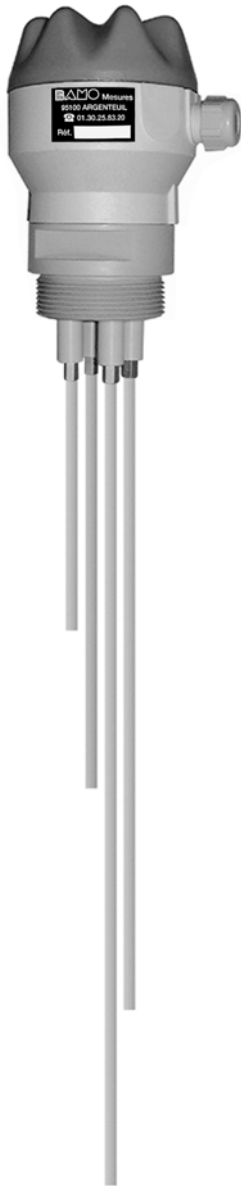


# LEVEL CONTROL WITH RESISTIVE PROBES STE / BES



- For all conductive liquids
- From 1 to 5 electrodes
- All motionless parts
- Adjustable lengths on site
- Maximum pressure 15 bar
- Maximum temperature 110°C
- Process connections in PPh or stainless steel 316
- Rods are in stainless steel or titanium

## PRINCIPLE

The difference of electrical resistance when electrodes are immersed in the conductive fluid switches a contact relay ES 2001 (please refer to documentation 530-01).

## APPLICATIONS

Control or regulation of level fluid in open or closed tanks, flumes, etc.  
Detection of fluid or lack of fluid in pipes, fluid leakage, pumps protection...

## DESCRIPTION

Each probe is made of 3 main parts:

- The housing: in PPh with cable gland 9 mm. Protection IP 65.
- Process connection: assures also electrical insulation between the rods, and with the tank. Material: PPh or stainless steel 316 Ti.
- Rods: 1 to 5 according to the model. Material: stainless steel 316 L or titanium (on request). Standard lengths are 500 to 2 000 mm and should be adjusted on site.

## MOUNTING

A vertical mounting above the tank is the best; if it is not possible, the limit angle is 45°C, downward. Caution: it is necessary to avoid any short circuit due to the liquid standing between two rods.

Verify concordance of pressure, temperature and chemical resistance of the probe with the process conditions. Caution: it is necessary to avoid damages due to vapours and condensation. Our technicians may help you to choose a model.

If possible, do not fit a plastic connection probe on metal: it could destroy the thread probe; blocking nuts are available.

If there are fluid turbulences, take care of accidental rods touching originating false signals; sheathed rods are available, or a tranquilization area could be a solution.

If the fluid creates deposit or vapours exist: it is necessary to avoid any electrical short circuit between rods with sheathed rods.

To determine number of necessary rods: 1 for each level + 1 reference rod if the tank is not of an electrical conductive material.

