

## DESCRIPTION

The PROP CAN valve controller with CAN bus regulates the flow rate of a proportional valve. It can be used in many hydraulic applications. CAN high speed or CAN low speed, alternatively RS485, can be used to communicate with other modules and supports easy integration into existing systems.

## TECHNICAL DATA

|   |  |
|---|--|
| Housing                                       | Plastic  |
| Connector                                     | 9-pin base plate   |
| Weight  | 60 g   |
| Temperature range<br>acc. to ISO 16750-4      | -40 °C...+85 °C  |
| Environmental protection<br>acc. to ISO 20653 | IP 6K8, when watertight socket is used and the mounting direction is correct |
| Current consumption                           | 30 mA  |
| Over-current protection                       | 1 A + Load   |
| Total Inputs and outputs                      | 2 Analog inputs, 1 PWM output (integrated current measurement INA)           |
| Input   | Analog input 0...11.4 V  |
| Output  | PWM output   |
| Supply voltage                                | 9...32 V (Code C for 12 V, Code E for 24 V, acc. to ISO 16750-2)             |
| Overvoltage protection                        | ≥ 33 V   |
| Quiescent current                             | integrated   |
| CAN interface                                 | CAN Interface 2.0 A/B<br>ISO 11898-2 compliant                               |

## REGULATORY APPROVALS AND TESTING

|                 |  |
|-----------------|--|
| E1 approval     | 05 7521  |
| Elektical tests | <p><b>Acc. to ISO 16750-2 or -4:</b><br/>                 Short circuit protection<br/>                 Reverse polarity protection<br/>                 Interruption pin<br/>                 Interruption plug<br/>                 Long-term overvoltage at <math>T_{65\text{ °C}}</math><br/>                 Storage test <math>T_{\text{max}}</math> and <math>T_{\text{min}}</math><br/>                 Operation test <math>T_{\text{max}}</math> and <math>T_{\text{min}}</math><br/>                 Temperature steps<br/>                 Wet heat<br/>                 Superimposed alternating voltage<br/>                 Reset behaviour during voltage drop</p> <p><b>Acc. to ISO 7637-2:</b><br/>                 Puls 1, 2a, 2b, 3a, 3b, 4</p> <p><b>Acc. to ISO 10605:</b><br/>                 ESD up to ± 8 kV</p> |

## SOFTWARE/PROGRAMMING

### Programming System

#### MRS Developers Studio

MRS Developers Studio  
 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.

For extended storage capacity from 32k you need the Codewarrior license. Download the paid license easily and securely from NXP.

## INPUT FEATURES - SUMMARY

| Pin 1 (X)<br>Pin 4 (15)                              | Usable as analog or digital input |                         | Pin 3 (C)  | 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 href="#">A</a> ) | Input resistance                  | 22.7 kΩ                 | Voltage input<br>0...11.4 V (see <a href="#">B</a> ) | Input resistance                  | 22.7 kΩ                 |
|  | Input frequency                   | $f_c^1 = 60 \text{ Hz}$ |  | Input frequency                   | $f_c^1 = 60 \text{ Hz}$ |
|  | Accuracy                          | $\pm 3 \%$              |  | Accuracy                          | $\pm 3 \%$              |
| Digital input<br>positive (see <a href="#">A</a> )   | Input resistance                  | 22.7 kΩ                 | Digital input<br>positive (see <a href="#">B</a> )   | Input resistance                  | 22.7 kΩ                 |
|  | Input frequency                   | $f_g^1 = 60 \text{ Hz}$ |  | Input frequency                   | $f_g^1 = 60 \text{ Hz}$ |
|  | Turn-on threshold                 | 6.5 V                   |  | Turn-on threshold                 | 6.5 V                   |
|  | Turn-off threshold                | 4.8 V                   |  | Turn-off threshold                | 4.8 V                   |

<sup>1</sup> cutoff frequency (-3 dB)

