

DESCRIPTION

The Micro PLC is a small control for automotive applications. Free configuration, parameterization and programmability offer a wide range of application possibilities in the automotive sector.

TECHNICAL DATA

Housing	Plastic PA66GF30
Connector	Baseplate 5/6/9 pin (depending on assembly)
Weight	45 g
Temperature range (ISO 16750-4 compliant)	-40°C bis +85 °C (at +85 °C not full load)
Environmental protection	IP 6K8, when using the waterproof plug-in socket and correct installation position (plug vertically downwards) For the assembly variant with potentiometer due to the housing bore IP 20
Current consumption	depending on assembly/function
Quiescent current	unavailable
Over-current Protection	Compare max. current
Total Inputs and outputs	Depending on assembly
Input	Depending on assembly: digital inputs
Output	Depending on assembly: Relay output (NO, NC)
Operating voltage	Depending on assembly, see operating voltage range starting page 6
Overvoltage protection	> 33 V
Reverse polarity protection	Yes

REGULATORY APPROVALS AND TESTING

E1 label	ECE R10 05 8091
Electrical tests	Gem. ISO 16750 – 2 bzw. -4: Short circuit protection Jump-start (12 V modules) Reverse polarity test Pin/connector interruption Storage test at TMax and TMin Operation test at TMax and TMin ISO 7637 - 2: Puls 1, 2a, 2b, 3a, 3b

SOFTWARE/PROGRAMMING

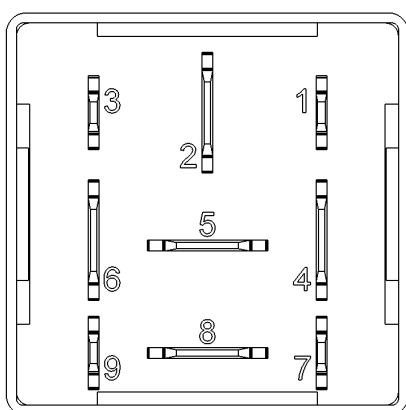
Programming system

The programming tool MRS Realizer is a suitable software for easy and fast programming of MRS-Controllers M1, M3, Micro PLC and the MRS-Proportional amplifier. Parameterization is easy by way of the relay contacts, thus you can save valuable time for open the housing. Easily create your own programs for your application via the Z-Graph. Therefore you will find graphic function blocks (based on IEC61131) in EAGLE™. You can download the new AUTODESK® EAGLE™ version according to your needs and requirements on the AUTODESK® EAGLE™ website.

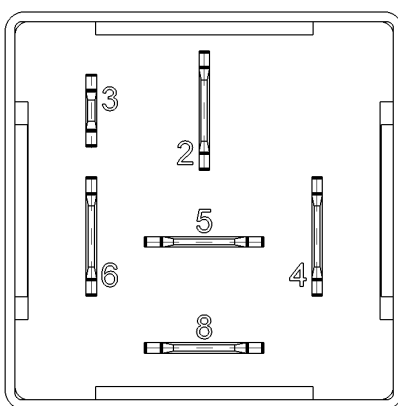
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PIN ASSIGNMENT POWER SUPPLY AND PROGRAMMING INTERFACES  
(DEPENDENT ON ASSEMBLY)

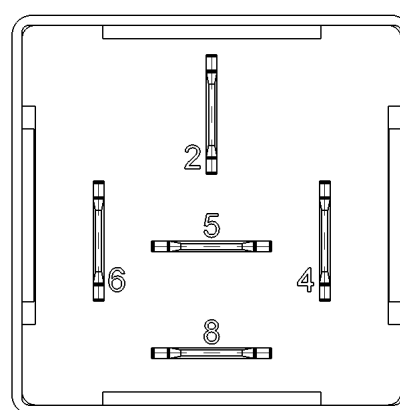
Pin	Description	Pin	Description
2	Operation voltage (Type S1,S4,S5 S8,S9,S10) Connection potential-free relay COM (Typ S2,S3,S6,S7)	5	Relays output NC (Type S1-S7)
3	Operation voltage (Type S2,S6)/ open collector output (optional S5,S7)	6	GND
4	Operation voltage (Type S4,S7)/ switching input (S1-S7)	8	Relays output NO (TypeW S1-S7)



