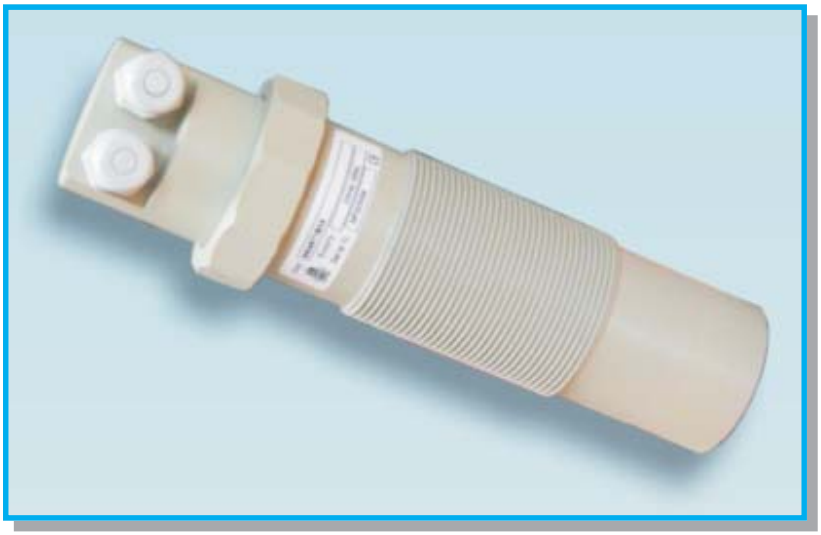
SmartCost

compact ultrasonic level transmitter with two thresholds for pump or alarm control

865B034B

SmartCost

This single-chip operated transmitter has been designed for use in tanks, basins and canals and is characterized by easy calibration procedures. If the probe is being used just as e two-threshold transmitter (min and max), calibration is performed by simply pressing two push buttons. The complete configuration also including pump or alarm control, is achieved simply connecting the transmitter to a PC through the RS485 port.The two transmitter relays may be setup as thresholds, as pump controls as self-diagnostic alarms, should malfunctioning occur. The ultrasonic transducer and electronics are enclosed into a 2" GAS. SmartCost is intended to operate with temperatures up to 80°C and is appropriate for applications involving aggressive chemical acids or liquids and even stirring devices (mixer).



- ***4÷20 mA Level/Distance transmitter up to 5 m***
- ***2 calibration push-buttons + RS485***
- ***2 built-in programmable relays (5A, 250Vac)***
- ***2" thread or flanged mechanical connection***
- ***IP65 and IP68 versions***
- ***Power supply 20÷30 Vdc or 24, 115, 230 Vac***

Measurement principle

The **SmartCost** level transmitter measuring technology is based on the emission of a short ultrasonic pulse. The ultrasonic wave runs towards the surface of the product to be measured and bounces on the surface, then backrunning towards the sensor. The time elapsed between wave emission and reception is defined as flight time and is proportional to the measured distance and ultimately to the level.

Implementation

The **SmartCost** incorporates a powerful single-chip allowing the completely digitized acquisition and processing of the acoustic signal immediately after the ultrasonic (physical) transducer, a significant feature which has been implemented using an extremely high-speed processor. The signal processing technique is therefore of the DSP type (digital signal processor) allowing to achieve special stability, disturbance immunity and accuracy which are unique, even within this class of products.
While normally operating, a built-in self-diagnostic control system monitors essential functions, detecting any echo absence (lost echo), reading instability or electronic fault occurrence. Such self-diagnostic monitoring allows to use one of the two relays available on the **SmartCost** as a malfunctioning alarm. The reliability during operation is ensured by the manufacturing techniques and materials used, involving forced ageing cycles (i.e. temperature range) and by the use of silicon components of demonstrated quality and reliability.

Device versions

On the IP65 version the calibration push-buttons are housed into the connection head of the transmitter. On the IP68 version of the same transmitter, the access to push-buttons on transmitters is no longer possible as waterproofing prevents opening the transmitter (which is in fact entirely welded and filled with waterproofing resin). The electric connection has no length limit and is obtained through electric wires connected to a watertight shunt box (IP65) also housing the calibration switches.