## OUTPUT FEATURES - SUMMARY

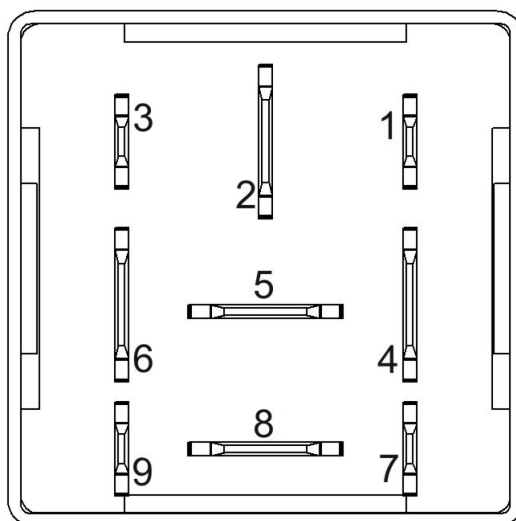
|  |  |                              |                                       |                                |     |
|--|--|------------------------------|---------------------------------------|--------------------------------|-----|
| Pin 8 (87)                             | Protective circuit for inductive loads             | Recovery diode integrated    | Pin 3 (C)<br>As open collector output | max. power<br>(at $T_{room}$ ) | 2 W |
|  | Wire fault diagnostics                             | Possible via current sense   |                                       |                                |     |
|  | Short circuit diagnostics                          | Possible via current sense   |                                       |                                |     |
| PWM output<br>(see <a href="#">C</a> ) | Output frequency                                   | 100 Hz...5 kHz               |                                       |                                |     |
|  | Switching current<br>(Limiting continuous current) | 3 A                          |                                       |                                |     |
|  | Valve connection:                                  | Pin 8 against<br>Pin 5 (GND) |                                       |                                |     |

PIN ASSIGNMENT POWER SUPPLY AND INTERFACES

| Pin | Description                 | Pin | Description |
|-----|-----------------------------|-----|-------------|
| 2   | Contact 30 / Supply voltage | 7   | CAN-H       |
| 6   | Contact 31 / Ground         | 9   | CAN -L      |