pin assignment 9-pin,  
bottom view

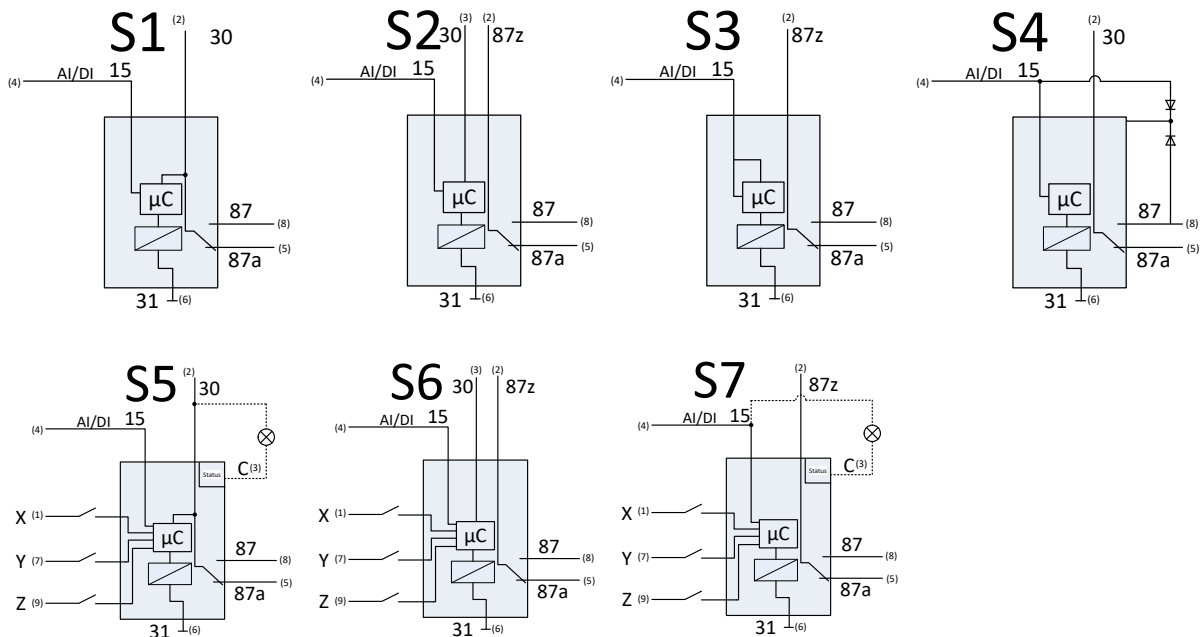
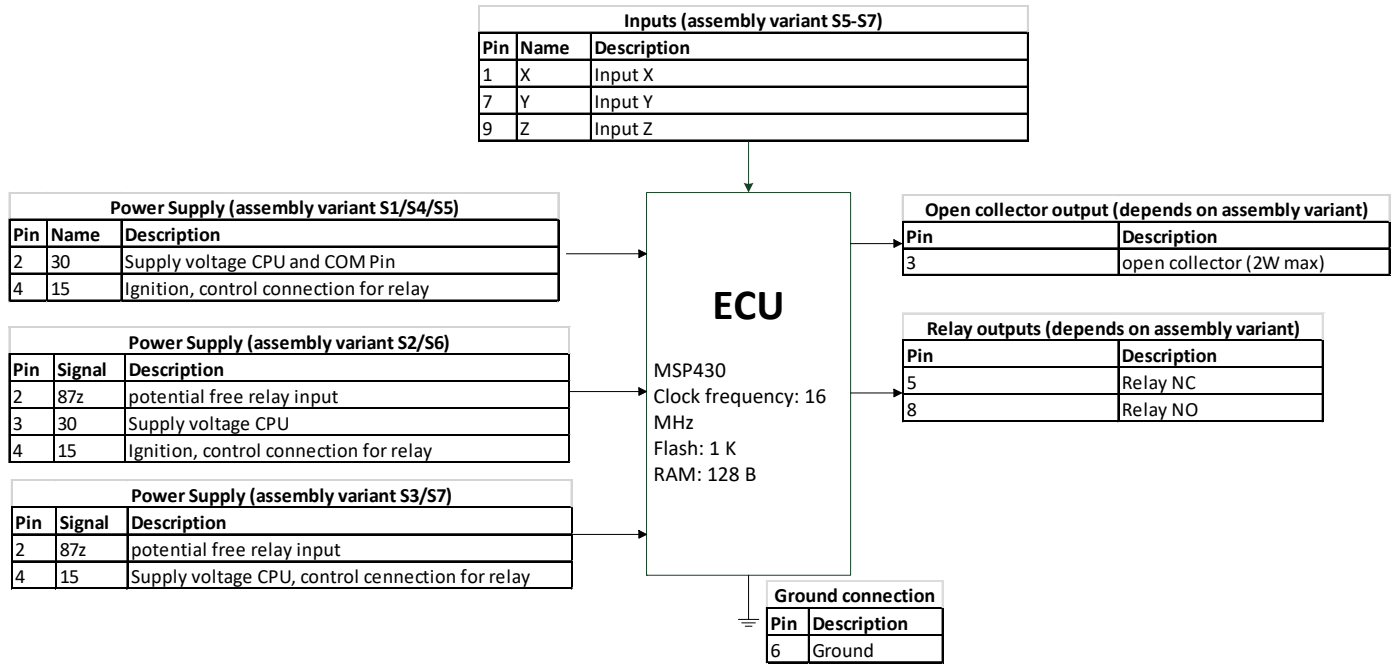


