

# HPM-23 SMART EXd EXPLOSION PROOF PRESSURE TRANSMITTER

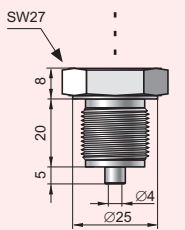
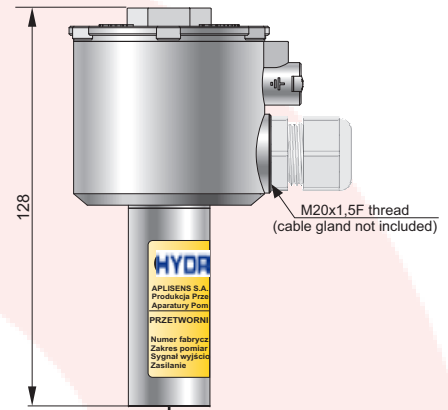
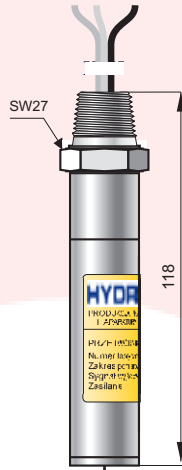
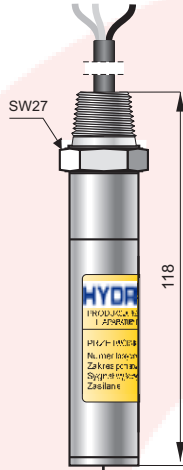


- ✓ 4...20 mA output signal + HART protocol
- ✓ Accuracy 0.1%
- ✓ NACE compatibility
- ✓ Measuring range up to 1380bar

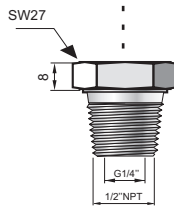
**SGM (1/2"NPTM)**  
cable connection  
IP68  
(IP66 for gauge pressure <80bar)

**FL (1/2"NPTM)**  
flying leads  
IP68  
(IP66 for gauge pressure <80bar)

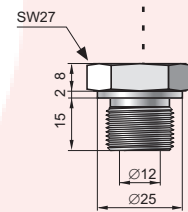
**PZ2**  
IP66



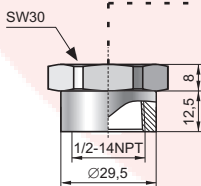
**G1/2 type**  
G1/2", Ø4 hole



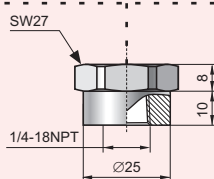
**1/2"NPT type**  
1/2"NPT male +  
internal thread G1/4"



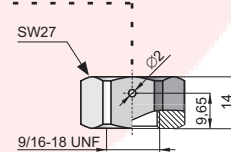
**GP type**  
G1/2", Ø12 hole



**1/2NPTF type**  
1/2-14 NPT female



**1/4NPTF type**  
1/4-18 NPT female



**Autoclave**  
type F-250-C  
(9/16-18 UNF)

## Application

HPM-23 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...1380 bar	(0...138 MPa)	13,8 bar	(1,38 MPa)	100:1	1600 bar (160 MPa)
2	0...1000 bar	(0...100 MPa)	10 bar	(1 MPa)	100:1	1200 bar (120 MPa)
3	0...600 bar	(0...60 MPa)	6 bar	(600 kPa)	100:1	1200 bar (120 MPa)
4	0...300 bar	(0...30 MPa)	3 bar	(300 kPa)	100:1	450 bar (45 MPa)
5	0...160 bar	(0...16 MPa)	1,6 bar	(160 kPa)	100:1	450 bar (45 MPa)
6	0...70 bar	(0...7 MPa)	0,7 bar	(70 kPa)	100:1	140 bar (14 MPa)
7	-1...70 bar	(-0,1...7 MPa)	0,71 bar	(71 kPa)	100:1	140 bar (14 MPa)
8	0...25 bar	(0...2,5 MPa)	0,25 bar	(25 kPa)	100:1	50 bar (5 MPa)
9	-1...25 bar	(-0,1...2,5 MPa)	0,26 bar	(26 kPa)	100:1	50 bar (5 MPa)
10	0...7 bar	(0...0,7 MPa)	0,07 bar	(7 kPa)	100:1	14 bar (1,4 MPa)
11	-1...7bar	(-100...700 kPa)	0,07 bar	(7 kPa)	114:1	14 bar (1,4 MPa)
12	-1...1,5bar	(-100...150 kPa)	0,12 bar	(12 kPa)	20:1	4 bar (400 kPa)
13	0...2 bar	(0...200 kPa)	100 mbar	(10 kPa)	20:1	4 bar (400 kPa)
14	0...1 bar	(0...100 kPa)	50 mbar	(5 kPa)	20:1	2 bar (200 kPa)
15	-0,5...0,5 bar	(-50...50 kPa)	50 mbar	(5 kPa)	20:1	2 bar (200 kPa)
16	0...0,25 bar	(0...25 kPa)	25 mbar	(2,5 kPa)	10:1	1 bar (100 kPa)
17	-100...100 mbar	(-10...10 kPa)	20 mbar	(2 kPa)	10:1	1 bar (100 kPa)
18	-15...70 mbar *	(-1,5...7 kPa)	5 mbar	(0,5 kPa)	17:1	0,5 bar (50 kPa)
19	0...1,3 bar abs	(0...130 kPa abs)	100 mbar abs	(10 kPa abs)	13:1	2 bar (200 kPa)
20	0...7 bar abs	(0...0,7 MPa abs)	100 mbar abs	(10 kPa abs)	70:1	14 bar (1,4 MPa)
21	0...25 bar abs	(0...2,5 MPa abs)	0,25 bar abs	(25 kPa abs)	100:1	50 bar (5 MPa)
22	0...70 bar abs	(0...7 MPa abs)	0,7 bar abs	(70 kPa abs)	100:1	140 bar (14 MPa)
23	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
<b>Response time</b>	16..230ms (programmable)
<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...30 V DC
<b>Output signal</b>	4...20 mA, two wire transmission
<b>Load resistance</b>	$R[\Omega] \leq \frac{U_{sup}[V] - 7,5V}{0,0225A}$
<b>Resistance required for communication</b>	min. 240Ω