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**LEVEL CONTROL WITH  
RESISTIVE PROBES  
STE / BES**

31-10-2008

540 I1 01 E

**NIV**

**540-01/1**

## CODES AND REFERENCES

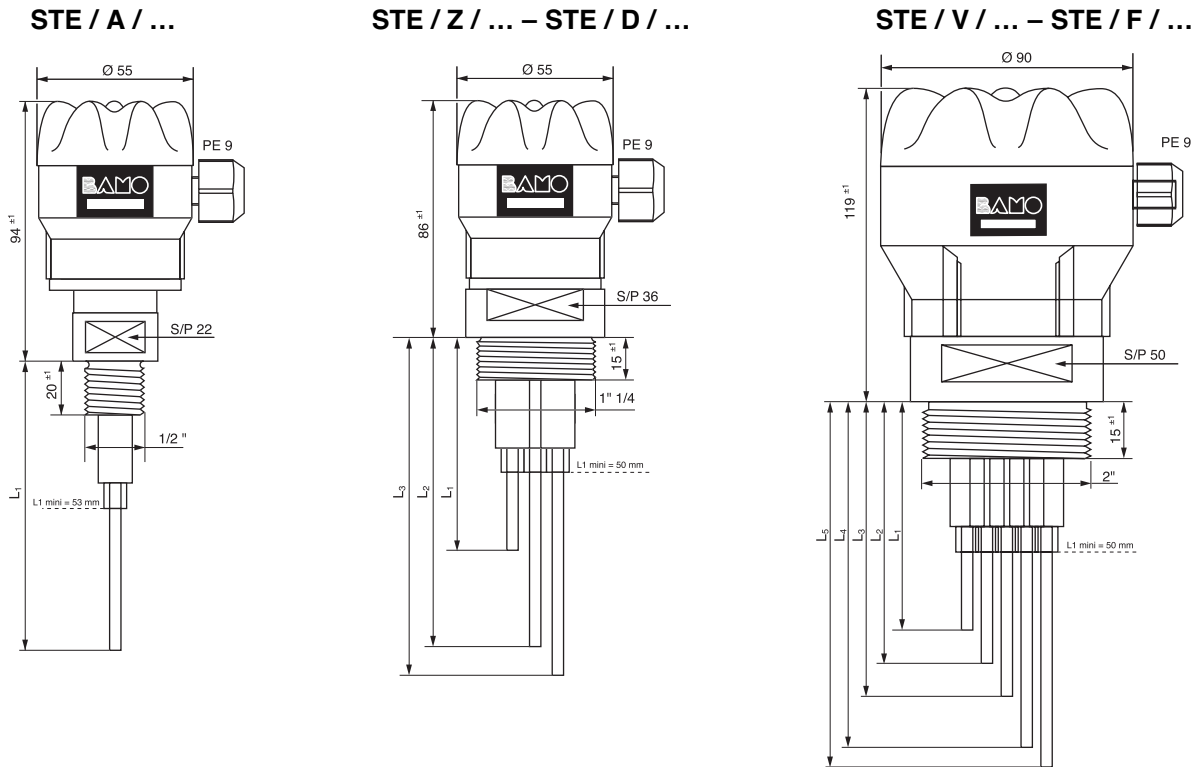
Rods Num	BSP [inch]	PPh Maxi. 6 bar / 110 °C		Stainless steel 316 Ti Maxi. 15 bar / 110 °C		Housing	Common features
		Reference	Code number	Reference	Code number		
1	1/2"	STE/A/PPH	540 110	STE/A/I	540 210	PP (IP 65)	Stainless steel rods Ø 4 mm threaded M4 Standard rod length: 500 mm Maximal length: 2 000 mm Over 2000 mm please see the type HE/HS resistive probes (documentation 542)
2	1 1/4"	STE/Z/PPH	540 120	STE/Z/I	540 220	PP (IP 65)	
3	1 1/4"	STE/D/PPH	540 130	STE/D/I	540 230	PP (IP 65)	
4	2"	STE/V/PPH	540 140	STE/V/I	540 240	PP (IP 65)	
5	2"	STE/F/PPH	540 150	STE/F/I	540 250	PP (IP 65)	

## SPECIAL MODELS

Rods in titanium: normally with PPh process connection  
Rods are 5 mm diameter, thread M5

Sheath polyolefin: to avoid short circuit between rods (max 100°C)

## DIMENSIONS



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LEVEL CONTROL WITH  
RESISTIVE PROBES  
**STE / BES**

31-10-2008

540 I1 01 E

**NIV**

**540-01/2**

# RESISTIVE AMPLIFIER RELAY FOR LEVEL CONTROL ES 2001



- For all electrical conductive liquids
- Dimensions: 22.5 mm width, rail DIN mounting
- Adjustable sensitivity and timer
- Selection of action mode
- Functions: On /Off level controller between 2 rods  
Level regulation between 3 rods

## PRINCIPLE

The resistive amplifier relay for level control ES 2001 works with the electrical conductivity property of the liquid, detecting the opening or closing circuit between two electrodes. A complete range of probes and rods are specially designed to answer to all type of applications.

The sensibility is adjusted in relation to the liquid conductivity from 1 to 150 kOhm. The hysteresis between on/off relay switching is about 10% of sensibility; This is to avoid false alarms originated by smog, foam or condensation of vapours. With both timers, it is easy to adjust the level detection or level regulation even if the fluid surface is moving (small wave effect).