pin assignment 6-pin,  
bottom view

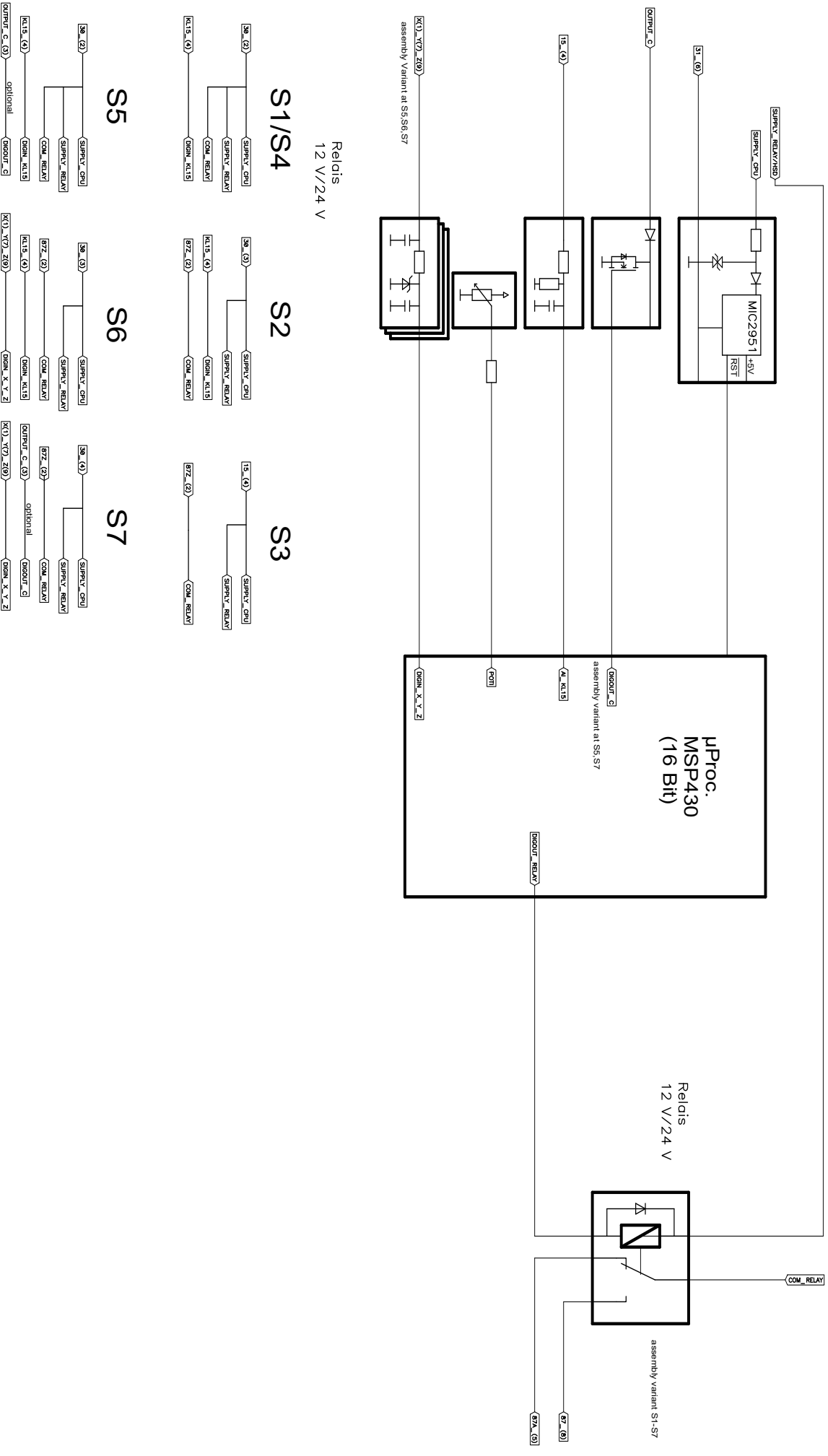


pin assignment 5-pin,  
bottom view

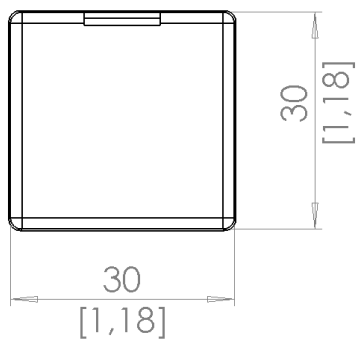
PIN FEATURE MAP



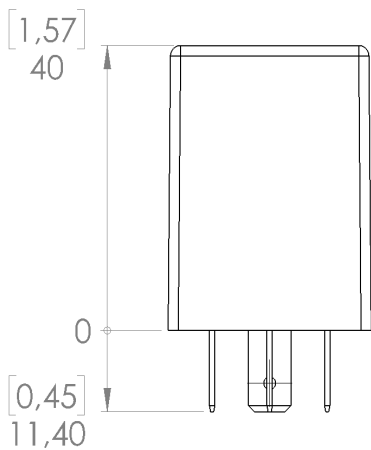
BLOCK DIAGRAMM



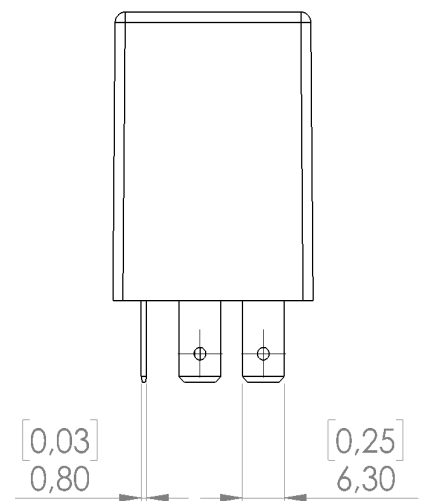
TECHNICAL DRAWING (IN MM)



