

Instruction manual

2281 Conductive multipoint switch with single channel relay



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Follow instruction manual

The instruction manual is part of the product and an important element within the safety concept.

- Read and follow instruction manual.
- Always keep instruction manual available for the product.
- Pass on instruction manual to all subsequent users of the product.

1. Intended use

The product is applicable for liquids with specific conductivity over 10 $\mu\text{S}/\text{cm}$. The switching unit can sense the resistance between probes. Conductivity measurement is suitable only for detecting the presence of liquid at a given level of the tank. This level is represented by the length of the probe. The conductive switch is suitable for filling / emptying control or level limit.

2. Safety and responsibility

In order to provide safety in the plant, the operator is responsible for the following measures:

- Products may only be used for its intended purpose, see intended use
- Never use a damaged or defective product.
Immediately sort out damaged product.
- Make sure that the piping system has been installed professionally and serviced regularly.
- Products and equipment shall only be installed by persons who have the required training, knowledge and experience.
- Regularly train personnel in all relevant questions regarding locally applicable regulations, safety at work, environmental protection especially for pressurised pipes.

The personnel is responsible for the following measures:

- Know, understand and follow the instruction manual and the advices therein.

3. Function

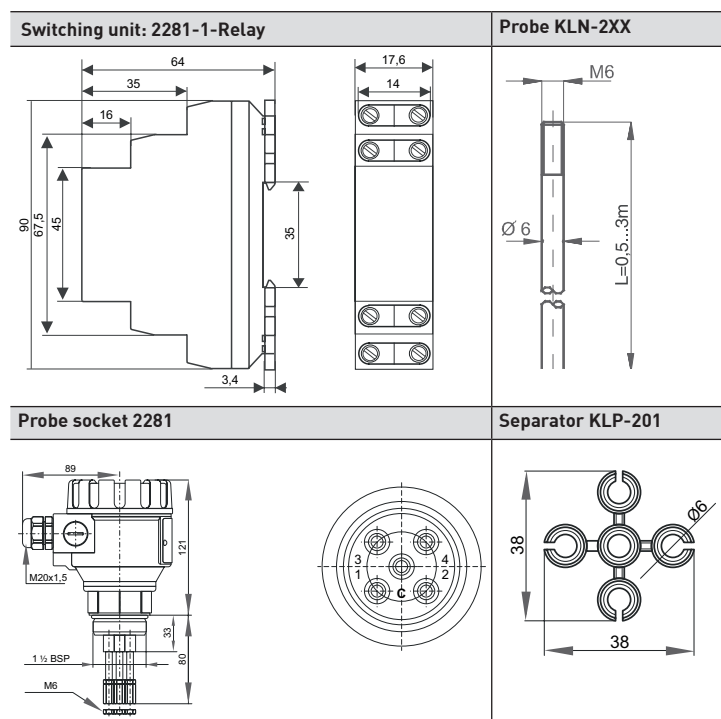
The level switch consists of a switching unit and the KLN-2 type probes. Probes are to be connected to the 2281 probe socket head that can be screwed into the tank. If the material of the tank or its internal insulation is not conductive then a reference probe should be used in addition to the one, two, three or four probe(s), if the material of the tank is conductive, the tank can be used as a reference probe.

4. Technical Data

4.1 Technical Data of the switching unit

Probe Voltage	3.5 V AC
Probe current	< 0.5 mA AC
Sensitivity	Adjustable: 5 k Ω ... 100 k Ω
Max. cable capacity	800 nF
Response	max. 400 ms
Setting accuracy (mech.)	$\pm 5\%$
Delay	Adjustable: 0.5 ... 10 s
t_1 delay	1.5 s
Relay output	1x SPDT
Switching voltage	250 V AC1, 24 V DC
Switching current	8A AC1
Switching power	2500 vA AC1. 240 W DC
Electrical strength	3.75 kV
Mechanical life-span	3 x 10 ⁷ switches
Electrical life-span	0,7x10 ⁵ switches
Power supply Un	24V-240V AC/ DC
Voltage range allowed	nominal voltage -15 %...+100 %
Power consumption	max. 2.5 VA/ W
Ambient temperature	-20°C ... +55°C
Electrical connection	max. 2.5 mm ² / with insulation 1.5 mm ²
Electrical protection	Class II.
Ingress protection	IP 20
Mechanical connection	DIN EN 60715 rail
Mass	72 g

5. Dimensions

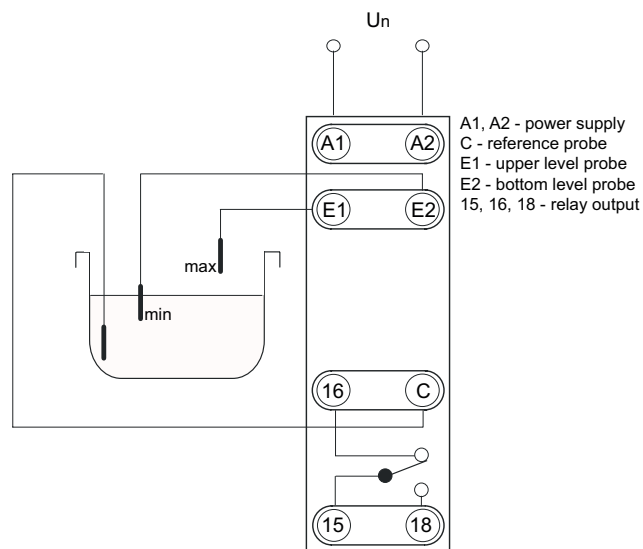


6. Installation

- Mount switching unit on DIN EN 60715 rail.
- Cut the KLN-2 type probes to the length required for level detection on site.
- Screw probes into the sockets.
- Tighten the probe with an M6 nut.
- Use separators at every 0.5 m for multiple probe devices to keep the probes apart.

