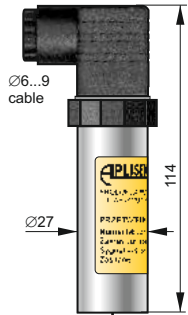


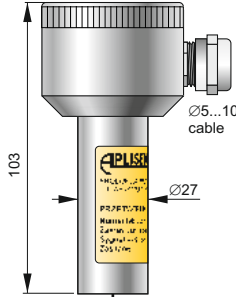
# SMART PRESSURE TRANSMITTER PCE-28.SMART



- ✓ 4...20 mA output signal + HART protocol
- ✓ Intrinsic safety certificate (ATEX, IECEx)
- ✓ Accuracy 0.1%
- ✓ Marine certificate – DNV, BV



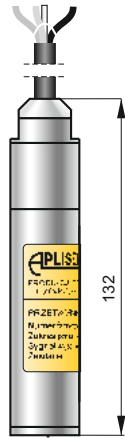
**PD type  
PD316 type  
IP65**



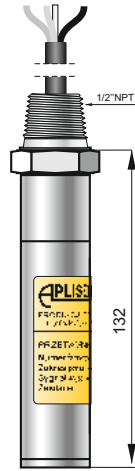
**PZ type  
PZ316 type  
IP66**



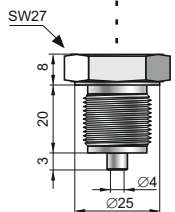
**PM12 type  
IP67 or IP65**



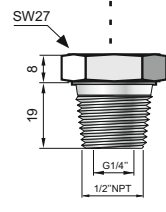
**SG type  
IP68**



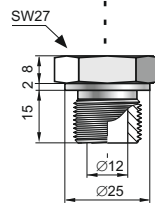
**SGM type  
IP68**



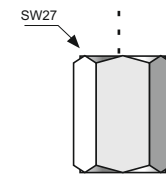
**G1/2 type  
G1/2", Ø4 hole  
M type  
M20x1.5, Ø4 hole**



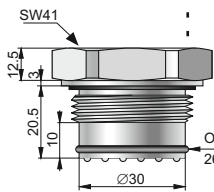
**1/2" NPT type  
1/2" NPT male +  
internal thread G1/4"**



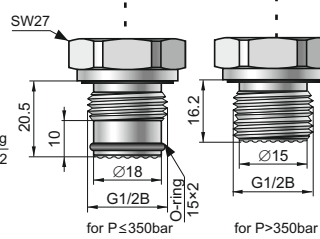
**GP type  
G1/2", Ø12 hole  
P type  
M20x1.5, Ø12 hole**



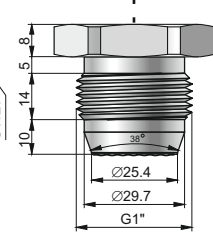
**1/2" NPT F type  
internal thread 1/2-14NPT  
1/4" NPT F type  
internal thread 1/4-18NPT**



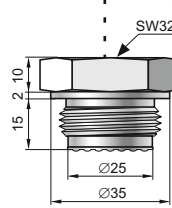
**CG1 type  
G1" with flush  
diaphragm**



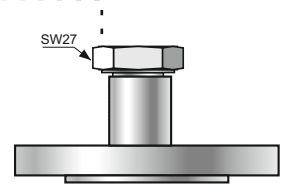
**CG1/2 type  
G1/2" with  
flush diaphragm**



**CG1-S38 type  
G1" with flush  
diaphragm**



**CM30x2 type  
M30x2 with flush  
diaphragm**



**Version with direct  
or remote  
diaphragm seal  
Diaphragm seal data -  
see chapter III**

## Application

PCE-28.SMART 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.

## Communication

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

Communication with the transmitter is carried out with:

- a KAP-03, KAP-03Ex communicator
- some other Hart type communicators, (\*)
- a PC using an HART/USB converter and Raport 2 configuration software.

(\*) .eddl files available on [www.aplisens.com](http://www.aplisens.com).

The data interchange with the transmitter enables 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 without additional mounting bracket. 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. The transmitter's electrical connections should be performed with twisted cable. The place for the communicator should be assigned before the communicator installation.

