PANAM®

ENGINEERING BEYOND LIMITS

Pressure & Differential Pressure Transmitters

- **PANAM®** Pressure & Differential Pressure Transmitters are available with programmable range, zero shift, characteristic and damping ratio adjustments with local panel keys
- Display with backlight available
- Explosion proof certificate (ATEX, IECEx)
- Intrinsic safety certificate (ATEX, IECEx)
- Safety Integrity Level (SIL) Certificate Available
- Exotic Material Diaphragms (Nickel, Platinum, Tantalum, Hastelloy etc.) available on request

HART SIL IECEx

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Rev/01/2025

Introduction

Since its inception in 1998 to present day, **PANAM®** has added new product every year and has broadened its product portfolio and its clientele base by continuous innovation. Key core values like Timely Delivery, Quality Consistency, Product Improvisation and after sales service has been instrumental in the phase wise evolution of company. Continuous improvement is the key to success, Customer feedback are taken with positive attitude and product are constantly upgraded to new quality and performance level to cope up with the market dynamics. **PANAM®** has dedicated R & D team which continuously upgrades products & adopt new technologies to bring new products in market. Our products are known for providing high-quality, high-reliability, low-cost options for the oil, gas & power industry. Over the year, the company has evolved from a product based company to a complete system solution provider. Over the years the company has attained state of the art operational efficiency for maintaining a competitive edge, with the increase in the utilization of its products in oil, gas and power sector.

PANAM® is having state of the art manufacturing facility span over an area of 1,65,000 sqft with a fleet of CNC machines, VMC machines, Semi-Automatic Lathe machines, High pressure test bench with SCADA control, Configuration / calibration center for transmitters.

PANAM® offers a Pressure and Differential Pressure Transmitters with adjustable characteristic and damping ratio with panel keys, Display with backlight, Intrinsic safety certificate (ATEX, IECEx,), Explosion proof certificate (ATEX, IECEx), SIL 2/3 certificate, Accuracy 0.075% (0.05% on request), Exotic Material Diaphragms (Nickel, Platinum, Tantalum, Hastelloy etc.) are also available on request.

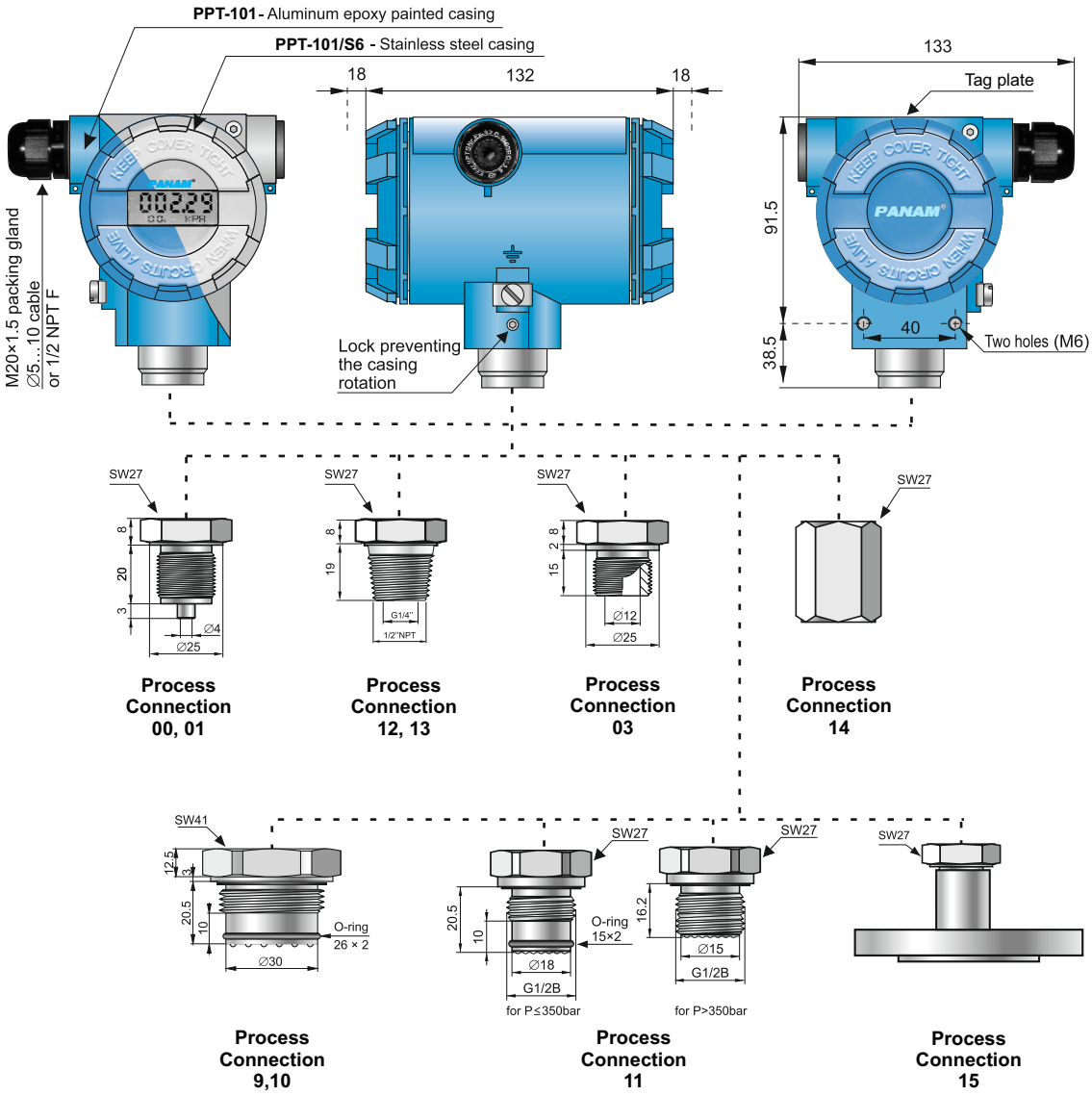
Contents

Smart Pressure Transmitter (PPT-101)

HART COMMUNICATION PROTOCOL

- ✓ **4...20 mA output signal + HART 5 / HART 7 protocol (special version: 0...20 mA or 0...5 mA output signal + HART protocol)**
- ✓ **Display with backlight**
- ✓ **Programmable range, zero shift, characteristic and damping ratio with local panel keys**
- ✓ **Safety version SIL2/SIL3**
- ✓ **Intrinsic safety certificate ATEX, IECEX**
- ✓ **Explosion proof certificate ATEX, IECEX**
- ✓ **Exotic Material Diaphragms (Nickel, Platinum, Tantalum, Hastelloy etc.) available on request**
- ✓ **Accuracy 0.075% (0.05%, 0.04% available on request)**
- ✓ **Gold plated diaphragm**

up to 5 years warranty



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Smart Pressure Transmitter (PPT-101)

Application and construction

Smart pressure transmitters are applicable for the measurement of gauge pressure, absolute pressure and vacuum. The active sensing element is a piezoresistant silicon sensor separated from the medium by a diaphragm and by specially selected manometric liquid. The casing is made of aluminium alloy cast or 316SS stainless steel, degree of protection IP66/IP67. The design of the casing enables the use of a local display, rotation of the display, rotation of the casing by 0-340° relative to the sensor, and a choice of cable direction.

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
- other Hart type communicators,(*)
- a PC using an HART/USB converter and Raport 2 configuration software.

(*) .eddl files available on request

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
  - adjustment of damping time constant
  - selection conversion characteristic (inversion, user's non-linear characteristic etc.)
- 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 with respect to a model pressure

Installation

The transmitter can be installed directly at the site on the process line. An universal mounting bracket is provided to transmitter fitting on 2" pipe (Mounting bracket accessory, see model configuration). When the pressure of steam or other hot media is measured, a syphon 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 a diaphragm seal. The transmitter's electrical connections should be done 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	1000 bar	(100 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)	0,08 bar	(8 kPa)	100:1	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	-25…25 mbar*	(-2,5...2,5 kPa)	2 mbar	(0,2 kPa)	25:1	0,5 bar	(50 kPa)
19	-7…7 mbar *	(-0,7..0,7 kPa)	1 mbar	(0,1 kPa)	14:1	0,5 bar	(50 kPa)
20	0...1,3 bar abs	(0...130 kPa abs)	100 mbar abs	(10 kPa abs)	13:1	2 bar	(200 kPa)
21	0...7 bar abs	(0...0,7 MPa abs)	100 mbar abs	(10 kPa abs)	70:1	14 bar	(1,4 MPa)
22	0...25 bar abs	(0...2,5 MPa abs)	0,25 bar abs	(25 kPa abs)	100:1	50 bar	(5 MPa)
23	0...70 bar abs	(0...7 MPa abs)	0,7 bar abs	(70 kPa abs)	100:1	140 bar	(14 MPa)
24	0...300 bar abs	(0...30 MPa abs)	3 bar abs	(300 kPa abs)	100:1	450 bar	(45 MPa)

* Hart modbus protocol available

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Technical data

Metrological parameters

Accuracy ≤ ±0,075% of the calibrated range (≤ ±0,1% for range no. 19)
Special version: ≤ ±0,05% of the calibrated range (≤ ±0,04% / ≤ ±0.025% on request)

Long-term stability (for the nominal measuring range) ≤ accuracy for 3 years or ≤ 2 x accuracy for 5 years

Thermal error < ±0,05% (FSO) / 10°C (0,1% for ranges no. 16 to19)
max. ±0.25% (FSO) in the whole compensation range (0,4% for ranges no. 16 to19)

Thermal compensation range -25...80°C
Special version: -40...80°C
On request: -50°... 65° C

Additional electronic damping 0...60 s

Error due to supply voltage changes 0,002% (FSO) / V

Materials

Wetted parts and diaphragms: 316L SS, Hastelloy C 276, Au

Casing: Aluminum, 316SS

Material of window: Hardened Glass

Operating conditions

Operating temperature range (ambient temp.)
-40...85°C (Safety: -25...85°C)
special version: (-50...85° C)

Medium temperature range -40...120°C
Safety: -40…85°C

over 120°C – use an impulse line or diaphragm seal

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

Electrical parameters

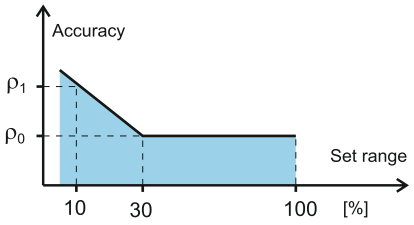
Version	Power supply
standard	10...55 VDC
Exia	10,5...30 VDC
Exd	13,5...55 VDC
Exia/Exd	11,5...30 VDC
Safety, Safety Exd	11,5...36 VDC
Safety Exia	11,5...30 VDC
Safety Exia/Exd	11,5...30 VDC

Output signal 4...20 mA + HART

Load resistance (for standard version) $R[\Omega] \leq \frac{U_{sup}[V] - 10V}{0{,}0225A}$

