Universal relay
ES 5000

SAFETY INSTRUCTIONS

- Installation, initial start-up and maintenance may only be performed by trained personnel!
- The device may only be connected to power which complies with the specifications included in the technical data and on the serial plate!
- The device must be disconnected from all sources of power during installation and maintenance work!
- The device may only be operated under the conditions specified in these operating instructions!

DESCRIPTION

The ES 5000 electrode relay operates according to the conductive principle, i.e. the electrical conductivity of the liquids to be monitored is used as the electrical connection between the immersed electrodes.

Application limits

Conductive level controls are not suitable for liquids that contain oil or grease or where electrically insulating deposits can form.

Measuring ranges

The ES5000 electrode relay can be used with liquids whose resistance between the electrodes is less than 150kΩ or whose conductivity is better than 6.6µS.

Control system

Interval switching (min. / max. level control) with triple electrode, monitoring of a fill level point (overflow / dry run alarm) with double electrode. (Metal containers can be used as reference electrodes)

Leakage detection

With special ribbon tape (LISA) or floor electrodes (BES 680), the leakage can be detected in collecting chambers. When a terminating resistor is connected to the end of the ribbon tape, the ‘wire break detection’ function can be activated. Short-circuit detection in the measuring circuit can be activated using a DIP switch (see the values in the technical data).

Please note:

When operating with 3 electrodes (min. / max. control), the ‘wire breakage monitoring’ function cannot be used.

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TECHNICAL DATA

Power supply	230V AC ±10%, 50 - 60Hz, or 24V DC ±10%
Consumption	<2VA / W
Ambient temperature	-15...+45°C
Casing	22.5x75x100mm, IP40 for DIN rail 35x7.5mm (EN 50 022) or in a cabinet for wall mount 88x150x130mm, IP55
Terminals	Protection class IP20, screw connection, cable cross-section max. 2.5mm²
Measuring circuit	Galvanic insulated, alternative current <6V and <2mA
Cable length	max. 500m (without wire break monitoring) max. 50m (with wire break monitoring) Wire cross-section min. 0.5mm²
Measuring function	MIN-MAX control MIN control or MAX control or leakage detection

Can be used for leakage detection

Open-circuit monitoring:

(only with connected 680kΩ load resistor)
Switchable via DIP4 if resistance of detection loop R>1.5MΩ:
Red alarm LED 3 lights up, relay drops out*):

Short-circuit monitoring:

Switchable via DIP3 if resistance of detectionloop <1kΩ:
Red alarm LED 4 lights up, relay drops out*)

*) DIP1= OFF

Sensitivity	2 adjustable ranges: LOW = approx. 5...70 kΩ (14...200 µS) HIGH = approx. 15...150kΩ (6.6...66µS)
Hysteresis	approx. 10% of the set sensitivity value
Relay output	2-fold changeover contact, potential-free AC: max. 250V, 3A DC: max. 125V, 1A
Operating principle	Operating / quiescent current, switchable
Delay	Switch-on delay / dropout delay 0.5...3sec. adjustable with potentiometer 2

CE mark
The device fulfills the legal requirements of applicable EU-guidelines:

SIGNALLING

Blue LED 1 lights up	Device ready for operation
Yellow LED 2 lights up	Output relay has energised
Red LED 3 lights up	Wire break in measuring circuit
Red LED 4 lights up	Short in measuring circuit

BEHAVIOUR WHEN SWITCHING ON THE SUPPLY VOLTAGE

The device is ready for operation approx. 5 seconds after switching on the supply voltage.

OPERATING RANGE

The capacitive resistance of long cables reduces the sensitivity of the electrode control.
A typical 3-core PVC cable has a capacitance of approx. 100pF/m.
The operating range is therefore dependent on the cable length.
The cable length can be increased by using low-capacitance cables.

MAINTENANCE

When used as intended, the appliance is maintenance-free.

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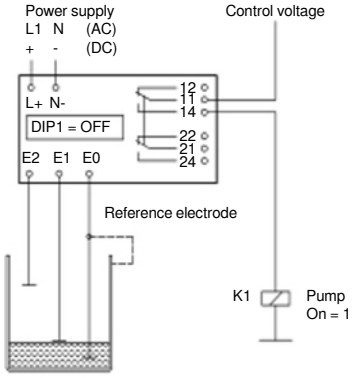
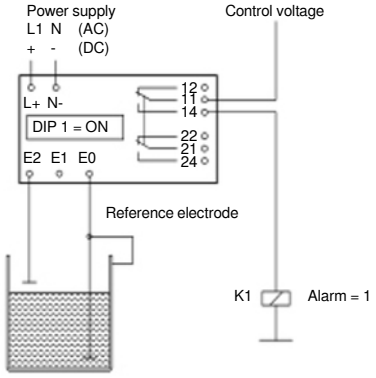
ELECTRICAL CONNECTION

Filling the container automatically



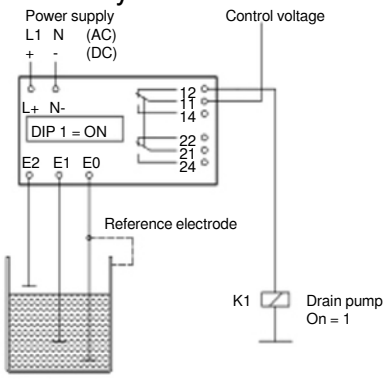
Please note: Open-circuit monitoring not possible