## Measuring ranges

No.	Nominal measuring range (FSO)		Minimum set range		Rangeability	Overpressure limit (without hysteresis)***
1	0...1000 bar	(0...100 MPa)	10 bar	(1 MPa)	100:1	1200 bar (120 MPa)
2	0...600 bar	(0...60 MPa)	6 bar	(600 kPa)	100:1	1200 bar (120 MPa)
3	0...300 bar	(0...30 MPa)	3 bar	(300 kPa)	100:1	450 bar (45 MPa)
4	0...160 bar	(0...16 MPa)	1,6 bar	(160 kPa)	100:1	450 bar (45 MPa)
5	0...70 bar	(0...7 MPa)	0,7 bar	(70 kPa)	100:1	140 bar (14 MPa)
6	-1...70 bar	(-0,1...7 MPa)	0,71 bar	(71 kPa)	100:1	140 bar (14 MPa)
7	0...25 bar	(0...2,5 MPa)	0,25 bar	(25 kPa)	100:1	50 bar (5 MPa)
8	-1...25 bar	(-0,1...2,5 MPa)	0,26 bar	(26 kPa)	100:1	50 bar (5 MPa)
9	0...7 bar	(0...0,7 MPa)	0,07 bar	(7 kPa)	100:1	14 bar (1,4 MPa)
10	-1...7 bar	(-100...700 kPa)	0,07 bar	(7 kPa)	114:1	14 bar (1,4 MPa)
11	-1...1,5 bar	(-100...150 kPa)	0,12 bar	(12 kPa)	20:1	4 bar (400 kPa)
12	0...2 bar	(0...200 kPa)	100 mbar	(10 kPa)	20:1	4 bar (400 kPa)
13	0...1 bar	(0...100 kPa)	50 mbar	(5 kPa)	20:1	2 bar (200 kPa)
14	-0,5...0,5 bar	(-50...50 kPa)	50 mbar	(5 kPa)	20:1	2 bar (200 kPa)
15	0...0,25 bar	(0...25 kPa)	25 mbar	(2,5 kPa)	10:1	1 bar (100 kPa)
16	-100...100 mbar	(-10...10 kPa)	20 mbar	(2 kPa)	10:1	1 bar (100 kPa)
17	-15...70 mbar *	(-1,5...7 kPa)	5 mbar	(0,5 kPa)	17:1	0,5 bar (50 kPa)
18	0...1,3 bar abs	(0...130 kPa abs)	100 mbar abs	(10 kPa abs)	13:1	2 bar (200 kPa)
19	0...7 bar abs	(0...0,7 MPa abs)	100 mbar abs	(10 kPa abs)	70:1	14 bar (1,4 MPa)
20	0...25 bar abs	(0...2,5 MPa abs)	0,25 bar abs	(25 kPa abs)	100:1	50 bar (5 MPa)
21	0...70 bar abs	(0...7 MPa abs)	0,7 bar abs	(70 kPa abs)	100:1	140 bar (14 MPa)
22	0...300 bar abs	(0...30 MPa abs)	3 bar abs	(300 kPa abs)	100:1	450 bar (45 MPa)

\* only for transmitters without diaphragm seal

## Technical data

### Metrological parameters

<b>Accuracy</b>	≤ ±0,1% of calibrated range
<b>Long-term stability</b> (for the basic range)	≤ accuracy for 3 years
<b>Thermal error</b>	< ±0,08% (FSO) / 10°C (0,1% for ranges no. 16, 17) max. ±0,25% (FSO) in the whole compensation range (0,4% for ranges 16, 17)
<b>Thermal compensation range</b>	-25...80°C -40...80°C – special version
<b>Additional electronic damping</b>	0...30 s
<b>Error due to supply voltage changes</b>	0.002% (FSO) / V

### Electrical parameters

<b>Power supply</b>	7,5...55 V DC (Ex 7,5...30 V DV)
<b>Output signal</b>	4...20 mA, two wire transmission

### Load resistance

$$R[\Omega] \leq \frac{U_{\text{sup}}[\text{V}] - 7,5\text{V}}{0,0225\text{A}}$$

### Resistance required for communication

min. 240Ω

### Materials

<b>Wetted parts and diaphragms:</b>	316Lss, Hastelloy C 276, Au
<b>Casing:</b>	304ss
	Optional: 316ss

### Operating conditions

<b>Operating temperature range (ambient temp.)</b>	-40...85°C
	Exia version: -40...80°C
<b>Medium temperature range</b>	-40...120°C

over 120°C – measurement with use an 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

