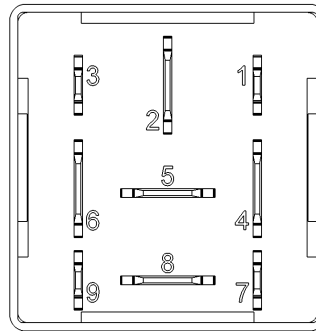


mounting direction



view of plug

DESCRIPTION

The PROP CAN 2CH controller with CAN can be used for the continuous control of 2 loads and is especially used for the control of proportional valves. It realizes due to its two outputs twofold functionality at the same installation space. The desired output current can be specified using the application software thanks to the microcontroller-operated current regulation.

TECHNICAL DATA

Housing	Plastic PA 66GF30
Connector	Base plate 9-pin
Weight	55 g
Temperature range (acc. to ISO 16750-4)	-40 °C to +85 °C
Environmental protection acc. ISO 20653	IP23
Current consumption	30 mA
Over-current protection	see max. switching current
Total inputs and outputs	4 (2 analog inputs, 2 outputs)
Inputs	Depending on assembly: Analog input 0...33 V Frequency input 10 kΩ PU vs KL30
Outputs	Configurable as: Digital, positive switching PWM output
Operating voltage	7...32 V (Code B at 12 V, Code E at 24 V acc. to ISO 16750-2)
Overvoltage protection	from approx. 33 V
Quiescent current	30 μA @ 12 V 80 μA @ 24 V measured with DO_EN_KL30=0
Reverse polarity protection	Yes
CAN interfaces	ISO 11898-2 and ISO 11898-5 capable CANBus Transceiver

REGULATORY APPROVALS AND TESTING

E1 approval	in preparation
Electrical tests	Acc. to ISO 16750 – 2 resp. -4: Short circuit protection Reverse polarity Overvoltage at TMax-20°C Storage test at TMax and TMin Operation test at TMax and TMin Superimposed alternating voltage Starting profile (form. Puls 4 acc. ISO 7637) Load Dump Test B at 24 V (R _i =4 Ω) Acc. ISO 7637 - 2: Pulse 1, 2a, 2b, 3a, 3b Acc. ISO 10605: ESD up to ± 15 kV, on discharge islands ± 20 kV

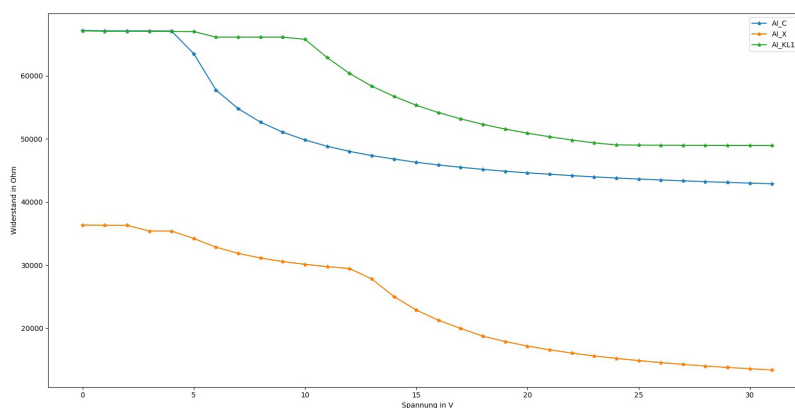
SOFTWARE/PROGRAMMING

Programming System	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.
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INPUT FEATURES - SUMMARY (DEPENDING ON ASSEMBLY)