Resistance required for communication min. 240 Ω

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

FSO: Full scale operation

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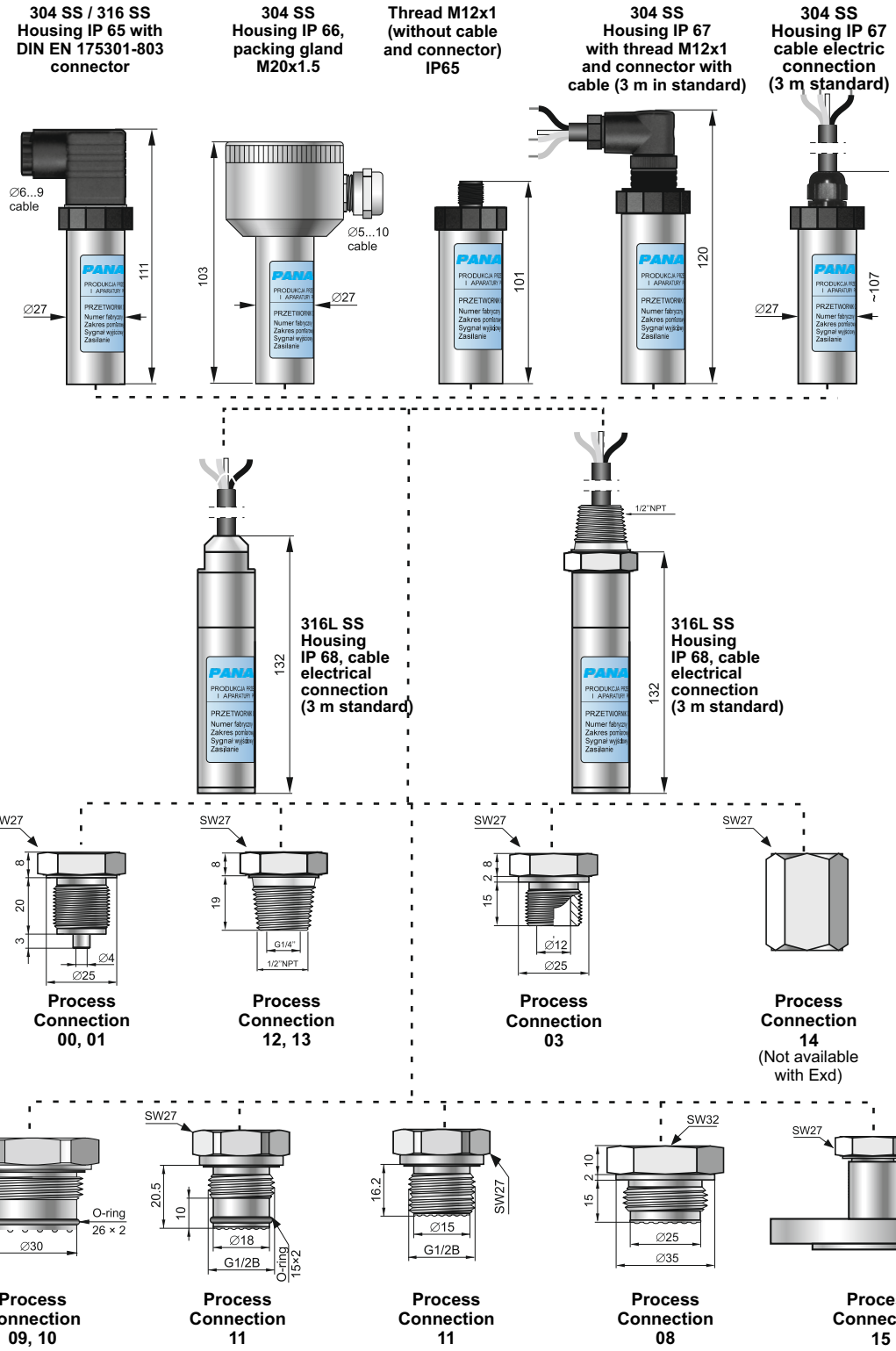
Smart Pressure Transmitter - Compact Type (PPT-102)

HART COMMUNICATION PROTOCOL

- ✓ 4...20 mA output signal + HART protocol
- ✓ Intrinsic safety certificate (ATEX, IECEx)
- ✓ Accuracy 0.1% (Special version 0.075%)



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Smart Pressure Transmitter - Compact Type (PPT-102)

Application

PPT-102 SMART Inline pressure transmitter is applicable for the measurement of gauge pressure, absolute pressure and vacuum. The active sensing element is a piezoresistant silicon sensor separated from the medium by a diaphragm and by specially selected 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 request

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
  - adjustment of damping time constant
  - selection conversion characteristic (inversion, user's non-linear characteristic etc.)
- 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

Installation

The transmitter is not heavy, so it can be installed on the pipe / equipment 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 done 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	1000 bar	(100 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 tranmitters without diaphragm seal*

Technical data

Metrological parameters

Accuracy ≤ ±0,1% of calibrated range
Special Version: ≤ 0.075% of calibrated span

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

Thermal error < ±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)

Thermal compensation range -25...80°C
special version:- -40...80° C
special version:- -50 ...65° C

Additional electronic damping 0...30 s

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

Electrical parameters

Power supply 7,5...55 V DC (Ex 7,5...30 V DV)

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

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

Resistance required for communication min. 240Ω

Materials

Wetted parts and diaphragms: 316L SS, Hastelloy C 276, Au

Casing: 304 SS

Optional: 316 SS

Operating conditions

SS 304, housing, IP 68, cable electrical connection -40...65°C

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

Exia version: -40…80°C

Medium temperature range -40...120°C

over 120°C – 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

FSO: Full scale operation

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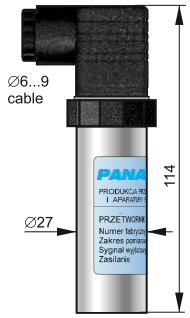
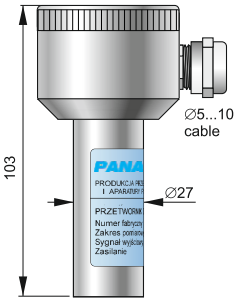
Pressure Transmitter - Compact Type (PPT-103)

- ✓ Any range from 0...25 mbar up to 0...1000 bar
- ✓ 4 ÷ 20 mA two-wire or 0 ÷ 10 V output
- ✓ Intrinsic safety certificate (ATEX, IECEx, SIL1)
- ✓ Gold plated diaphragm
- ✓ NACE Compatibility
- ✓ Version with local display

304 SS / 316 SS Housing IP 65 with DIN EN 175301-803 connector

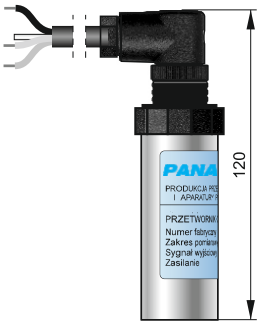


304 SS Housing IP 66, packing gland M20x1.5

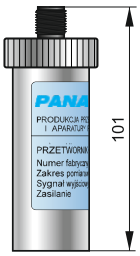


Thread M12x1 (without cable and connector) IP65

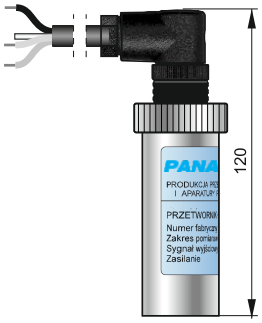
304 SS Housing IP 67 with thread M12x1 and connector with cable (3 m in standard)



304 SS Housing IP 65 with thread M12x1, Stainless Steel Version

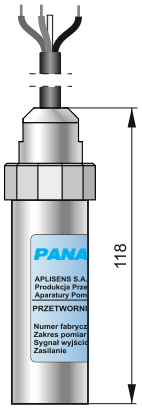


304 SS Housing IP 67 with thread M12x1 and connector with cable (3 m standard)



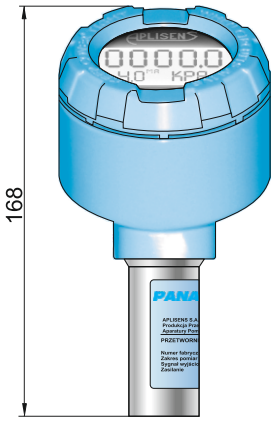
304 SS Housing IP 67 cable electrical connection (3 m cable in standard)

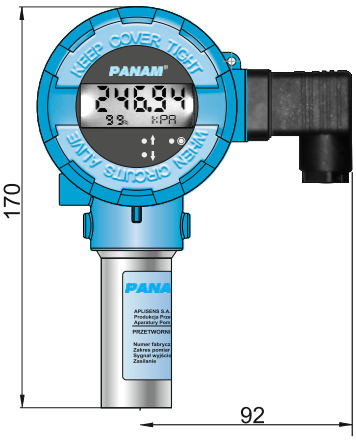
304 SS Housing IP 67 cable electrical connection (3 m cable in standard)



304 SS Housing IP 68 cable electrical connection (3 m cable in standard)

Aluminium Housing local display IP 65, DIN43650 connector (4...20mA version only)





Aluminium Housing local display IP 65, DIN43650 connector (4...20mA version only)
without Zero and Span potentiometers

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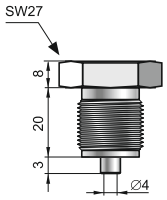
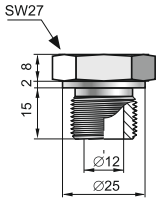
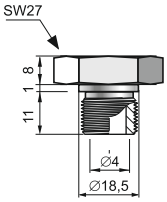
Pressure Transmitter - Compact Type (PPT-103)



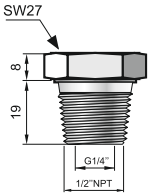
Process Connection 00, 01



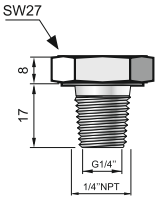
Process Connection 03



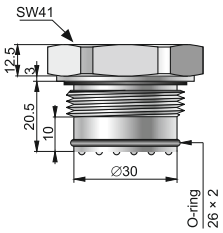
Process Connection 16



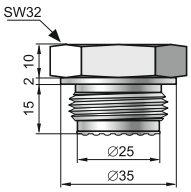
Process Connection 12, 13



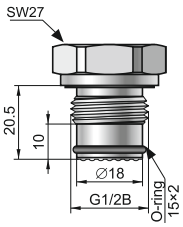
Process Connection 17



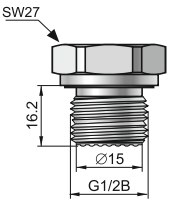
Process Connection 09, 10



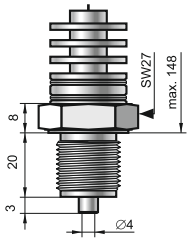
Process Connection 08



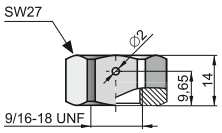
Process Connection 11



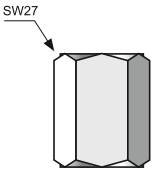
Process Connection 11



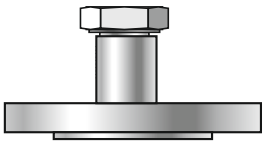
Process Connection 18



Process Connection 19



Process Connection 14



Process Connection 15

Application and construction

The PPT-103 pressure transmitter is applicable for the measurement of gauge pressure, absolute pressure and vacuum. The active sensing element is a piezoresistant silicon sensor separated from the medium by a diaphragm and by specially selected manometric liquid. The electronics is placed in a casing with a degree of protection from IP 65 to IP 68, depending on the electrical connection applied.

Calibration

Potentiometers can be used to shift the zero position and the range by up to ±10%, without altering the settings (not possible with aluminum casing & SS 304 housing, IP 68 & electrical cable connection.

