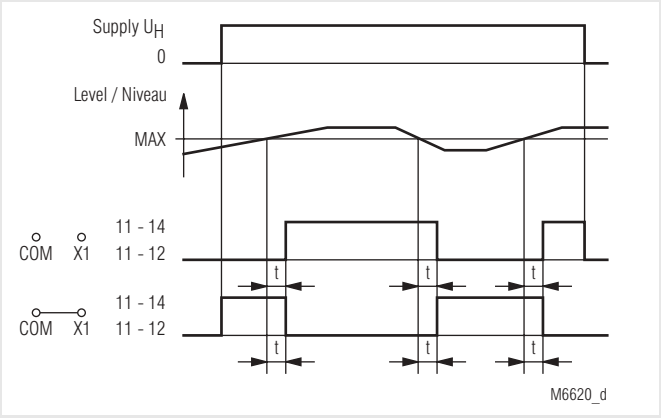
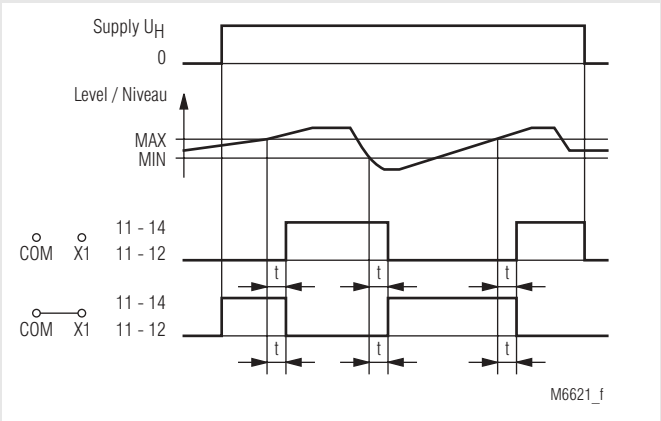
Level sensing relay MK 9151 varimeter

0221581

Function diagrams

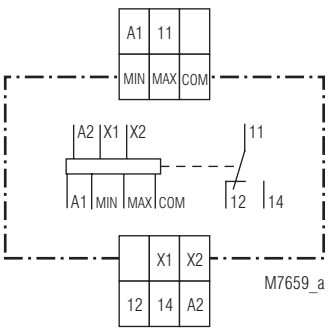


1-point level control

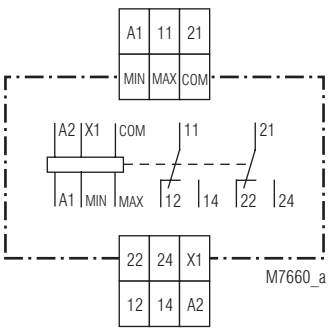


2-point level control

Circuit diagrams



MK 9151.11



MK 9151.12

- According to IEC/EN 60 255, DIN VDE 0435-303
- 3 probe connections for 2-point and 1-point level control
- Also for use as moisture detector
- High interference resistance of the measuring circuit, which is isolated from the mains
- Max. wire length to the probes: 1500 m
- Large setting range: 2 ... 450 kΩ
  this permits differentiation between fluid and foam
- Adjustable response and release time delay: 0,2 ... 20 s
- Programmable for open circuit operation (without bridge) or closed circuit operation(bridge X1-X2 or X1-COM)
- For auxiliary voltages of 24 ... 415 V AC or 24 V DC
- Green LED for operation
- Yellow LED for contact position
- 1 or 2 changeover contacts
- Also available with sealable transparent cover
- Available with safe separation according to IEC/EN 61 140, IEC/EN 60 947-1
- Width 22,5 mm

Approvals and marking

Canada / USA *

* see variants

Application

- Level monitoring and control for conductive liquids and powders, e.g. maximum and minimum filling levels, overfilling and protection against dry running
- Monitoring and control of the mixing ratio of conductive liquids
- General resistance monitoring tasks, e.g. limit temperature detection with PTC

Indicators

green LED:	on, when supply connected
yellow LED:	on, when output relay active

Notes

All commercially available probes are suitable.

The reference probe for level measurement is generally located at the lowest point of the container and must always be connected to the "COM" terminal. The container itself can be used as a reference probe if it consists of conductive material.

1-point level control (see Figure) is especially suitable for protection against overfilling and dry running on containers with a free inlet/outlet. In this configuration, all that is required besides the reference probe "COM" is the "MAX", which must be located at the desired limit level. The output relay switches over after the set delay time if the fluid level exceeds or falls below the limit level, which permits fluid to be pumped out or added.