Pin 1 (X)			Pin 4 (KL15)						
	Programmable as analog or digital input			Programmable as analog- or digital input					
	Resolution	12 Bit		Resolution	12 Bit				
Voltage input 0...33 V (see A)	Input resistance	see diagram AI_X when sensor input assembled, otherwise same resistance value as AI_C	Voltage input 0...33 V (see A)	Input resistance	see diagram				
	Input frequency	$f_g^1 = 345$ Hz (with sensor input) 375 Hz (without sensor input)		Input frequency	$f_g^1 = 330$ Hz				
	Accuracy	$\leq 3\%$		Accuracy	$\leq 3\%$				
Frequency input (see B)	Input resistance	see diagram AI_X when sensor input assembled, otherwise same resistance value as AI_C	Pin 3 (C)	Voltage input 0...33 V (see A)	Input resistance				
	Accuracy	up to 400 Hz $\leq 3\%$				Input frequency	Accuracy		
	Turn-on threshold	~ 3.4 V						Turn-on threshold	Turn-off threshold
	Turn-off threshold	~ 1.6 V							
Sensor input (see C)	Potential	≈ 0.5 x supply voltage	Frequency input (see B)	Input resistance	see diagram AI_C				
	Input resistance	10 k Ω against supply				Accuracy	Turn-on threshold	Turn-off threshold	

¹ Cutoff frequency (-3 dB), measured with 10 V sine



OUTPUT FEATURES - SUMMARY

Pin 2, 3 (87A, 87)	Protective circuit for inductive loads	integrated
	Wire fault diagnostics	via current sense
	Short circuit diagnostics	via current sense
Digital, positive switching (high side; see C) incl. INA-current sense	Switching voltage	7...32 V
	Switching current	see below
PWM output (see C)	Output frequency max. switching current	10 Hz...1 kHz see below
Short circuit resistance against GND and V_s	Shutdown of the outputs controlled by output driver	

LOAD TESTS OF HSD-OUTPUTS

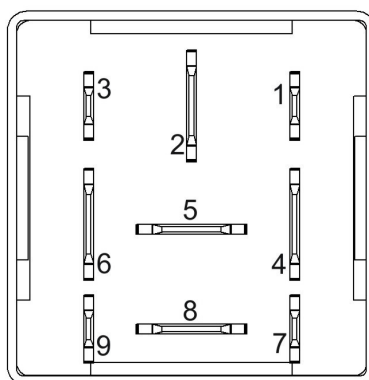
Test without PWM	Test no.	Load	Test parameter	Test with PWM	Test no.	PWM	Load	Test parameter
	1	2.77 A per output	at 85°C and $V_s = 28 V$		1	200 Hz	1.6 A per output	at 85°C and $V_s = 28 V$
					2	500 Hz	0.9 A per output	at 85°C and $V_s = 28 V$
					3	200 Hz	2.4 A per output	at 23°C and $V_s = 28 V$
					4	500 Hz	1.5 A per output	at 23°C and $V_s = 28 V$

PIN ASSIGNMENT POWER SUPPLY AND INTERFACES

Pin	Description	Pin	Description
2	Operating voltage terminal 30	7	CAN - H
4	Terminal 15 / ignition	9	CAN - L
6	Ground / GND		