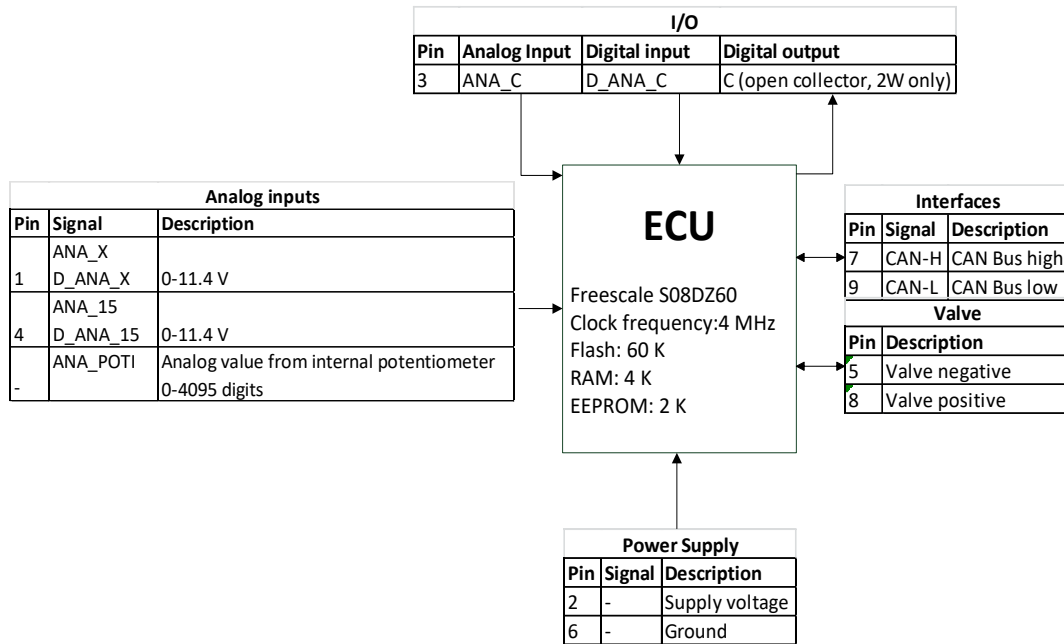
PIN ASSIGNMENT IN- AND OUTPUTS

| Pin | Signal                | Description   | Pin | Signal   | Description   |
|-----|-----------------------|---|-----|----------|---|
| 1   | ANA_X<br>D_ANA_X      | Analog input X 0...11.4 V or digital input  | 5   | -        | Connection proportional valve negative (B)              |
| 3   | ANA_C<br>D_ANA_C<br>C | Analog input C 0...11.4 V or digital input C or Digital output (open collector, 2 W max.) | 8   | ANA_PWM  | Connection proportional valve positive (A),             |
| 4   | ANA_15<br>D_ANA_15    | Analog input 15 0...11.4 V or digital input 15  | -   | ANA_POTI | Analog input of internal potentiometer; 0...4095 digits |