7. Electrical Connection

If the wall of the tank is conductive no reference probe is needed. In this case terminal C is to be connected to the tank. On multiple probe units E1 and E2 are marked with 1,..4, the reference probe is marked with C. Admissible length of cable between signal processor and probes depends on cable capacity and conductivity.



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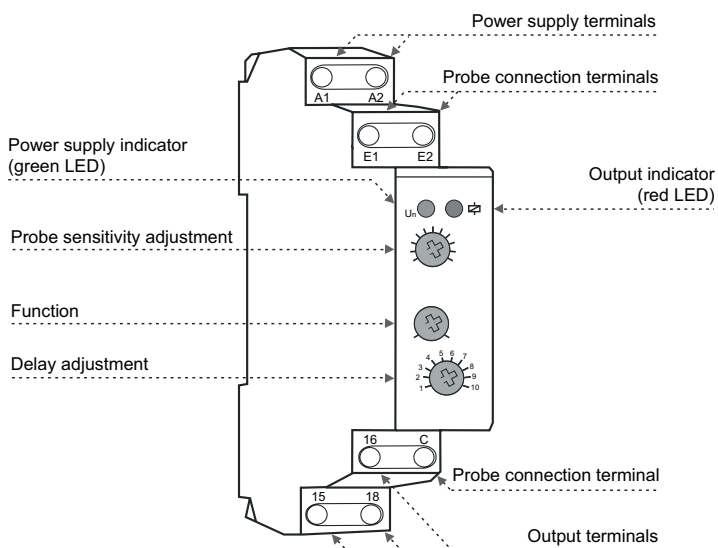
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8. Putting into operation

8.1 Adjustment

The green LED (U_n) shows that the unit is on, and the energized state of the relay is indicated by the red LED. Operating mode and delay time (ON and OFF) can be set with the rotary selector switch and potentiometer on the front panel.

To set the sensitivity using SENS potentiometer do the following: submerge all probes into the fluid. Set a minimal delay time (t). Adjust the sensitivity from min. to max. value until the relay becomes energized. Now set the sensitivity a little higher, but don't set a higher sensitivity than needed.

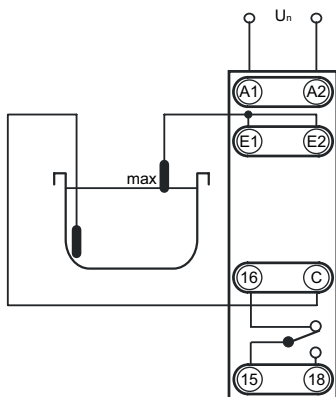


8.2 LED Indication

Green LED is on	• power supply is on
Red LED is on	• relay is switched on (contacts 15 and 18 are closed)
Red LED is off	• relay is disconnected (contacts 15 and 16 are closed)
Red LED is blinking	• output delay indication

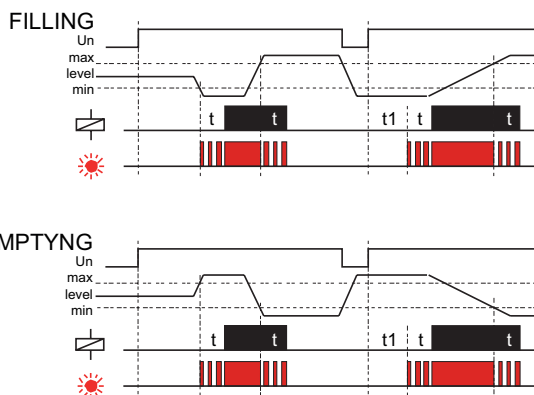
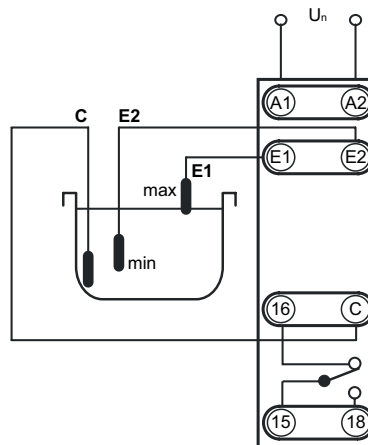
8.3 Single-Level monitoring limit switching

If only one level is monitored, the sensor probe should be connected to both E1 and E2 terminals. For High Fail-safe mode indication the 'PUMP' switch should be in 'UP' position and for Low level alarm indication in 'DOWN' position. Level alarm conditions are indicated in the same way (by de-energized relay state) as when a power cut-off occurs.



8.4 Level control

The level switch can be used for control of tilling or emptying. During filling control the 'PUMP' switch should be in position 'UP' and during emptying control in position 'DOWN'. That way in case a power supply outage occurs (energized relay) overflowing or unwanted emptying is prevented.



9. Maintenance, Repair

The device does not require regular maintenance. Repair within and beyond the warranty period is carried out at the manufacturer's location.

10. Storage

- Ambient temperature: -30 to +70 °C
- Relative humidity: max. 85%

11. Disclaimer

The technical data are not binding. They neither constitute expressly warranted characteristics nor guaranteed properties nor a guaranteed durability. They are subject to modification. Our General Terms of Sale apply.