Installation

The transmitter is not heavy, so it can be installed directly 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 diaphragm seal.

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Measurements under explosion hazard

ATEX Intrinsic safety version is available for taking measurements in zones under explosion hazard. The installation of the transmitter in a zone under explosion hazard requires the use of a Ex power supply.

Technical data

Any measuring range 0...25 mbar ÷ 0...1000 bar (over pressure, under pressure); 400 mbar ÷ 80 bar (absolute pressure)

	Measuring range				
	25 mbar	100 mbar	400 mbar	0…1 bar ÷ 160bar	0…160 bar ÷ 1000bar
Overpressure Limit (repeated, without hysteresis)	1 bar	1 bar	2,5 bar	4 x range	2 x range; max. 1200 bar
Damaging Overpressure	2 bar	2 bar	5 bar	8 x range; max. 2000 bar	
Accuracy	0,6%	0,3%	0,2% (0,16% - special version)		
Long term stability	0,6% / year	0,2% / year	0,1% / year		
Thermal error	Typically 0,5% / 10°C Max 0,6% / 10°C	Typically 0,3% / 10°C Max 0,4% / 10°C		Typically 0,2% / 10°C Max 0,3% / 10°C	

Hysteresis, repeatability 0,05%

Response time < 120 ms
version TR: < 30 ms

Thermal compensation range -10...80°C

Operating temperature range (ambient temp.) -40...80°C

Medium temperature range -40...130°C

over 130°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

Output signal 4...20 mA, two wire transmission
0..10V

Material of wetted parts 316Lss, Hastelloy C 276, Au

Material of casing 304 SS, 316L SS

Power supply
output 4..20mA
8…36 V DC (Ex 9...28 V DC)
version TR, version Safety: 10,5…36 V DC (Ex 12...28 V DC)
AL Housing version: (11…36V DC)
output 0..10V
13…30 VDC

Error due to supply voltage changes 0,005%/ V

Load resistance $R[\Omega] \leq \frac{U_{sup}[V] - 8V}{0{,}02A}$

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Ordering Information for Pressure Transmitters & Smart Pressure Transmitters

PPT-101-AL-09-1-0-0-5-00-1-00-1-1-1-00

Number of Valves

PPT - **PANAM**® Pressure Transmitters

Model Description

101 - Smart Pressure Transmitter
102 - Smart Pressure Transmitter - Compact Type
103 - Pressure Transmitter - Compact Type

Material of Construction of Housing

AL - Aluminum
S4 - SS304 - Stainless Steel
S6 - SS316 - Stainless Steel

Range

01 - -100 to 100 mbar
02 - -15 to 70 mbar
03 - -25 to 25 mbar
04 - -7 to 7 mbar
05 - -1 to 70 bar
06 - -1 to 25 bar
07 - -1 to 7 bar
08 - -1 to 1.5 bar
09 - -0.5 to 0.5 bar
10 - 0 to 2.5 bar
11 - 0 to1 bar
12 - 0 to 2 bar
13 - 0 to 7 bar
14 - 0 to 25 bar
15 - 0 to 70 bar
16 - 0 to 160 bar
17 - 0 to 300 bar
18 - 0 to 600 bar
19 - 0 to 1000 bar
20 - 0 to 0.25 bar ABS
21 - 0 to 1.3 bar ABS
22 - 0 to 7 bar ABS
23 - 0 to 25 bar ABS
24 - 0 to 70 bar ABS
25 - 0 to 300 bar ABS

Output

1 - 4 to 20 mA with HART
2 - Modbus Output
3 - 4 to 20 mA with Two Wires

Thermal Compensation Range

0 - -25°C to 80°C (Standard)
1 - -40°C to 80°C
2 - -50°C to 65°C

Accuracy

0 - ±0.075% of the calibrated range (Standard) - For model 101 only
1 - ±0.05% of the calibrated range - optional
2 - For model no 102, 103 option '0' & '1' is not applicable, accuracy will depend on range of instrument selected, refer detailed catalogue
3 - Special accuracy for models 102 & 103 only

MOC of Wetted Parts

1 - Gold Platted - Thread G1/2'' (male) with Ø4 hole, gold plated diaphragm
2 - Hastelloy - For Threaded process connection
3 - Hastelloy - For Flanged Process Connection
4 - Nickel - Applicable only for CF diaphragm Seal only
5 - SS316L - Standard for all configurations
6 - Tantalum - Applicable only for CF diaphragm Seal only
7 - Titanium - Applicable only for CF diaphragm Seal only

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Ordering Information for Pressure Transmitters & Smart Pressure Transmitters

PPT-101-AL-09-1-0-0-5-01-1-00-1-1-1-00

Process Connection

01 - Thread M20x1,5 (male) with Ø4 hole, wetted parts SS316L
02 - Thread G1/2'' (male) with Ø4 hole, wetted parts SS316L
03 - Thread M20x1,5 (male) with Ø12hole, wetted parts SS316L
04 - Thread G1/2'' (male) with Ø12hole, wetted parts SS316L
05 - Thread G1/2'' (male)with Ø12hole, wetted parts Hastelloy C 276, pressure >=0,25bar
06 - Thread G1/2'' (male)with Ø12hole, wetted parts Hastelloy C 276, pressure < 0,25bar
07 - Thread M30x2 with flush diaphragm, wetted parts SS316L
08 - Thread M30x2 with flush diaphragm, wetted parts Hastelloy C 276
09 - Thread G1'' with flush diaphragm, wetted parts SS316L
10 - Thread G1'' with flush diaphragm, wetted parts Hastelloy C 276
11 - Thread G1/2'' with flush diaphragm, wetted parts SS316L
12 - Thread 1/2''NPT Male,G1/4" Female,wetted parts SS316L/ max set range 690bar
13 - Thread 1/2''NPT Male, wetted parts Hastelloy C 276/max set range 690bar
14 - Thread M20x1.5 with adapter to 1/2"NPT Female, wetted parts SS316L
15 - Diaphragm Seal Process Connection (For model code of Diaphragm Seal, Please refer to our catalogue for Diaphragm Seals "PDS")
16 - Thread G1/4" (male) withØ4 hole, wetted parts SS316L
17 - Thread NPT 1/4" (male) with wetted parts SS316L
18 - Thread G1/2" (male) with radiator
19 - Compatible with Autovalve type F-250-C

Electrical Connection

1 - Packing gland M20x1.5
2 - Thread 1/2" NPT Female
3 - DIN EN 175301-803 connector
4 - M12x1
5 - Electrical Cable - Select Length in Accessories
6 - DIN 43650 connection (Output 4-20mA version only)

Certificates of Pressure Transmitters (Multiple Options Can Be Selected)

00 - Not required
11 - Exia certificate*
12 - Exd certificate *
13 - SIL 1 Certificate
14 - SIL 2 Certificate
15 - SIL 3 Certificate
16 - NACE MR-01-75 certificate

* For complete certificate details please contact **PANAM®** team

IP Rating

0 - IP 66 1 - IP 65 2 - IP 67 3 - IP 68

Testing Certificates

0 - No Test Certificate Required
1 - Callibration Certificate
2 - Callibration Certificate & Hydrostatic Test Certificate
3 - Material Test Certificate, Callibration Certificate & Hydrostatic Test Certificate

Display

0 - Without Display
1 - With Display

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Ordering Information for Pressure Transmitters & Smart Pressure Transmitters

PPT-101-AL-09-1-0-0-5-00-1-00-1-1-1-00

Accessories (Multiple options can be selected)

00 - No accessory required
01 - Mounting Bracket in Galvanised (Zinc Coated) Steel for 2" Pipe
02 - Mounting Bracket in SS 304 for 2" Pipe
03 - Mounting Bracket in SS 316L for 2" Pipe
04 - SS 316 Tag Plate fixed to the housing
05 - SS 316 Tag Plate mounted on wire
06 - 2 Valve Manifold, R Type, 1/2" NPT FxF, Vent 1/4" NPT F, SS316 (2VM-SS-8-R)
07 - 2 Valve Manifold, RM Type, 1/2" NPT MxF, Vent - 1/4" NPT F, SS316 (2VM-SS-8-RM)
08 - 2 Valve Manifold, RM Type, M20x1.5 MxF, Vent - 1/4" NPT F, SS316 (2VM-SS-20M-RM)
09 - 2 Valve Manifold, RM Type, 1/2" BSPP MxF, Vent - 1/4" NPT F, SS316 (2VM-SS-8G-RM)
10 - Needle Valve with Vent, 1/2" NPT MxF, Metal Seat, SS316 (PBB-SB-H-S-08-MF)
11 - Needle Valve with Vent, 1/2" BSP MxF, Metal Seat, SS316 (PBB-SB-H-S-8G-MF)
12 - Needle Valve with Vent, M20x1.5 MxF, Metal Seat, SS316 (PBB-SB-H-S-M20-MF)
13 - Syphon - 1/2" NPT Male x 1/2" NPT Female - Q type
14 - 1/2" NPT Female Flushing Ring
15 - 1/2" NPT Female Flushing Ring With Hex Nipples
16 - Flushing Ring Needle Valve - 1/2'' Male/Female
17 - Flushing Ring Ball Valve - 1/2'' Male/Female
18 - Monoflange - Please add monoflange model code from the "PANAM Double and Block Valve" catalogue after the complete transmitter code using " + " to separate both the models
19 - Sunshade/ Protection box for single transmitter
20 - Sunshade/ Protection box with heating element for single transmitter
21 - Cable at electrical connection (Cable Length - 3m)
22 - Cable at electrical connection (Cable Length - Xm), **required cable length to be specified in place of Xm**

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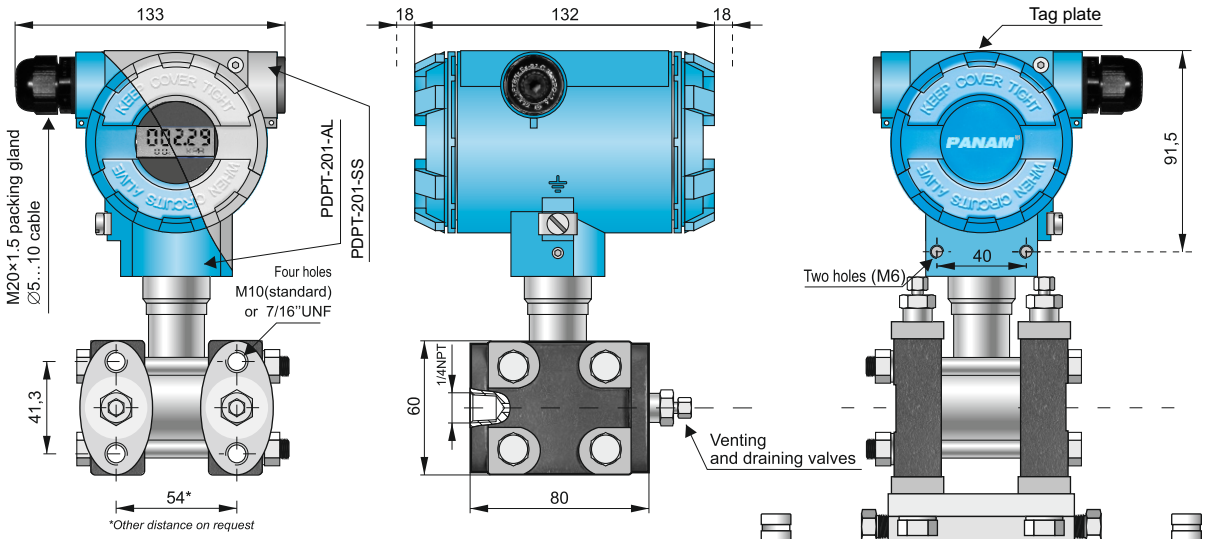
Smart Differential Pressure Transmitter (PDPT-201)