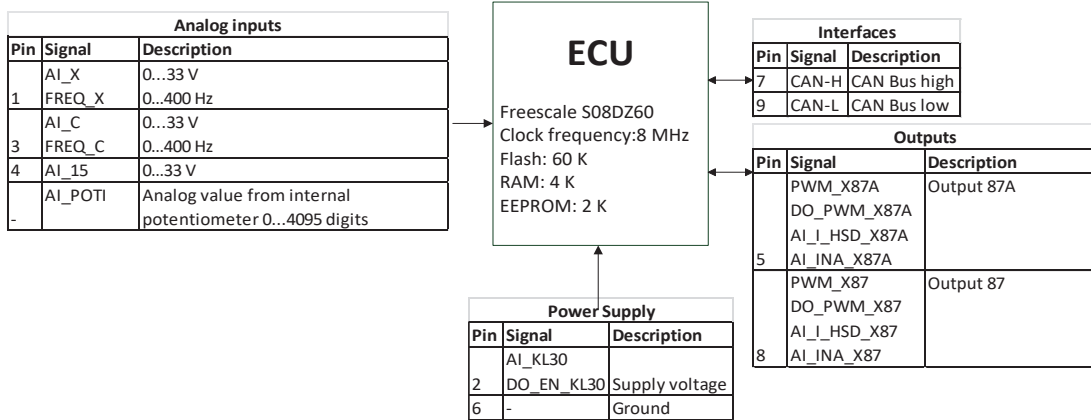
PIN ASSIGNMENT INPUTS AND OUTPUTS

Pin	Signal	Description	Pin	Signal	Description
1	AI_X FREQ_X	Analog input X 0-33 V or frequency input	4	AI_KL15	Analog input KL15 0...33 V
2	AI_KL30 DO_EN_KL30	KL30 measurement 0...33 V with activation possibility (default value = 0)	5	DO_PWM_X87A PWM_X87A AI_I_HSD_X87A AI_INA_X87A	Digital output X87A with PWM-option and HSD current sense or INA 293 current measurement
3	AI_C FREQ_C	Analog input X 0-33 V or frequency input	8	DO_PWM_X87 PWM_X87 AI_I_HSD_X87 AI_INA_X87	Digital output X87 with PWM-option and HSD current sense or INA 293 current measurement