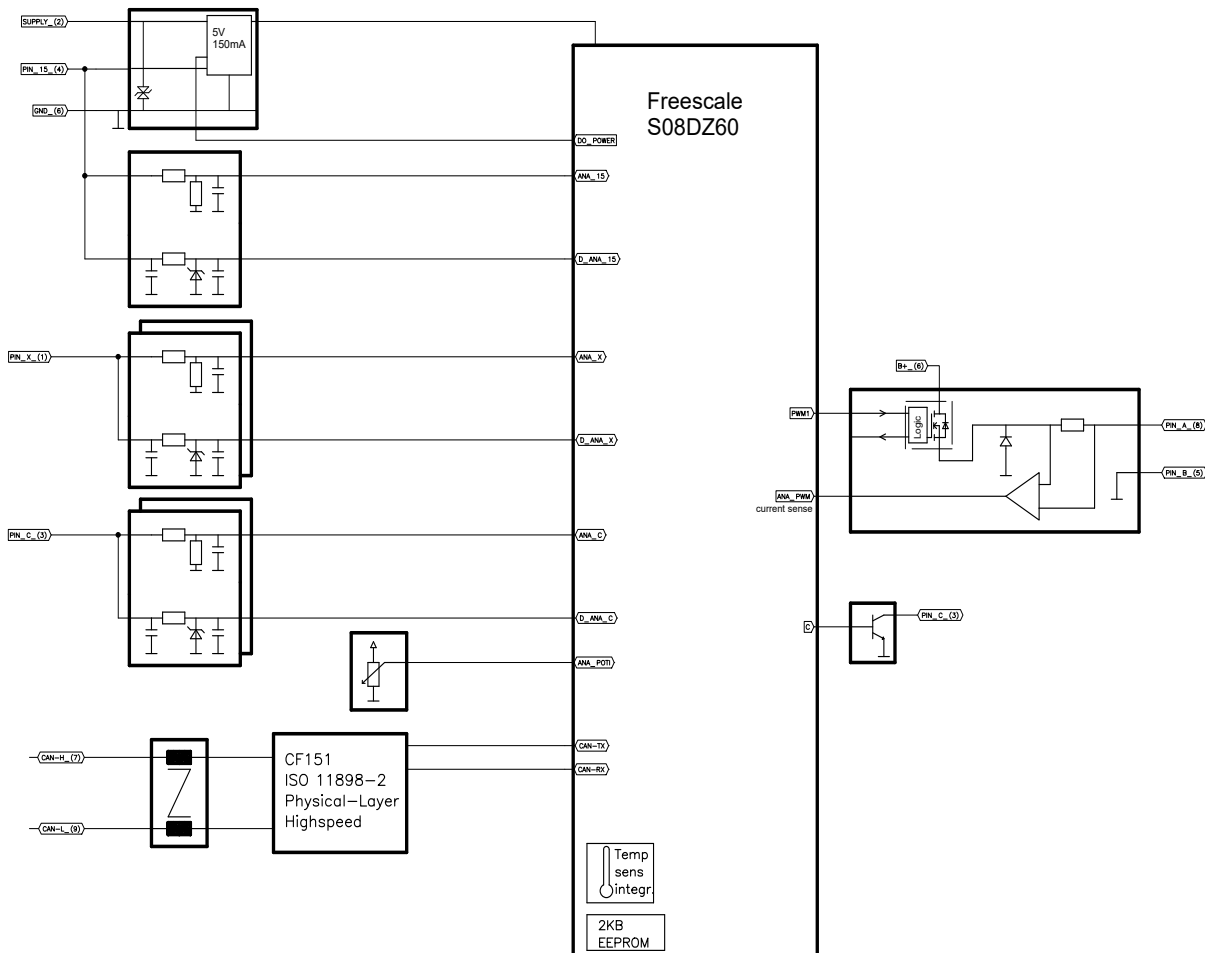


view of plug - bottom view

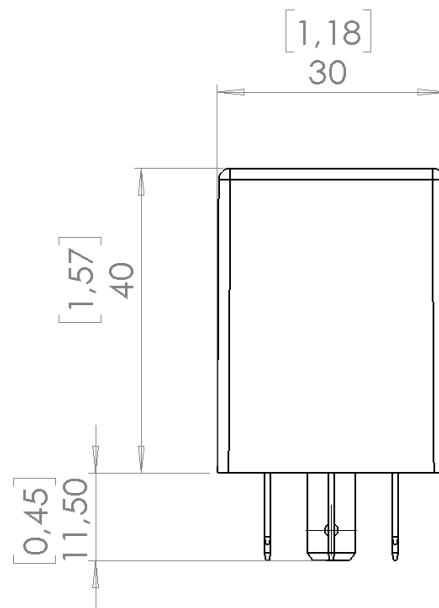
PIN FEATURE MAP



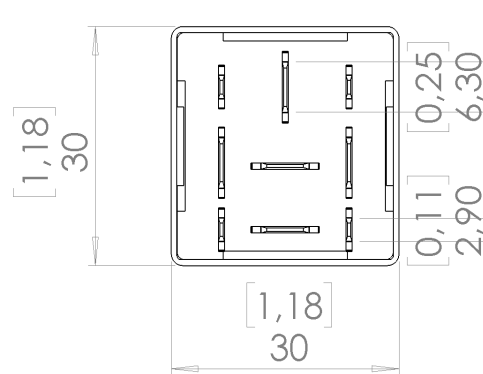
BLOCK DIAGRAM



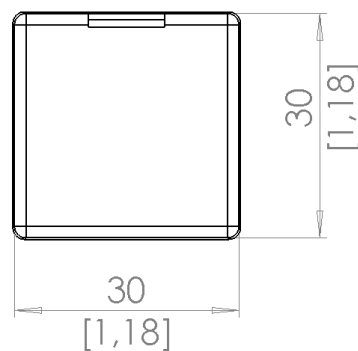
TECHNICAL DRAWING IN MM [INCH]



