

Relay for resistive level detection

ES5000



- For all electrical conductive liquids
- Suitable for level or leakage detection
- Adjustable sensitivity and timer, Selection of action mode
- Self diagnostic with instant alarm (LED) for: Short circuit on the loop detection, Loop detection cable break off
- Functions:
 - On /Off level controller between 2 rods
 - Level regulation between 3 rods
 - Leakage, inundation and humidity detection

PRINCIPLE

The relay ES 5000 works with the electrical conductivity property of the liquid, detecting the opening or closing circuit between two electrodes.

APPLICATIONS

Relay for level control

Minimal or maximal levels – Dosing, flow detection and alarm, pump control, solenoid valve control, fluid detection in a pipe.

Relay for leakage, inundation and humidity detection

In use with a LISA sensor, the relay ES5000 is dedicated for leakage detection on water distribution (pipes, sprinklers) and alarming in case of water, condensates or humidity in areas where water is prejudicial for equipments. The relay ES5000 includes a self diagnostic of the detection loop (short circuit on the loop detection and ribbon sensor break off) in order to warranty a positive safe detection system.

TECHNICAL FEATURES

| | |
|----------------------|--|
| Power supply input: | 230, 115, 48, 24 V AC - 50/60 Hz 12, 24 V DC |
| Consumption: | < 2 VA |
| Ambient temperature: | -15 to +45°C |
| Mass: | 100 g |
| Mounting: | DIN rail (DIN 46277) |
| Dimensions: | 22.5 x 75 x 99 mm |
| Protection: | IP40 – Tropicalized on request (<i>varnish</i>) |
| Hysteresis: | About 10% of sensitivity |
| Adjustable timer: | 0.5 ... 3 s (<i>increase and decreasing signal</i>) |
| Sensitivity: | Low range = 5 to 70 kOhm High range = 15 to 150 kOhm |
| Current loop output: | Galvanic insulated, < 6 V ac / < 2 mA |
| Relay outputs (2): | Max 250 V, 3 A [AC] Max 125 V, 1 A [DC] |
| CE Labels: | In accordance with low voltage guidelines (2006/95/EEC) and (89/336/CEE) |

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22, Rue de la Voie des Bans - Z.I. de la Gare - 95100 ARGENTEUIL
Tél : (+33) 01 30 25 83 20 - Web : www.bamo.fr
Fax : (+33) 01 34 10 16 05 - E-mail : info@bamo.fr

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ES5000

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544 I1 06 B

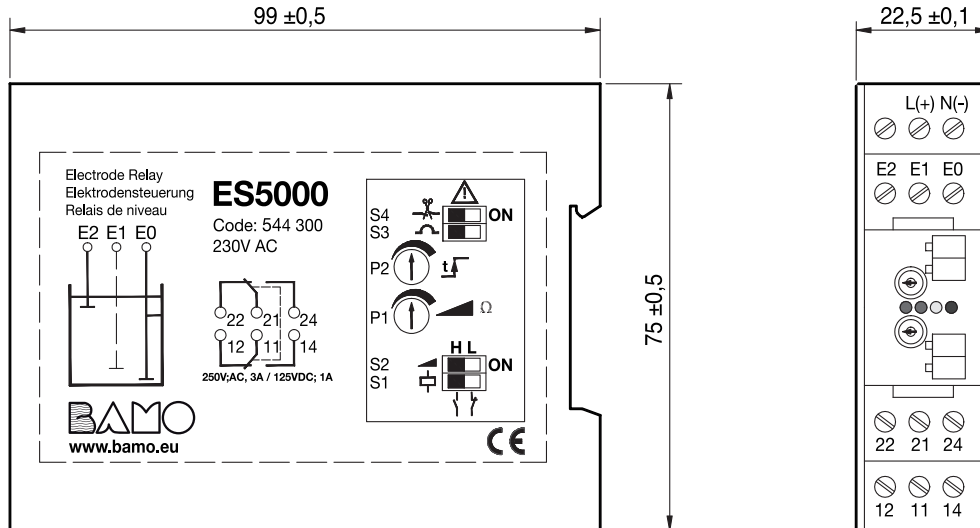
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544-06/1

