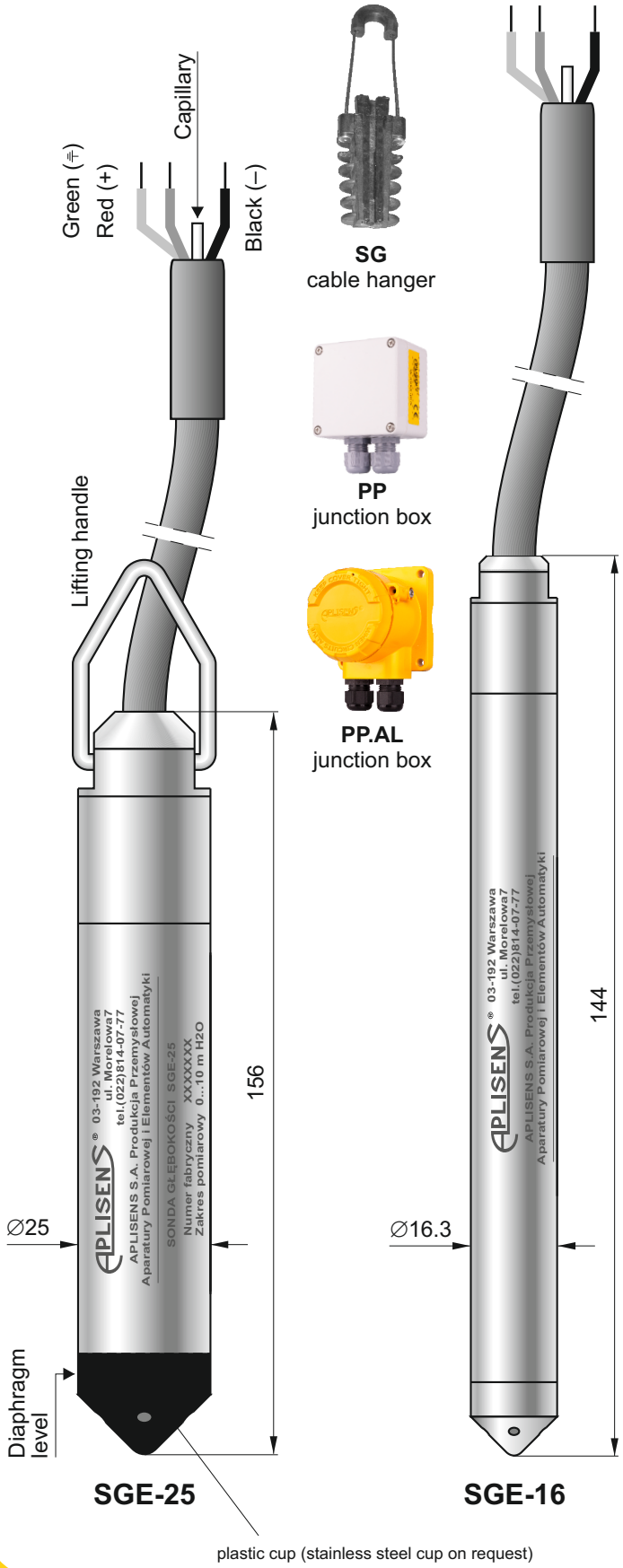
Hydrostatic level probes SGE-25 and SGE-16



SG
cable hanger

PP
junction box

PP.AL
junction box

- ✓ **Any measurement range from 1 up to 500 m H_2O**
- ✓ **Integrated internal overvoltage protection circuit**
- ✓ **Marine certificate DNV**
- ✓ **ATEX Intrinsic safety**

Application

The SGE-25 hydrostatic level probe is applicable to measure liquid levels in tanks, deep wells or piezometers.

The SGE-16 probe is a specialized device designed to measure water levels in narrow diameter piezometers or wells.

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, 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). If the probe is to be lowered deeper than 100m, the cable should be hanged at steel lifting rope. Cleaning the probe diaphragm by mechanical means is strictly prohibited.