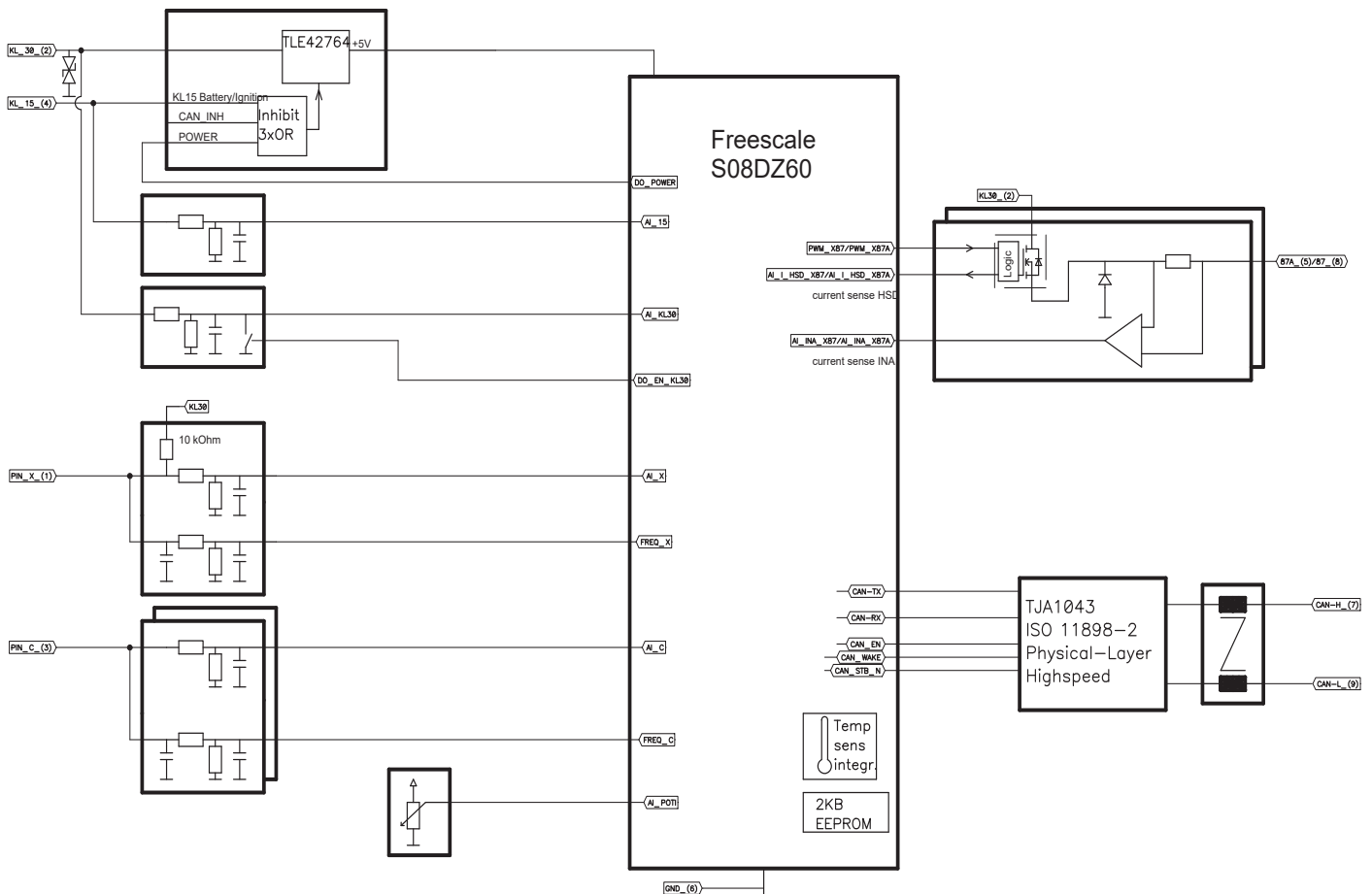


Pin assignment

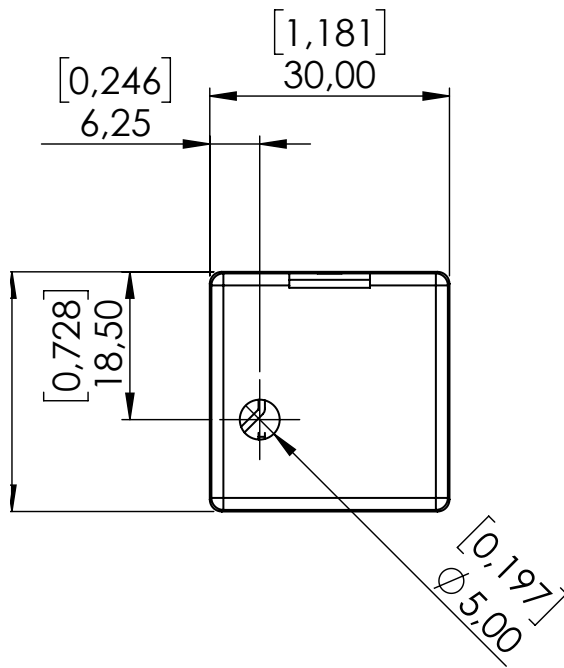
PIN - FEATURE MAP



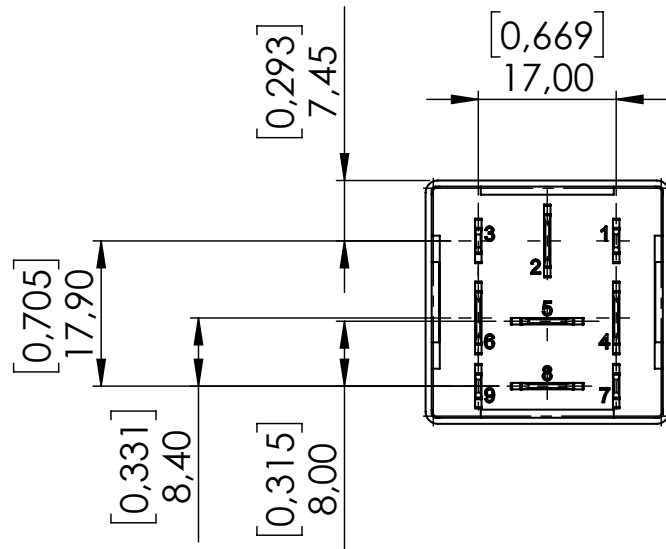
BLOCK FUNCTION DIAGRAM



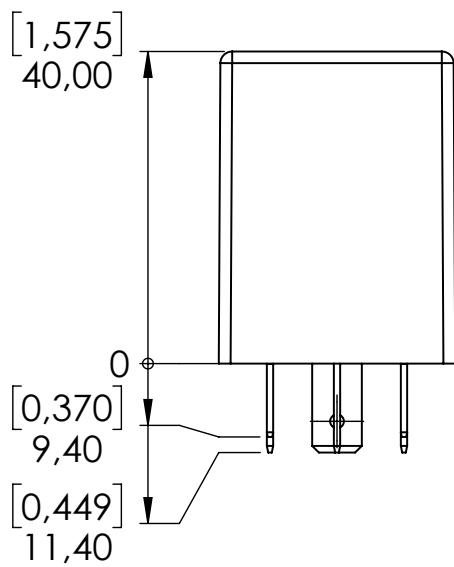
TECHNICAL DRAWING IN MM [INCH]



Top view



Bottom view



Side view

ASSEMBLY VARIANTS AND ORDERING INFORMATIONS

Drawing no.	Inputs			Outputs	CAN bus	Wake-up source	Remarks
	A Voltage 0...33 V	B Frequency 0...400 Hz	C Sensor input 10 kΩ pull-up				
				D HSD outputs with current sense optional via HSD / INA	High-Speed		