- ✓ **4...20 mA output signal + HART 5 / HART 7 protocol (special version: 0...20 mA or 0...5 mA output signal + HART 5 protocol)**
- ✓ **Display with backlight**
- ✓ **Safety version SIL2/SIL3**
- ✓ **Explosion proof certificate ATEX, IECEx**
- ✓ **Intrinsic safety certificate ATEX, IECEx**
- ✓ **Programmable zero range, shift, adjustment of characteristic and damping ratio with local panel keys**
- ✓ **Static pressure limit up to 1000 bar**
- ✓ **Accuracy 0,075% (0,05%, 0,04% on request)**
- ✓ **Gold plated diaphragms**
- ✓ **Wetted part material 316L / Hastelloy C 276 / Tantalum / Gold Plated**

HART COMMUNICATION PROTOCOL

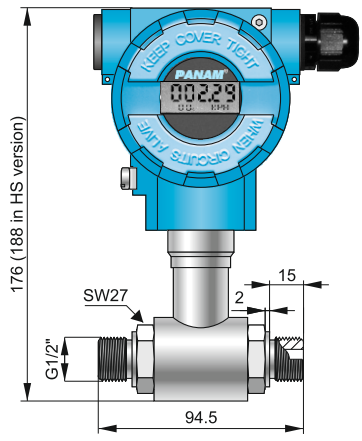
up to 5 years warranty

NOW static pressure limit up to 1000 bar

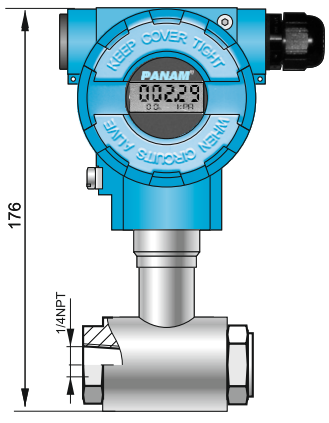


Transmitter **PDPT-201** version with 01,02 Process Connection to be mounted together with a valve manifold

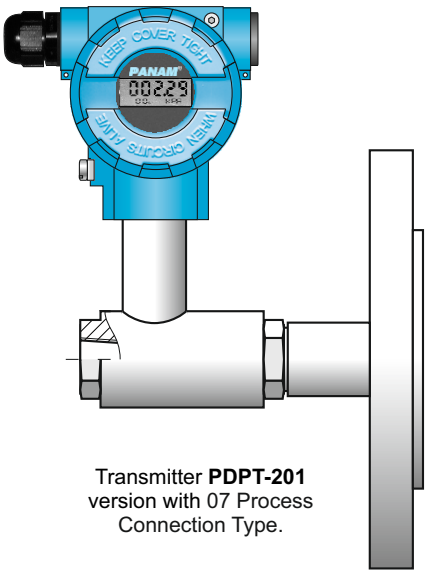
Version with process connection rotated 90°



Transmitter **PDPT-201** version with 05 Process Connection Type.



Transmitter **PDPT-201** version with 06 Process Connection Type.



Transmitter **PDPT-201** version with 07 Process Connection Type.

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Smart Differential Pressure Transmitter (PDPT-201)

Application and construction

The PDPT-201 transmitter is designed for measurement of differential pressure of gases, vapours and liquids. The active element is a piezoresistant silicon sensor separated from the medium by separating diaphragms and a specially selected manometric fluid. The special design of the active sensing element ensures that it is able to withstand pressure surges and static pressure up to 1000 bar. The casing is made of aluminium alloy cast or 316SS stainless steel, degree of protection IP66/IP67. The design of the casing enables the use of a local display, rotation of the display, rotation of the casing by 0-340° relative to the sensor, and a choice of cable direction.

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

(*) .eddl files available on request

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, square root, 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

Installation

The transmitter with 1/2" NPT (F) process connection is not heavy and can be installation without any additional accessory. For installation of the other transmitters on a 2" pipe we recommend using a PANAM® Mounting bracket (for more details of the mounting bracket, please see the ordering information of accessories. The transmitters with process connections 01,02,03,04 are designed for easy and quick installation with 3-5 Valve Manifolds. To order the standard manifolds, please select them in the accessories section of the ordering information. For more customized solutions, please refer PANAM® Manifolds Catalogue. When the special process connections are required for the measurement of specific media levels in closed tanks the transmitters are installed with PANAM® Diaphragm seals. Different combinations of diaphragm seals are described further in 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	Process Connection 01: 250/320/413/600 bar Process Connection 05: 40 bar for range 16 (see ordering information for process connection details on page - 27)
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	
9	-25…25 mbar	(-2,5…2,5 kPa)	2 mbar	(0,2 kPa)	25:1	
10	-7…7 mbar	(-700…700 Pa)	1 mbar	(0,1 kPa)	14:1	

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Technical data

Metrological parameters

Accuracy ≤ ±0,075% of the calibrated range
Special version: ≤ ±0,05% of the calibrated range
(≤ ±0,04%, ≤ ±0,025% on request)

Long term stability ≤ accuracy for 3 years
(for the nominal measuring range) or 2 x accuracy for 5 years
HS Version: ≤ accuracy for 10 years

Thermal error < ±0,05% (FSO) / 10°C for measuring ranges no:- 1 - 9
< ±0,08% (FSO) / 10°C for ranges no. 10
max. ±0,25% (FSO) in the whole compensation range
spec. version for ranges no 1-9:
≤ ±0,03% (FSO) / 10°C
ranges no:- 02, 03, 05, 09, 11, 12, 13, 14, 16
max. ±0,1% (FSO) in the whole compensation range

Thermal compensation range -25…80°C

Zero shift error for static pressure
0,01% (FSO) / 10 bar for ranges no. 3, 4, 5, 6, 7, 9
0,03% (FSO) / 10 bar for range no. 8
0,06% (FSO) / 10 bar for ranges no. 1, 2
0,02% (FSO) / 10 bar for range no. 10
Zeroing the transmitter in conditions of static pressure can eliminate this error.

Additional electronic damping 0…60 s
Error due to supply voltage changes 0,002% (FSO) / V

Operating conditions

Operating temperature range (ambient temp.) -25...85°C
Exia, IS version: -25…80°C
Exd, XP version: -25…75°C
Medium temperature range -25...120°C
Safety, 1000bar version: -25…85°C
PED, 600 bar version: -25...100°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

Electrical parameters

Version	Power supply
standard	10...55 VDC
Exia	10,5…30 VDC
Exd	13,5…55 VDC
Exia/Exd	11,5…30 VDC / 11,5…55 VDC
Safety, Safety Exd	11,5…36 VDC
Safety Exia	11,5…30 VDC
Safety Exia/Exd	11,5…30 VDC / 11,5…36 VDC

Output signal 4...20 mA + HART

Load resistance (for standard version) $R[\Omega] \leq \frac{U_{sup}[V] - 10V}{0{,}0225A}$

Resistance required for communication min. 240 Ω

Materials

Wetted parts Process Connection - 05, 06 - SS 316L
Process Connection - 01, 02 - SS 316L
(see ordering information for process connection details on page - 27)

Diaphragms SS316L
Nickel, Gold and Titanium also available on request

Casing Aluminium
Option: SS316
Material of window: hardened glass

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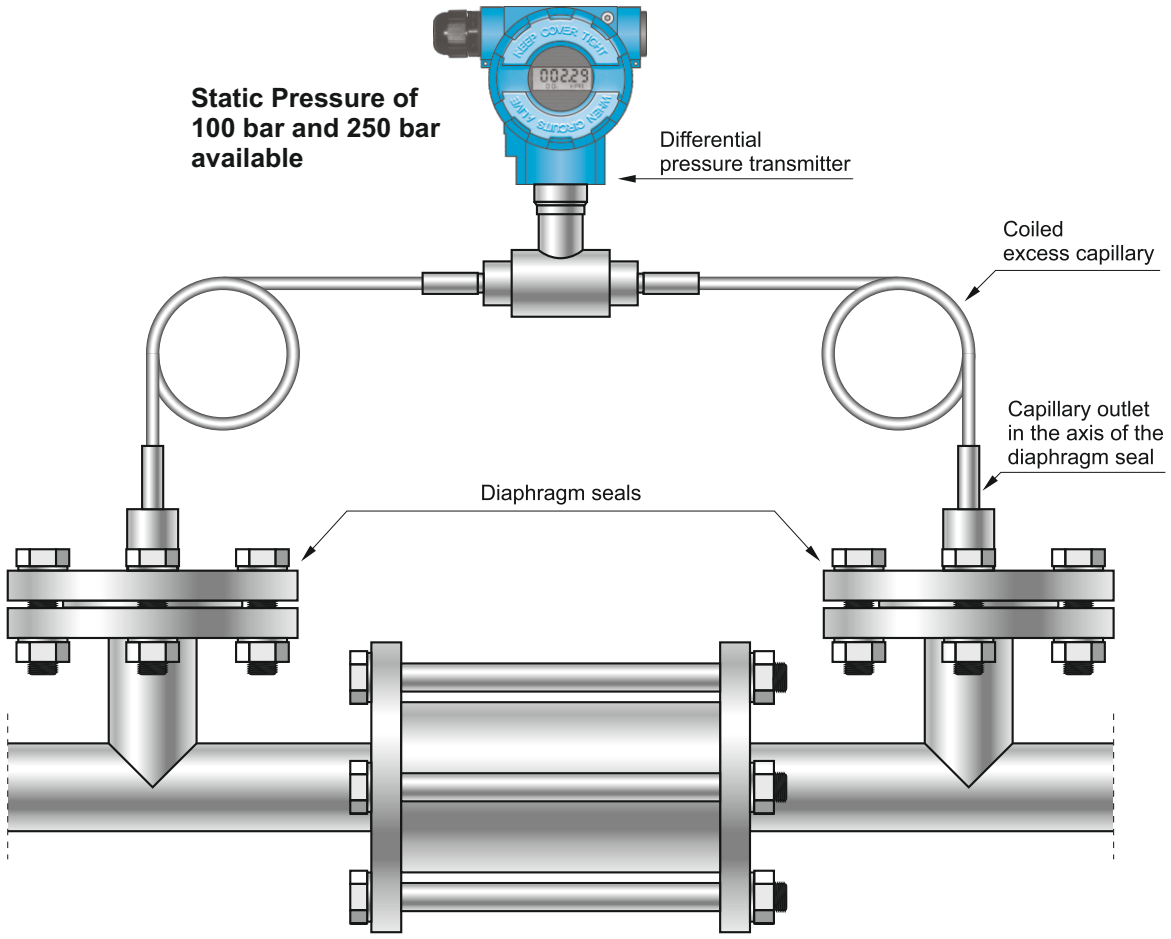
Smart Differential Pressure Transmitter - With Two Remote Diaphragm Seals (PDPT-201-1)

- ✓ 4...20 mA output signal + HART 5 / HART 7 protocol
- ✓ Accuracy 0,1%
- ✓ Safety version SIL2/SIL3
- ✓ Intrinsic safety certificate ATEX, IECEx.
- ✓ Explosion proof certificate ATEX, IECEx.
- ✓ Fully welded sensor guarantees tightness of oil system for many years
- ✓ Ability to configure measuring range locally



Example of a filter loss measurement

Recommendations

The version of the transmitter with two remote diaphragm seals is recommended for the measurement of pressure differences when the hydrostatic pressure of the manometric fluid in the capillaries (which depends on the vertical spacing of the seals) is significantly less than the measuring range of the transmitter. The best measurement results are obtained when the applied capillaries are identical, as short as possible, and terminated with identical seals. At such a configuration additional temperature errors, related to the remote sealing, affect both of the measurement chambers of the differential pressure transmitter in the same way, and thus cancel each other out.