CODE NUMBERS AND REFERENCES

| Code | Reference | Designation |
|---------|-----------------|--|
| 544 300 | ES5000 /230 | Relay, input power supply 230 V / 50-60 Hz |
| 544 310 | ES5000 /115 | Relay, input power supply 115 V / 50-60 Hz |
| 544 320 | ES5000 /48 | Relay, input power supply 48 V / 50-60 Hz |
| 544 330 | ES5000 /24 | Relay, input power supply 24 V / 50-60 Hz |
| 544 352 | ES5000 /12 V dc | Relay, input power supply 12 V DC |
| 544 354 | ES5000 /24 V dc | Relay, input power supply 24 V DC |

DIMENSIONS



OPERATING RANGE

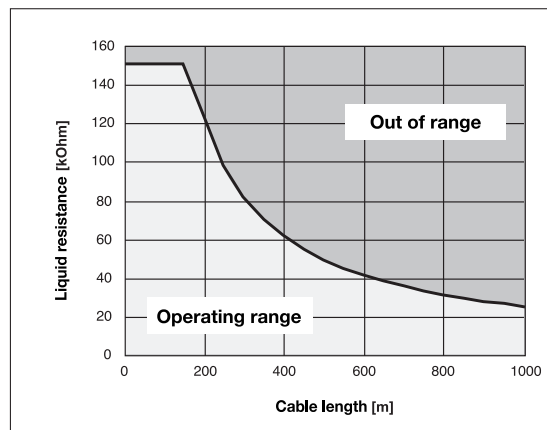
The capacitive resistance of a long cable reduces the sensitivity of the relay ES5000. A standard PVC cable, shielded, 3 conductors, has a capacitance of approx. 100 pF/m. This results in an operating range which is dependent upon cable length and the liquid resistance in accordance with the following drawing.

Caution:

- Choose a suitable cable with 0.5 mm² wires
- Over 25 m distances, preferably use a shielded cable
- All the detection loop, must be faraway from high power lines

! To assure the self diagnostic of the detection loop (*short circuit on the loop detection and ribbon sensor break off*) using the relay ES5000, the standard cable (2 wires 0.5 mm²) connecting the sensor, is **50 m as a maximum**.

[Only for V AC supply]



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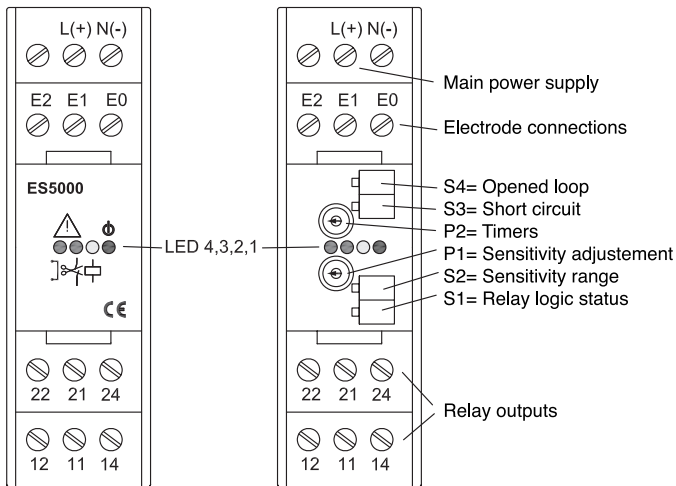
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544 I1 06 B

