INSTRUCTION MANUAL
AMPLIFIER RELAY ES2001

SAFETY INSTRUCTIONS

- Installation, commissioning and maintenance may only be performed by qualified personnel!
- Only connect the unit to the voltage specified in the technical data or on the type plate (observe polarity for DC)!
- 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 the operating instructions.

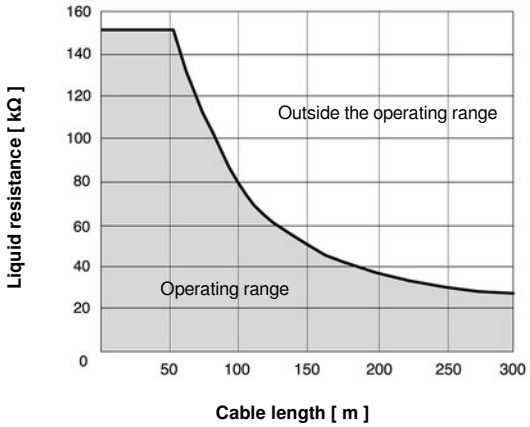
TECHNICAL DATA

Power supply	230, 115, 48, 24 V ±10% AC 50/60 Hz; 24, 12 V DC
Connected load	≤ 2 VA
Relay output	2 changeover contacts, potential-free AC: Max. 250 V, 5 A, 500 VA DC: Max. 125 V, 1 A, 40 W
Measuring circuit	Galvanically isolated, AC voltage < 6 V / < 2 mA
Measuring function	MIN-MAX control MIN control or MAX control
Hysteresis	About 20% of the set sensitivity value
Response sensitivity	2 adjustable ranges 1...70kΩ / 5...150kΩ or approx. 1mS...14µS / 0.2mS...6.5µS
Working principle	Open / Closed curent lopp
Delay	ON/OFF delay adjustable: 0.5 to 3 s Adjustment through potentiometer
Ambient temperature	-15 ... +45 °C
Dimension	22.5 x 75 x 100 mm
Housing	IP40 for mounting DIN rail 35x7.5 mm (EN 50 022) / IP55 for wall-mount cabinet 88x150x130mm
Cable	min. Wire cross-section 0.5mm^2, shielded cable
Electrical connections	IP20, screw terminals, cable cross-section max 2.5 mm^2
Signalling	1x LED: "Operating" 1x LED: "Status of relay"

EC Conformity: The instrument meets the legal requirements of the current European Directives.

OPERATING RANGE

The capacitive resistance of long cables reduces the sensitivity of the detection.
A standard 3-wire PVC cable has a capacitance of 100 pF/m
The range therefore depends on the liquid resistance and on the cable length between the electrode and the relay ES2001.
This results in an operating range according to the diagram below:



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RECOMMENDATIONS FOR THE CABLE

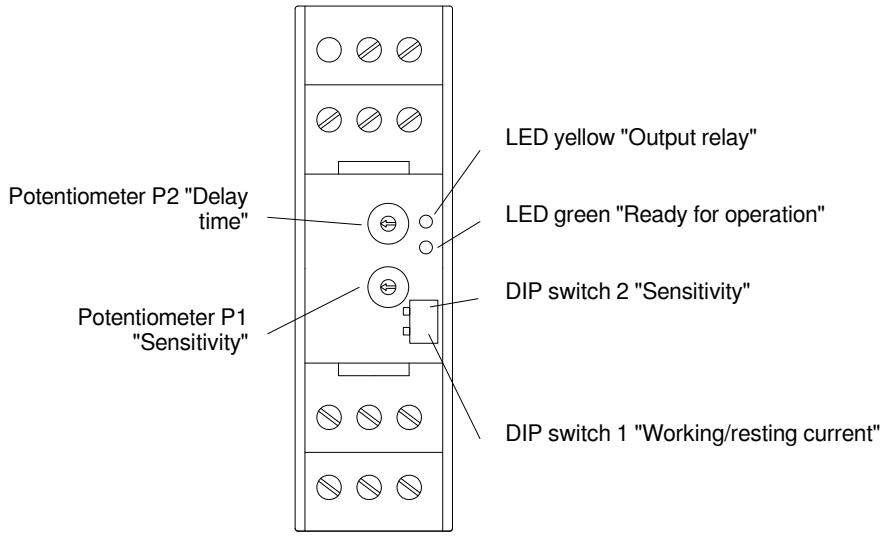
- Use a multi-core cable of 0.5 mm².
- This cable must be separated from other cables.
- Above 25 m length, it is necessary to use a shielded cable.

SETTINGS

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

Sensitivity	Potentiometer P1 and DIP S2 To adaptat the sensitivity to the liquid conductivity.
Note	The poorer the liquid conductivity and greater the distance between electrodes, the higher the response sensitivity must be set.
Caution	An excessive sensitivity leads to faulty triggering.
Open / Closed current loop	DIP S1
Delay	Potentiometer P2: To prevent multiple switching with waves on the liquid surface.

