

SMART PRESSURE TRANSMITTER APCE-2000



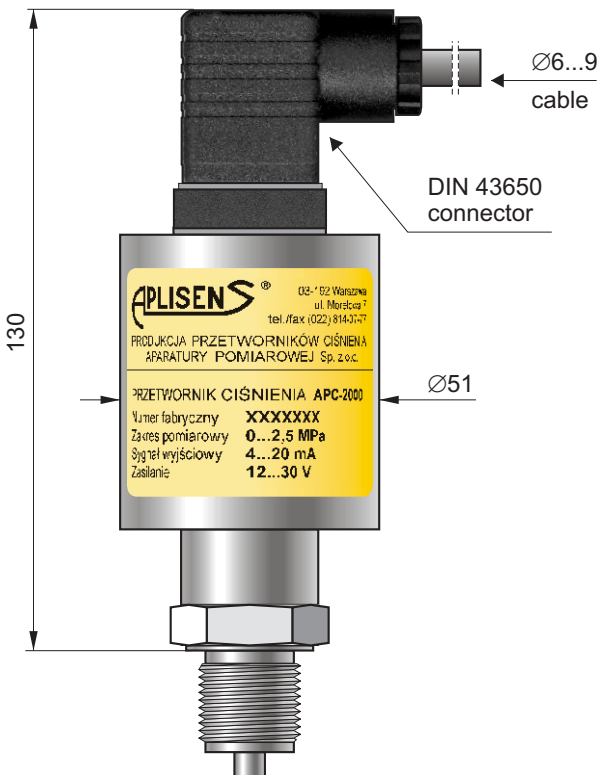
**Aplisens
KAP-03
Communicator**

- ✓ 4...20 mA output signal + HART protocol
- ✓ ATEX Intrinsic safety
- ✓ 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.

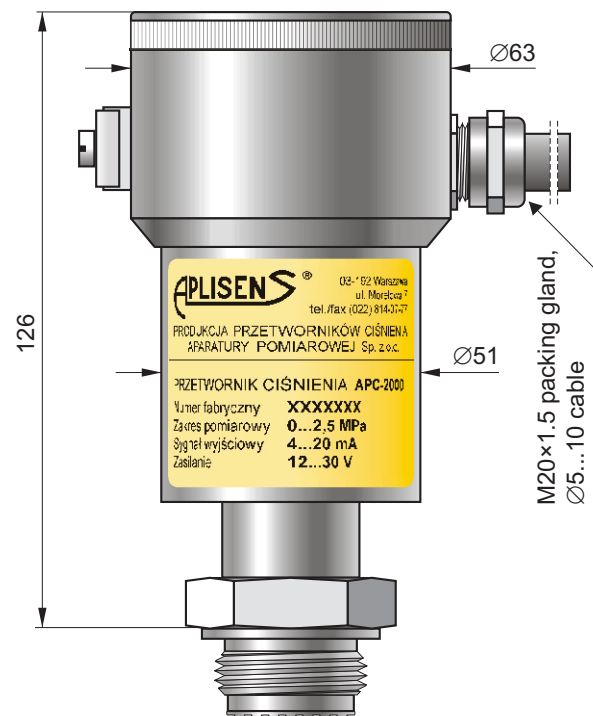
APCE-2000PD



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 versions are available for taking measurements in the zones under explosion hazard.

APCE-2000PZ

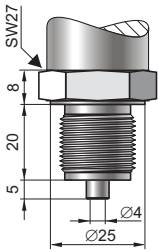


PZ version

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 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", $\varnothing 4$ hole

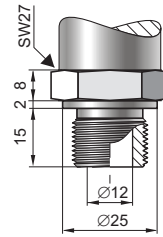
M type

M20 \times 1.5, $\varnothing 4$ 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", $\varnothing 12$ hole

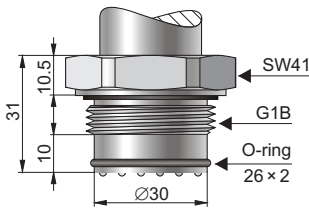
P type

M20 \times 1.5, $\varnothing 12$ 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.