All technical data in this list relate to the state at the moment of edition. We reserve the right for technical improvements and changes at any time.

Technical data

Input

Setting range of the fluid resistance:	2 ... 450 kΩ (other ranges on request)	
Setting:	on logarithmically divided absolute scale	
Switching point hysteresis:	approx. 3 % (at 450 kΩ) ... 6 % (at 2 kΩ) of the set value	
Voltage and temperature influence:	< 2 % of the set value	
Max. cable length to the probes:	Set value	Cable length (at 100 nF/km)
	450 kΩ	50 m
	100 kΩ	200 m
	35 kΩ	500 m
	10 kΩ	1500 m
	5 kΩ	3000 m
Max. sensing voltage:	approx. AC 10 V	
Max. sensing current:	approx. AC 1,5 mA (internally generated)	
Response and release times:	0,2 ... 20 s Setting on logarithmically-divided absolute scale	

Auxiliary circuit

Auxiliary voltage U_H:	AC 24, 42 ... 48, 110 ... 127, 220 ... 240, 380 ... 415 V DC 24 V	
Voltage range of U_H	AC: 0,8 ... 1,1 U_N DC: 0,85 ... 1,25 U_N	
Nominal power consumption	AC: approx. 2 VA DC: approx. 1 W	
Frequency range:	45 ... 400 Hz	

Output

Contacts		
MK 9151.11:	1 changeover contact	
MK 9151.12:	2 changeover contacts	
Thermal current I_{th}:	5 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V:	5 x 10^5 switching cycles	
Permissible operating:	6 000 switching cycles / h	
Short-circuit strength		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	30 x 10^6 switching cycles	

General data

Operating mode:	Continuous operation	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distances		
overvoltage category / contamination level		IEC 60 664-1
input/auxiliary circuit:	6 kV / 2	(1 kV for DC 24 V-devices)
input/output circuit:	6 kV / 2	(4 kV for MK 9151.12)
auxiliary/output circuit:	4 kV / 2	
EMC		
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge voltages:	1 kV	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection:	Housing: IP 40	IEC/EN 60 529
	Terminals: IP 20	IEC/EN 60 529
Housing:	Thermoplastic with V0 behavior according to UL subject 94	
Vibration resistance:	Amplitude 0,35 mm, frequency 10 ... 55 Hz, IEC/EN 60 068-2-6	
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	

Technische Daten

Wire connection:	2 x 1,5 mm² solid or 2 x 1,0 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Wire fixing:	Flat terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Weight:	155 g	

Dimensions

Width x height x depth: 22,5 x 82 x 99 mm

Standard type

MK 9151.11 2 ... 450 kΩ AC 220 ... 240 V

Article number:	0044505	stock item
• Output:	1 changeover contact	
• Measuring range:	2 ... 450 kΩ	
• Auxiliary voltage U_H:	AC 220 ... 240 V	
• Width:	22,5 mm	

Variants

MK 9151._ _/60	CSA approval
MK 9151. _ _ /001:	time delay on Min level
MK 9151. _ _ /002:	time delay on Max level
MK 9151. _ _ /400:	with sealable transparent cover
MK 9151. _ _ /106:	with save separation according to VDE 0106

Ordering example for Variants

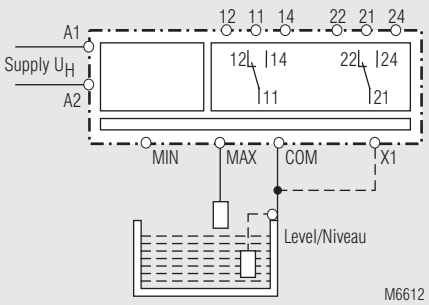
MK 9151 .12 /_ _ _ 2 ... 450 kΩ AC 220 ... 240 V

- Auxiliary voltage
- Measuring range
- Variant, if required
- Contacts
- Type

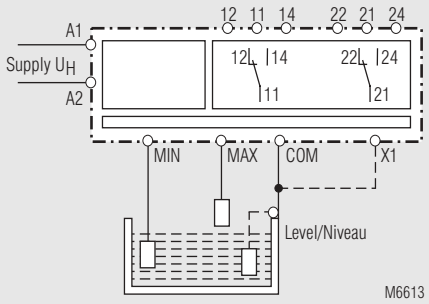
Accessories

OA 5640: Standard probe

Applications



1-point level control



2-point level control