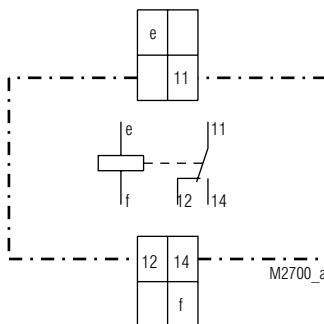


0221587



- According to IEC 255, EN 60 255, VDE 0435 part 303
- Single-phase
- Can be used for under- or overvoltage detection
- Measuring ranges from 14 to 288 V
- Settable response value
- Without auxiliary supply
- Width 22,5 mm

### Circuit diagram



### Approvals and marking



### Applications

Because of the electromechanical construction the ML 9702 is insensitive to high voltage peaks with high energy and radio frequency disturbance. Special interference suppression is not necessary. It is used in emergency power supply systems, as fast reacting overvoltage protection and to monitor voltage in control circuits.

### Function

The setting ration is 1:2.

Please note when mounting the units without distance to each other:

1. If the relays are connected to DC voltage please connect all the units with the same polarity
2. If the relays are connected to AC voltage please connect on all units terminal f to neutral.
3. If the relays are connected to a 3-phase system it is possible that the relays influence each other by magnetic fields, so that the response value is increased by approx. 25 %.

If the units are mounted with a distance of > 22 mm, the a.m. behaviour does not occur.

### Technical data

#### Input circuit

<b>Nominal voltage <math>U_N</math>:</b>	AC 24, 110, 127, 230, 240 V DC 24, 110, 127, 220, 240 V
<b>Response value:</b>	0,6 ... 1,2 $U_N$
<b>Setting:</b>	infinite variable
<b>Setting accuracy:</b>	± 5 %
<b>Hysteresis:</b>	AC approx. 0,85 / DC approx. 0,5
<b>Nominal consumption:</b>	7 VA / 1,4 W
<b>Nominal frequency:</b>	50 / 60 Hz
<b>Frequency range:</b>	± 5 %

#### Output

##### Contacts

ML 9702.11:	1 changeover contact	
<b>Thermal current <math>I_{th}</math>:</b>	4 A	
<b>Switching capacity</b>		
NO contact:	2 A / AC 230 V	EN 60 947-5-1
NC contact:	1 A / AC 230 V	EN 60 947-5-1

## Technical data

<b>Electrical life:</b>	1,2 x 10 <sup>6</sup> switching cycles 1 500 switching cycles / h at 30 % of the switching capacity 0,8 x 10 <sup>6</sup> switching cycles 1 000 switching cycles / h at 50 % of the switching capacity 0,3 x 10 <sup>6</sup> switching cycles 500 switching cycles / h at 100 % of the switching capacity
<b>Permissible switching frequency:</b>	1 000 switching cycles
<b>Short-circuit strength max. fuse rating:</b>	2 A gL EN 60 947-5-1
<b>Mechanical life:</b>	1,5 x 10 <sup>6</sup> switching cycles

## General data

<b>Operating mode:</b>	Continuous operation	
<b>Temperature range:</b>	see nomograph of overload and temperature range	
<b>Clearance and creepage distances</b>		
overvoltage category / contamination level:	4 kV / 3	IEC 60 664-1
<b>EMC</b>		
Electrostatic discharge:	8 kV (air)	EN 61 000-4-2
HF irradiation:	10 V/m	EN 61 000-4-3
Fast transients:	2 kV	EN 61 000-4-4
Surge voltages between		
wires for power supply:	1 kV	EN 61 000-4-5
between wire and ground:	4 kV	EN 61 000-4-5
HF-leitungsgeführt:	10 V	EN 61 000-4-6
Interference suppression:	Limit value class B	EN 55 011
<b>Degree of protection:</b>		
Housing:	IP 40	EN 60 529
Terminals:	IP 20	EN 60 529
<b>Housing:</b>	Thermoplastic with V0 behaviour according to UL subject 94	
<b>Vibration resistance:</b>	Amplitude 0,35 mm frequency 10 ... 55 Hz EN 60 068-2-6	
<b>Climate resistance:</b>	Humid heat EN 60 068-2-30	
<b>Terminal designation:</b>	EN 50 005	
<b>Wire connection:</b>	2 x 2,5 mm <sup>2</sup> solid or 2 x 1,5 mm <sup>2</sup> stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
<b>Wire fixing:</b>	Flat terminals with self-lifting clamping piece EN 60 999	
<b>Mounting:</b>	DIN rail EN 50 022	
<b>Weight:</b>	250 g	