Potentiometer	**Anticlockwise**	**Right stop**
P1 Sensitivity	Minimum	Maximum
P2 Delay	approx. 0.5 seconds	approx. 3 seconds
DIP switch	**ON**	**OFF**
1	Current in the loop	No current
2	High sensitivity 5 to 150 kΩ	Low sensitivity 1 to 70 kΩ



Signalling:

Green LED lights up	Unit ready for operation
Yellow LED lights up	Output relay status is changed

MAINTENANCE

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

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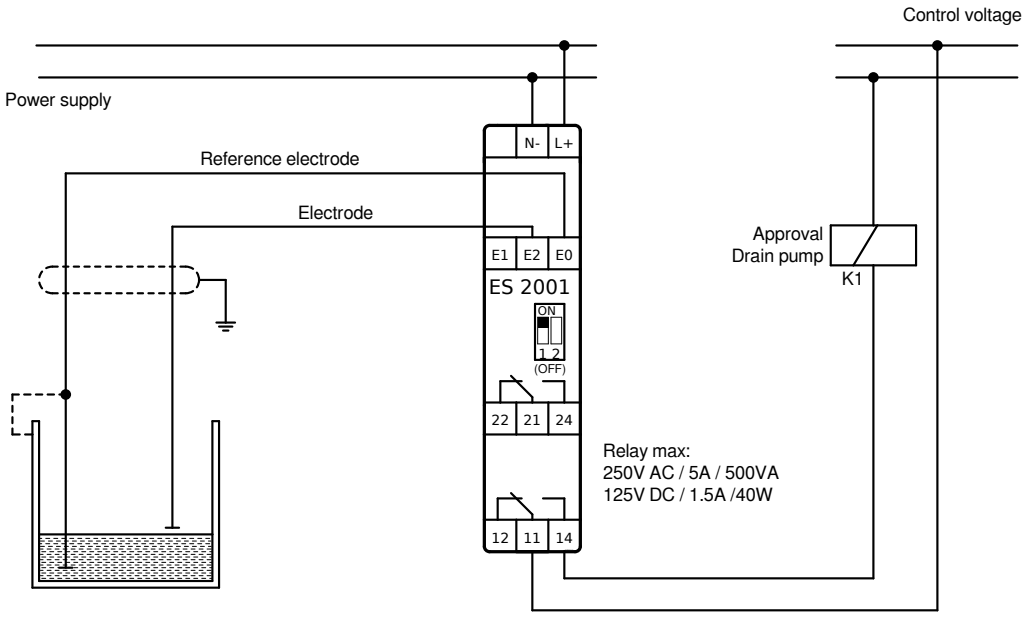
ELECTRICAL CONNECTIONS

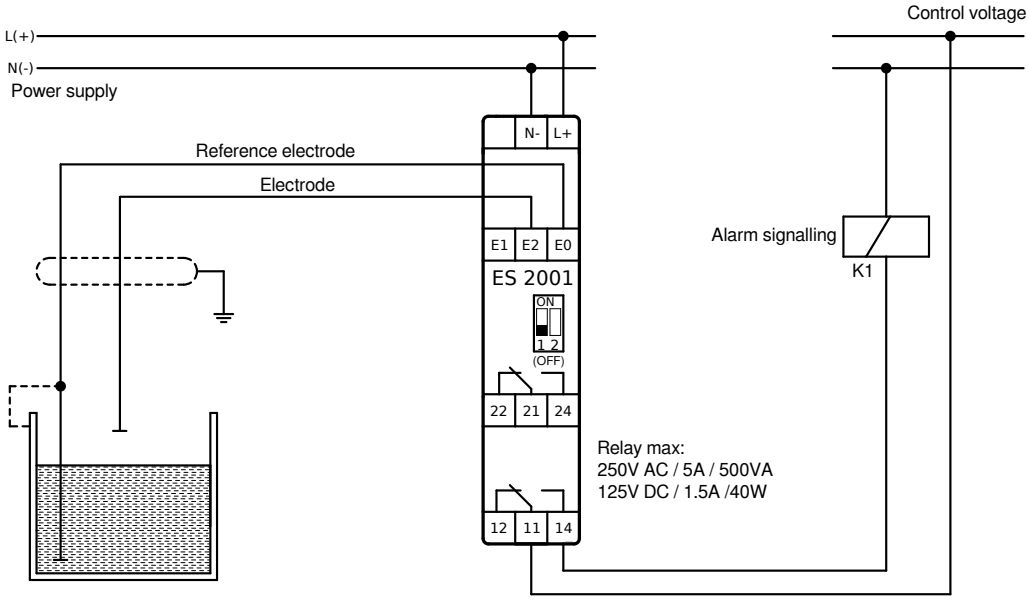
1. Dry run protection / overfill alarm (2 electrodes)
The relay is energized as soon as the liquid forms an electrical bridge between the level electrode and the reference electrode (or metal tank wall).

