

HYDROSTATIC LEVEL PROBES

LG-25.Smart and LG-25S.Smart

Programmable zero shift, range and damping ratio
4...20 mA output signal + Hart protocol
Accuracy 0.1%, digital compensation of secondary errors
Integrated internal overvoltage protection circuit
ATEX Intrinsic safety

Ex II 1G EEx ia IIC T4/T5/T6
 I M1 EEx ia I

Application

The LG-25.Smart level probe is designed to measure levels of liquids in tanks, deep wells or piezometers.

The LG-25S.Smart probe is designed to measure levels of liquids containing contaminants or suspensions. A typical use for this probe is the measurement of levels of liquid waste in intermediate pumping stations, fermentation chambers, settling tanks etc.

Principles of operation, construction

The probe measures levels of liquid based on the simple relationship between the height of a column of liquid and the resulting hydrostatic pressure. The pressure measurement is made at the level of the separating diaphragm of the submerged probe and is related to atmospheric pressure via a capillary situated in the cable.

The active element is a piezoresistant silicon sensor separated from the medium by a separating diaphragm. The sensor's digital electronic circuits contain an additional overvoltage protection circuit, which protects the probe from damage caused by induced interference from atmospheric discharges or from associated electrical devices.

Configuration

The following metrological parameters can be configured:

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

Calibration

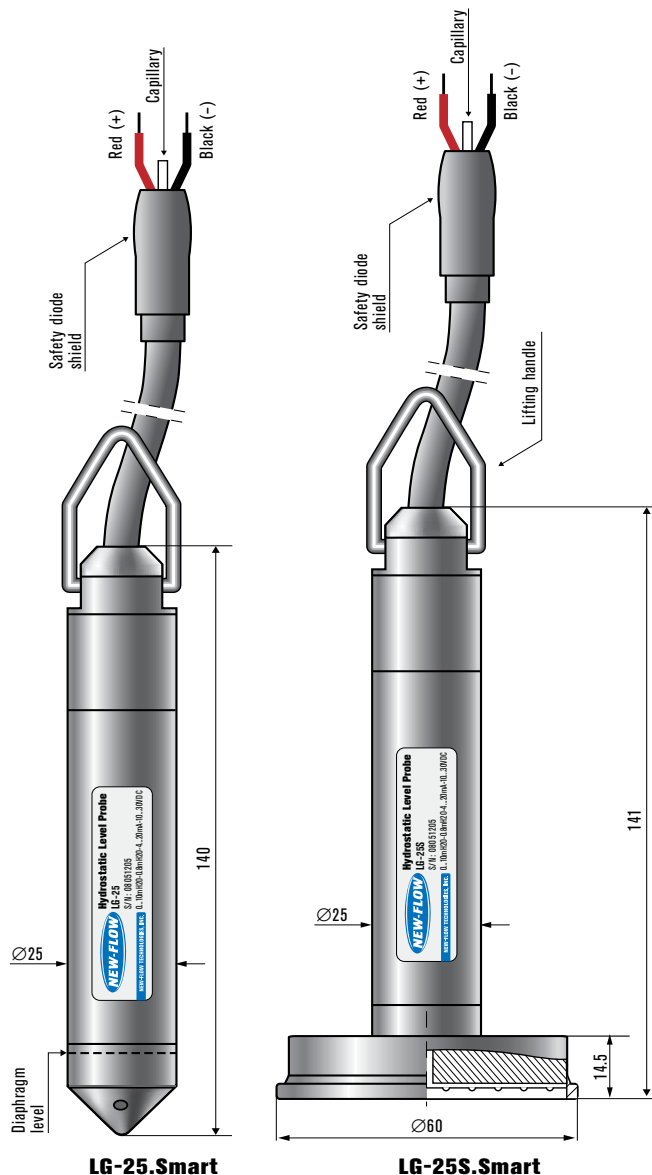
It is possible to set the zero point and carry out calibration against a standard pressure.

Communication

Communication with the probe is based on the Hart protocol using a $4 \div 20$ mA signal. Configuration and calibration of the transmitter are carried out using a KAP-01 communicator, certain other communicators (Hart).

Data exchange with the probe also makes it possible to:

- identify the probe;
- read the currently measured hydrostatic pressure, output current and % width of range.