Overfill alarm



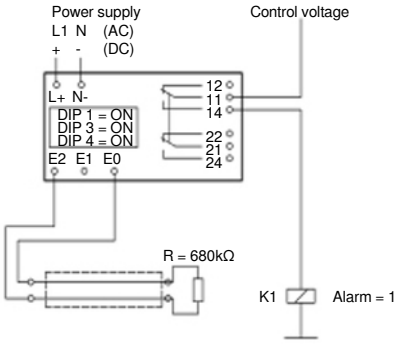
Please note: Open-circuit monitoring not possible

Draining the container automatically

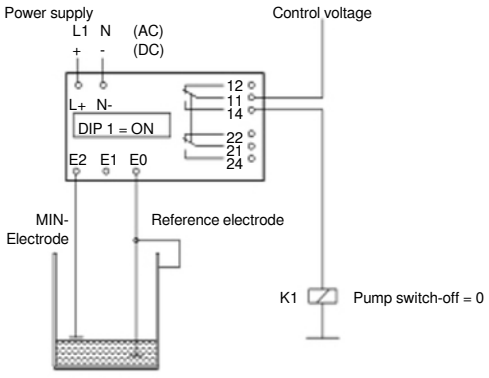


Please note: Open-circuit monitoring not possible

Leakage detector

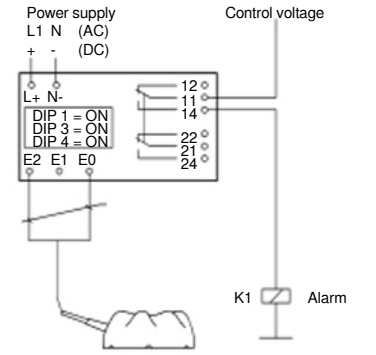


Dry run protection



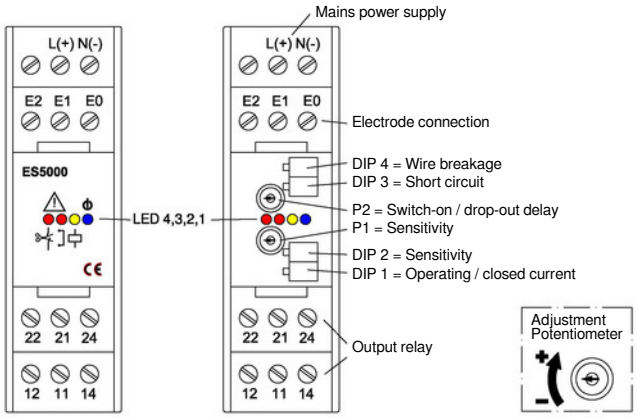
Please note: Open circuit monitoring possible

Floor electrode BES 680



Floor leak detector with integrated 680kΩ resistor

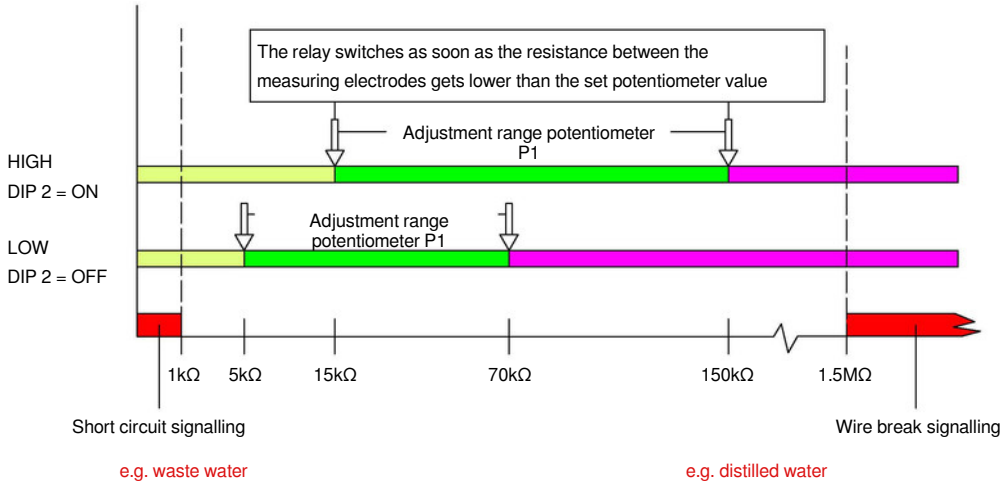
ADJUSTMENT



The front panel can be removed by levering it out with a screwdriver.

Responsiveness:
Potentiometer P1 and DIP2
Adaptation to the conductivity of the respective liquid.

Principle	The poorer the conductivity of the liquids used and the greater the distance between the electrodes, the higher the response sensitivity must be set.
Please note	Excessive response sensitivity can lead to incorrect switching!



Switch-on / dropout delay time Potentiometer P2
Flutter protection to prevent multiple switching in the event of fluctuating liquid surfaces

Potentiometer	Left stop	Right stop
P1 Sensitivity	min.	max.
P2 Delay time	approx. 0.5sec	approx. 3sec

DIP switch	ON	OFF
1	Operating current	Quiescent current
2	High sensitivity	Low sensitivity
3	Short-circuit monitoring	without
4	Wire break monitoring	without

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