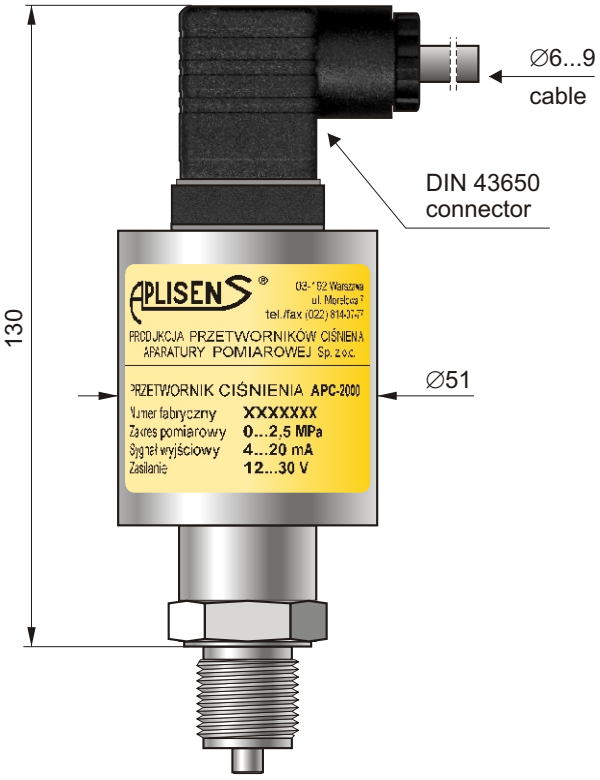
SMART PRESSURE TRANSMITTER APCE-2000

- ✓ **4…20 mA output signal + HART protocol**
- ✓ **ATEX Intrinsic safety**
- ✓ **PED Conformity (97/23/EC)**
- ✓ **Accuracy 0.1%**
- ✓ **Rangeability 100:1**

Application

The APCE-2000 pressure transmitter is applicable to the measurement of the pressure, underpressure and absolute pressure of gases, vapours and liquids. The active sensing element is a piezoresistant silicon sensor separated from the medium by a diaphragm and by specially selected type of manometric liquid.

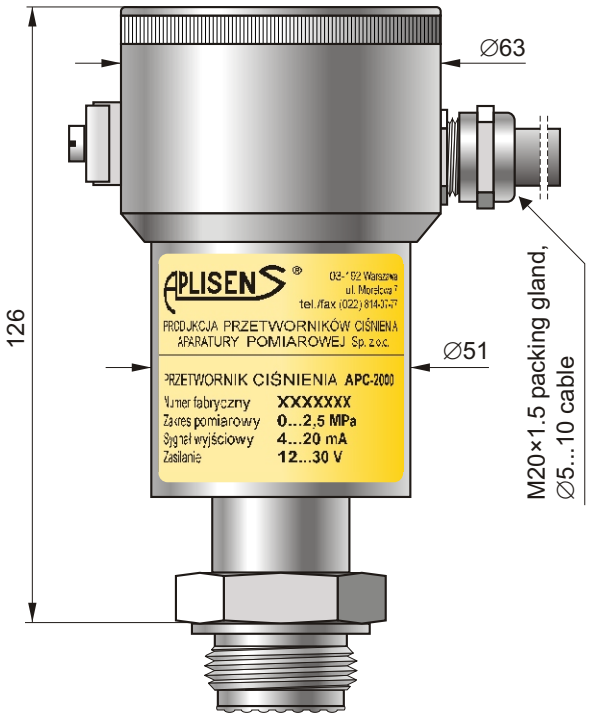
APCE-2000PD



PD version

Stainless steel casing with standard DIN 43650 connector, degree of protection IP-65. The electronics are encased in a protective silicone gel. ATEX Intrinsic safety Ⓔx II 1/2G EEx ia IIC T4/T5/T6 I M1 EEx ia I versions are available for taking measurements in the zones under explosion hazard.

APCE-2000PZ

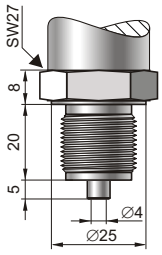


PZ version

Casing made entirely from stainless steel, with high mechanical strength, degree of protection IP-65. The electrical connections enable the output current to be measured without breaking the circuit. The electronics are encased in a protective silicone gel. ATEX Intrinsic safety Ⓔx II 1/2G EEx ia IIC T4/T5/T6 I M1 EEx ia I versions are available for measurements in zones under explosion hazard.

APCE-2000PZ transmitters may operate in extreme conditions, in the presence of corrosive gases, e.g. hydrogen sulphide, and at very low temperatures.