## APPLICATIONS

- Reed contact, models included in BRK60, BW60, CNL, MNR6, MNR7 etc.
- Flow switch, such as ZE951 (IDP – PDP), CDP etc.

Also on level control for electrically conductive liquid media:  
Minimal or maximal levels – Dosing, flow detection and alarm, pump control, solenoid valve control, fluid detection in a pipe.  
With appropriate electrodes for use as limit transducer in: Water, wastewater – Acids, lye – Brines, etc.

It is necessary to have one relay ES2001 for each detection level.

## TECHNICAL FEATURES

Main power supply:	230 V AC $\pm$ 10% – 50/60 Hz (standard) – other on request
Consumption:	2 VA
Working temperature:	Maximal, +45°C
Housing:	IP40 – cabinet, tropicalized version, on request
Mounting:	Rail DIN 46277
Galvanic insulation:	Between main line and electrodes circuit
Sensitivity:	2 adjustable ranges, 1...70 kOhm and 5...150 kOhm
Switching power:	500 VA / 250 V AC / 5 A – 1 A / 125 V DC / 40 W Screw connectors for reverse contact
Timers, adjustable:	t = 0.5 to 5 s for increasing level 0.5 t for decreasing level
Hysteresis:	approx. 10% of adjusted sensitivity
Electrodes circuit:	6 V AC, < 1.5 mA
Indicators:	1 operating LED, 1 switching status LED

## CODE NUMBERS AND REFERENCES

Code	Reference	Designation
530 200	ES 2001 /230	Main supply 230 V - 50/60 Hz
530 210	ES 2001 /115	Main supply 115 V - 50/60 Hz
530 220	ES 2001 /48	Main supply 48 V - 50/60 Hz
530 230	ES 2001 /24	Main supply 24 V - 50/60 Hz
530 252	ES 2001 /12 V DC	Main supply 12 V DC
530 254	ES 2001 /24 V DC	Main supply 24 V DC

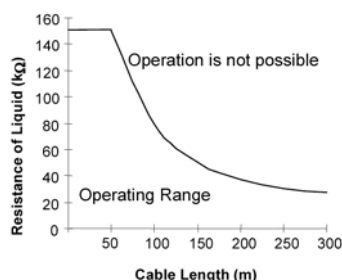
## Operating range

. The capacitive resistance of long cables reduces the sensitivity of the electrode controls.

. A typical, shielded, 3 conductor PVC cable has a capacitance of approx. 100 pF per metre.

. This results in an operating range which is dependent upon cable length and the resistance of the liquid in accordance with the following diagram:

[only for V AC supply]



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**RESISTIVE AMPLIFIER RELAY  
FOR LEVEL CONTROL  
ES 2001**

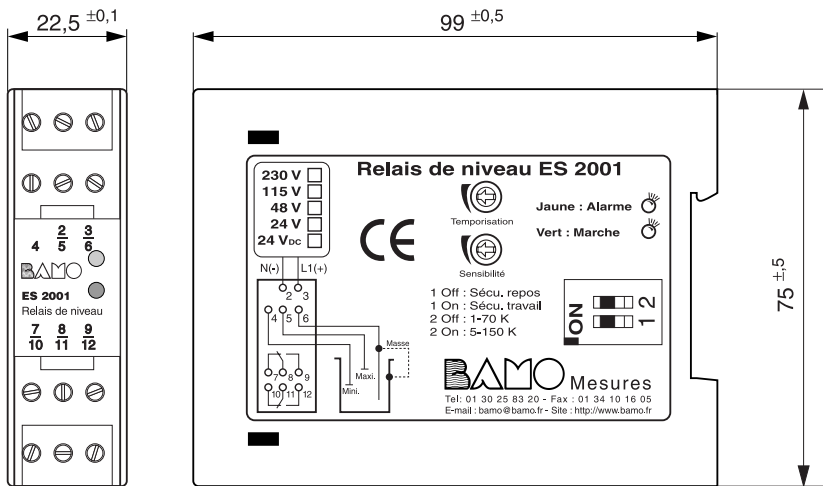
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## DIMENSIONS



## SAFE DETECTION SET UP



### 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.

## WIRING

Multiple wire cable of 0.5 mm<sup>2</sup> should be used. Care to separate this cable from power cables. Over 25 m long, it is necessary to use a shielded cable, with a maximum length of 300 m.