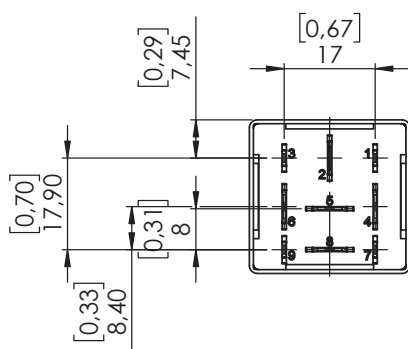
top view



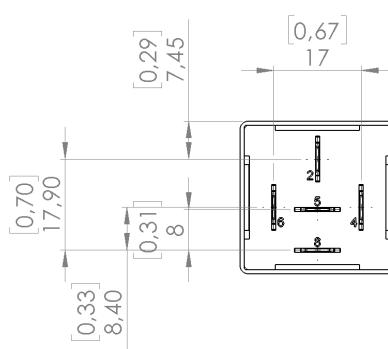
side view



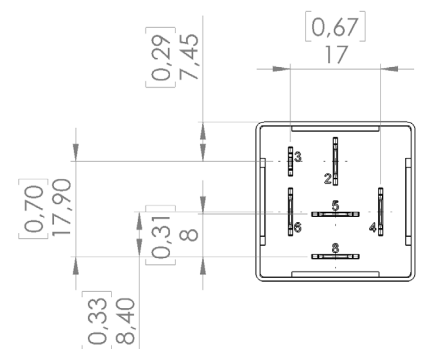
side view  
5-pin



bottom view  
9-pin



bottom view  
5-pin



bottom view  
6-pin

ASSEMBLY OPTIONS AND ORDER INFORMATION MICRO SPS

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Digital inputs	Pin assignment of outputs			Max. load output at 23°C	Operating voltage range
							C	relay	HSD		
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 KL15	X, Y, Z	C	relay	HSD	max. load current <sup>4</sup> relay NO/NC	
<b>1.005.150.00</b>	9	12 V / S5	0.3	2 / 2	programmable	1,7,9	3	5,8		15 A / 5 A	10-16 V
<b>1.005.151.00</b>	9	12 V / S5	0.3	2 / 2	programmable	1,7,9		5,8		15 A / 5 A	10-16 V
<b>1.005.153.00</b>	9	12 V / S7	30	4 / 2	programmable	1,7,9	3	5,8		15 A / 5 A	10-16 V
<b>1.005.154.00</b>	9	12 V / S6	0.3	3 / 2	programmable	1,7,9		5,8		15 A / 5 A	10-16 V
<b>1.005.250.00</b>	9	24 V / S5	0.3	2 / 2	programmable	1,7,9	3	5,8		10 A / 5 A	16-32 V
<b>1.005.251.00</b>	9	24 V / S5	0.3	2 / 2	programmable	1,7,9		5,8		10 A / 5 A	16-32 V
<b>1.005.253.00</b>	9	24 V / S7	0.8	4 / 2	programmable	1,7,9	3	5,8		10 A / 5 A	16-32 V
<b>1.005.254.00</b>	9	24 V / S6	0.3	3 / 2	programmierbar	1,7,9		5,8		10 A / 5 A	16-32 V

<sup>1</sup> If supply voltage is present according to column 3, relay not energized

<sup>4</sup> Current limitation due to relay in use, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

ASSEMBLY OPTIONS AND ORDER INFORMATION TIME RELAY WITH SWITCH ON DELAY ADJUSTABLE

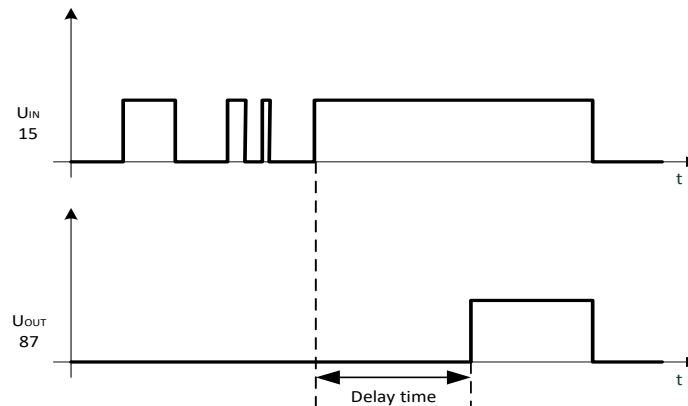
Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V	relay outputs	max. load current <sup>4</sup> relays NO/NC		
1.022.110.xx	5 + Poti	12 V / S3	0.5	4 / 2	10 V / 7.5 V	5,8 (potential free)	15 A / 5 A	10-16 V	When ordering, please specify individual delay time (example: 5 seconds)
1.022.112.xx	5 + Poti	12 V / S1	0.3	2 / 2	6 V / 3.6 V	5,8	15 A / 5 A	10-16 V	
1.022.210.xx	5 + Poti	24 V / S3	0.5	4 / 2	16 V / 16 V	5,8 (potential free)	10 A / 5 A	16-32 V	
1.022.212.xx	5 + Poti	24 V / S1	0.3	2 / 2	6 V / 3.6 V	5,8	10 A / 5 A	16-32 V	

<sup>1</sup> if supply voltage is present according to column 3, relay not energized (pickup voltage relay)

<sup>4</sup> current limitation due to relay in use, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAM TIME RELAY WITH SWITCH ON DELAY

If the voltage is applied to terminal 15, the relay will move on after the set time has elapsed. If the voltage is removed at Terminal 15, the relay drops off immediately.



ASSEMBLY OPTIONS AND ORDER INFORMATION TIME RELAY WITH SWITCH OFF DELAY ADJUSTABLE

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V	relay outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.022.111.xx</b>	5 + Pot	12 V / S4	13	4 / 2	supply (S4) <sup>3</sup>	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual delay time (example: 5 seconds)
<b>1.022.113.xx</b>	5 + Pot	12 V / S1	0.3	2 / 2	6.3 / 3.6	5,8	15 A / 5 A	10-16 V	
<b>1.022.116.xx</b>	6 + Pot	12 V / S2	0.3	3 / 2	6.3 / 3.6	5,8 (potential free)	15 A / 5 A	10-16 V	
<b>1.022.211.xx</b>	5 + Pot	24 V / S4	7	4 / 2	supply (S4) <sup>3</sup>	5,8	10 A / 5 A	16-32 V	
<b>1.022.213.xx</b>	5 + Pot	24 V / S1	0.3	2 / 2	6.3 / 3.6	5,8	10 A / 5 A	16-32 V	
<b>1.022.216.xx</b>	6 + Pot	24 V / S2	0.3	3 / 2	6.3 / 3.6	5,8 (potential free)	10 A / 5 A	16-32 V	
<b>1.003.120.xx</b>	5	12 V / S4	30	4 / 2	supply (S4) <sup>3</sup>	5,8	15 A / 5 A	10-16 V	
<b>1.003.220.xx</b>	5	24 V / S4	16	4 / 2	supply (S4) <sup>3</sup>	5,8	10 A / 5 A	16-32 V	