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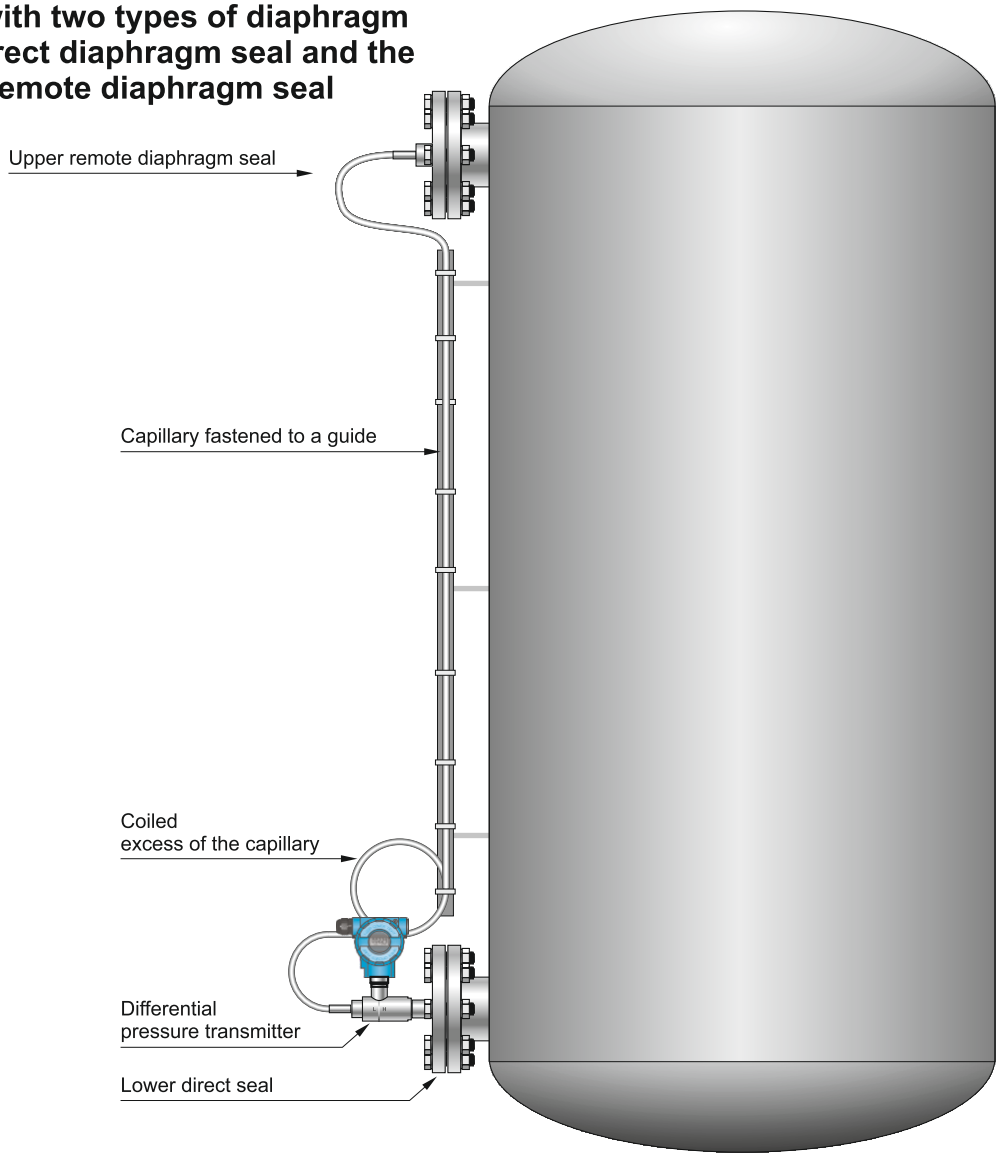
Transmitter with two types of diaphragm seal: one – direct diaphragm seal and the other – remote diaphragm seal



Example of measurement of the level in a pressure tank

Recommendations

The transmitter with a direct diaphragm seal (connected to the positive measurement chamber) and a remote diaphragm seal (connected to the negative chamber) is recommended for hydrostatic measurements of: levels, densities, phase boundaries and pressure differences (with differentiated height of pulse source points*).

In such a configuration, at ambient temperature changes, two opposite phenomena appear concurrently.

Thermal expansion causes the change in the volume (and hence also the change in density) of the manometric fluid in the capillary, which results in a change of the hydrostatic pressure related to the vertical spacing of the seals.

This phenomenon is counteracted by the elastic reaction of the diaphragm of the upper diaphragm seal, which is displaced by the change in volume of manometric fluid. Based on tests and experiments, the transmitters are provided with carefully selected seal diaphragms, which guarantee compensation of the errors resulted from the ambient temperature changes.

The best metrological results are obtained using assembly, which include DN 80, DN 100 and PDS-TD diaphragm seals with a diameter of at least 65 mm, where the length of the capillary is (1 to 1.3) × (vertical spacing of seals). It is recommended using identical diaphragm seals at the both upper and lower connection points.

* The difference in height of pulse source points, at which the hydrostatic pressure of the manometric fluid is comparable to or greater than the range of the transmitter.

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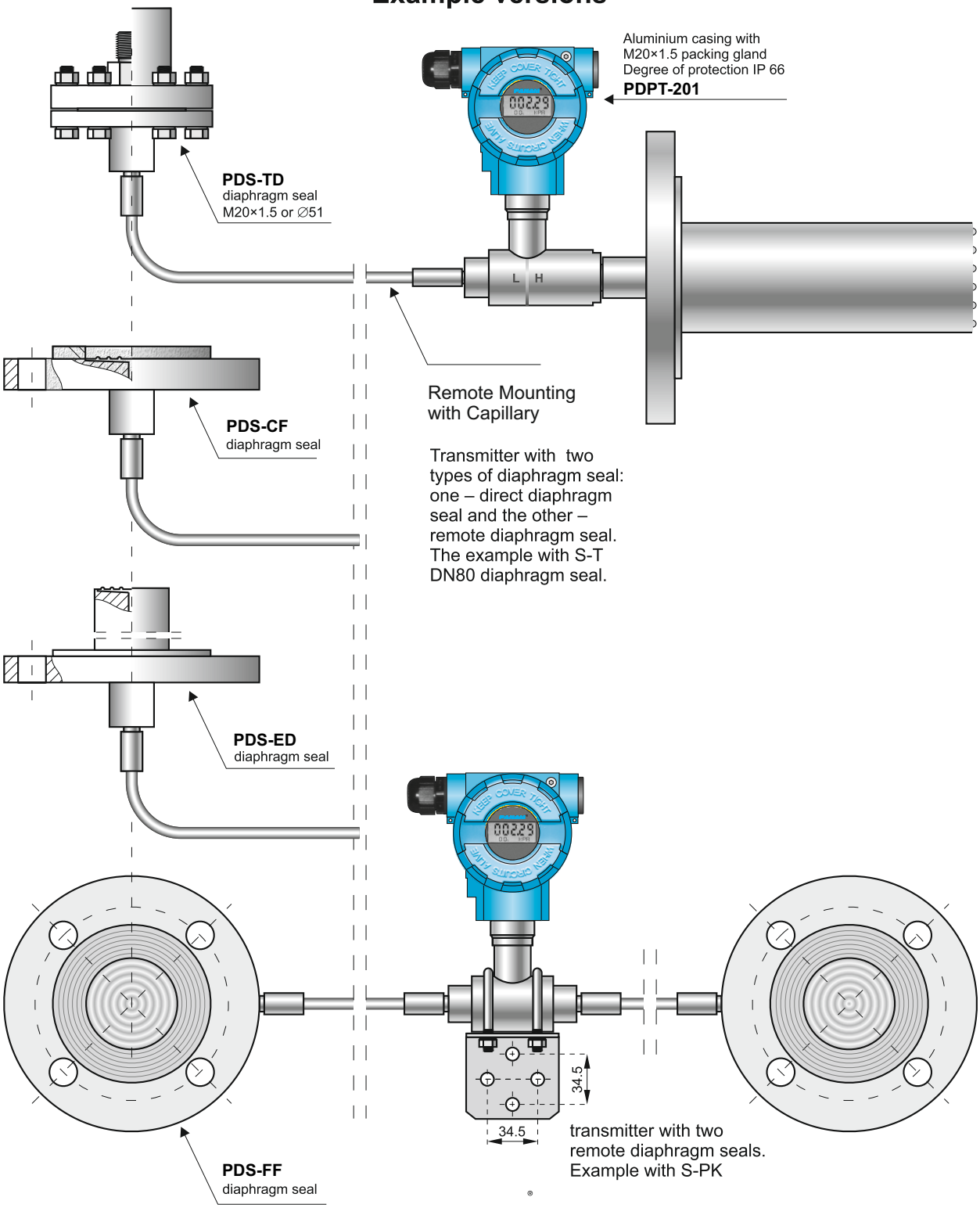
Smart Differential Pressure Transmitter - Double Diaphragm Seal (PDPT-201)

Example versions



Note: The appropriate configuration of the complete set of pressure transmitter, diaphragm seals and capillaries, as well as the proper selection of manometric fluid, depends on several factors, including the physical and chemical properties, temperature range of the medium, the vertical spacing of the diaphragm seals, the measuring range, static pressure range, range of ambient temperatures and the technical specifications for mechanical connection of the diaphragm seals to the pressure devices.

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Smart Differential Pressure Transmitter - Double Diaphragm Seal (PDPT-201)

Application and construction

The differential pressure transmitter is applicable to the measurement of pressure differences of: gases, vapours and liquids in cases where it is necessary to use seals and the pressure pulse source points may be several metres apart. Typical applications include the hydrostatic measurement of: levels in closed tanks, densities and phase boundaries, and the measurement of a filter loss, pressure differences between media in pasteurisers etc. The available range of the diaphragm seals allows measurement at great majority of media. The active element is a piezoresistant silicon sensor separated from the medium by a distance sealing system. The special design of the measuring unit means that it can withstand pressure surges and overloads of up to 40 bar. The electronic circuits are enclosed in a casing with a degree of protection IP 65 or IP66.

Configuration

The settings of the following metrological parameters can be changed:

- ♦ the units of pressure in which the range is configured,
- ♦ start and end points of the range, time constant,
- ♦ inverted characteristic (output signal 20 ÷ 4 mA).

Communication

The transmitter is configured and calibrated using a KAP-03 communicator, some other communicators (HART) or a PC using an HART/USB converter and Aplisens RAPORT 2 configuration software.