1.168.300.0000	1,3,4	1,3		5,8	X	CAN, KL15, DO_POWER	
1.168.300.2000	1,3,4	1,3	1	5,8	X	CAN, KL15, DO_POWER	Activation of the sensor input with DO_EN_KL30 = 1

ACCESORIES

Description	Order number
Programming tool MRS Developer Studio	1.100.100.09
Socket package watertight 40 mm	114265
Socket	1.017.002.00
Tab receptacle 2.8 mm 0.5 – 1.0 mm ²	105292
Tab receptacle 6.3 mm 1.0 mm ²	102355
PCAN-USB Interface	105358

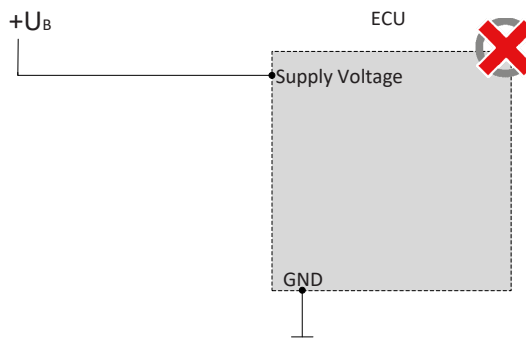
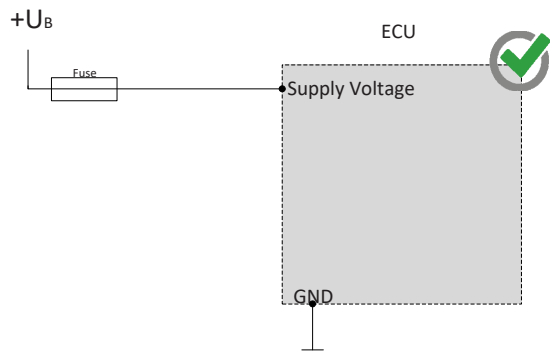