## Ordering procedure

Model	Code	Description																																														
PCE-28.SMART		Smart pressure transmitter																																														
Versions, certificates  more than one option is available	/Exia.....	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p> II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb II 1D Ex ia IIIC T105°C Da I M1 Ex ia I Ma</p> <p><b>IECEX</b> Ex ia IIC T4/T5/T6 Ga/Gb Ex ia IIIC T105°C Da Ex ia I Ma</p> </div> <div style="width: 50%;"> <p>For PM12, PKD version:  II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb <b>IECEX</b> Ex ia IIC T4/T5/T6 Ga/Gb</p> <p>For ALW, ALM version:  II 1/2G Ex ia IIC T4 Ga/Gb II 1D Ex ia IIIC T105°C Da Ex ia IIC T4 Ga/Gb <b>IECEX</b> Ex ia IIIC T105°C Da</p> </div> </div>																																														
	/MR..... /Tlen..... /-40...+80°C..... /NACE.....	<p>Marine certificate – DNV, BV (not available in ALW and ALM version)</p> <p>For oxygen service (sensor filled with Fluorolube fluid), only G1/2" connection</p> <p>Extended thermal compensation range -40 ÷ 80°C</p> <p>NACE MR-01-75 certificate (process connections: M, G1/2", P, GP and 1/2"NPTM)</p>																																														
Nominal measuring range	/0+1000 bar.....	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Range</th> <th style="width: 33%;">Min. set range</th> </tr> </thead> <tbody> <tr> <td>0+1000 bar (0+100 MPa)</td> <td>10 bar (1 MPa)</td> </tr> <tr> <td>0+600 bar (0+60 MPa)</td> <td>6 bar (600 kPa)</td> </tr> <tr> <td>0+300 bar (0+30 MPa)</td> <td>3 bar (300 kPa)</td> </tr> <tr> <td>0+160 bar (0+16 MPa)</td> <td>1,6 bar (160 kPa)</td> </tr> <tr> <td>0+70 bar (0+7 MPa)</td> <td>0,7 bar (70 kPa)</td> </tr> <tr> <td>-1+70 bar (-0,1+7 MPa)</td> <td>0,71 bar (71 kPa)</td> </tr> <tr> <td>0+25 bar (0+2,5 MPa)</td> <td>0,25 bar (25 kPa)</td> </tr> <tr> <td>-1+25 bar (-0,1+2,5 MPa)</td> <td>0,26 bar (26 kPa)</td> </tr> <tr> <td>0+7 bar (0+700 kPa)</td> <td>0,07 bar (7 kPa)</td> </tr> <tr> <td>-1+7 bar (-100+700 kPa)</td> <td>0,07 bar (7 kPa)</td> </tr> <tr> <td>-1+1,5 bar (-100+150 kPa)</td> <td>120 mbar (12 kPa)</td> </tr> <tr> <td>0+2 bar (0+200 kPa)</td> <td>100 mbar (10 kPa)</td> </tr> <tr> <td>0+1 bar (0+100 kPa)</td> <td>50 mbar (5 kPa)</td> </tr> <tr> <td>-0,5+0,5 bar (-50+50k Pa)</td> <td>50 mbar (5 kPa)</td> </tr> <tr> <td>0+0,25 bar (0+25 kPa)</td> <td>25 mbar (2,5 kPa)</td> </tr> <tr> <td>-100+100 mbar (-10+10 kPa)</td> <td>20 mbar (2 kPa)</td> </tr> <tr> <td>-15+70 mbar (-1,5+7 kPa)</td> <td>5 mbar (0,5 kPa)</td> </tr> <tr> <td>0+1,3 bar ABS (0+130 kPa ABS)</td> <td>0,1 bar ABS (10 kPa ABS)</td> </tr> <tr> <td>0+7 bar ABS (0+700 kPa ABS)</td> <td>0,1 bar ABS (10 kPa ABS)</td> </tr> <tr> <td>0+25 bar ABS (0+2,5 MPa ABS)</td> <td>0,25 bar ABS (25 kPa ABS)</td> </tr> <tr> <td>0+70 bar ABS (0+7 MPa ABS)</td> <td>0,7 bar ABS (70 kPa ABS)</td> </tr> <tr> <td>0+300 bar ABS (0+30 MPa ABS)</td> <td>0,3 bar ABS (30 kPa ABS)</td> </tr> </tbody> </table>	Range	Min. set range	0+1000 bar (0+100 MPa)	10 bar (1 MPa)	0+600 bar (0+60 MPa)	6 bar (600 kPa)	0+300 bar (0+30 MPa)	3 bar (300 kPa)	0+160 bar (0+16 MPa)	1,6 bar (160 kPa)	0+70 bar (0+7 MPa)	0,7 bar (70 kPa)	-1+70 bar (-0,1+7 MPa)	0,71 bar (71 kPa)	0+25 bar (0+2,5 MPa)	0,25 bar (25 kPa)	-1+25 bar (-0,1+2,5 MPa)	0,26 bar (26 kPa)	0+7 bar (0+700 kPa)	0,07 bar (7 kPa)	-1+7 bar (-100+700 kPa)	0,07 bar (7 kPa)	-1+1,5 bar (-100+150 kPa)	120 mbar (12 kPa)	0+2 bar (0+200 kPa)	100 mbar (10 kPa)	0+1 bar (0+100 kPa)	50 mbar (5 kPa)	-0,5+0,5 bar (-50+50k Pa)	50 mbar (5 kPa)	0+0,25 bar (0+25 kPa)	25 mbar (2,5 kPa)	-100+100 mbar (-10+10 kPa)	20 mbar (2 kPa)	-15+70 mbar (-1,5+7 kPa)	5 mbar (0,5 kPa)	0+1,3 bar ABS (0+130 kPa ABS)	0,1 bar ABS (10 kPa ABS)	0+7 bar ABS (0+700 kPa ABS)	0,1 bar ABS (10 kPa ABS)	0+25 bar ABS (0+2,5 MPa ABS)	0,25 bar ABS (25 kPa ABS)	0+70 bar ABS (0+7 MPa ABS)	0,7 bar ABS (70 kPa ABS)	0+300 bar ABS (0+30 MPa ABS)	0,3 bar ABS (30 kPa ABS)