Process connections



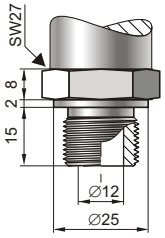
G1/2 type
G1/2″, ∅4 hole

M type
M20×1.5, ∅4 hole

Wetted parts material: **316Lss**

Application

Applicable to measurement the pressure of uncontaminated gases, vapours and liquids at any measuring ranges.



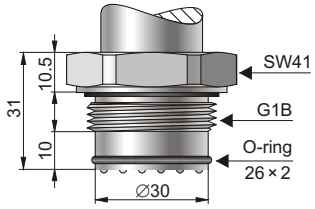
GP type
G1/2″, ∅12 hole

P type
M20×1.5, ∅12 hole

Wetted parts materials: **316Lss – standard**
Hastelloy C-276

Application

Applicable to measurement the pressure of viscous and contaminated media. Max. measuring range 0…70 bar.



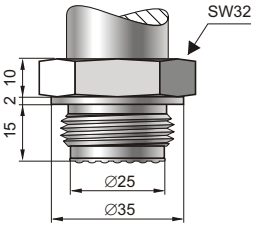
CG1 type
G1″ with flush diaphragm

Wetted parts material: **316Lss**

Application

Applicable to measurement the pressure of dusty gases, and viscous or solidifying liquids. at the measuring ranges from –100…100 mbar to 0…70 bar.

The transmitters with flush diaphragm are applied in food industry and pharmaceutical industry in aseptic systems. Using of Aplisens fitting sockets with a seal upstream the process connection (see page 54) is recommended.



CM30×2 type
M30×2 with flush diaphragm

Wetted parts materials: **316Lss – standard**
Hastelloy C-276

Communication and configuration

The communication standard for data interchange with the transmitter is the HART protocol.

Communication with the transmitter is carried out with:
- ◊ a KAP-02 communicator,
- ◊ some other Hart type communicators,
- ◊ a PC using an RS-HART converter and RAPORT-01 configuration software.

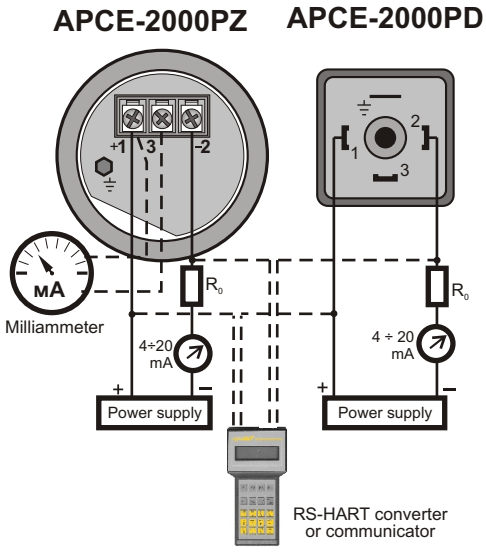
Along with the RAPORT-01, the SECTIONAL LINEARIZATION software is supplied. The software enables leading of the 21-point, non-linear user's characteristic into the transmitter.

The data interchange with the transmitter enables the users to:
- ◊ identify the transmitter;
- ◊ configure the output parameters:
  - – measurement units and the values of the start points and end points at the measurement range;
  - – damping time constant;
  - – conversion characteristic (inversion, user's non-linear characteristic);
- ◊ read the currently measured pressure value of the output current and the percentage output control level;
- ◊ force an output current with a set value;
- ◊ calibrate the transmitter in relation to a model pressure.

Installation

The transmitter is not heavy, so it can be installed on the installation. When the pressure of steam or other hot media is measured, a siphon or impulse line should be used. The needle valve placed upstream the transmitter simplifies installation process and enables the zero point adjustment or the transmitter replacement. When the special process connections are required for the measurement of levels and pressures (e.g. at food and chemical industries), the transmitter is provided with an Aplisens diaphragm seal. Installing accessories and a full scope of diaphragm seals are described in detail in the further part of the catalogue. The transmitter's electrical connections should be performed with twisted cable. The place for the communicator should be assigned before the communicator installation.

