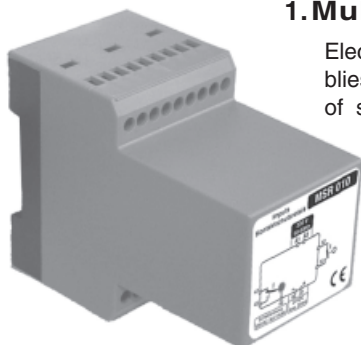


# Impulse Controlled Multifunctional Relays

– for Limit Switch Contact Assemblies, with Additional DC-Output –  
and **Power Supply Unit** 24 V, 50 mA



Models  
**MSR**



## 1. Multifunctional Relays

Electromechanical contact assemblies are highly suitable for all kinds of switching jobs at the various industrial fields.

Nevertheless, there are limits to their applicability. The multifunctional relays models MSR were especially developed to increase the usability of electromechanical contact assemblies:

- The switching capacity of mechanical contacts is limited by the size of the measuring element and by the amount of torque of the instrument's actual value pointer that acts on the carrier arm resp. arms of the contact assembly. An MSR relay increases the switching capacity owing to a relay output with 1 or 2 potential free change-over contacts.
- Due to the fact that even very small loads produce a spark between the contact pins at the moment of switching, the oil filling of liquid filled pressure gauge or thermometer cases will become dark. Furthermore the contact pins may carbonize. These impurities as well as the oil liquid itself build up insulating layers on the contact surfaces which may cause faulty switchings.
- A higher transition resistance caused by ambient influences such as pollutions, oxidation, or aggressive atmospheres may lead to faulty switchings of mechanical contacts in unfilled instruments as well. An MSR relay allows an almost loadfree switching of the contact assembly by impulse control signals in pulse/pause ratio 1:100. Resistive layers can be overcome by the pulse voltages up to 35-40 VDC.
- Vibrations or concussions may cause undesired switching operations of the contacts. This reduces the service life of the limit-switch contact assembly, and it can even release uncontrolled, faulty switching operations, which may be a serious security risk. The MSR relays work with a fall-delay time of typically 0.4 sec. which means a reduction of the possibility of unintended switching operations.  
[The side-stable version model MSR 011 has got no fall-delay time!]
- The MSR relays can be distinguished further more for their additional voltage output of 24 V DC ( $I_{max.} = 20\text{ mA}$ ) for the power supply of external pressure or temperature sensors resp. transmitters. This is an advantage for example for pressure gauges with limit switch contact assembly and a built-in pressure transmitter model DMU.

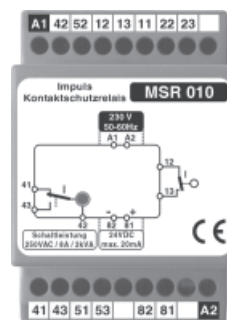
## 2. Power Supply Units

Besides our impulse controlled multifunctional relays we also have plain power supply units for the power supply of sensors, LED displays et. al. in our standard supply programme. The voltage output is galvanically separated from the mains. These power supply units are devices to be built-in, respectively electrical equipment for the use in closed electrical operational buildings such as factories/industrial plants.

These instruments should only be installed, worked on and replaced by skilled personnel (electrician) who have been properly instructed. This naturally counts for the multifunctional relays as well.

## Standard Configuration

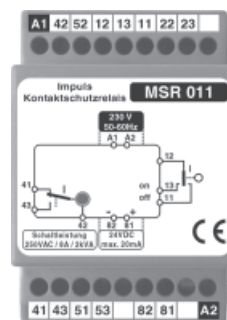
### 1. Relay



#### Model MSR 010

for 1 standard or magnetic contact (with status indication)

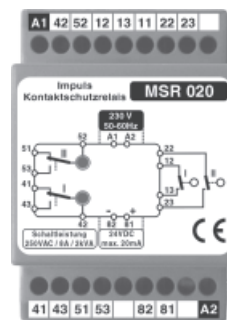
(Relay output  
1 potential-free change over contact)



#### Model MSR 011

for 2 standard or magnetic contacts S21 / M21 (with status indication), interval operation; the switching condition of one contact is memorized temporarily until the other contact is operated

(Relay output  
1 potential-free change over contact – side-stable –)

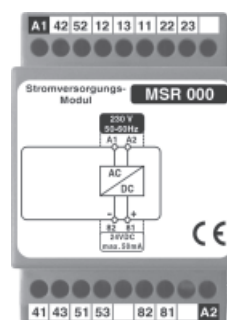


#### Model MSR 020

for 2 standard or magnetic contacts (with status indication)

(Relay output  
2 potential-free change over contacts)

### 2. Power Supply Unit



#### Model MSR 000

Power supply unit  
(24 V / 50 mA)



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**9/03**

# Regulations

The multifunctional relays MSR are devices to be built-in, respectively electrical equipment for the use in closed electrical operational buildings such as factories/industrial plants with access only for skilled personnel (electricians) or properly instructed, experienced personnel. Multifunctional relays come under the following regulations:

- EN 50 178 Electrical safety
- EN 50 082-2 Interference resistance
- EN 50 081-1 Interference emission
- EN 60 947-5-1 Low voltage switches

# Technical Data

## 1. Relays

- for 1 low-action (standard) or magnetic limit switch contact assembly..... **MSR 010**
- for 2 low-action (standard) or magnetic limit switch contact assemblies..... **MSR 020**
- for 2 low-action (standard) or magnetic limit switch contact assemblies (interval operation) (models S 21 or M 21)..... **MSR 011**

all instruments with **LED indication of the switching status**

### Power supply

Operation voltage: 230 VAC, + 6...-10%, 50 – 60 Hz  
 Power consumption: typ. 6 VA