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Measuring set range	/...+... [required units]	Calibrated range in relation to 4mA and 20mA output																																														
Casing, electrical connection	/PD.....	304SS housing, IP65 with DIN EN 175301-803 connector																																														
	/PD316.....	316LSS housing, IP65 with DIN EN 175301-803 connector																																														
	/PZ.....	304SS housing, IP66, packing gland M20x1,5																																														
	/PZ316.....	316SS housing, IP66, packing gland M20x1,5																																														
	/PM12 (IP67).....	304SS housing, IP67 with thread M12x1 and connector with cable (3 m in standard)																																														
	/PM12 (IP65).....	304SS housing, IP65 with thread M12x1 (without cable)																																														
	/SG.....	316LSS housing, IP68, cable electrical connection (3 m of cable in standard)																																														
/SGM.....	316LSS housing, IP68, cable electrical connection (3 m of cable in standard)																																															
Process connections	/M.....	Thread M20x1,5 (male) with Ø4 hole, wetted parts SS316L																																														
	/G1/2.....	Thread G1/2" (male) with Ø4 hole, wetted parts SS316L																																														
	/G1/2(Au).....	Thread G1/2" (male) with Ø4 hole, gold plated diaphragm (range no. 1, 2, 3, 4, 5)																																														
	/G1/4.....	Thread G1/4" (male), wetted parts SS316L (Pressure limits: max. 400bar)																																														
	/P.....	Thread M20x1,5 (male) with Ø12 hole, wetted parts SS316L																																														
	/GP.....	Thread G1/2" (male) with Ø12 hole, wetted parts SS316L																																														
	/GP(Hastelloy).....	Thread G1/2" (male) with Ø12 hole, wetted parts Hastelloy C 276																																														
	/CM30x2.....	Thread M30x2 with flush diaphragm, wetted parts SS316L (Pressure limits: min. 0,1bar / max. 70bar)																																														
	/CM30x2(Hastelloy).....	Thread M30x2 with flush diaphragm, wetted parts Hastelloy C 276 (Pressure limits: min. 0,1bar / max. 70bar)																																														
	/CG1".....	Thread G1" with flush diaphragm, wetted parts SS316L (Pressure limits: min. 0,1bar / max. 70bar)																																														
	/CG1"(Hastelloy).....	Thread G1" with flush diaphragm, wetted parts Hastelloy C 276 (Pressure limits: min. 0,1bar / max. 70bar)																																														
	/CG1"-S38.....	Thread G1" with flush diaphragm, wetted parts SS316L (Pressure limits: min. 0,1bar / max. 1bar)																																														
	/CG1/2".....	Thread G1/2" with flush diaphragm, wetted parts SS316L (Pressure limits: min. 2,5bar)																																														
/1/2"NPTM.....	Thread 1/2"NPT Male, G1/4" Female, wetted parts SS316L (Pressure limits: 1/2"NPT Male max. 690bar, G1/4" Female max. 1000bar)																																															
/1/2"NPTF.....	Thread G1/2" or M20x1,5 with adapter to 1/2"NPT Female, wetted parts SS316L (Pressure limits: max. 690bar)																																															
/code of diaphragm seal...	Diaphragm seal (see chapter of diaphragm seals)																																															
Accessories	/MT.....	Stainless Steel Tag plate mounted on wire																																														
Other specification	/.....	Description of required parameters																																														

**Example:** Pressure transmitter, output 4...20mA + HART, version Exia, nominal measuring range 0...7bar, calibrated range 0...6bar, process connection 1/2"NPT male, electrical connection DIN EN 175301-803 connector.

**PCE-28.SMART/Exia/0...7bar/0...6bar/PD/1/2"NPTM**