUTING

CAN bus communication is the main communication between the control unit and the vehicle. Therefore, connect the CAN bus with special care and check the correct communication with the vehicle to avoid undesired behavior.



The control must be protected against overload (see performance data)





## SAFETY AND INSTALLATION INFORMATION

It is essential to read the instructions in full thoroughly before working with the device.

Please note and comply with the instructions in the operating instructions and the information in the device data sheet, see [www.mrs-electronic.com](http://www.mrs-electronic.com)

**Staff qualification:** Only staff with the appropriate qualifications may work on this device or in its proximity.

### SAFETY



**WARNING! Danger as a result of a malfunction of the entire system.**

Unforeseen reactions or malfunctions of the entire system may jeopardise the safety of people or the machine.

- Ensure that the device is equipped with the correct software and that the wiring and settings on the hardware are appropriate.



**WARNING! Danger as a result of unprotected moving components.**

Unforeseen dangers may occur from the entire system when putting the device into operation and maintaining it.

- Switch the entire system off before carrying out any work and prevent it from unintentionally switching back on.
- Before putting the device into operation, ensure that the entire system and parts of the system are safe.
- The device should never be connected or separated under load or voltage.



**CAUTION! Risk of burns from the housing.**

The temperature of the device housing may be elevated.

- Do not touch the housing and let all system components cool before working on the system.

### PROPER USE

The device is used to control or switch one or more electrical systems or sub-systems in motor vehicles and machines and may only be used for this purpose. The device may only be used in an industrial setting.



**WARNING! Danger caused by incorrect use.**

The device is only intended for use in motor vehicles and machines.

- Use in safety-related system parts for personal protection is not permitted.
- Do not use the device in areas where there is a risk of explosion.

**Correct use:**

- operating the device within the operating areas specified and approved in the associated data sheet.
- strict compliance with these instructions and no other actions which may jeopardise the safety of individuals or the functionality of the device.

**Obligations of the manufacturer of entire systems**

It is necessary to ensure that only functional devices are used. If devices fail or malfunction, they must be replaced immediately.

System developments, installation and the putting into operation of electrical systems may only be carried out by trained and experienced staff who are sufficiently familiar with the handling of the components used and the entire system.

It is necessary to ensure that the wiring and programming of the device does not lead to safety-related malfunctions of the entire system in the event of a failure or a malfunction. System behaviour of this type can lead to a danger to life or high levels of material damage.

The manufacturer of the entire system is responsible for the correct connection of the entire periphery (e.g. cable cross sections, correct selection/connection of sensors/actuators).

Opening the device, making changes to the device and carrying out repairs are all prohibited. Changes or repairs made to the cabling can lead to dangerous malfunctions. Repairs may only be carried out by MRS.

**Installation**

The installation location must be selected so the device is exposed to as low a mechanical and thermal load as possible. The device may not be exposed to any chemical loads.

Install the device in such a manner that the plugs point downwards. This means condensation can flow off the device. Single seals on the cables/leads must be used to ensure that no water gets into the device.

**Putting into operation**

The device may only be put into operation by qualified staff. This may only occur when the status of the entire system corresponds to the applicable guidelines and regulations.

### FAULT CORRECTION AND MAINTENANCE



**NOTE The device is maintenance-free and may not be opened.**

- If the device has damage to the housing, latches, seals or flat plugs, it must be taken out of operation.

Fault correction and cleaning work may only be carried out with the power turned off. Remove the device to correct faults and to clean it.

Check the integrity of the housing and all flat plugs, connections and pins for mechanical damage, damage caused by overheating, insulation damage and corrosion. In the event of faulty switching, check the software, switches and settings.

Do not clean the device with high pressure cleaners or steam jets. Do not use aggressive solvents or abrasive substances.