MANUFACTURER

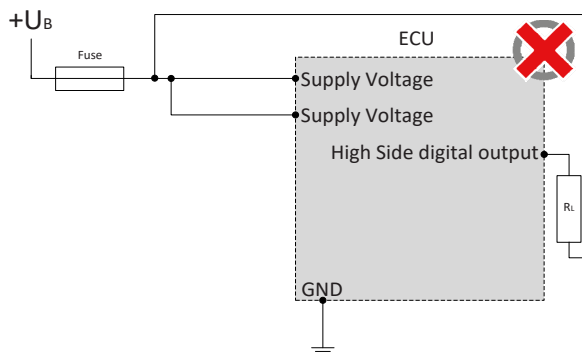
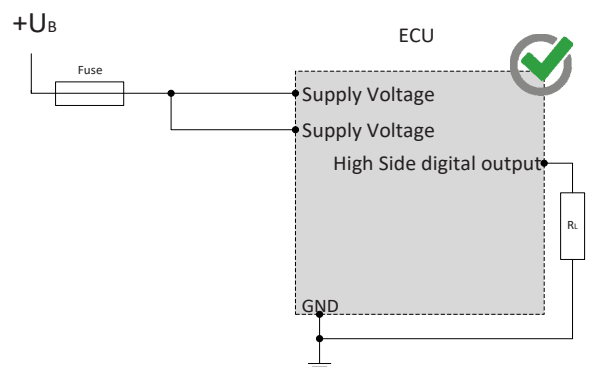
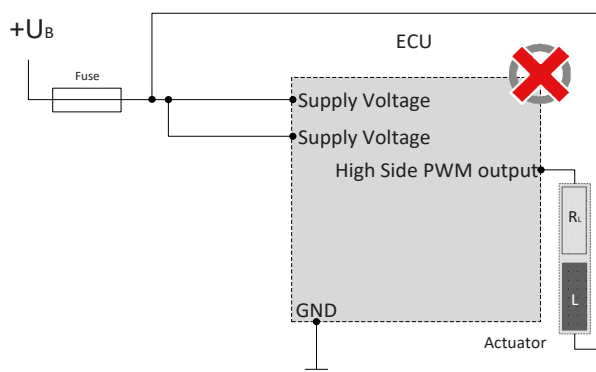
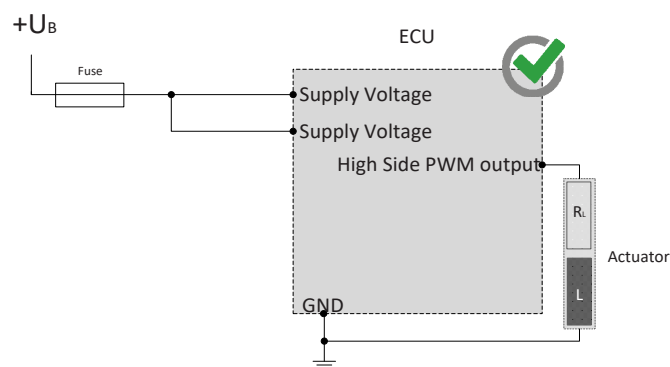
MRS Electronic GmbH & Co. KG
Klaus-Gutsch-Str. 7
78628 Rottweil
Germany

NOTES ON WIRING AND CABLE ROUTING

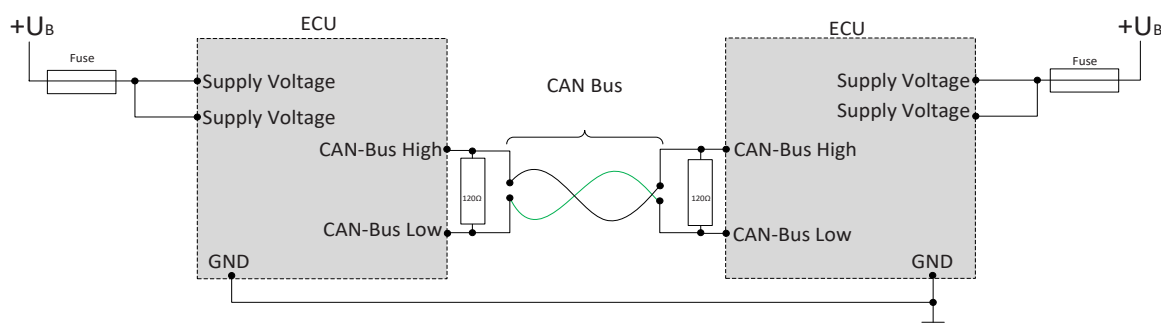
The control must be protected against overload (see performance data)



Hightside outputs may only be switched to ground..



The CAN-Bus or LIN-Bus communication is the main communication between the ECU and the vehicle. Therefore, connect the CAN bus or Lin bus with special care and check the correct communication with the vehicle to avoid unwanted behaviour.



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

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.