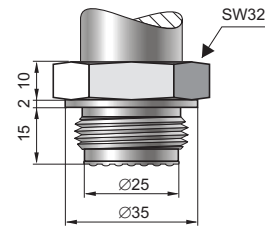
CG1 type

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 64) is recommended.



CM30 \times 2 type

M30 \times 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-03 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.

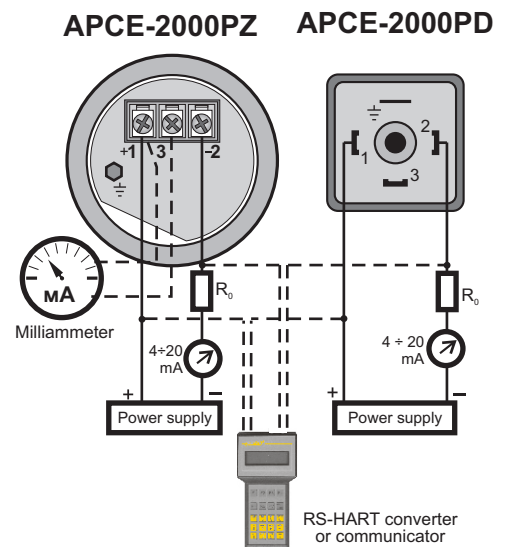
The data interchange with the transmitter enables the users to:

- ◇ 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

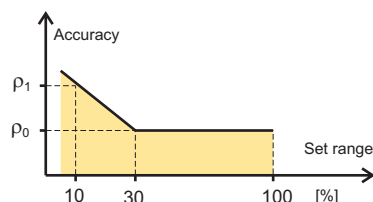
Metrological parameters

Accuracy	≤ ±0.1% of calibrated range (0,25% for range 12)
Long-term stability (for the basic range)	≤ accuracy for 3 years
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 (Ex 12...28 V)
Output signal	4...20 mA, two wire transmission
Load resistance	$R[\Omega] \leq \frac{U_{sup}[V] - 10.5V}{0.02A} \cdot 0.85$
Resistance required for communication	250...1100 Ω

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

Materials

Wetted parts and diaphragms: 316Lss or Hastelloy C 276
Casing: 304ss

Operating conditions

Operating temperature range (ambient temp.) -40...85°C
 EEx version -40...65°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

- ◇ Extended compensation range **-40...80°C**
- ◇ Extended compensation range **-60...50°C**
- ◇ **EEx ia** – ATEX Intrinsic safety
- ◇ **PED** – European Pressure Equipment Directive N° 97/23/EC, category IV
- ◇ **Tlen** – transmitter designed to measure of 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) without ranges 11 and 12.
- ◇ **0...160bar** - Nominal measuring range 0...160bar , min. set span 1,6bar (160kPa)
- ◇ **-1..6bar** - Nominal measuring range -1..6bar, min. set span 0,07bar (7kPa)
- ◇ **0...1000bar** - Nominal measuring range 0...1000bar, min. set span 10bar (1MPa)
- ◇ **Others**

