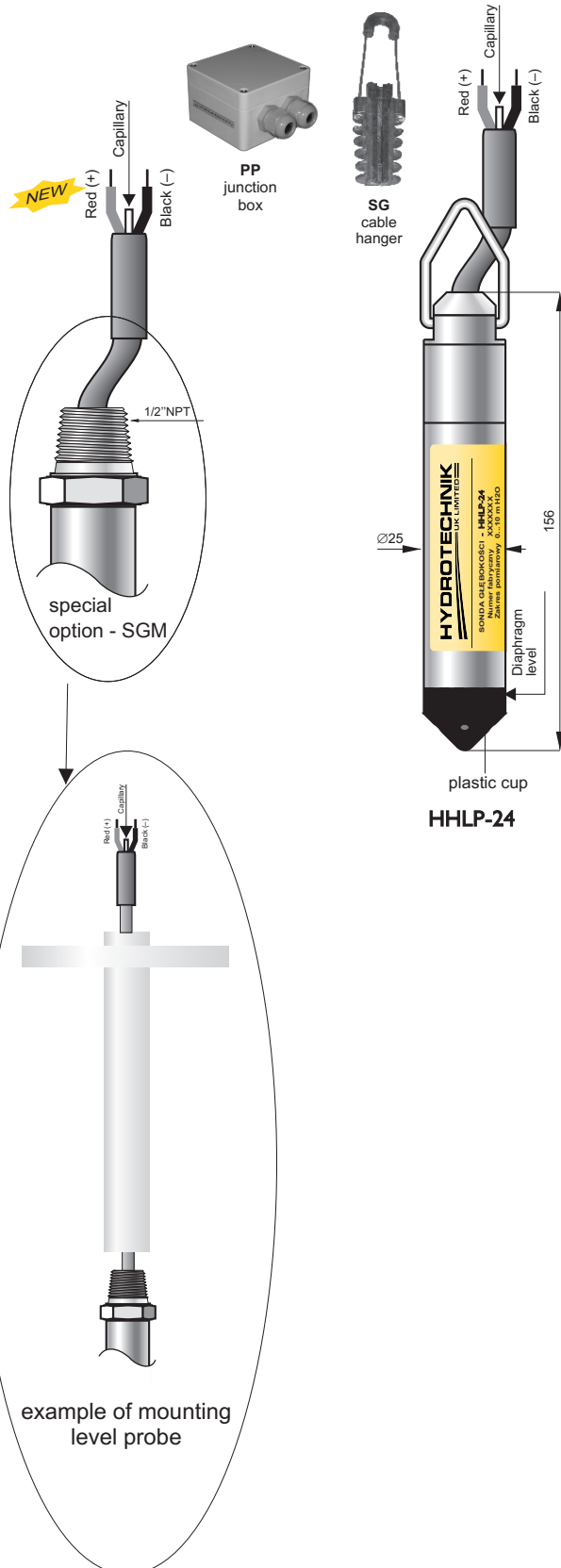


HHLP-24 series Smart level probe



- ✓ Programmable zero shift, range and damping ratio
- ✓ 4...20 mA output signal + HART protocol
- ✓ Accuracy 0.1%
- ✓ Integrated internal overvoltage protection circuit
- ✓ ATEX Intrinsic safety
- ✓ Marine certificate DNV

Application

The HHLP-24 level probe is applicable to measure liquid levels in tanks, deep wells or piezometers.

Principles of operation, construction

The probe measures liquid levels, basing on a simple relationship between the height of the liquid column and the resulting hydrostatic pressure. The pressure measurement is carried out on the level of the separating diaphragm of the immersed probe and is related to atmospheric pressure through a capillary in the cable.

The active sensing element is a piezoresistant silicon sensor separated from the medium by an isolating diaphragm. The electronic amplifier, which works in combination with the sensor, is additionally equipped with an overvoltage protection circuit, which protects the probe from damage caused by induced interference from atmospheric discharges or from associated heavy current engineering appliances.

Configuration

The following metrological parameters can be configured:

- ◆ the units of pressure;
- ◆ start and end-points of set range;
- ◆ damping time constant;
- ◆ inverted characteristic (output signal $20 \div 4$ mA).

Calibration

It is possible to calibrate the probe in relation to a model pressure.

Communication

The communication standard for data interchange with the probe is the Hart protocol.

Communication with the probe is carried out with:

- a KAP-03 communicator,
- some other Hart type communicators,
- a PC using an HART/USB converter and RAPORT 2 configuration software.