Electrical diagram



Measuring ranges

No.	Nominal measuring range (FSO)		Minimum set range		Rangeability	Overpressure limit (without hysteresis)	
1	0..300 bar	(0..30 MPa)	3 bar	(300 kPa)	100:1	450 bar	(45 MPa)
2	0...70 bar	(0...7 MPa)	0.7 bar	(70 kPa)	100:1	140 bar	(14 MPa)
3	0...25 bar	(0...2.5 MPa)	0.25 bar	(25 kPa)	100:1	50 bar	(5 MPa)
4	0...7 bar	(0...0.7 MPa)	0.07 bar	(7 kPa)	100:1	14 bar	(1.4 MPa)
5	-1...1.5 bar	(-100...150 kPa)	120 mbar	(12 kPa)	20:1	4 bar	(400 kPa)
6	0...2 bar	(0...200 kPa)	100 mbar	(10 kPa)	20:1	4 bar	(400 kPa)
7	0...1 bar	(0...100 kPa)	50 mbar	(5 kPa)	20:1	2 bar	(200 kPa)
8	-0.5...0.5 bar	(-50...50 kPa)	50 mbar	(5 kPa)	20:1	2 bar	(200 kPa)
9	0...0.25 bar	(0...25 kPa)	25 mbar	(2.5 kPa)	10:1	1 bar	(100 kPa)
10	-100...100 mbar	(-10...10 kPa)	20 mbar	(2 kPa)	10:1	1 bar	(100 kPa)
11	-15...70 mbar*	(-1.5...7 kPa)	5 mbar	(0.5 kPa)	17:1	0.5 bar	(50 kPa)
12	-7...7 mbar*	(-0.7...0.7 kPa)	1 mbar	(0.1 kPa)	14:1	0.5 bar	(50 kPa)
13	0...1.1 bar abs	(0...110 kPa abs)	50 mbar abs	(5 kPa abs)	22:1	2 bar	(200 kPa)
14	0...7 bar abs	(0...7 MPa abs)	0.07 bar abs	(7 kPa abs)	100:1	14 bar	(1.4 MPa)
15	0...25 bar abs	(0...2.5 MPa abs)	0.25 bar abs	(25 kPa abs)	100:1	50 bar	(5 MPa)
16	0...70 bar abs	(0...7 MPa abs)	0.7 bar abs	(70 kPa abs)	100:1	140 bar	(14 MPa)

* only for transmitters without diaphragm seal

Technical data

Metrological parameters

Accuracy ≤ ±0.1% of calibrated range (0,25% for range 12)

Long-term stability ≤ accuracy for 3 years (for the basic range)

Thermal error < ±0.08% (FSO) / 10°C (0.1% for ranges 10, 11, 12)
max. ±0.25% (FSO) in the whole compensation range (0.4% for ranges 10, 11,12)

Thermal compensation range -25...80°C (-5...65°C for range 12)
-40...80°C – special version

Time Constant 300 ms

Additional electronic damping 0...30 s

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

Electrical parameters

Power supply 10.5...36 V DC (EEx 12...28 V)

Output signal 4...20 mA, two wire transmission

Load resistance $R[\Omega] \le \frac{U_{sup}[V] - 10.5\,V}{0.02\,A} \cdot 0.85$

Resistance required for communication 250...1100 Ω

Wetted parts and diaphragms 00H17N14M2 (316Lss) or Hastelloy C-276

Casing 0H18N9 (304ss)

Operating conditions

Operating temperature range (ambient temp.) -40...85°C

Medium temperature range -40...120°C
over 120°C – measurement with the use of impulse line or diaphragm seals

CAUTION: the medium must not be allowed to freeze in the impulse line or close to the process connection of the transmitter

Special versions, certificates

- ◊ Accuracy ≤ **±0.075%** FSO (does not apply to ranges 10, 11, 12)
- ◊ Extended compensation range **-40...80°C**
- ◊ **EEx** – ATEX Intrinsic safety
- ◊ **PED** – European Pressure Equipment Directive N° 97/23/EC
- ◊ **TIen** – transmitter designed for oxygen (only type G1/2 or M process connection)
- ◊ **Hastelloy** – wetted parts made of Hastelloy C 276 (only type GP, P and CM30×2 process connection)
- ◊ Basic range **0…100 bar**
- ◊ **Others**

Ordering procedure

APCE-2000PD /
APCE-2000PZ /___/__÷__/__÷__/___

Special versions: **0.075%**, **-40…80°C**, **EEx**, **PED**, **TIen**, **Hastelloy**, **others** – description

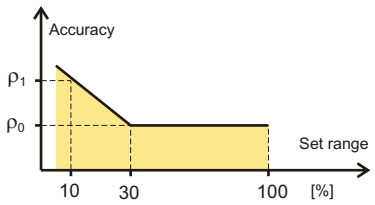
Nominal range

Start of set range – in relation to 4 mA output

End of set range – in relation to 20 mA output

Type of process connection (**G1/2**, **GP**, **CG1**, **M**, **P**, **CM30×2**) or type of diaphragm seal according to the diaphragm seals data sheets

Accuracy depending on the set range



ρ_0 – error for nominal measuring range (0...100% FSO)

ρ_1 – error for range 0...10% FSO

$\rho_1 = 2 \times \rho_0$

Numerical error values are given in the technical data under metrological parameters

Example: APCE-2000PD transmitter / EEx version / basic range 0...2 bar / cal. range 0 ÷ 1.5 bar / process connection G1/2, ∅4

APCE-2000PD / EEx / 0 ÷ 2 bar / 0 ÷ 1.5 bar / G1/2