<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

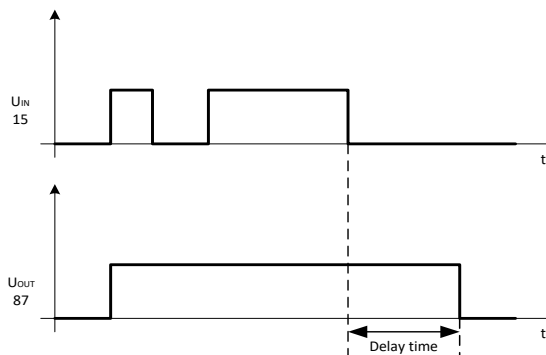
<sup>2</sup> can be reprogrammed, if not S4

<sup>3</sup> digital input=supply

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAM TIME RELAY WITH SWITCH OFF DELAY ADJUSTABLE

If the voltage is applied to terminal 15, the relay will immediately pull on. If the voltage is removed at Terminal 15, the relay falls off after the set time has elapsed.





ASSEMBLY OPTIONS AND ORDER INFORMATION TIME RELAY WITH SWITCH OFF DELAY

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V	relay outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.003.120.xx</b>	5	12 V / S4	30	4 / 2	supply (S4) <sup>3</sup>	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual delay time (example: 5 seconds)
<b>1.003.220.xx</b>	5	24 V / S4	16	4 / 2	supply (S4) <sup>3</sup>	5,8	10 A / 5 A	16-32 V	

<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

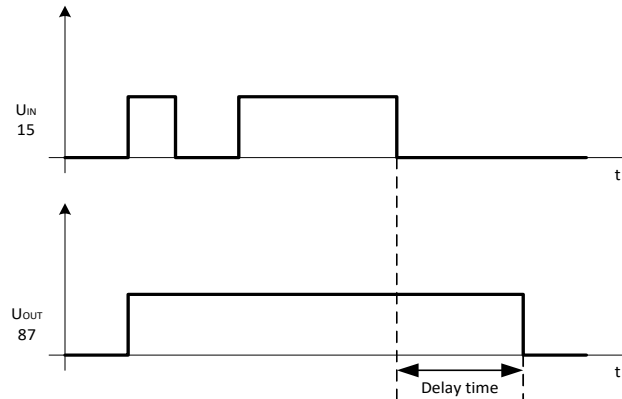
<sup>2</sup> can be reprogrammed, if not S4

<sup>3</sup> digital input=supply

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAM TIME RELAY WITH SWITCH OFF DELAY

If the voltage is applied to terminal 15, the relay will immediately pull on. If the voltage is removed at Terminal 15, the relay will fall off after the specified time has elapsed.



ASSEMBLY OPTIONS AND ORDER INFORMATION TIME RELAY MICRO SPS SWITCH ON AND OFF DELAY

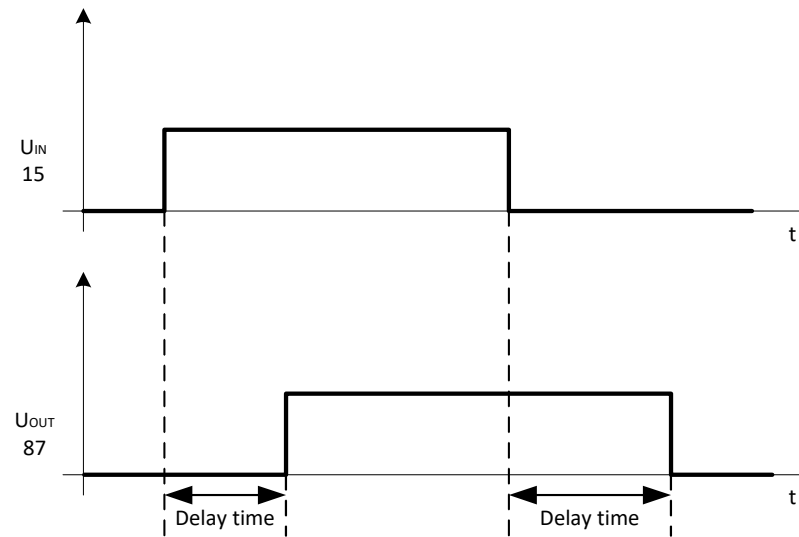
Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V	relay outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.003.190.xx</b>	5	12 V / S4	30	4 / 2	supply (S4)	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual delay time (example: 5 seconds)
<b>1.003.290.xx</b>	5	24 V / S4	16	4 / 2	supply (S4)	5,8	10 A / 5 A	16-32 V	

<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAMM TIME RELAY SWITCH ON AND OFF DELAY

If voltage is applied to terminal 15, the relay picks up after the specified time has elapsed. If the voltage is removed from terminal 15, the relay drops out after the specified time has elapsed.