The data interchange with the transmitter enables the users the transmitter identification, as well as reading of the currently measured differential pressure value, output current and percent of range width.

Measuring ranges

Nominal measuring range (FSO)	Minimum set range	Vertical spacing of diaphragm seals	Maximum set range width, considering the actual vertical spacing of the diaphragm seals (m)	Static pressure limit
-160…160 mbar	0,1 m H_2O	≤ 1,7 m	[1,6 + (vertical spacing of seals × 0,94)] m H_2O	40 bar
-0,5…0.5 bar	0,5 m H_2O	≤ 6 m	[5 + (vertical spacing of seals × 1,04)] m H_2O	40 bar
-1,6…2 bar	1,5 m H_2O	≤ 15 m	[20 + (vertical spacing of seals × 1,04)] m H_2O	40 bar
-1,6…16 bar	1 bar	≤ 15 m	16 bar	40 bar

CAUTION: The maximum vertical diaphragm seal spacing shown in the table applies to level measurement, ensuring that it is possible to set the zero point of the transmitter when the tank is empty. For measurements of density or phase boundaries (in the sugar, chemical or refinery industries) the vertical spacing of the diaphragm seals can be larger.

Metrological parameters

Accuracy ≤ ±0.1% (FSO)
The other parameters as given in the sheet for the smart differential pressure transmitter PDPT-201

Sealing effect errors – as given in the relevant diaphragm seal sheet in chapter III (Diaphragm Seals), concerning the distance seal.

NOTE: The additional absolute zero error due to ambient temperature can be compensated by configuring the transmitter, seals and capillaries

Electrical parameters

As given in the sheet for the PDPT-201 differential pressure transmitter.

Operating conditions

Operating temperature range (ambient temperature) -25...85°C
Exia version: -25...80°C
Exd version: -25...75°C

Medium temperature range – as given in the appropriate diaphragm seal sheet (remote seal)

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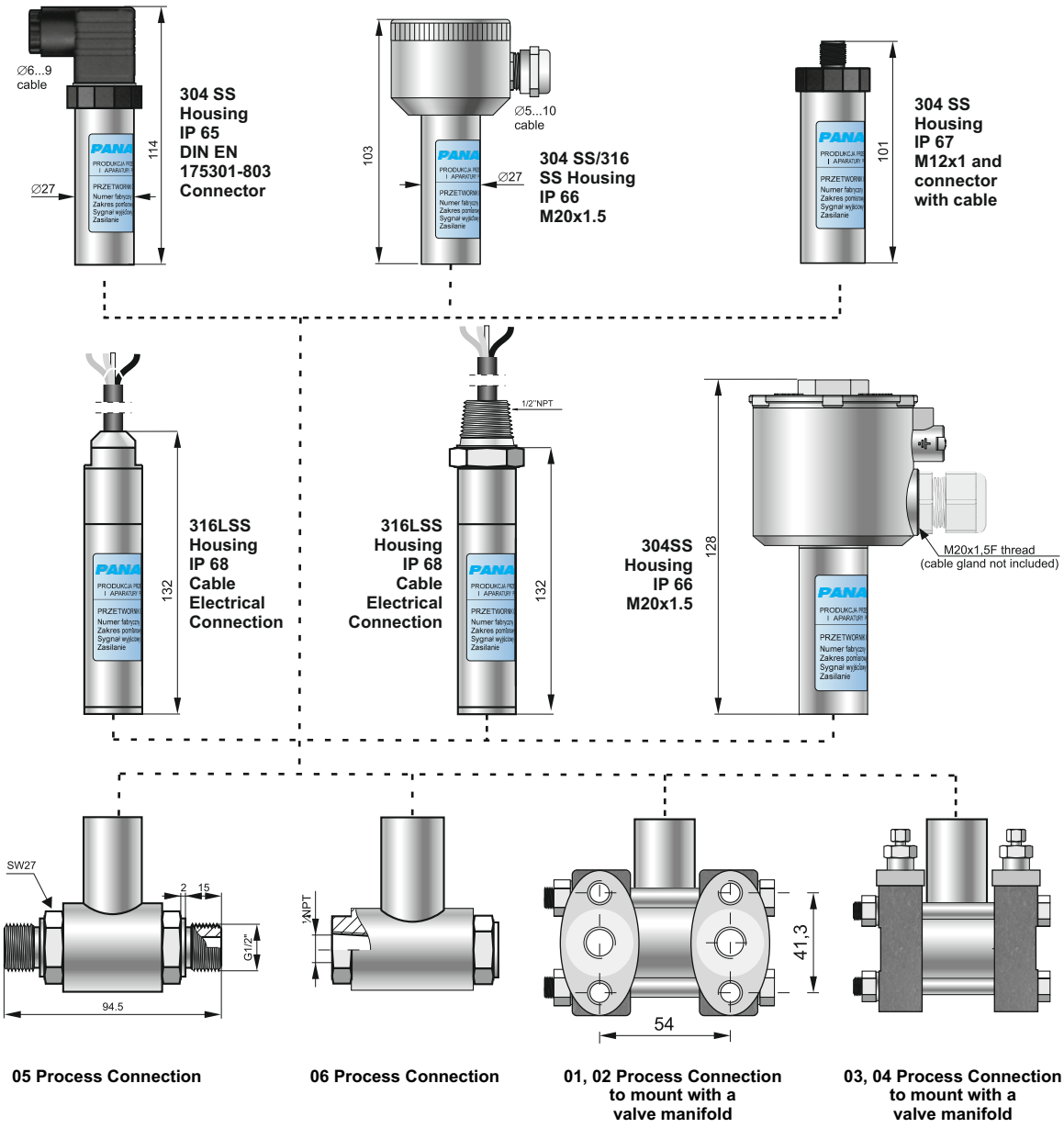
Smart Differential Pressure Transmitter - Compact Type (PDPT-202)

HART COMMUNICATION PROTOCOL

- ✓ 4...20 mA output signal + HART protocol
- ✓ Intrinsic safety certificate (ATEX, IECEx)
- ✓ Explosion proof certificate (ATEX, IECEx)
- ✓ Static pressure limit up to 413 bar
- ✓ Accuracy 0,1%
- ✓ Wetted parts material 316L



05 Process Connection

06 Process Connection

01, 02 Process Connection to mount with a valve manifold

03, 04 Process Connection to mount with a valve manifold

For details of process connection see ordering information on page - 25

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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	Process Connection: 01 / 02 - 250/320/413 bar Process Connection: 05 - 40 bar (for range 0 to 70 bar) For details of process connection see ordering information page
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 ≤ ±0,1% of calibrated range

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

Thermal error < ±0,08% (FSO) / 10°C
max. ±0,3% (FSO) in the whole compensation range

Thermal compensation range -25…80°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 (Exia & Exd, 7.5...30 VDC)

Output signal 4...20 mA + HART

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

Resistance required for communication min. 240 Ω

Materials

Wetted parts SS316L

Diaphragms SS316L, others available upon request

Casing: SS304
Optional: SS316

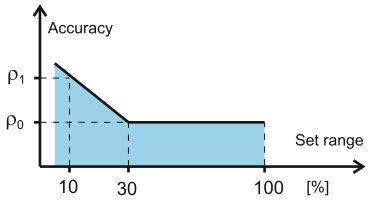
Operating conditions

Operating temperature range (ambient temp.) -25...85°C
Exia version -25…80°C

Medium temperature range -25...120°C
over 120°C – Measurement with impulse line or diaphragm seals is recommended
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

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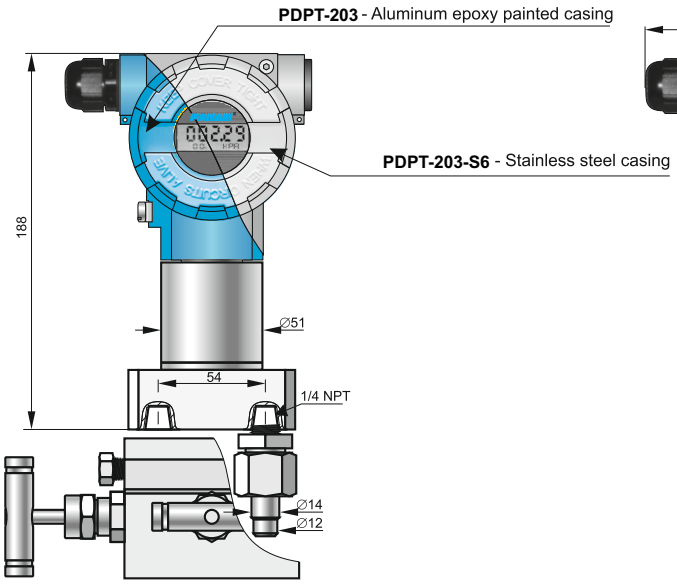
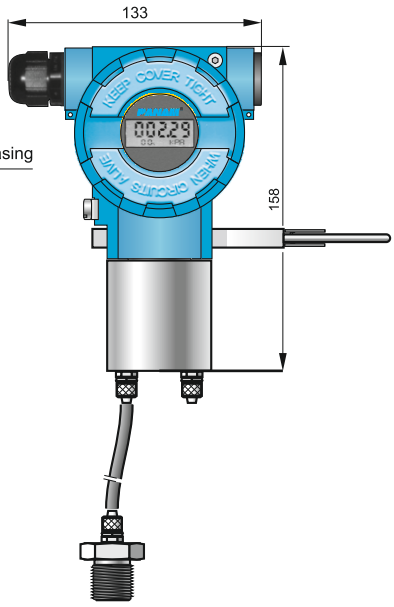
Smart Differential Pressure Transmitter - Low Pressure Measurement (PDPT-203)

HART COMMUNICATION PROTOCOL

- ✓ **4...20 mA output signal + HART protocol**
- ✓ **Display with backlight**
- ✓ **Programmable range, zero shift, damping ratio and characteristic with local panel keys**
- ✓ **Selectable linear or radical conversion characteristic**
- ✓ **Accuracy from 0,1%**
- ✓ **Intrinsic safety certificate (ATEX, IECEx)**
- ✓ **Explosion proof certificate (ATEX, IECEx)**
- ✓ **Safety version SIL2/SIL3**



PDPT-203 Industrial Version,
01 process connector to be
mounted along with a valve manifold



PDPT-203 Economic Version,
process connection with terminal
connecting to ∅ 6 pipe
08 process connection

Application

The PDPT-203 transmitter is applicable to the measurement of differential pressure of gases. Typical applications include the measurement of blast pressure, chimney draughts or pressure / underpressure in furnace chambers. The ability to select the radical conversion characteristics enables the transmitter to be used in gas-flow measurement systems using reducing pipes or other impeding elements. The transmitter can withstand overpressure up to 1 bar. The housing of the electronic circuit has the degree of protection IP66/IP67.

Configuration, calibration

The following parameters can be configured:

- ♦ The units of pressure,
- ♦ Start and end-points of measuring range, damping time constant,
- ♦ Conversion characteristic (inversion, user's non-linear characteristic).

Ability to calibrate the transmitter with reference to a standard pressure.

Communication

Communication with the transmitter is carried out with a KAP-03 communicator, some other Hart communicators or a PC with an Hart/USB converter and RAPORT 2 configuration software.

Additionally, the data interchange with the transmitter enables the users to identify the transmitter, read the currently measured pressure difference value, output current and percentage of measuring range.