side view



bottom view



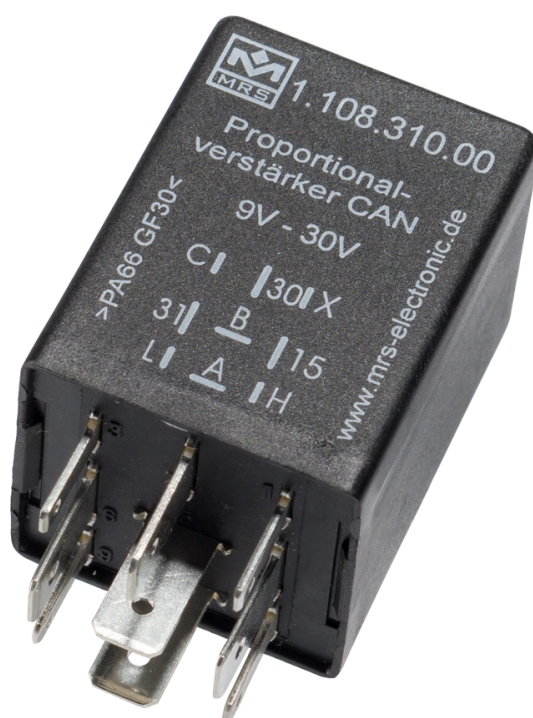
aerial view

## ASSEMBLY VARIANTS AND ORDERING INFORMATIONS

|                      | Pins inputs                |   | Outputs                      |            | CAN bus | Remarks   |
|----------------------|----------------------------|---|------------------------------|------------|---------|---|
|                      | A<br>voltage<br>0...11.4 V | B<br>I/O's (optionally as<br>analog input or<br>digital output) | C<br>PWM<br>(100 Hz...5 kHz) | High-Speed |         |   |
| <b>1.108.310.00</b>  | 1, 4                       | 3   | 8 → 5                        | X          |         | The output of the controller for the proportional valve (pin 8 and 5) may only be operated with the load connected. The maximum connection length from control output to valve is 2m. If this length must be exceeded for application reasons, an individual acceptance test must be carried out.   |
| <b>1.108P.310.00</b> | 1, 4                       | 3   | 8 → 5                        | X          |         | <b>CANopen variant</b><br>The output of the controller for the proportional valve (pin 8 and 5) may only be operated with the load connected. The maximum connection length from control output to valve is 2m. If this length must be exceeded for application reasons, an individual acceptance test must be carried out.   |
| <b>1.108.310.1A</b>  | 1, 4                       | 3   | 8 → 5                        | X          |         | <b>Ground: PIN 5 (valve negative) and PIN 6 (Ground) bridged</b><br>The output of the controller for the proportional valve (pin 8 and 5) may only be operated with the load connected. The maximum connection length from control output to valve is 2m. If this length must be exceeded for application reasons, an individual acceptance test must be carried out. |

## ACCESSORIES

| Description   | Order number |
|---|--------------|
| Programming tool MRS Developers Studio                      | 1.100.100.09 |
| Cable set Prop CAN  | 109446       |
| Socket  | 1.017.002.00 |
| Socket package watertight 40 mm                             | 1.017.010.40 |
| FASTON terminal for latching 6.3 mm 1.5-2.5 mm <sup>2</sup> | 103064       |
| FASTON terminal for latching 6.3 mm 1 mm <sup>2</sup>       | 102355       |
| FASTON terminal for latching 2.8 mm 0.5-1.0 mm <sup>2</sup> | 105292       |
| PCAN USB interface  | 105358       |