The data interchange with the probe also enables the users to:

- ◆ identify the probe;
- ◆ read the currently measured hydrostatic pressure value, output current and percentage of measuring range.

Installation, method of use

When lowered to the reference level, the probe may either hang freely on the cable or lie on the bottom of the tank. The cable with the capillary can be extended using a standard signal cable. For the cable connection a special **SG** cable hanger is recommended. The cable connection should be situated in a non-hermetically sealed box (the internal pressure inside the box should be equal to the atmospheric pressure), preventing water or other contaminants from getting into the capillary. The **PP** junction box is recommended. For systems with long signal transmission lines, it is recommended the using of an addi-

tional UZ-2 overvoltage protection circuit in the form of a wall-mounted box which allows the cables connection. When the probe cable is being wound up, the minimum winding diameter should be 30cm and the cable should be protected from mechanical damage.

If there is a possibility of turbulence in the tank (for example, because of the mixer operating mixers or a turbulent inflow), the probe should be installed inside a screening tube (e.g. made of PVC). The line hooked on the lifting handle can simplify the operation of the probe pulling out. Cleaning the probe diaphragm by mechanical means is strictly prohibited.

Measuring ranges

No.	Nominal measuring range (FSO)	Minimum set range	Overpressure limit (without hysteresis)
1	0...1,5 m H ₂ O	0,15 m H ₂ O	15 m H ₂ O
2	0...10 m H ₂ O	0,8 m H ₂ O	100 m H ₂ O
3	0...100 m H ₂ O	8 m H ₂ O	700 m H ₂ O

Technical data

Metrological parameters

Accuracy ≤ ±0,1% for nominal range
SGE-25.Smart ≤ ±0,3% for range 0...10% FSO
Long term stability ≤ 0,1% (FSO) for 2 years
Thermal error < ±0,08% (FSO) / 10°C
 max ±0,2% in the whole compensation temp. range
Thermal compensation range -25...80°C
Response time 16...230ms (programmable)
Additional electronic damping 0...30s
Error due to supply voltage changes 0,002% (FSO) / V

Electrical parameters

Power supply 7,5...55 VDC (Ex 7,5...28 VDC)
Output signal 4...20 mA (two wire transmission)
Load resistance $R[\Omega] \leq \frac{U_{sup}[V] - 7,5V}{0,0225A}$
Resistance required for communication >240 Ω

Operating conditions

Medium temperature range -30...40°C
 ETFE or PTFE version: 0...80°C
 CAUTION: The medium must not be allowed to freeze in the immediate vicinity of the probe.
Degree of protection IP68
Material of casing SS316L
Material of diaphragm Hastelloy C276 (optionally: SS316L)
Cable shield PU, ETFE, PTFE

Ordering procedure

Model	Code	Description
HHLP-24		Smart level probe
Versions, certificates	/Exia.....	II 1G Ex ia IIC T4/T5/T6 Ga I M1 Ex ia I Ma
	/SGM.....	II 1G Ex ia IIB T4/T5/T6 I M1 Ex ia I Ma
	/MR.....	Version with thread on packing gland
	/316L.....	Marine certificate (DNV), only with ETFE cable Membrane material: 316L
Nominal measuring range	/0...1,5 m H ₂ O.....	Range: 0...1,5 m H ₂ O Min. set range: 0,15 m H ₂ O
	/0...10 m H ₂ O.....	0...10 m H ₂ O 0,8 m H ₂ O
	/0...100 m H ₂ O.....	0...100 m H ₂ O 8 m H ₂ O
Measuring set range	/...+... [required units]	Calibrated range in relation to 4mA and 20mA output
Cable	/PU.....	Polyurethane cable (medium temp. up to 40°C)
	/PU PZH.....	Polyurethane, halogen free cable with hygienic certification (medium temp. up to 40°C)
	/ETFE.....	ETFE cable (not suitable for mineral oil products, medium temp. up to 80°C)
	/ETFE-R.....	ETFE cable with Viton/silicon sealing (suitable for mineral oil products, medium temp. up to 40°C)
	/PU + PTFE.....	Polyurethane cable with PTFE shielding (medium temp. up to 80°C)
	/ETFE + PTFE.....	ETFE cable with PTFE shielding (medium temp. up to 80°C)
	L=...m	Cable length (standard: 5m, 10m, 12m, 15m, 20m, a multiple of 5m, other length on request)
Accessories	/SG.....	Cable hanger
	/PP.....	Junction box