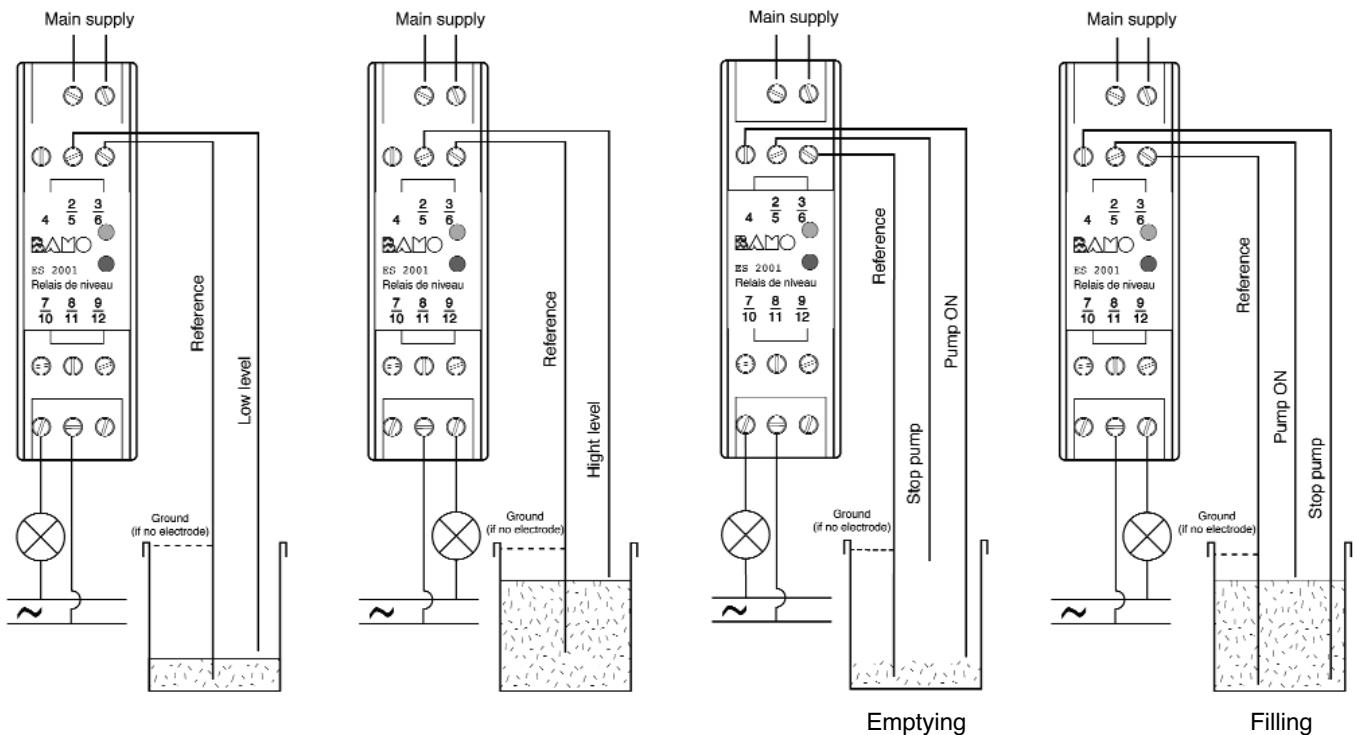
## FUNCTION

### 1. ON/OFF DETECTION: 2 rods

The relay actuates when the liquid allow the current to go through the loop.

### 2. ON/OFF REGULATION: 3 rods

The relay actuates and keeps its function until the liquid reach the upper level (filling) or the lower level (emptying). A LED indicates the relay status.



### Relay testing: Disconnect all the rods (electrodes)

Alarm function Shunt 6 and 5: relay actuates

Regulation function Shunt 6, 5 and 4. Let free 5 and then 4

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## RESISTIVE AMPLIFIER RELAY FOR LEVEL CONTROL

### ES 2001

02-10-2008

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