### Materials

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


### Operating conditions

<b>Operating temperature range (ambient temp.)</b>	
FL electrical connection	-40...80°C*
SGM electrical connection	-40...65°C*
* more information available in user's manual and certificate	
<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
HPM-23		Smart pressure transmitter  II 2G Ex db IIC T6/T5/T4 Gb II 2D Ex tb IIIC T85°C/T100°C/T120°C Db I M2 Ex db I Mb (only for PZ2 casing) Ex db IIC T6/T5/T4 Gb <b>IECEX</b> Ex tb IIIC T85°C/T100°C/T120°C D Ex db I Mb (only for PZ2 casing)
Versions, certificates	/MR..... /NACE.....	Marine certificate – DNV, BV NACE MR-01-75 certificate
Nominal measuring range	/0+1380 bar.....	Range: 0+1380 bar (0+138 MPa) Min. set range: 13,8 bar (1,38 MPa)
	/0+1000 bar.....	0+1000 bar (0+100 MPa) 10 bar (1 MPa)
	/0+600 bar.....	0+600 bar (0+60 MPa) 6 bar (600 kPa)
	/0+300 bar.....	0+300 bar (0+30 MPa) 3 bar (300 kPa)
	/0+160 bar.....	0+160 bar (0+16 MPa) 1,6 bar (160 kPa)
	/0+70 bar.....	0+70 bar (0+7 MPa) 0,7 bar (70 kPa)
	/-1+70 bar.....	-1+70 bar (-0,1+7 MPa) 0,71 bar (71 kPa)
	/0+25 bar.....	0+25 bar (0+2,5 MPa) 0,25 bar (25 kPa)
	/-1+25 bar.....	-1+25 bar (-0,1+2,5 MPa) 0,26 bar (26 kPa)
	/0+7 bar.....	0+7 bar (0+700 kPa) 0,07 bar (7 kPa)
	/-1+7 bar.....	-1+7 bar (-100+700 kPa) 0,07 bar (7 kPa)
	/-1+1,5 bar.....	-1+1,5 bar (-100+150 kPa) 120 mbar (12 kPa)
	/0+2 bar.....	0+2 bar (0+200 kPa) 100 mbar (10 kPa)
	/0+1 bar.....	0+1 bar (0+100 kPa) 50 mbar (5 kPa)
	/-0,5+0,5 bar.....	-0,5+0,5 bar (-50+50k Pa) 50 mbar (5 kPa)
	/0+0,25 bar.....	0+0,25 bar (0+25 kPa) 25 mbar (2,5 kPa)
	/-100+100 mbar.....	-100+100 mbar (-10+10 kPa) 20 mbar (2 kPa)
	/-15+70 mbar.....	-15+70 mbar (-1,5+7 kPa) 5 mbar (0,5 kPa)
	/0+1,3 bar ABS.....	0+1,3 bar ABS (0+130 kPa ABS) 0,1 bar ABS (10 kPa ABS)
	/0+7 bar ABS.....	0+7 bar ABS (0+700 kPa ABS) 0,1 bar ABS (10 kPa ABS)
/0+25 bar ABS.....	0+25 ABS (0+2,5 MPa ABS) 0,25 bar ABS (25 kPa ABS)	
/0+70 bar ABS.....	0+70 bar ABS (0+7 MPa ABS) 0,7 bar ABS (70 kPa ABS)	
/0+300 bar ABS.....	0+300 bar ABS (0+30 MPa ABS) 0,3 bar ABS (30 kPa ABS)	
Measuring set range	/...+... [required units]	Calibrated range in relation to 4mA and 20mA output
Casing, electrical connection	/SGM (1/2"NPTM).....	316LSS housing, cable electrical connection (3 m of cable in standard)
	/FL (1/2"NPTM).....	316LSS housing, flying leads (2 m of flying leads in standard)
	/PZ2.....	304SS housing, IP66, electrical connection M20x1,5F
Process connection	/G1/2.....	Thread G1/2" (male) with Ø4 hole, wetted parts SS316L Pressure limits: max. 1000bar
	/GP.....	Thread G1/2" (male) with Ø12 hole, wetted parts SS316L Pressure limits: min. 0,25bar / max. 350bar
	/GP(Hastelloy).....	Thread G1/2" (male) with Ø12 hole, wetted parts Hastelloy C 276 Pressure limits: min. 0,25bar / max. 350bar
	/1/2"NPTM.....	Thread 1/2"NPT Male, wetted parts SS316L Pressure limits: max. 690bar
	/1/2"NPTF.....	Thread 1/2"NPT Female, wetted parts SS316L Pressure limits: min. 10bar / max. 690bar
	/1/4"NPTF.....	Thread 1/4"NPT Female, wetted parts SS316L Pressure limits: min. 10bar / max. 690bar
/Autoclave.....	Compatible with Autovalue type F-250-C Pressure limits: min. 400bar / max. 1380bar	
Accessories	/MT.....	Stainless Steel Tag plate mounted on wire
Other specification	/.....	Description of required parameters