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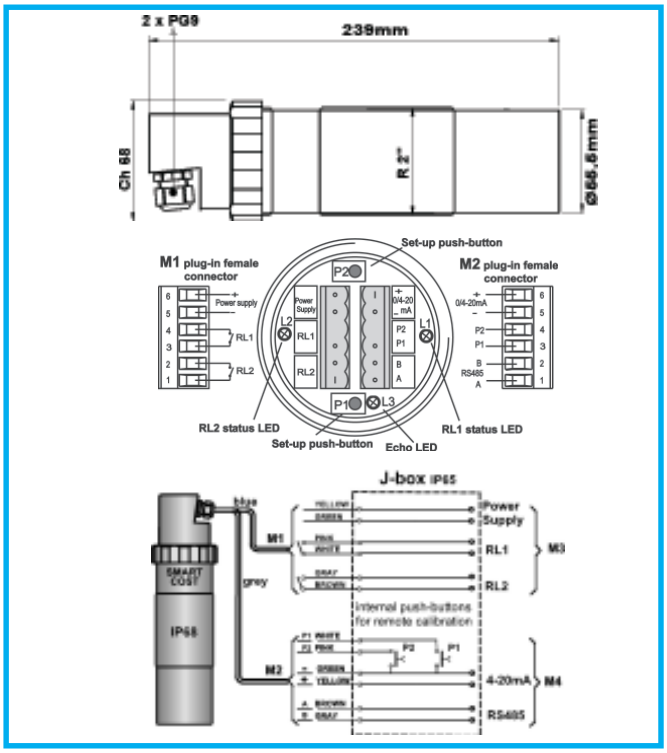
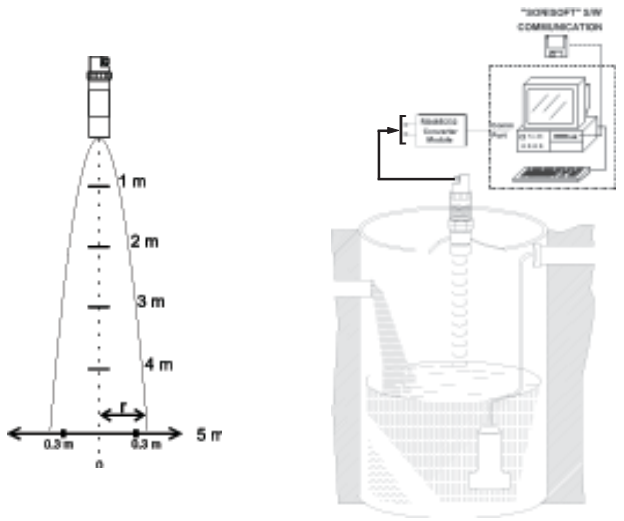
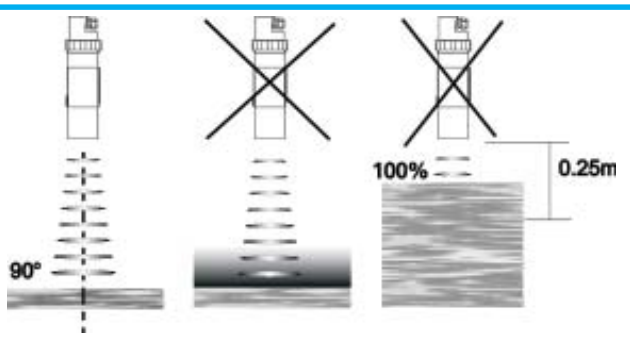
SmartCost transmitter

TECHNICAL DATA

Housing:	**PP (optional PVDF)**
Mechanical installation:	**2" G.M. BSP**
Protection class:	**IP65 or IP68**
Electrical connection:	**Internally extractable terminal boards (IPG65 version); output cable (IP68)**
Working temperature:	**- 30 to + 60°C (80°C for short period)**
Pressure:	**0.5 to 1.5 bar (absolute)**
Power supply:	**24 Vdc or 24, 48, 118, 230 Vac**
Power consumption:	**2.0W**
Analogic output:	**4÷20 mA; max load 750 ohm**
Output relay :	**n°2 relays; 5A 230 Vac (n.o. contact)**
Max meas. distance range:	**5 m (7 m with Extended Range) [The above distance must be intended from perfect reflecting surfaces]**
Communication port:	**RS485**
Blocking distance:	**0.25 m**
Temperature compensation:	**PT100; -30 to + 80°C**
Accuracy:	**± 0.5% (of the measured distance) in any case not better than ± 1 mm**
Resolution:	**0.2 mm**
Calibration:	**two push-buttons or via RS485 port**
LED display:	**green LED indicating echo reception yellow LEDS: REL1 and REL2 conditions**







Install perpendicularly to the surface to be measured

Do not use with foaming products

Avoid installation if the level of the product to be measured approximates 0.25 m

During the installation it is important to remind that in the proximity of the probe there is a 0.25 m blind area within which sensor measurement is inhibited. In order to obtain a safe measurement, free from spurious echoes (i.e. not reflected by the surface undergoing measurement), an accurate adjustment of the probe orientation is required, making sure at the same time that the ultrasonic wave emitting lobe is free from obstructions of any kind.

Calibration

Probe calibration is performed acting on the two P1 and P2 push bottons, placing the probe at the required distance, thus electronically memorizing the two differing physical situations. To set the 4mA signal, just place the probe at the distance to which the 4mA output is required to correspond; once achieved this press the two switches according to a pre-established sequence. Similarly, to set the 20 mA signal, just place the probe at the distance to which the 20mA output is required to correspond; once achieved press again the same two switches, paying attention to the different and pre-established sequence. Calibration of the 4÷20 mA transmitter is thus achieved. The 2 relays may be setup as thresholds, applying once again the self-teaching method, i.e. presetting the level on the selected position on which the trigger point is to be fixed and pressing the switches according to a pre-established sequence. Relay calibration and configuration for functions such as alarm, pump control and electronics diagnosis require using the RS485 communication port. To perform these operations through a PC the "LC" software is available.

Electrical characteristics

In the IP65 version the lid may be unscrewed, giving accessto two 6-contact extractable connectors. No special or coaxial cable is required and there is no distance limit. As power supply is Vac the current output is galvanically separated from power supply. In the IP68 version the electrical connection is achieved through multithread wires.

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