Installation, method of use

When lowered to the reference level the probe may 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. The cable connection should be situated in a non-hermetic box (with internal pressure equal to atmospheric pressure), preventing water or other contaminants from reaching the capillary. When the probe cable is wound up the minimum winding diameter should be 30 cm and the cable should be protected from mechanical damage. The lines at the end of the cable are linked with a protective diode which shorts out if the permitted voltage (39 V) is exceeded. For this reason the cable supplied by the manufacturer should not be shortened.

Measurement ranges

No.	Basic range (FSO)	Maximum range (measurement limits)	Minimum set range	Ability to shift the start of the range	Overpressure limit (without hysteresis)
1	0...10 m H ₂ O	-1...11.5 m H ₂ O	0.8 m H ₂ O	0...10 m H ₂ O	30 m H ₂ O
2	0...100 m H ₂ O	-5...115 m H ₂ O	8.0 m H ₂ O	0...100 m H ₂ O	300 m H ₂ O

Technical data

Metrological parameters

Accuracy $\leq \pm 0.1\%$ for basic range

LG-25.Smart: $\leq \pm 0.3\%$ for range 0...10% FSO

Long term stability: $\leq 0.1\%$ (FSO) for 2 years

Accuracy $\leq \pm 0.16\%$ for basic range

LG-25S.Smart: $\leq \pm 0.4\%$ for range 0...10% FSO

Thermal error: $< \pm 0.08\%$ (FSO) / 10°C

$< \pm 0.2\%$ over entire compensation temp. ranges)

For the LG-25S.Smart probe the use of a diaphragm seal causes an additional absolute zero error, related to changes in the medium temperature, of up to 80 Pa / 10°C

Thermal compensation range: -10...60°C

Time for stabilization of output signal: 0.3 s

Additional electronic damping: 0...30 s

Error due to supply voltage changes: 0.002% (FSO) / V

Special versions:

EEx – Atex intrinsic safety

Teflon – Teflon cable shielding

-20 ÷ 80°C – extended thermal compensation range

Probe for basic range 1.5 m H₂O

Ordering Information

LG-25.Smart / ___ / ___ ÷ ___ / ___ ÷ ___ / L = ... m

LG-25S.Smart / ___ / ___ ÷ ___ / ___ ÷ ___ / L = ... m

Special versions:
EEX, Teflon, -25 ÷ 80°C

Basic range

Set range

Cable length

Example: LG-25.Smart probe, Teflon cable shielding, basic range 0 ÷ 10 m H₂O, set range 0 ÷ 3.25 m H₂O, cable 8 m

LG-25.Smart / Teflon / 0 ÷ 10 m H₂O / 0 ÷ 3.25 m H₂O / L = 10 m

In tanks where there is a possibility of turbulence (where mixers operate or where there is a turbulent inflow), the probe should be installed in a screening tube (e.g. made from PVC). To make it easier to raise the probe, a line can be attached to the lifting handle. The probe diaphragm must not be cleaned by mechanical means.

Electrical parameters

Power supply: 10...30 VDC (EEx 12...28 VDC)

Output signal: 4...20 mA (two wire transmission)

Load resistance: $R[\Omega] \leq \frac{U_{\text{sup}}[\text{V}] - 10\text{V}}{0.02\text{A}} \cdot 0.95$

Resistance required for communication: 250...1100 Ω

Operating conditions

Medium temperature range:

-30...80°C for basic range 0...12 m H₂O

-30...50°C for basic range 0...100 m H₂O

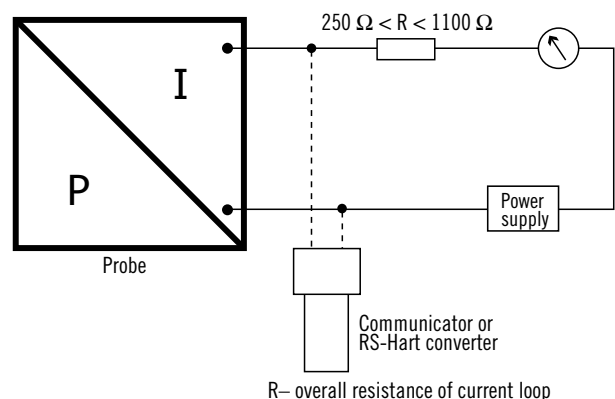
CAUTION: The medium must not be allowed to freeze in the immediate vicinity of the probe.

Protection rating of casing: IP-68

Material of casing and diaphragm: OOH17N14M2 (316Lss)

Cable shield: POLYURETHANE

How to connect the communicator



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