Installation

The economical version can be mounted on any stable construction using the mounting bracket. The transmitter's connection shanks have terminals to be connected to the elastic Ø6×1 impulse line. Where the process measurement comes through a metal pipe, we suggest an M20×1.5 adapter for a Ø6×1 fitting using.

The transmitter with 01 process connection should be mounted on a 3-valve and 5-valve manifold. We recommend **PANAM**® Manifolds as listed in the accessories section of the ordering information.

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Operating guidelines

The transmitter should be mounted in a vertical position. The impulse lines should be connected in such a way that any condensed liquids drains away from the device.
Where there is a significant difference in height between the place where the transmitter is mounted and the place where the measurement (Taping) is taken, the measurement may vary with the temperature of the impulse line. Connecting a compensating pipe close to the impulse line, from the transmitter's reference connection shank to the height at which the impulse is taken can minimise this effect.
To prevent dust from entering the measuring cells, the impulse lines should be attached with care, with particular attention should be given to the tightness of the connections between the impulse lines and the transmitter.

Measuring ranges

Nominal measuring range (FSO)	Minimum set range	Overpressure limit	Static pressure limit
0...25 mbar (0...2500 Pa)	1 mbar (100 Pa)	1 bar	350 mbar
-2,5...2,5 mbar (-250...250 Pa)	0,2 mbar (20 Pa)	350 mbar	350 mbar
-7...7 mbar (-700...700 Pa)	1 mbar (100 Pa)	350 mbar	350 mbar
-25...25 mbar (-2500...2500 Pa)	5 mbar (500 Pa)	1 bar	1 bar
-100…100 mbar (-10...10 kPa)	20 mbar (2 kPa)	1 bar	1 bar

Meterological parameters

Nominal range	0...25 mbar	-2,5...2,5 mbar	-7...7 mbar	-25...25 mbar	-100…100 mbar
Accuracy	≤ ±0,075%	≤ ±0,25%	≤ ±0,1%	≤ ±0,1%	≤ ±0,075%

Thermal error < ±0,1% (FSO) / 10°C
max. ±0,4% (FSO) in the whole compensation range
Thermal compensation range -10…70°C
Additional electronic damping 0…30 s
Error due to supply voltage changes 0,002% (FSO) / V

Electrical parameters

Power supply 10...55 VDC (Exia 10,5...30 V DC)
Safety: 11,5...36 VDC (Exia 11,5...30 V DC)

Output signal 4...20 mA + HART

Load resistance (for standard version) $R[\Omega] \leq \frac{U_{sup}[V] - 10V}{0{,}0225A}$

Resistance required for communication min. 240 Ω

Operating conditions

Operating temperature range (ambient temp.) -30...85°C

Materials

Casing	Aluminium option: 316 SS
adapter 01\02 process connection	304 SS
adapter 08 process connection	brass

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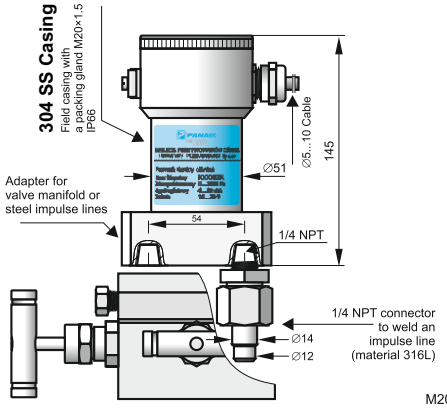
Smart Differential Pressure Transmitter - Low Pressure Measurement (PDPT-204)

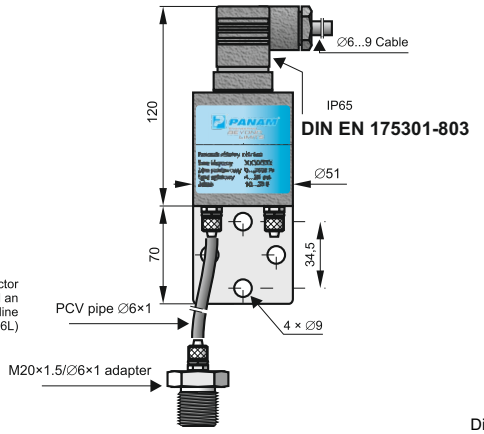
HART COMMUNICATION PROTOCOL

- ✓ **Programmable range, zero shift, damping ratio and characteristic**
- ✓ **4...20 mA output signal + HART protocol**
- ✓ **Accuracy from 0.1%**
- ✓ **ATEX Intrinsic safety**

min. range **0.2 mbar**



PDPT-204 Industrial Version, 01 process connector to be mounted along with a valve manifold an example with M20X1.5 Electrical Connection



PDPT-204 Economic Version, process connection with terminal connecting to ∅6 pipe (process connection - 08) An example with DIN EN 175301-803 Electrical Connection

PDPT-204 wall-mounted version with display and local keys allowing programming, process connection - 08 and electrical connection - 5
Dimensions: width: 80, height: 110, depth: 67

Application

The PDPT-204 transmitter is applicable to gases, for the measurements of their pressure, underpressure and differential pressure. Typical applications include the measurement of blast pressure, chimney draughts or pressure / underpressure in furnace chambers. The ability to select the radical conversion characteristics enables the transmitter to be used in gas-flow measurement systems using reducing pipes or other impeding elements. The transmitter can withstand overpressure up to 1 bar. The housing of the electronic circuit has the degree of protection IP65, IP66 , IP67.

Configuration, calibration

The following parameters can be configured:

- ♦ The units of pressure,
- ♦ Start and end-points of measuring range, damping time constant,
- ♦ Conversion characteristic (radical, inversion, user's non-linear characteristic).

Ability to calibrate the transmitter with reference to a standard pressure.

Communication

Communication with the transmitter is carried out with a KAP-03 communicator, some other Hart communicators or a PC with an HART/USB converter and RAPORT 2 configuration software.

Additionally, the data interchange with the transmitter enables the users to identify the transmitter, read the currently measured pressure difference value, output current and percentage of measuring range.

Installation

The economical version can be mounted on any stable construction using the assembly fixture with ∅9 opening. The transmitter's connection shanks have terminals to be connected to the elastic ∅6×1 impulse line. Where the pulse comes through a metal pipe, we suggest an M20×1.5 adapter for a ∅6×1 fitting using.

The transmitter with 08 process connection should be mounted on a 3-valve and 5-valve manifold. We recommend to use **PANAM**® pre assembled transmitters with Valve Manifolds type valves

Operating guidelines

The transmitter should be mounted in a vertical position. The impulse lines should be connected in such a way that any condensed liquids drains off away from the device.

Where there is a significant difference in height between the place where the transmitter is mounted and the place where the tapping is taken, the measurement may vary with the temperature of the impulse line. Connecting a compensating pipe close to the impulse line, from the transmitter's reference connection shank to the height at which the impulse is taken can minimise this effect.

To prevent dust from entering the measuring cells, the impulse lines should be attached with care, with particular attention to the tightness of the connections between the impulse lines and the transmitter.

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Smart Differential Pressure Transmitter - Low Pressure Measurement (PDPT-204)

Measuring ranges

Nominal measuring range (FSO)	Minimum set range	Overpressure limit	Static pressure limit
0...25 mbar (0...2500 Pa)	1 mbar (100 Pa)	1 bar	350 mbar
-2,5...2,5 mbar (-250...250 Pa)	0,2 mbar (20 Pa)	350 mbar	350 mbar
-7...7 mbar (-700...700 Pa)	1 mbar (100 Pa)	350 mbar	350 mbar
-25...25 mbar (-2500...2500 Pa)	5 mbar (500 Pa)	1 bar	1 bar
-100…100 mbar (-10...10 kPa)	20 mbar (2 kPa)	1 bar	1 bar

Meterological parameters

Nominal range	0...25 mbar	-2,5...2,5 mbar	-7...7 mbar	-25...25 mbar	-100…100 mbar
Accuracy	≤ ±0,075%	≤ ±0,25%	≤ ±0,1%	≤ ±0,1%	≤ ±0,075%

Technical data

Thermal error < ±0,1% (FSO) / 10°C
max. ±0,4% (FSO) in the whole compensation range

Thermal compensation range -10…70°C

Additional electronic damping 0…30 s

Error due to supply voltage changes 0,002% (FSO) / V

Electrical parameters

Power supply

PDPT-204 (M20x1.5 DIN 175301-803) 7,5...55 VDC (Exia 7,5...30 VD C)

PDPT-204 (Process connection 08) 10...55 VD C

Output signal 4...20 mA + HART

Load resistance $R[\Omega] \leq \frac{U_{sup}[V] - U^*}{0{,}0225A}$

U* - PDPT-204 (M20x1.5 DIN 175301-803) 7,5 VD C

PDPT-204 (Process connection 08) 12 VD C

Resistance required for communication min. 240 Ω

Operating conditions

Operating temperature range (ambient temp.) -30...85°C
Exia version: -25...80°C
PDPT-204 Wall Mounted Version -25...60°C

Materials

PDPT-204 (M20x1.5 DIN 175301-803)

Casing SS304
adapter 01 process connection SS304
adapter 08 process connection brass

PDPT-204 Wall Mounted Version
Casing plastic box

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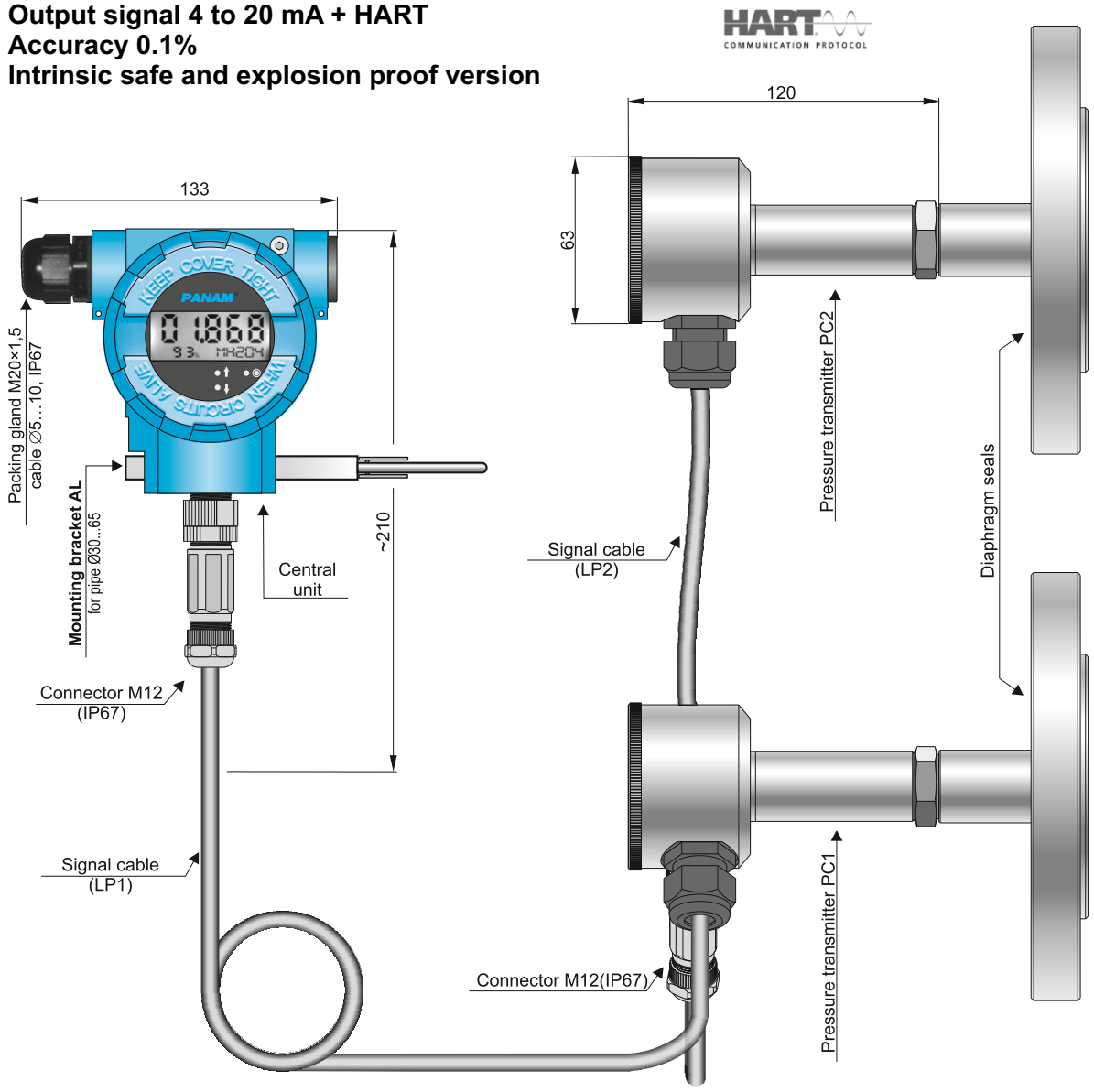
Smart Differential Pressure Transmitter for Level Measurement (PDPT-205)

