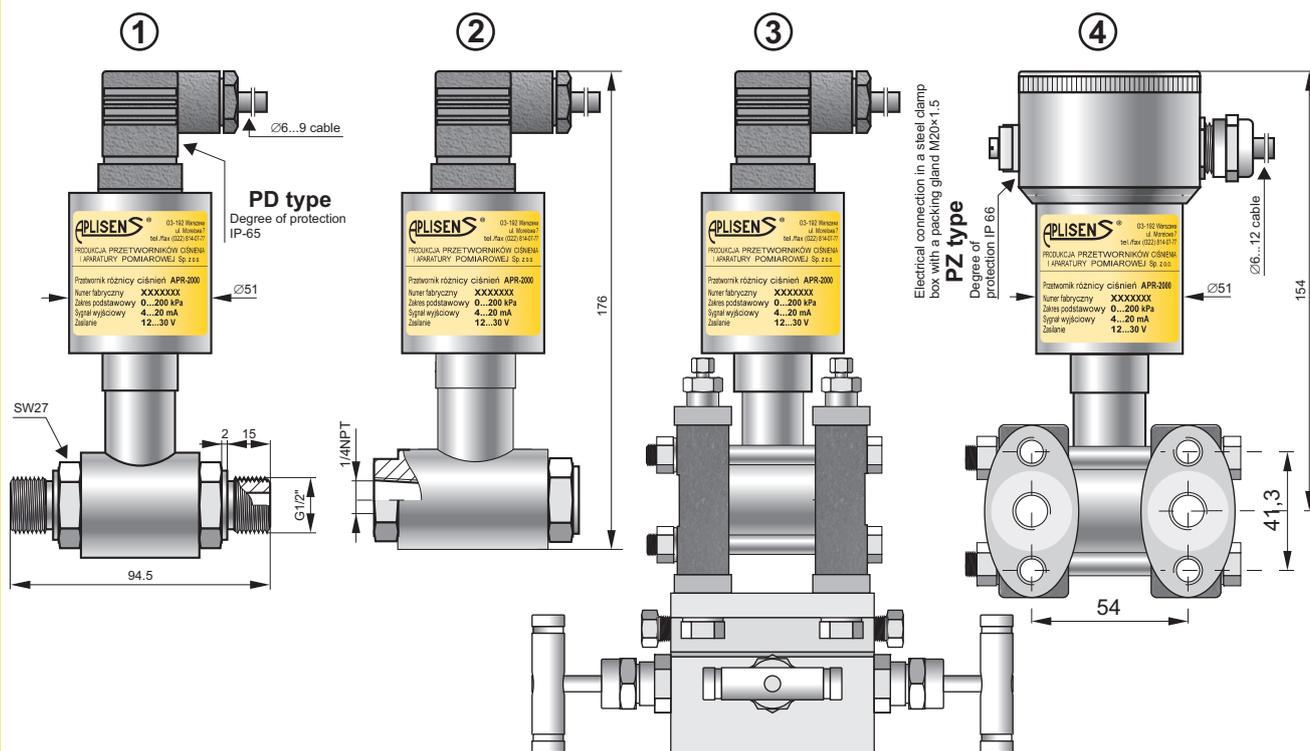


SMART DIFFERENTIAL PRESSURE TRANSMITTER APRE-2000



- ✓ 4...20 mA output signal + HART protocol
- ✓ ATEX Intrinsic safety
- ✓ Static pressure limit up to 320 bar
- ✓ Accuracy 0.1%
- ✓ Wetted parts material 316L



- 1) Transmitter APRE-2000PD version with **GP type** process connection; 2) Transmitter APRE-2000PD version with **PN type** process connection; 3) Transmitter APRE-2000PD – version with **type CH** process connection rotated 90°; 4) Transmitter APRE-2000PD – version with **type C** process connection

Application and construction

The APRE-2000 transmitter is applicable to the measurement of differential pressure of gases, vapors and liquids. The active element is a piezoresistant silicon sensor separated from the medium by separating diaphragms and a specially selected type of manometric fluid. The special design of the active sensing element ensures that it is able to withstand pressure surges and overloads of up to 250 or 320 bar. Electronics in the casing with a degree of protection IP65, IP66.

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 with the HART/USB converter and Aplisens RAPORT 2 configuration software.

(*) .eddl files available on www.aplisens.com

The data interchange with the transmitter enables user to:

- ◆ identify the transmitter;
- ◆ configure the output parameters:
 - measurement units and values of the start and end-points of the measuring 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 model pressure.

Installation

The transmitter with **P type** process connection is not heavy, so it can be fitted directly onto impulse lines. For fitting in any desired position on a $\varnothing 25$ pipe an Aplsens mounting bracket (**Fi 25 mounting bracket**, see page IV/ 5) is recommended.

