Multifunctional relay
for double low-action and snap-action contacts with indication of switching condition

MSR 020

Range of application

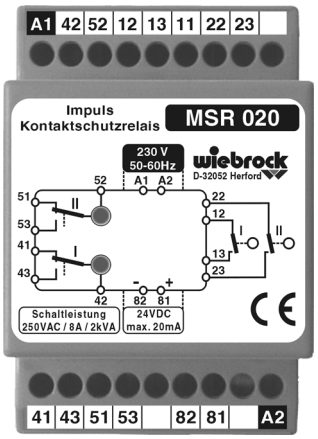
The multifunctional relays of the MSR 020 series are contact protection relays to connect double contacts. These increase the switching safety and the switching capacity of electro-mechanical limit value switches and reduce the contact load of same. Any unintended switching operations of the limit value switches caused by vibration are largely reduced in a fail-delay time.
Multifunctional relays are absolutely recommended for use with limit value switches immersed in oil.

Regulations

Multifunctional relays are apparatus to be built in, or electronic operating material for use in closed electrical industrial plants, and must be installed exclusively by electrical experts or persons trained in electronics. Any mistakes made by inappropriate handling are not subject to any guarantee.

Multifunctional relays comply with the following regulations:

- **EN 50178 Electrical safety**
- **EN 61000.6.2 Resistance to interference**
- **EN 61000.6.3 Emission of interfering impulses**
- **EN 60947-5-1 Low voltage switching apparatus**



Technical data**	Terminals	**MSR 020** relay output basic version	**MSR 020-E** elektronic output PNP for SPS input	**MSR 020-L** reed relay output for small switching operations	**MSR 020-N** relay output control voltage > 100 V for low action contacts
Auxiliary energy					
Rated operational voltage Ue	A1-A2	230 V AC 50-60 Hz +6...-10% resp. available with the following supply voltages 115 V AC 50-60 Hz +6...-10% 24 V AC 50-60 Hz +6...-10% 24 V DC +15...-10%			230 V AC 50-60 Hz +6.-10% resp. available with the following supply voltage 115 V AC 50-60 Hz +6..-10%
Power consumption		typ. 6 VA (1,5 VA/W)*			typ. 6 VA
Control signals					
Control voltage	12, 22	35-40 V DC pulses (24 V DC pulses)*			Positiv semi sinus wave of the
Pulse/pause ratio		0.5 ms / 50 ms ±20%			auxiliary energy above 50 kΩ
Switching threshold	13, 23	9,7 V DC ±10%			9,7 V DC ±10%
Input impedance	13, 23	3,3 kΩ, 100 nF ±20%			3,3 kΩ, 100 nF ±20%
Wire and contact resistance	12-13, 22-23	max. 4,7 kΩ , 47 nF (3,0 kΩ, 47 nF)*			max. 40 kΩ, 47 nF
Outputs	42-41-43 52-51-53	2 relays (change over contact)	2 electronic outputs PNP 41(+), 43(-) 51(+), 53(-)	2 reedrelays (make contact)	2 relays (change over contact)
Pick-up and fall delay time		10 ms/450 ms ±20% +50 ms	0,5 ms/450 ms ±20% +50 ms	1,5 ms/450 ms ±20% +50 ms	10 ms/450 ms ±20% +50 ms
Contact material		AgCdO resp. AgNi+Au			AgCdO resp. AgNi+Au
Breaking capacity		max. 250 V AC/8 A min. 24 V DC/0,1 A	24 V DC max. 50 mA Conditionally resistant	max. 100 V/0,5 A/10 W(VA) min. 1 V/1 mA	max. 250 V AC/8 A min. 24 V DC/0,1 A
Rated operational current Ie		Utilization category AC1 250 V/8 A AC13 250 V/3 A DC1 250 V/0,3 A DC13 250 V/0,1 A	Freewheeling diode built in	Electric strength Coil / contact 350 Veff	Utilization category AC1 250 V/8 A AC13 250 V/3 A DC1 250 V/0,3 A DC13 250 V/0,1 A
Short-circuit protection device		F 10 A			F 10 A
Max. short circuit current		< 100 A			< 100 A
Voltage output		only for external apparatus, e.g. sensor supply or LED displays			
Power output	82(-), 81(+)	24 V DC ±10% Imax. 20 mA			
Max. short circuit current		Conditionally resistant to short-circuit			
Range of application					
Rated insulation voltage		250 V AC			
Overvoltage category		III			
Contamination level	EN 50178	2			
Protection type	EN 60529	IP 20			
Temperature range		0...70 °C			
Material of casing		Polyamide 6.6, colour red/black			
Annotation		*) The data refer to auxiliary energy/rating voltage 24 V AC/DC **) Alteration on request			

Accessories

(re. catalogue page K 11-00.020)

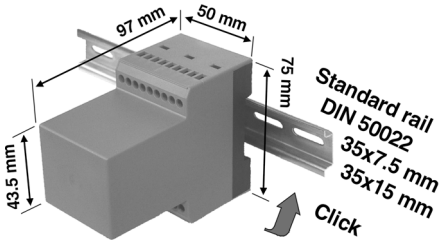
Protecting casing IP 65 (IEC 529)

Adapter for individual fastening

Standard rail acc. to DIN 50022

Connection, fastening and dimensions

AWG	Nm	mm²	mm²
20...14	0.5 max	1x(0,5...2,5) 2x(0,5...1,5)	1x(0,5...2,5) 2x(0,5...1,5)