ASSEMBLY OPTIONS AND ORDER INFORMATION PULSE RELAY ADJUSTABLE

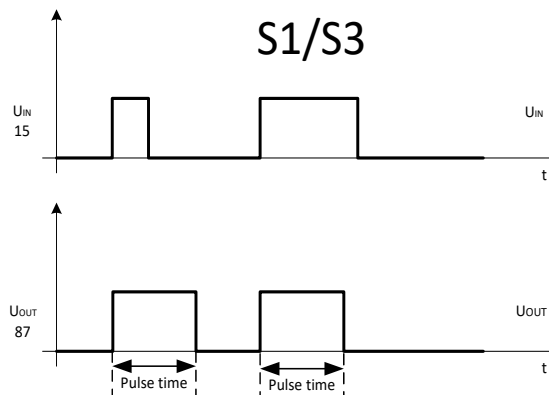
Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V	relay outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.022.115.xx</b>	5 + Poti	12 V / S1	0.3	2 / 2	6.3 V / 3.6 V	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual delay time (example: 5 seconds)
<b>1.022.114.xx</b>	5 + Poti	12 V / S3	30	4 / 2	supply (S3)	5,8	15 A / 5 A	10-16 V	
<b>1.022.215.xx</b>	5 + Poti	24 V / S1	0.3	2 / 2	6 V / 3.6 V	5,8	10 A / 5 A	16-32 V	
<b>1.022.214.00</b>	5 + Poti	24 V / S3	16	4 / 2	supply (S3)	5,8	10 A / 5 A	16-32 V	

<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAMM PULSE RELAY ADJUSTABLE

Pulse relays can be adjusted when consumers are to be switched on or off for a time-defined range. You can choose from five time ranges by default (see table). Within the selected time range, the pulse time can be changed via potentiometer. We realize other time ranges on request. Please specify the desired time range when ordering. Circuit diagram S1: Operating voltage is applied to terminal 30. If the voltage is fixed briefly or permanently at Terminal 15, the relay will immediately pull on the set time and then fall off again. Circuit diagram S2: Operating voltage is applied to terminal 87z. If the voltage is short or permanent at Terminal 15, the relay will immediately pull in for the set time and then fall off again. Control and contacts are separated from each other and can thus be placed in a chain of links. All schematics: The duration of the control signal does not affect the duration of the output pulse (i.e. the relay is not retriggerable). The exact pulse length can be set with the potentiometer within the given time interval.



ASSEMBLY OPTIONS AND ORDER INFORMATION UNDERVOLTAGE MONITOR

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V <sup>1</sup>	relay outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.008.100.00</b>	5	12 V / S1	0.3	2 / 2	11.5 V / 12.5 V	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual voltage threshold (example: On: 11 V / Off: 13 V)
<b>1.008.100.xx</b>	5	12 V / S1	0.3	2 / 2	order variant	5,8	15 A / 5 A	10-16 V	
<b>1.008.200.00</b>	5	24 V / S1	0.3	2 / 2	23.5 V / 24.5 V	5,8	10 A / 5 A	16-32 V	
<b>1.008.200.xx</b>	5	24 V / S1	0.3	2 / 2	order variant	5,8	10 A / 5 A	16-32 V	

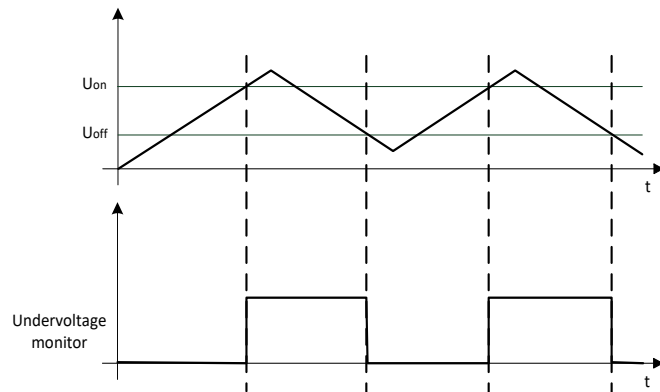
<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAM UNDERVOLTAGE MONITOR

The undervoltage monitors are used for voltage monitoring. The undervoltage monitor switches off consumers when certain threshold voltages at terminal 15 are undershot. If a certain threshold voltage is exceeded again, the consumer is switched on again. The standard values are 11.5 V / 12.5 V for 12 V and 23.5 V / 24.5 V for 24 V. The voltage thresholds can also be freely selected - please specify when ordering. Delay times are also possible. Please specify the desired range when ordering.

# Undervoltage



To prevent the relay contact from bouncing, we recommend programming an individual time delay and a hysteresis for the switching threshold. This is not included in the function diagram.

ASSEMBLY OPTIONS AND ORDER INFORMATION OVERVOLTAGE MONITOR

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold switching input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V <sup>1</sup>	relays outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.008.126.00</b>	5	12 V / S1	0.3	2 / 2	11.5 V / 12.5 V	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual voltage threshold (example: On: 11 V / Off: 13 V)
<b>1.008.126.xx</b>	5	12 V / S1	0.3	2 / 2	order variant	5,8	15 A / 5 A	10-16 V	
<b>1.008.156.00</b>	6	12 V / S2	0.3	3 / 2	11.5 V / 12.5 V	5,8	15 A / 5 A	10-16 V	
<b>1.008.156.xx</b>	6	12 V / S2	0.3	3 / 2	order variant	5,8	15 A / 5 A	10-16 V	
<b>1.008.226.00</b>	5	24 V / S1	0.3	2 / 2	23.5 V / 24.5 V	5,8	10 A / 5 A	16-32 V	
<b>1.008.226.xx</b>	5	24 V / S1	0.3	2 / 2	order variant	5,8	10 A / 5 A	16-32 V	

