

# Hydrostatic level probes SGE-25S and SGE-25C for measurement of waste liquid levels

- ✓ Any measurement range from 2 up to 20 m H<sub>2</sub>O
- ✓ Integrated internal overvoltage protection circuit
- ✓ ATEX Intrinsic safety
- ✓ Marine certificate DNV

II 1G Ex ia IIC T4/T5/T6 Ga  
II 1G Ex ia IIB T4/T5/T6 Ga (probes with PTFE cable)  
I M1 Ex ia I Ma

### Application

The SGE-25S and SGE-25C probes are applicable 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, design

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.

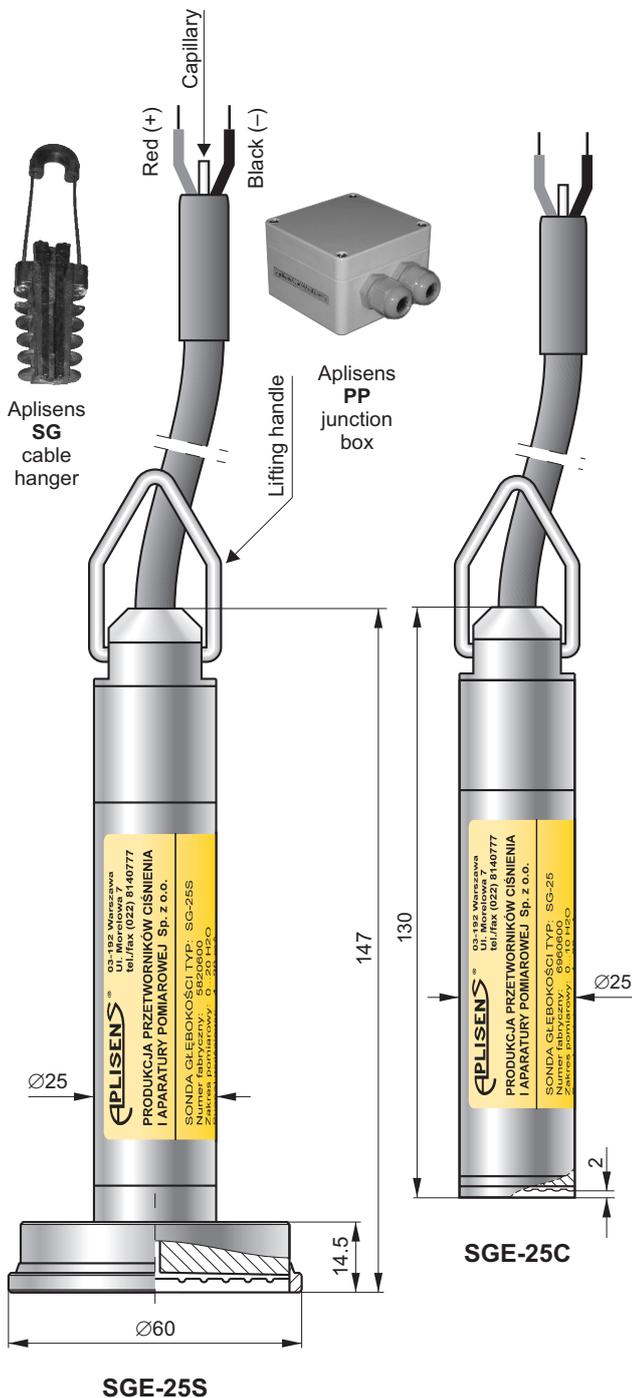
The use of a special separator with a large uncovered diaphragm minimizes the metrological effect of sediment deposit on the diaphragm surface. This enables the probe long lifetime and proper work in contaminated media (even in the presence of abrasives, such as sand) and facilitates cleaning with delicate stream of running water (washing with water under pressure may damage the probe).

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, and is meant to standardize the signal, 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.

### 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 Aplisens **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 Aplisens **PP** junction box is recommended. For systems with long signal transmission lines, it is recommended the using of an additional Aplisens **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.