Dry run protection



Drain pump relay drops out when the electrode (E2) becomes free or in the event of a fault/power failure/cable break in the electrode control unit

Overfill alarm



The overfill alarm relay drops out when the electrode (E2) is immersed or in the event of a fault/power failure in the electrode control unit

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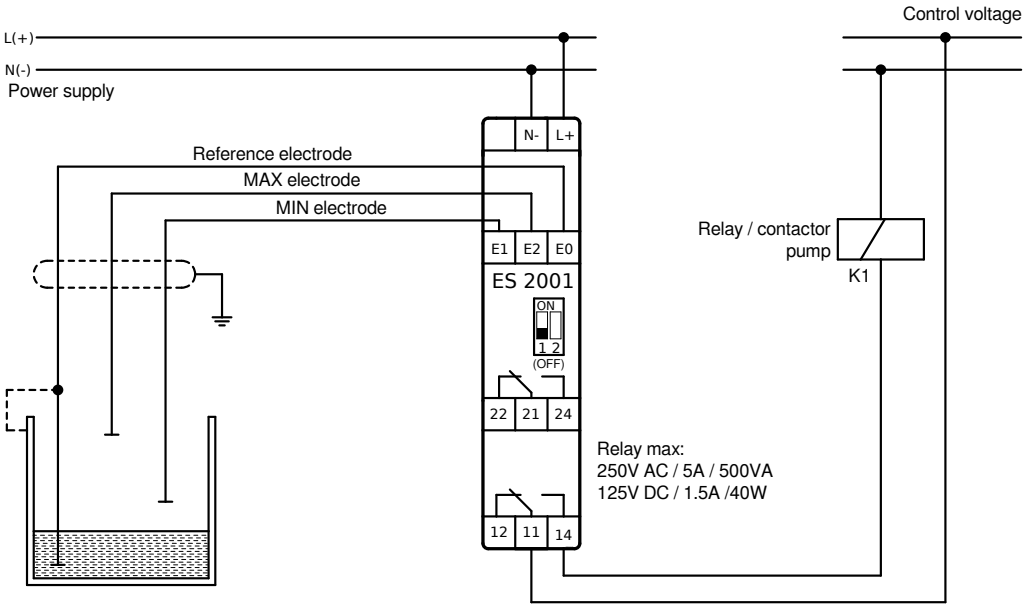
ELECTRICAL CONNECTIONS (continuation)

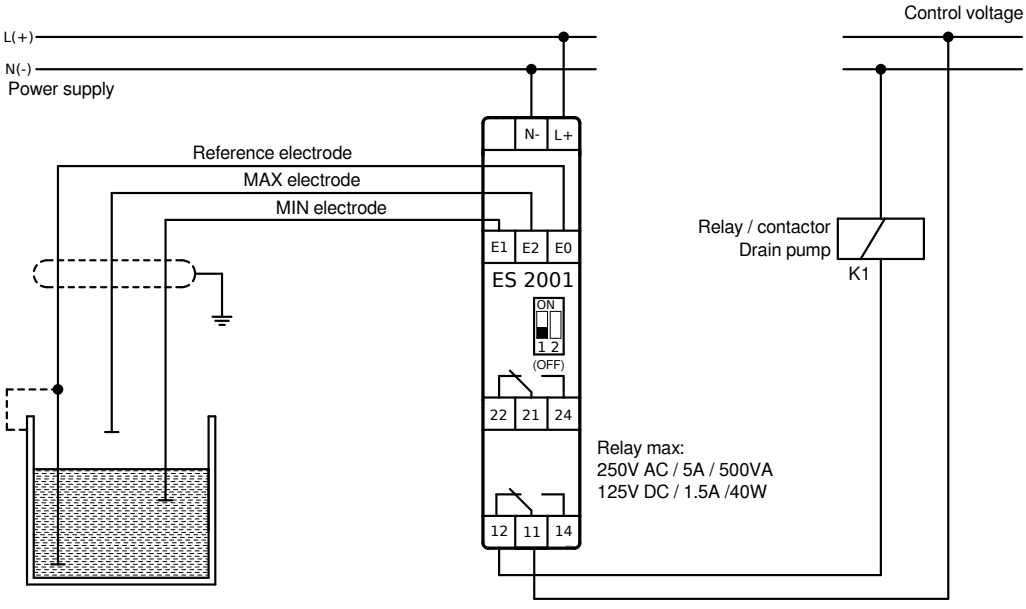
2. Automation of filling or draining (3 electrodes)
The self-holding function between two trigger points is carried out via the third electrode.
An LED shows the status of the relay.
It lights up as soon as the relay is energised.

Filling the container



Relay of the filling pump activates when MIN-electrode becomes free; ...drops off when MAX electrode is immersed

Draining the container



Relay of the drain pump activates when MAX electrode immerses; ...drops off when MIN electrode becomes free