## Dimensions

**Width x height x depth:** 22,5 x 80 x 102 mm

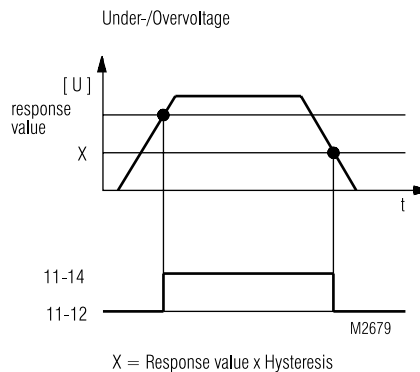
## Standard type

ML 9702.11 AC 230 V 50 / 60 Hz	
Article number:	0029210 stock item
• Output:	1 changeover contact
• Nominal voltage U <sub>N</sub> :	AC 230 V
• Width:	22,5 mm

## Ordering example

ML 9702	.11	DC 24 V	
		Nominal voltage	
		Contacts	
		Type	

## Characteristics



## Undervoltage detection (closed circuit operation)

Example:

required response value ≤ AC 196 V

$$\text{setting value} = \frac{\text{required response value}}{\text{Hysteresis}} = \frac{196 \text{ V}}{0,85} = 230 \text{ V}$$

If the voltage exceeds 230 V the contact 11-14 closes. If the voltage drops under 196 V the output contact switches back to 11-12.

## Overvoltage detection (open circuit operation)

Example:

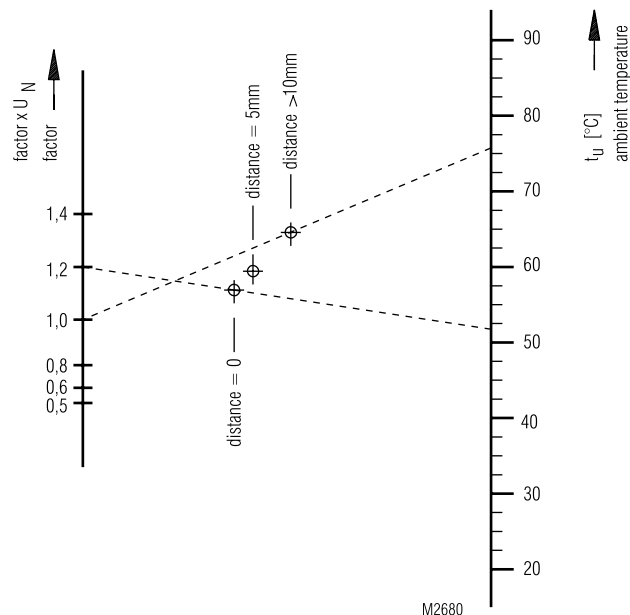
required response value:

≥ AC 230 V

= Setting value on ML 9702

(accurate setting with voltmeter)

If the voltage exceeds 230 V the contact 11-14 closes. If the voltage drops under 196 V (hysteresis 0,85) the output contact switches back to 11-12.



## Overload and ambient temperature:

Nomograph to evaluate the max. continuous overload depending on mounting distance and ambient temperature:

Example:

1. select ambient temperature e.g. 52 °C

2. select mounting distance e.g. 0 mm

draw a line through the 2 points and extend it to the left scale.

Factor 1,2 means, that the relay can be used with 1,2 times overvoltage having an ambient temperature of 52 degrees and the relay is mounted without distance.