## Technical data

Any measurement range 2 ÷ 20 m H<sub>2</sub>O (we recommend the standard ranges: 2,5, 4, 6, 10 m H<sub>2</sub>O)

|                                                      | Measuring Range                        |                      |                                                   |
|------------------------------------------------------|----------------------------------------|----------------------|---------------------------------------------------|
|                                                      | 2,5 m H <sub>2</sub> O                 | 4 m H <sub>2</sub> O | 0...10 m H <sub>2</sub> O ÷ 20 m H <sub>2</sub> O |
| Overpressure Limit (repeatable – without hysteresis) | 20 × range                             | 20 × range           | 10 × range                                        |
| Accuracy % FSO acc. to IEC 60770                     | 1,5%                                   | 1%                   | 0,5%                                              |
| Accuracy % FSO acc. to BFSL                          | 0,75%                                  | 0.5%                 | 0,25%                                             |
| Thermal error of zero                                | Typical 0,4% / 10°C<br>max 0,6% / 10°C |                      | Typical 0,2% / 10°C<br>max 0,3% / 10°C            |
| Thermal error of span                                | Typical 0,3% / 10°C<br>max 0,4% / 10°C |                      | Typical 0,2% / 10°C<br>max 0,3% / 10°C            |

|                                   |                                                           |
|-----------------------------------|-----------------------------------------------------------|
| <b>Hysteresis, repeatability</b>  | 0,05%                                                     |
| <b>Thermal compensation range</b> | 0 ÷ 40°C – standard<br>-10 ÷ 70°C – special version       |
| <b>Medium temperature range</b>   | -25 ÷ 40°C - standard<br>0 ÷ 75°C – ETFE and PTFE version |

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

## Electrical parameters

**Output signal** 4 ÷ 20 mA, two wire transmission  
Special version: 0 ÷ 10 V three wire transmission (not applicable to Ex)

**Load resistance (for current output)**  $R [\Omega] \leq \frac{U_{sup} [V] - 8V}{0,02 A}$

**Load resistance (for supply output)**  $R \geq 20k\Omega$

**Power supply** 8 ÷ 36 VDC (Ex: 9...28 VDC)  
TR version: 10,5+ 36 VDC (Ex: 10,5...28 VDC)  
13 ÷ 30 VDC (for 0 ÷ 10 V output)

**Error due to supply voltage changes variation** 0,005% / V

**Degree of protection** IP-68

**Material of casing and diaphragm**

SG-25S (casing SS316L, diaphragm SS316L /option Hastelloy C/)

SG-25C (casing SS316L, diaphragm SS316L)

**Cable shielding** POLYURETHANE

## Ordering procedure

| Model                  | Code                                                           | Description                                                                                                                                                                                                                                                        |
|------------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SGE-25C<br>SGE-25S     |                                                                | Level probe                                                                                                                                                                                                                                                        |
| Versions, certificates | /Exia.....<br>/MR.....<br>/-10+70°.....<br>/TR.....            | II 1G Ex ia IIC T4/T5/T6 Ga<br>II 1G Ex ia IIB T4/T5/T6 Ga (for probe with cable in PTFE shield)<br>I M1 Ex ia I Ma<br>Marine certification (DNV), only with PU PZH cable<br>Extended thermal compensation range<br>Response time <30ms (only for 4...20mA output) |
| Measuring set range    | /...+... [required units]                                      | Calibrated range in relation to 4mA and 20mA (or 0V and 10V) output                                                                                                                                                                                                |
| Output signal          | /4...20mA.....<br>/0...10V.....                                | 4...20mA / power supply: 8...36VDC (Exia 9...28VDC, TR 10,5...36VDC)<br>/0...10V / power supply 13...30VDC                                                                                                                                                         |
| Type of cable          | /PU.....<br>/ETFE.....<br>/PU + PTFE.....<br>/ETFE + PTFE..... | Polyurethane cable (medium temp. up to 40°C)<br>ETFE cable (medium temp. up to 75°C)<br>Polyurethane cable with PTFE shielding (medium temp. up to 75°C)<br>ETFE cable with PTFE shielding (medium temp. up to 75°C)                                               |
| Cable length           | /L=...m.....                                                   | Cable length;                                                                                                                                                                                                                                                      |
| Accessories            | /SG.....<br>/PP.....                                           | Cable hanger<br>Junction box                                                                                                                                                                                                                                       |