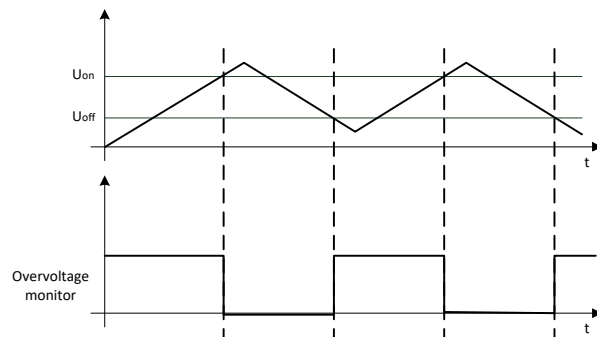
<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAM OVERVOLTAGE MONITOR

The overvoltage monitors are used for voltage monitoring. The overvoltage monitor switches off consumers when certain threshold voltages are exceeded at terminal 15. If the voltage falls below a certain threshold voltage again, the consumer is switched on again. The standard values are 11.5 V / 12.5 V for 12 V and 23.5 V / 24.5 V for 24 V. The voltage thresholds can also be freely selected - please specify when ordering. Delay times are also possible. Please specify the desired range when ordering.

## Overvoltage



To prevent the switch from bouncing, we recommend programming an individual time delay. This is not included in the function diagram.

ASSEMBLY OPTIONS AND ORDER INFORMATION RANGE MONITOR

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold digital input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 and 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V <sup>1</sup>	relays outputs	max. load current* relays NO/NC		
1.008.127.00	5	12 V / S1	0.3	2 / 2	11.5 V/ 12.5 V	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual voltage threshold (example: On: 11 V / Off: 13 V)
1.008.127.xx	5	12 V / S1	0.3	2 / 2	order variant	5,8	15 A / 5 A	10-16 V	
1.008.150.00	6	12 V / S2	0.3	3 / 2	11.5 V/ 12.5 V	5,8	15 A / 5 A	10-16 V	
1.008.150.xx	6	12 V / S2	0.3	3 / 2	order variant	5,8	15 A / 5 A	10-16 V	
1.008.227.00	5	24 V / S1	0.3	2 / 2	23.5 V/24.5 V	5,8	10 A / 5 A	16-32 V	
1.008.227.xx	5	24 V / S1	0.3	2 / 2	order variant	5,8	10 A / 5 A	16-32 V	
1.008.240.00	5	24 V / S3	16	4 / 2	23.5 V/24.5 V	5,8	10 A / 5 A	16-32 V	
1.008.240.xx	5	24 V / S3	16	4 / 2	order variant	5,8	10 A / 5 A	16-32 V	

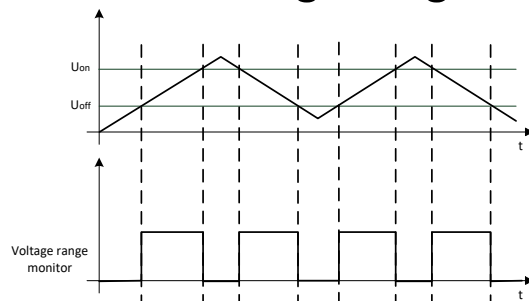
<sup>1</sup> if supply voltage is present according to column 3 (pickup voltage relay)

<sup>4</sup> current limitation due to relay used, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

FUNCTION DIAGRAMM RANGE MONITOR

The overvoltage monitors are used for voltage monitoring. The range monitoring switches off consumers when certain threshold voltages are exceeded/fallen short of at terminal 15. If a certain threshold voltage is again under/exceeded, the consumer is switched on again. The default values are 11.5 V/ 12.5 V for 12 V and 23.5 V/24.5 V for 24 V. The voltage thresholds can also be freely selected - please specify when ordering. Delay times are also possible. Please specify the desired range when ordering.

Voltage range



To prevent the switch from bouncing, we recommend programming an individual time delay. This is not included in the function diagram.

## ASSEMBLY OPTIONS AND ORDER INFORMATION FREQUENCY MONITOR

Order number	Number of pins	Supply voltage	Current consumption <sup>1</sup>	Supply $\mu$ C / output	Switching threshold digital input	Pin assignment of outputs	Max. load output at 23°C	Operating voltage range	Features
		see page 3 und 4	$\pm 0.05$ mA	pin	pin 4 $\pm 0.5$ V <sup>1</sup>	relays outputs	max. load current <sup>4</sup> relays NO/NC		
<b>1.026.111.xxx</b>	5	12 V / S1	0.3	2 / 2	6 V / 6 V	5,8	15 A / 5 A	10-16 V	When ordering, please specify individual frequency range between 10-1,000 Hz (example: 500 Hz)
<b>1.026.112.xxx</b>	9	12 V / S6	0.3	3 / 2	6 V / 6 V	5,8	15 A / 5 A	10-16 V	
<b>1.026.211.xxx</b>	5	24 V / S1	0.3	2 / 2	6 V / 6 V	5,8	10 A / 5 A	16-32 V	
<b>1.026.212.xxx</b>	6	24 V / S2	0.3	3 / 2	6 V / 6 V	5,8	10 A / 5 A	16-32 V	

<sup>1</sup> if supply voltage acc. to column 2 is present (pick-up voltage relay)

<sup>4</sup> current limitation by used relay, observe data sheet characteristics of relay: 12V=HFKB-012-1Z, 24V=HF3FF/024-1Z

## FUNCTION DIAGRAM FREQUENCY MONITOR

The frequency monitor switches off consumers when certain threshold frequency is exceeded or not reached at terminal 15. The frequency thresholds can be freely selected, frequency range 10 - 1,000 Hz (with an accuracy of  $\pm 2\%$ ) please specify when ordering. Delay times are also possible.