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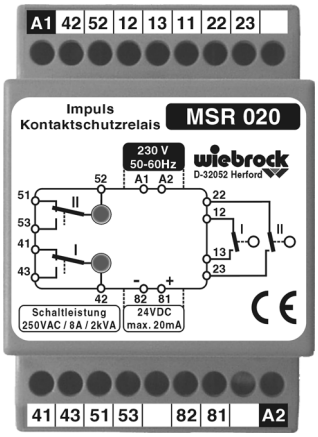
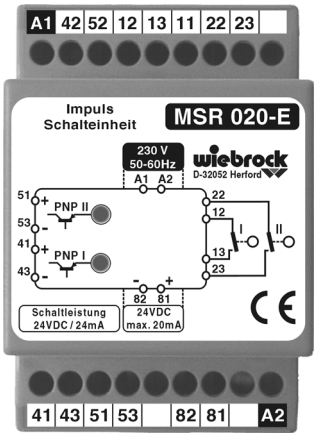
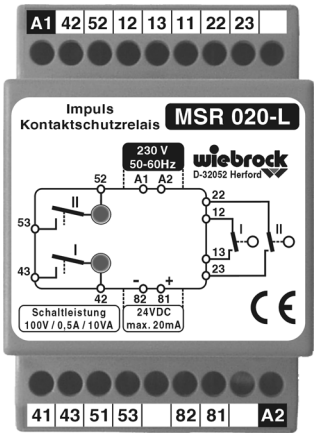
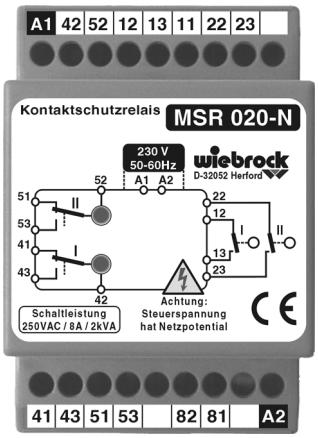
Versions









Important notice

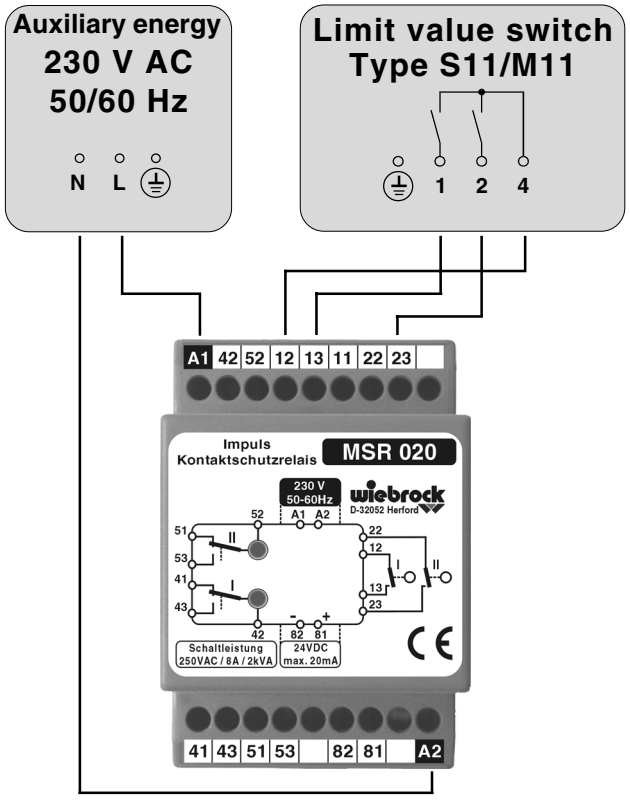
If desired, it is possible to interconnect several relays (MSR 010 and MSR 020). In this case one control output (terminal 12 or 22) may operate a maximum of 4 control inputs (terminal 13 or 23). In this way, the permissible contact transition resistance is reduced to 2 kOhm at maximum (1 kOhm with an auxiliary energy of 24 V AC/DC). A link between the control outputs is not necessary.

If one control output is meant to operate the inputs of several MSR relays, it will be imperative to provide a uniform reference potential. In this case, the terminals 82 of the MSR relays must be connected. Example of connection: re. catalogue page K11-05.010 (for triple and quadruple contacts).

Important notice for MSR xxx-N

The control circuit of the MSRxxx-N is not galvanically separated from the mains. If one control output is meant to operate the control inputs of several MSRxxx-N, all MSRxxx-N relays must be supplied in equiphase by one and the same voltage (A1 on A1 and A2 on A2), and the control outputs of the respective control inputs must be inter-connected. Special attention must be paid to the control outputs of the new MSRxxx-N version provided with a CE symbol. These should not to be wired together with the previous MSRxxx-N version which is not marked by the CE symbol.

Example of connection MSR 020



Functional discription

The multifunctional relay is supplied with the respective voltage via terminals A1 and A2. When the supply voltage has been switched in (the connected limit value switch is not operated, contact 1 - 4 resp. 2-4 is open) the potential free change-over device of the MSR-relay is non-operative (re. type plate). By operating the limit value switch (contact 1-4 resp. 2-4 is closed) the contact at the change-over device is closed. When the supply voltage is interrupted, the potential free change-over device of the MSR relay returns to its inoperative condition.