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544-06/2

SET UP AND DISPLAYS



| | |
|---------------------|-------------------------------------|
| LED 1 blue | Power ON |
| LED 2 yellow | Output relay actuating |
| LED 3 red | Detection loop opened |
| LED 4 red | Short circuit on the loop detection |

| Potentiometer | To the left | To the right |
|----------------|---------------|--------------|
| P1 sensitivity | Minimal | Maximal |
| P2 timer | 0.5 s approx. | 3 s approx. |

| Switch | ON | OFF |
|--------|---------------------------|--------------------------|
| S1 | ON status (*) | OFF status (*) |
| S2 | Highest sensitivity range | Lowest sensitivity range |
| S3 | Short circuit monitoring | Without |
| S4 | Opened loop monitoring | Without |

(*) see below

Switch 1: "ON"

The active relay actuation is maintained when the main supply is shut off, even if there is sufficient liquid (*factory set up*).

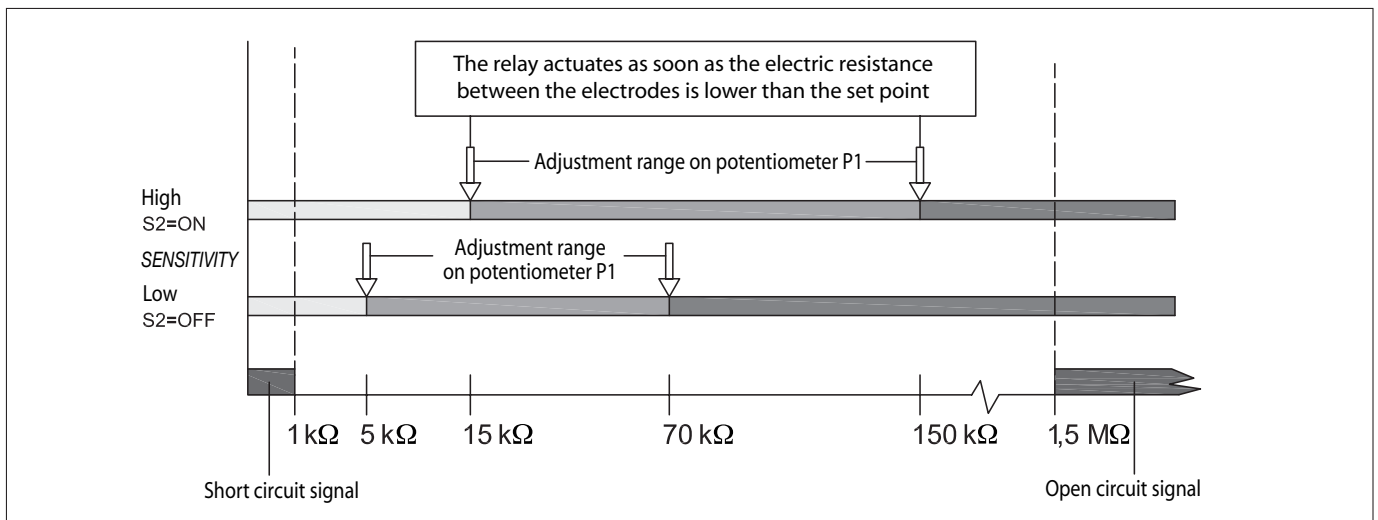
Switch 1: "OFF"

This set up lives the relay non active when the main supply is shut off, even if there is or not liquid.

Timer: To avoid false detection when the fluid surface is moving (*waves or sudden level changes*).

Sensitivity: To adapt the detection level to the liquid conductivity.

Hysteresis: To avoid false alarms originated by smog, foam or condensation of vapours.



The electrical resistance value for the loop may be between 1.5 kOhm and 1 MOhm

Leakage detection application

Opened loop monitoring
(Inserting a 680 kOhm resistance)

With S4 - position ON

The red LED is lighting when $R_{LOOP} > 1.5 \text{ MOhm}$ and the relay status changes.

Short circuit monitoring

With S3 - position ON

The red LED is lighting when $R_{LOOP} < 1 \text{ kOhm}$ and the relay status changes.