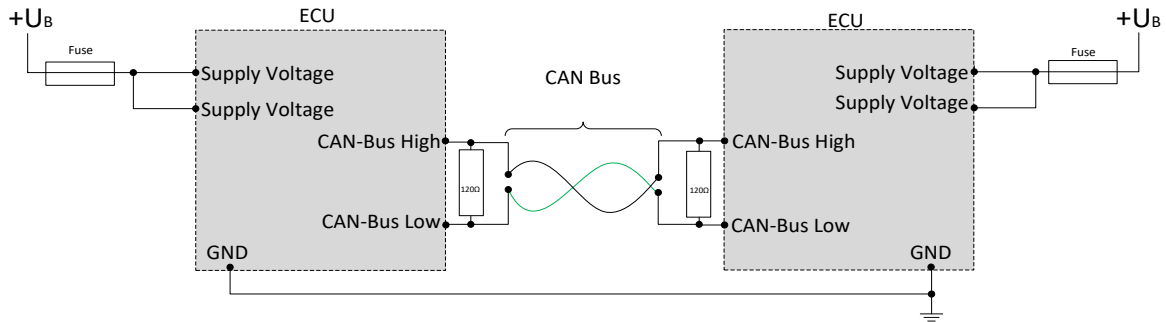


## MANUFACTURER

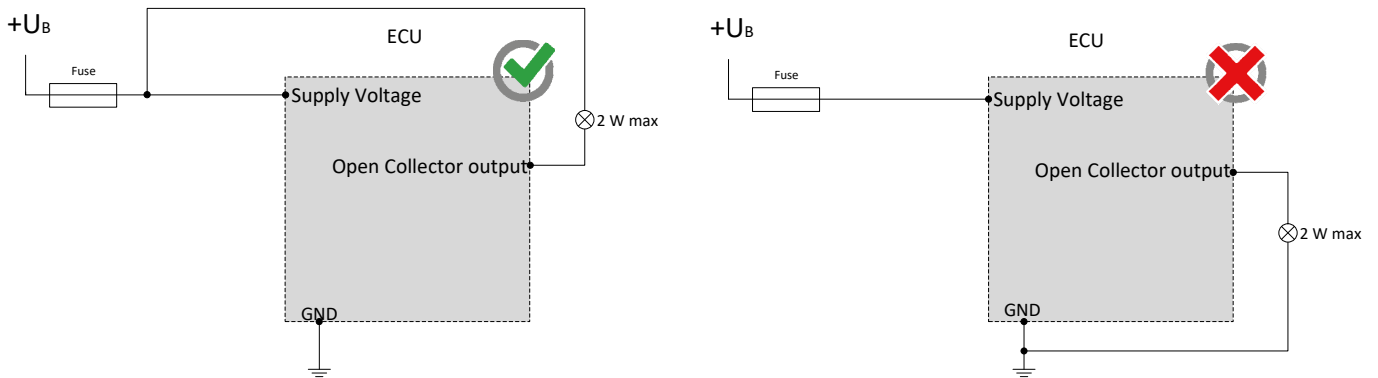
MRS Electronic GmbH & Co. KG  
Klaus-Gutsch-Str. 7  
78628 Rottweil  
Germany

NOTES ON WIRING AND CABLE ROUTING

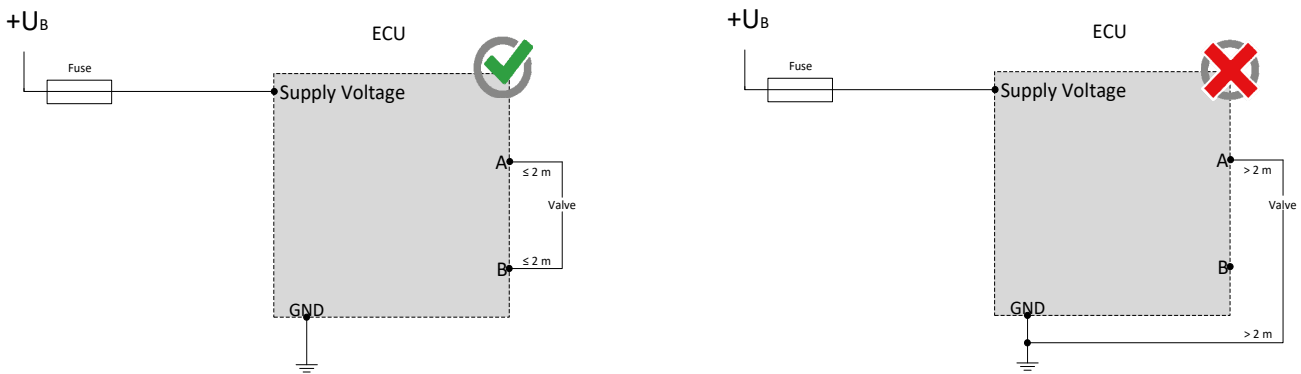
CAN bus communication is the main communication between the control unit and the vehicle. Therefore, connect the CAN bus with special care and check the correct communication with the vehicle to avoid undesired behavior.



The open-collector output may only be switched to power supply of the module.



The output of the valve (pin 8 and 5) may only operate with connected load between pin 8 and 5. The length between ECU and valve may not exceed 2 m. If this length must be exceeded for application, an individual acceptance must take place.





## 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.