Technical data for the SGE-25 level probe

Measuring range
Any measuring range 1 ÷ 500 m H_2O

	Measuring Range		
	1 m H_2O	**4 m H_2O**	**0...10 m H_2O ÷ 500 m H_2O**
Overpressure Limit (repeatable – without hysteresis)	40 × range	25 × range	10× range (max. 700 m H_2O)
Accuracy % FSO acc. to IEC 60770	0,6%	0,3%	0,2%
Accuracy % FSO acc. to BFSL	0,3%	0,15%	0,1%
Thermal error	Typical 0,3% / 10°C max 0,4% / 10°C		Typical 0,2% / 10°C max 0,3% / 10°C

Long term stability 0,1% or 1 cm H_2O for 1 year
Hysteresis, repeatability 0,05%
Thermal compensation range 0 ÷ 40°C – standard
0 ÷ 50°C – optional, only ETFE
-10 ÷ 70°C – special version
Medium temperature range -30 ÷ 40°C – standard
0 ÷ 80°C – ETFE and PTFE version
CAUTION: The medium must not be allowed to freeze in the immediate vicinity of the probe

Technical data for the SGE-16 level probe

Measurement ranges 10 ÷ 100 m H_2O
Overpressure limit 10 × range (max. 700 m H_2O)
(repeatable – without hysteresis)
Accuracy 0,3%
Hysteresis, repeatability 0,05%
Thermal compensation range 0 ÷ 40°C
Process temperature limit -30 ÷ 40°C
(version with ETFE and PTFE cable) 0 ÷ 80°C

Electrical parameters (applicable to both probes)

no	Signal type	Power supply	Available in models
1	4 ÷ 20mA	8…36 VDC	SGE-25
2	4 ÷ 20mA	9…28 VDC	SGE-25/Exia
3	0 ÷ 10V	13…30 VDC	SGE-25
4	0 ÷ 3,3V	5,5…16 VDC	SG-25A, SG-25A/Exia
5	0 ÷ 3,3V	4,1…5,6 VDC	SG-25B, SG-25B/Exia
6	0,5 ÷ 4,5 V	8…16 VDC	SG-25A, SG-25A/Exia
7	0,5 ÷ 4,5 V	5,0…5,6 VDC	SG-25B, SG-25B/Exia
8	4 ÷ 20mA	8…36 VDC	SGE-16
9	0 ÷ 3,3 V	3,6…4,5 VDC	SGE-16

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

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

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

Degree of protection IP68
Material of casing SS316L
Cable shield PU, ETFE, PTFE

Material of diaphragm
SGE-25 Hastelloy C276 / SGE-16 SS316L

Ordering procedure

Model	Code	Description
SGE-25 (SG-25A, SG-25B) / SGE-16		Level probe
Versions, certificates	/Exia(2G) *……	II 2G Ex ia IIC T6/T5/T4 Ga I M1 Ex ia I Ma IECEx Ex ia IIC T6/T5/T4 Ga Ex ia I Ma available with cable: - ETFE with PTFE shield without additional grounding cord
	/Exia *……	II 1G Ex ia IIB T6/T5/T4 Ga I M1 Ex ia I Ma IECEx Ex ia IIB T6/T5/T4 Ga Ex ia I Ma available with cable: - PU - ETFE - ETFE with PTFE shield with additional grounding cord
	/Exia(H2) *……	II 1G Ex ia IIC T6/T5/T4 Ga I M1 Ex ia I Ma IECEx Ex ia IIC T6/T5/T4 Ga Ex ia I Ma available with cable: - PU
	/MR……	Marine certification (DNV), only with ETFE cable
	/0÷50°……	Extended temperature range, only with ETFE cable
	/-10÷70°……	Extended thermal compensation range
* - applicable for SGE-25 and SG-25A/B	/Pt100 or /PT1000….....	Probe with Pt100 or PT1000 sensor, only with ETFE cable
Measuring set range	/…÷… [required units]	Calibrated range
Output signal	/4…20mA……	4…20mA PS: SGE-25: 8…36VDC (Exia 9…28VDC, TR 10,5…36VDC) / SGE-16: 10,5…36VDC
	/0…10V……	0…10V PS: SGE-25: 13…30VDC
	/0…3,3V……	0…3,3V PS: SG-25A, SG-25A/Exia: 5,5…16VDC / SG-25B, SG-25B/Exia: 4,1…5,6VDC
	/0,5…4,5V……	0,5..4,5V PS: SG-25A, SG-25A/Exia: 8…16VDC / SG-25B, SG-25B/Exia: 5…5,6VDC
Type of 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 75°C)
	/ETFE-R……..	ETFE cable with Viton/silicon sealing (suitable for mineral oil products, medium temp. up to 40°C)
	/ETFE + PTFE…	ETFE cable with PTFE shielding (medium temp. up to 75°C)
Cable length	/L=…m……	Cable length (standard: 5m, 10m, 12m, 15m, 20m, 25m, other length on request)
Accessories	/SG….	Cable hanger
	/PP….	Junction box
	/PP.AL	Junction box