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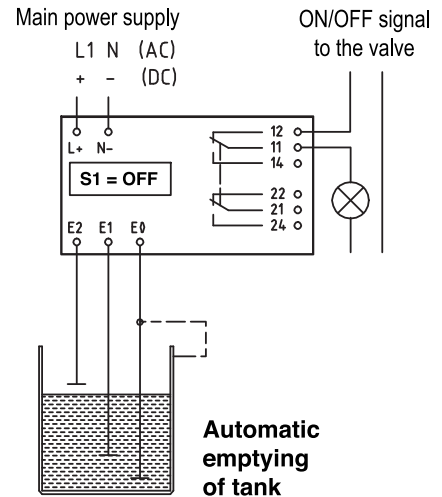
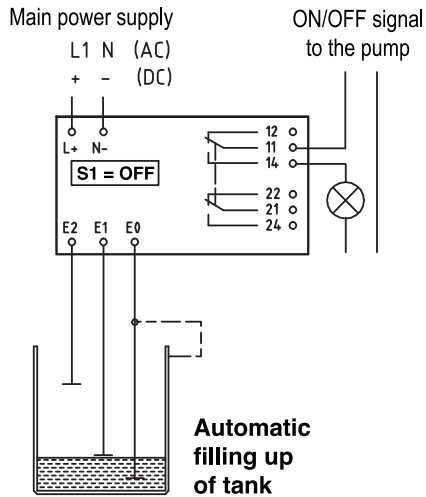
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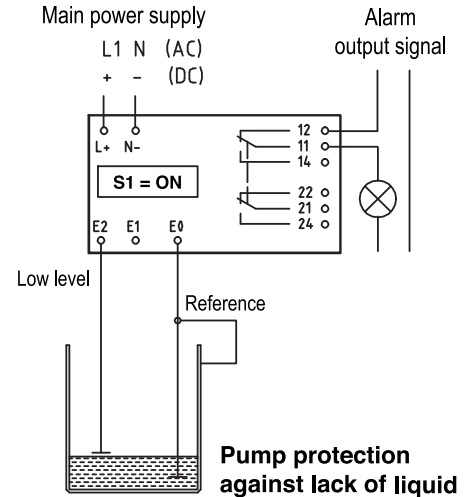
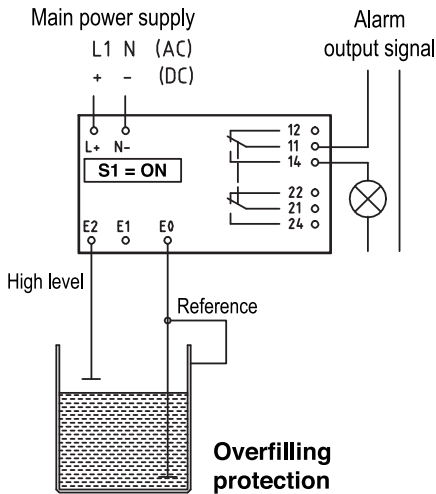
544-06/3

WIRING

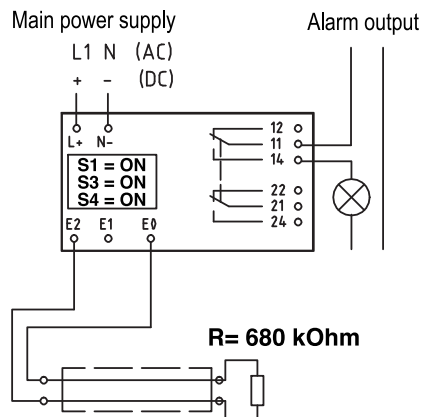
ON/OFF Regulation: 3 rods (S3 and S4 position "OFF")



ON/OFF Regulation: 2 rods (S3 and S4 position "OFF")



LEAKAGE DETECTION: (S3 and S4 position "ON")



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544 I1 06 B

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544-06/4