## ACCESSORIES

Description	Order Number
Software programming tool MRS Realizer	1.100.100.01
Programming station MRS	1.100.000.02
Socket package watertight 30x30x40	114265
Socket	1.017.002.00
Tab receptacle 6,3 mm/1,5-2,5 mm <sup>2</sup>	103064
Tab receptacle 2,8 mm/0,5-1,0 mm <sup>2</sup>	105292



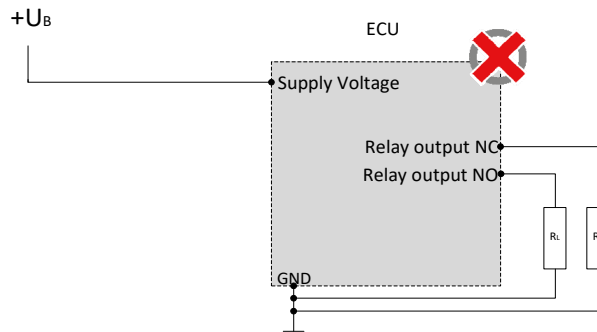
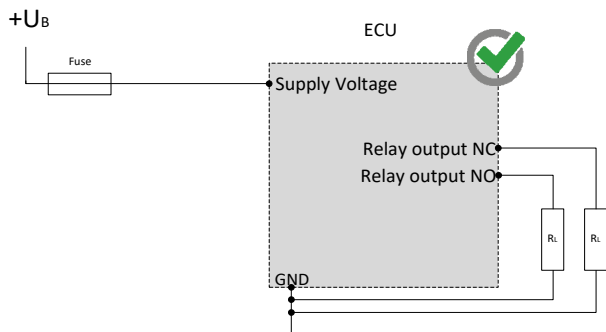
## MANUFACTURER

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

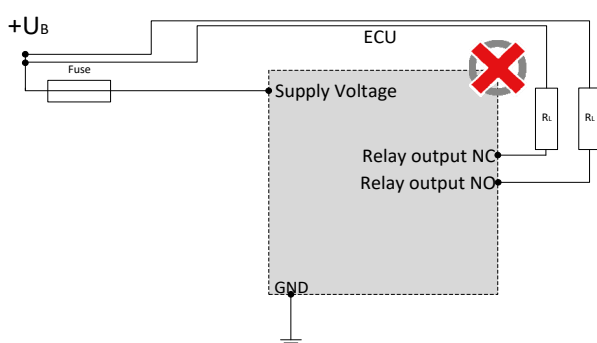
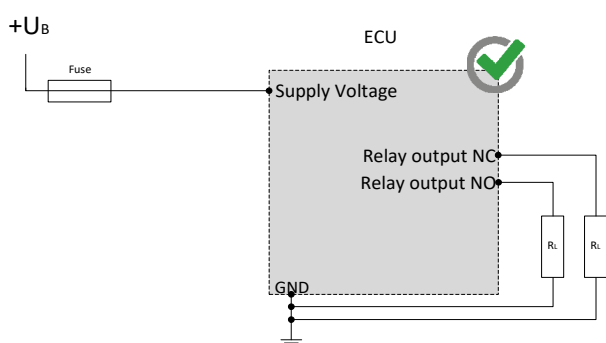


## NOTES ON WIRING AND CABLE ROUTING

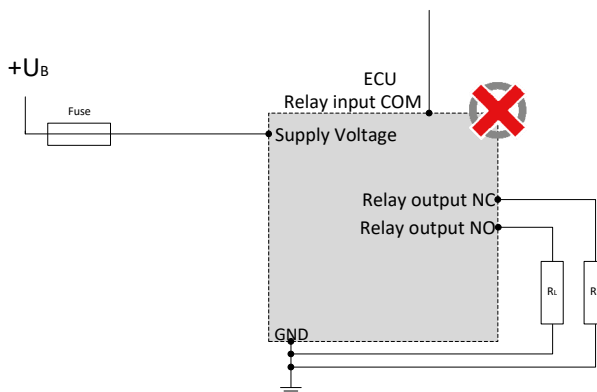
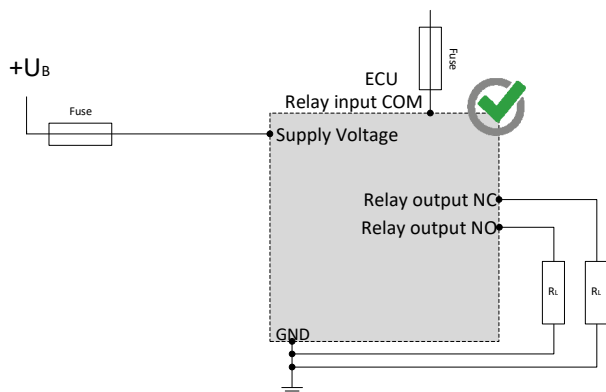
The module must be protected against overcurrent with a suitable fuse.



Relay outputs may only be switched to ground (S1).



The potential-free relay connection must be fused separately (S2, S3).



## 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.de](http://www.mrs-electronic.de)

**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.