The version with **C type** process connections can be fitted directly to a 3- or 5-valve manifold. We recommend factory-mounted transmitters with VM type valve manifold (see page IV/ 2). A transmitter without a valve manifold can be fitted in any position on a 2" pipe or on a wall using the **C-2" mounting bracket** (see page IV/ 5).

When the special process connections are required for the level measurement of media in closed tanks (e.g. in the sugar and chemical industries) the transmitter is fitted with an Aplsens diaphragm seal. Sets of differential pressure transmitters with diaphragm seals are described in detail presented in the further part of the catalogue.

Measuring ranges

No.	Nominal measuring range (FSO)	Minimum set range	Rangeability	Overpressure limit/ static pressure limit
1	0...70 bar (0...7 MPa)	7 bar (700 kPa)	10:1	C-type: 250 / 320 bar (250 bar for PED version) GP-type: 40 bar (for range no. 1: 70bar)
2	0...16 bar (0...1,6 MPa)	1,6 bar (160 kPa)	10:1	
3	0...2,5 bar (0...250 kPa)	0,2 bar (20 kPa)	12,5:1	
4	0...1 bar (0...100 kPa)	50 mbar (5k Pa)	20:1	
5	0...0,25 bar (0...25 kPa)	10 mbar (1k Pa)	25:1	
6	-0,5...0,5 bar (-50...50 kPa)	0,1 bar (10 kPa)	10:1	
7	-100...100 mbar (-10...10 kPa)	10 mbar (1 kPa)	20:1	
8	-5...70 mbar (-0,5...7 kPa)	4 mbar (0,4 kPa)	18:1	

Technical data

Metrological parameters

Accuracy $\leq \pm 0,1\%$ of calibrated range
Long term stability \leq accuracy for 3 years
 (for the nominal measuring range) $\leq 2 \times$ accuracy for 5 years
Thermal error $< \pm 0,08\%$ (FSO) / 10°C
 max. $\pm 0,3\%$ (FSO) in the whole compensation range
Thermal compensation range $-25...80^\circ\text{C}$

Zero shift error for static pressure
 $0,01\%$ (FSO) / 10 bar for ranges no. 3, 4, 5, 6, 7
 $0,03\%$ (FSO) / 10 bar for range no. 8
 $0,06\%$ (FSO) / 10 bar for ranges no. 1, 2
 Zeroing the transmitter in conditions of static pressure can eliminate this error.

Additional electronic damping 0...30 s
Error due to supply voltage changes 0,002% (FSO) / V

Electrical parameters

Power supply 7,5...55 VDC (Ex ia 7,5...30 VDC)
Output signal 4...20 mA + HART
Load resistance $R[\Omega] \leq \frac{U_{\text{sup}}[\text{V}] - 7,5\text{V}}{0,0225\text{A}}$
Resistance required for communication min. 240 Ω

Materials

Wetted parts SS316L
Diaphragms SS316L
Casing SS304

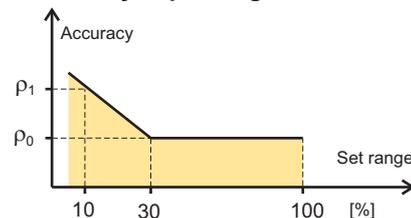
Operating conditions

Operating temperature range (ambient temp.) $-25...85^\circ\text{C}$
 Exi a version $-25...80^\circ\text{C}$
Medium temperature range $-25...120^\circ\text{C}$
 PED version $-25...100^\circ\text{C}$

over 120°C – measurement with use an impulse line or diaphragm seals
 up to 100°C – version for 413bar static pressure

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

Accuracy depending on the set range



ρ_0 – error for range 30...100% FSO
 ρ_1 – error for range 10% FSO
 $\rho_1 = 2 \times \rho_0$
 Numerical error values are given in the technical data under metrological parameters