### Control signals

Impulse control voltage: 35 – 40 VDC  
 Puls/pause ratio: 0.5 ms / 50 ms ± 20%  
 Switching threshold: 9.7 VDC ± 10%  
 Input impedance: 3300 Ohm, 100 nF ± 20%  
 Wire and contact resistance: max. 4700 Ohm, 47 nF

### Outputs

#### Relay output

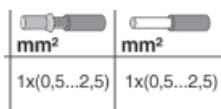
potential-free change over contact  
 Pick-up/fall-delay time: 10 ms / 450 ms ± 20% + 50 ms  
 Contact material: AgCdO bzw. AgNi+Au  
 Rated operational current  $I_e$  } AC 1:250 V/8A | DC 1:250 V/0.3A  
 acc. utilization category: } AC13:250 V/3A | DC13:250 V/0.1A  
 Breaking capacity: max. 1860 VA min. 24 V; 100 mA  
 Short-circuit protection: F10A (max. short-circuit current < 100 mA)  
 Electr. working life  $I_e$ : 10<sup>5</sup> switchings operations at 6 switchings / min.  
 Mech. working life: 10<sup>7</sup> switchings operations (without load)

#### Voltage output

for the power supply of external instruments only, such as sensors, or LED displays  
 24 VDC ± 10%  
 $I_{max}$  20 mA  
 conditionally resistant to short-circuit

### Operation ranges / limitations

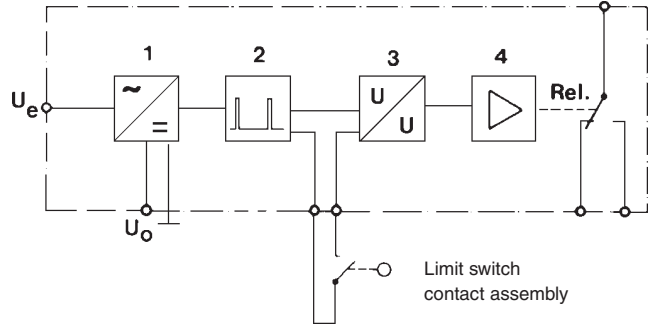
Rated insulation voltage: 250 VAC  
 Overvoltage category: III  
 Contamination level: 2 / EN 50 178  
 Protection type: IP 20 / EN 60 529  
 Temperature range: 0 – 70 °C  
 Case material: Polyamide 6.6 red and black  
 Mounting: Standard mounting bar 35 x 7,5 (1.38" x .29") DIN EN 60715  
 Cable diameter: 0.5 - 2.5 mm<sup>2</sup> (0.02 - 0.10 inch<sup>2</sup>) (thin wire or unifilar)



### Special options

- Reed-switch relay output (potential free making contact) for low switching capacity max. 100 V / 0,5 A / 10 W(VA)..... **MSR ... L**
- Electronic output PNP for SPS input 24 VDC, max. 50 mA..... **MSR ... E**
- Relay output control voltage > 100 V with light working spirals especially for low-action (standard) contacts, max. 250 V AC / 8 A, min. 24 V DC / 0.1 A..... **MSR ... N**
- Power supply 24 VDC, others upon request

### Block diagram relay



- 1 = Power supply unit
- 2 = Pulse generator
- 3 = Impedance converter
- 4 = Switching amplifier
- $U_e$  = Supply voltage output
- $U_o$  = Direct voltage output

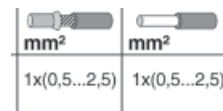
## 2. Power Supply Unit MSR 000

### Power supply

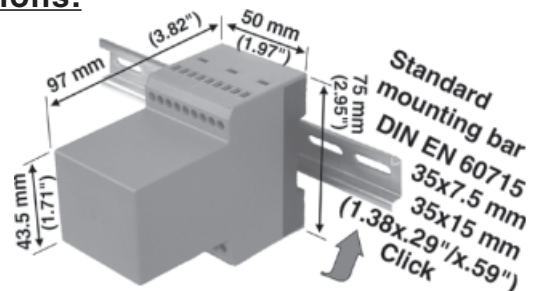
Operation voltage: 230 VAC, + 6...-10%, 50 – 60 Hz  
 Power consumption: typ. 5 VA  
 Voltage output: 24 V DC -, ± 10%  
 Power output: max. 50 mA  
 Remaining ripple: ≤ 50 mVpp  
 Protective circuit: 10 Ohm fuse resistor  
 Max. short circuit current: conditionally resistant to short-circuit

### Operation ranges / limitations

Rated insulation voltage: 250 VAC  
 Overvoltage category: III  
 Contamination level: 2 EN 50 178  
 Protection type: IP 20 EN 60 529  
 Temperature range: 0 – 70 °C  
 Case material: Polyamide 6.6 red and black  
 Mounting: Standard mounting bar 35 x 7.5 mm (1.38" x .29") DIN EN 60715  
 Cable diameter: 0.5 - 2.5 mm<sup>2</sup> (0.02 - 0.10 inch<sup>2</sup>) (thin wire or unifilar)



### Dimensions:



### Weight ( kg / lb ):

MSR-Relay 0.220 kg / .50 lb  
 MSR 000 0.180 kg / .40 lb

The information in this leaflet is given in good faith, but we reserve the right to make changes without notice.