Ordering Procedure

Model	Code	Description	
APCE-2000		Smart pressure transmitter.	
Casing, output signal, electrical connection	⇒ PD.....	Housing IP65 with DIN43650 connector, without display, output 4–20mA +Hart.	
	PZ.....	304SS housing, IP65, without display, output 4–20mA + Hart packing gland M20x1,5	
Versions, certificates* *) more than one option is available	/EEExia.....	Ex II 1/2G EEExia IIC T4/T5/T6 and I M1 EEExia I	
	/Tlen.....	For oxygen service (sensor filled with Fluorolube fluid, only M and G1/2 Process connection)	
	/-60...+50C.....	Extended thermal compensation range -60 - 50°C	
	/-40...+80C.....	Extended thermal compensation range -40 - 80°C	
Nominal measuring range		Range	Min. set range
	/0÷1000bar**.....	0÷1000bar (0÷100MPa)	10bar (1MPa)
	/0÷300bar.....	0÷300bar (0÷30MPa)	3bar (300kPa)
	/0÷160bar**.....	0÷160bar (0÷16MPa)	1,6 bar (160kPa)
	/0÷70bar.....	0÷70bar (0÷7MPa)	0,7bar (70kPa)
	/0÷25bar.....	0÷25bar (0÷2,5MPa)	0,25bar (25kPa)
	/0÷7bar.....	0÷7bar (0÷700kPa)	0,07bar (7kPa)
	/0÷2bar.....	0÷2bar (0÷200kPa)	100mbar (10kPa)
	/0÷1bar.....	0÷1bar (0÷100kPa)	50mbar (5kPa)
	/0÷0,25bar.....	0÷0,25bar (0÷25kPa)	25mbar (2,5kPa)
	/-0,5÷+0,5bar.....	-0,5÷0,5bar (-50÷50kPa)	50mbar (5kPa)
	/-1÷1,5bar.....	-1÷1,5bar (-100÷150kPa)	120mbar (12kPa)
	/-1÷6bar**.....	-1÷6bar (-100÷600kPa)	300mbar (30kPa)
	/-100÷100mbar.....	-100÷100mbar (-10÷10kPa)	20mbar (2kPa)
	/-15÷70mbar.....	-15÷70mbar (-1,5÷70kPa)	5mbar (0,5kPa)
	/-7÷7mbar.....	-7÷7bar (-0,7÷0,7kPa)	1mbar (0,1kPa)
	/0÷1,1bar ABS.....	0÷1,1bar absolute pressure (0÷110kPa abs)	50mbar abs (5kPa abs)
	/0÷7barABS.....	0÷7bar absolute pressure (0÷700kPa abs)	0,07bar abs (7kPa abs)
/0÷25barABS.....	0÷25bar absolute pressure (0÷2,5MPa abs)	0,25bar abs (25kPa abs)	
** non-standard ranges available on request	/0÷70bar ABS.....	0÷70bar absolute pressure (0÷7MPa abs)	0,7bar abs (70kPa abs)
Measuring set range	/...÷... [required units]	Start and end of calibrated range in relation to 4mA and 20mA output	
Process connections	⇒ /M.....	Thread M20x1,5 (male) with Ø4hole, wetted parts SS316L	
	/G1/2".....	Thread G1/2" (male) with Ø4hole, wetted parts SS316L	
	/P.....	Thread M20x1,5 (male) with Ø12hole, wetted parts SS316L	
	/P (Hastelloy).....	Thread M20x1,5 (male) with Ø12hole, wetted parts Hastelloy C 276	
	/GP.....	Thread G1/2" (male) with Ø4hole, wetted parts SS316L	
	/GP (Hastelloy).....	Thread G1/2" (male) with Ø4hole, wetted parts Hastelloy C 276	
	/CM30x2.....	Thread M30x2 with flush diaphragm, wetted parts SS316L	
	/CM30x2 (Hastelloy).....	Thread M30x2 with flush diaphragm, wetted parts Hastelloy C 276	
	/CG1".....	Thread G1" with flush diaphragm, wetted parts SS316L	
	/CG1/2".....	Thread G1/2" with flush diaphragm, wetted parts SS316L	
	/1/2"NPT M.....	Thread M20x1,5 with adapter to ½"NPT Male, wetted parts SS316L	
/1/2"NPT F.....	Thread M20x1,5 with adapter to ½"NPT Female, wetted parts SS316L		
/code of diaphragm seal.....	Diaphragm seal (see chapter of diaphragm seals)		
Other specification	/.....	Description of required parameters e.g. non-standard process connection G3/4" or M22x1,5	
The most typical specification is marked by "⇒" mark.			

Example : Pressure transmitter , output 4..20mA + HART, version EEExia, nominal measuring range 0..7bar, calibrated range 0..6bar, process connection M20x1,5, electrical connection DIN43650 connector.

APCE-2000PD/EEExia/0..7bar/0..6bar/M

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