Ordering procedure

Model	Code	Description																		
APRE-2000		Smart differential pressure transmitter																		
Casing, output signal, electrical connection	/PD..... /PZ.....	Housing IP65 with DIN EN 175301-803 connector, without display, output 4-20mA + Hart 304SS housing, IP66, without display, output 4-20mA + Hart																		
Versions, certificates more than one option is available	/Exia..... /Tlen..... /320 bar..... /NACE.....	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb II 1D Ex ia IIIC T110°C Da I M1 Ex ia I Ma Exia for HS version available from Q4/2016 For oxygen service (sensor filled with Fluorolube fluid) Static pressure 320 bar, only for C process connection NACE MR-01-75 certificate (only process connections type C) </div> </div>																		
Nominal measuring range	/0+70 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+70 bar (0+7000 kPa)</td> <td>7 bar (700 kPa)</td> </tr> <tr> <td>0+16 bar (0+1600 kPa)</td> <td>1,6 bar (160 kPa)</td> </tr> <tr> <td>0+2,5 bar (0+250 kPa)</td> <td>0,2 bar (20 kPa)</td> </tr> <tr> <td>0+1 bar (0+100 kPa)</td> <td>50 mbar (5 kPa)</td> </tr> <tr> <td>0+0,25 bar (0+25 kPa)</td> <td>10 mbar (1 kPa)</td> </tr> <tr> <td>-0,5+0,5 bar (50+50 kPa)</td> <td>0,1 bar (10 kPa)</td> </tr> <tr> <td>-0,1+0,1 bar (-10+10 kPa)</td> <td>10 mbar (1 kPa)</td> </tr> <tr> <td>-5+70 mbar (0,5+7 kPa)</td> <td>4 mbar (0,4 kPa)</td> </tr> </tbody> </table>	Range	Min. set range	0+70 bar (0+7000 kPa)	7 bar (700 kPa)	0+16 bar (0+1600 kPa)	1,6 bar (160 kPa)	0+2,5 bar (0+250 kPa)	0,2 bar (20 kPa)	0+1 bar (0+100 kPa)	50 mbar (5 kPa)	0+0,25 bar (0+25 kPa)	10 mbar (1 kPa)	-0,5+0,5 bar (50+50 kPa)	0,1 bar (10 kPa)	-0,1+0,1 bar (-10+10 kPa)	10 mbar (1 kPa)	-5+70 mbar (0,5+7 kPa)	4 mbar (0,4 kPa)
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/-5+70 mbar.....																				
Measuring set range	/...+... [required units]	Calibrated range in relation to 4mA and 20mA output																		
Process connections	/C.....	Thread 1/4NPT F on the cover flanges cover flanges material SS316L. Allows mounting with a valve manifold. Process connection of cover flange: M10 (option /C(7/16) - 7/16"UNF acc. to IEC 61518), wetted parts material: SS316L C-type process connection rotated 90°																		
	/CH.....	Thread G1/2" (male), wetted parts material: SS316L																		
	/GP.....	Thread 1/4"NPT (female), wetted parts material: SS316L																		
	/PN.....	Diaphragm seal (see chapter of diaphragm seals) mounted on Hi side of transmitter, Lo side 1/4NPT Female																		
	/code of diaphragm seal.....																			
Gasket (refers only to C, CH process connection)	(without marking).....	FPM Viton																		
	/NBR.....	NBR																		
	/PTFE.....	PTFE																		
Accessories	/C-2".....	Mounting bracket for 2" pipe (to C process conn.), mat. zincd steel																		
	/C-2"(SS).....	Mounting bracket for 2" pipe (to C process conn.), mat. ss304																		
	/C-2"(SS316).....	Mounting bracket for 2" pipe (to C process conn.), mat. ss316																		
	/C-2"B.....	Mounting bracket for 2" pipe (to C(7/16) process conn.), mat. zincd steel																		
	/C-2"B(SS).....	Mounting bracket for 2" pipe (to C(7/16) process conn.), mat. ss304																		
	/C-2"B(SS316)...	Mounting bracket for 2" pipe (to C(7/16) process conn.), mat. ss316																		
	/FI25.....	Mounting bracket for 1" pipe (to P process conn.), mat. Stainless Steel																		
/RedSpaw GP....	Connector to weld impulse pipes dia. 12 and 14 mm, material 15HM(SO) or SS316(S). Only process connection GP type																			
/RedSpaw C.....	Connector to weld impulse pipes dia. 12 and 14 mm, material 15HM. Only process connection C type.																			
/Red d/P 1/2".....	Adapter for differential pressure transmitters with C type process connection, output thread 1/2NPT F. Material SS316L																			
Other specification	/.....	Description of required parameters																		

Example 1: Differential pressure transmitter, output 4..20mA + HART, version Exia, static pressure 320bar, nominal measuring range 0..2bar, calibrated range 0..1,6bar, process connection C, stainless steel housing, mounting bracket for 2" pipe

APRE-2000PZ/Exia/320bar/0..2bar/0..1,6bar/C/C-2"

Example 2: Differential pressure transmitter, output 4..20mA + HART, nominal measuring range 0..1bar, calibrated range 0..1bar, process connection flange diaphragm seal DN80PN40 , electrical connection with DIN EN 175301-803 connector.

APRE-2000PD/0..1bar/0..1bar/S-P DN80PN40