- ✓ **Measurement of differential pressure based on two absolute pressure transmitters**
- ✓ **Applicable for measurement of level in pressure tanks**
- ✓ **Modular construction with possibility of replacement of each module of the measuring system**
- ✓ **Output signal 4 to 20 mA + HART**
- ✓ **Accuracy 0.1%**
- ✓ **Intrinsic safe and explosion proof version**



Measuring ranges

No.	Nominal measuring range (FSO)	Minimum set range (differentia pressure)	Admissible overpressure for pressure transmitters PC1 and PC2 (without hysteresis)	Static pressure limit (depending on the set range of differential pressure)	Measuring ranges of pressure transmitters PC1 and PC2
1	0…1 bar	100 mbar	25 bar	-0.9…(1,5-URV) bar	2.5 bar ABS
2	0…6 bar	250 mbar	40 bar	-0.9…(15-URV) bar	16 bar ABS
3	0…60 bar	1 bar	160 bar	-0.9…(99-URV) bar	100 bar ABS

Note: if the pressure rating of diaphragm seal is lower than the values given in the table then it should be considered as acceptable for PC1 and PC2 transmitters

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Smart Differential Pressure Transmitter for Level Measurement (PDPT-205)

Application and construction

Modular electronic differential pressure transmitter PDPT-205 is applicable to hydrostatic measurement of level in closed tanks, density or phase boundary.
The measuring system consists of 3 separate modules - central unit and two absolute pressure transmitters. Level is calculated in central unit based on measurement from two pressure transmitters. High pressure transmitter measures hydrostatic pressure of liquid in tank, low pressure transmitter measures pressure of gases above the liquid. Differential pressure is calculated in the central unit. With default settings of central unit function of high pressure transmitter is designed for transmitter directly connected with central unit. User can change this assignment to second transmitter by changing configuration in central unit in local menu or via HART protocol. Measuring points can be several dozen meters apart.
The casing of central units is made of aluminium alloy cast or stainless steel with degree of protection IP66 or IP67 equipped with local display and buttons for configuration.
Measuring element of each of absolute pressure transmitters is piezoresistant silicon sensor separated from the medium by diaphragm and manometric liquid. Process connection of absolute pressure transmitters can be diaphragm seal or threaded flush connection. By using diaphragm seals transmitters can be used for measurement of contaminated medium, medium with high viscosity, very hot or very cold medium or medium where sanitary process connection is needed.
Electronic units of pressure transmitters are closed in sealed stainless steel casings with degree of protection IP 67.
All modules of measuring system are connected with electric cables (length of cables is specified by user).

This system is an alternative for differential pressure transmitter with two remote diaphragm seals connected with capillaries filed with silicon oil used in measurement of level on closed tank. The advantage of PDPT-205 is modularity of measuring system. By using M12 connection in case of any malfunction user has possibility to replace each of three modules. Furthermore measurement is free of additional errors caused by the temperature gradient in the oil-based diaphragm sealing system.
PDPT-205 transmitter gives not only information about differential pressure but also about static pressure and temperature (both transmitters and central unit)

Communication and configuration

The communication standard for data interchange with the transmitter is HART protocol. Communication with the transmitter is carried out with a PC computer using HART/USB converter and RAPORT 2 configuration software. There is also possibility of configuration using buttons and local display.
The data interchange with transmitter enables user to:

- identify the transmitter;
- setting LRV and URV by numeric value or by given pressure;
- zeroing of differential pressure measurement;
- change of measurement units;
- change of conversion characteristic;
- change of display configuration;
- Reading of differential pressure, static pressure of each of transmitters, temperature of central unit and each of transmitters;
- Reading of output signal in mA or percentage of measuring range;
- change of assignation of high and low pressure transmitters (PC1 and PC2);
- reset to factory settings.

Metrological parameters

Accuracy	≤ ±0,1%
Long term stability (for the nominal measuring range)	≤ accuracy for 3 years
Thermal error (including errors from diaphragm seal)	< ±0,1% (FSO) / 10°C
Thermal compensation range	-25...80°C
Processing time (calculation cycle period)	0.5 sec
Additional electronic damping	0...60 s (factory setting: 2 s)
Error due to supply voltage changes	0.002% (FSO) / V

Electrical parameters

Power supply (standard version)	13...55 V DC
Output signal	4 to 20 mA +Hart 7
Load resistance	$R[\Omega] \leq \frac{U_{SUP.}[V]-13V}{0{,}0225A}$
Resistance required for communication	min 240 Ω

Operating conditions

Operating temperature range (ambient temp.)	-30...85°C
special version	-40...85°C
Maximum medium temperature	150°C
special version	200°C

Construction, materials

Wetted parts	acc. to diaphragm seal datasheets
Casing:	
central unit	Aluminium option: SS316
pressure transmitters	SS304
Ingress protection class	IP67

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Ordering Information (Smart Differential Pressure Transmitters)

PDPT-201-AL-01-1-1-01-1-1-00-0-0-0-00-XXX

Model

PDPT - **PANAM**® Differential Pressure Transmitter

Model Description

201 - Smart Differential Pressure Transmitter
201-1 - Smart Differential Pressure Transmitter with two remote diaphragm seal
201-2 - Smart Differential Pressure Transmitter with two diaphragm seal (One direct and one remote)
202 - Smart Differential Pressure Transmitter (Compact Model)
203 - Smart Differential Pressure Transmitter - Low Pressure (SIL Version Available)
204 - Smart Differential Pressure Transmitter - Low Pressure measurement
205 - Smart Differential Pressure Transmitter for Level measurement

Material of Construction of Housing

AL - Aluminum
S4 - SS304 - Stainless Steel
S6 - SS316 - Stainless Steel

Range

01 - -160 to 160 mbar
02 - -100 to 100 mbar
03 - -25 to 25 mbar
04 - -7 to 7 mbar
05 - -5 to 70 mbar
06 - -2.5 to 2.5 bar
07 - -1.6 to 2 bar
08 - -1.6 to 16 bar
09 - -0.5 to 0.5 bar
10 - -0.1 to 0.1 bar
11 - 0 to 2.5 bar
12 - 0 to 1 bar
13 - 0 to 2.5 bar
14 - 0 to 2.5 bar
15 - 0 to 25 bar
16 - 0 to 70 bar
17 - 0 to 10 mH2O (Over Pressure Range is 25 bar)
18 - 0 to 60 mH2O (Over Pressure Range is 40 bar)
19 - 0 to 25 mbar
20 - -2.5 to 2.5 mbar

Output

1 - 4 to 20 mA with HART
2 - 4 to 20mA

Accuracy

0 - ±0.075% of the calibrated span (Standard) - Only for Model PDPT-201
1 - ±0.05% of the calibrated span
2 - ±0.01% of the calibrated span
3 - Std as per selected range and model (For all models)
4 - Special version as per selected range and model (For all models)

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Ordering Information (Smart Differential Pressure Transmitters)

PDPT-201-AL-01-1-1-01-1-1-00-0-0-0-00-XXX

Process Connection

- 01 - Thread 1/4NPT F on the cover flanges cover flanges material SS 316. Process connection of cover flange: M10
- 02 - Thread 1/4NPT F on the cover flanges cover flanges material SS 316. Process connection of cover flange: (7/16) -7/16"UNF
- 03 - 01 Type process connection (90° Rotated)
- 04 - 02 Type process connection (90° Rotated)
- 05 - Thread G1/2'' (male)
- 06 - Thread 1/4"NPT (female)
- 07 - Diaphragm Seal Process Connection, Please refer to PANAM® catalogue for Diaphragm Seals "PDS"
- 08 - Process connection with terminal connecting for Ø6mm elastic pipe

Gasket

1 - FKM - Standard Option 2 - NBR 3 - PTFE 4 - No Gasket

Electrical Connection

- 1 - Packing gland M20x1,5
- 2 - Thread 1/2" NPT Female
- 3 - DIN EN 175301-803 connector
- 4 - Packing Gland M12x1
- 5 - Electrical Connector PG-7

Certificates of Pressure Transmitters

- 00 - Not required
- 11 - Exia Certificate*
- 12 - Exd Certificate*
- 13 - SIL 1 Certificate
- 14 - SIL 2 Certificate
- 15 - SIL 3 Certificate
- 16 - NACE MR-01-75 certificate

* For complete certificate details please contact PANAM team

IP Rating

0 - IP 66 1 - IP 65 2 - IP 67 3 - IP 68

Testing Certificates

- 0 - No Test Certificate Required
- 1 - Callibration Certificate
- 2 - Calibration Certificate & Hydrostatic Test Certificate
- 3 - Material Test Certificate, Calibration Certificate & Hydrostatic Test Certificate

Display

0 - Without Display 1 - With Display

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Ordering Information (Smart Differential Pressure Transmitters)

PDPT-201-AL-01-1-1-01-1-1-00-0-0-0-00-XXX

Accessories

00 - No accessory required
01 - 3-valve manifold, PTFE packing, 1/2''NPTF process connection, M10 screws for transmitter assembling
02 - 3-valve manifold, PTFE packing, 1/2''NPTF process connection, 7/16 UNF screws for transmitter assembling
03 - 5-valve manifold, PTFE packing, 1/2''NPTF process connection, M10 screws for transmitter assembling
04 - 5-valve manifold, PTFE packing, 1/2''NPTF process connection, 7/16 UNF screws for transmitter assembling
05 - Mounting bracket for 2” pipe, mat. zinced steel
06 - Mounting bracket for 2” pipe, mat. Stainless Steel
07 - Stainless Steel Tag Plate Fixed to the housing
08 - Stainless Steel Tag plate mounted on wire
09 - Static pressure 320 bar
10 - Static pressure 413 bar
11 - Static pressure 600 bar
12 - Cable at electrical connection (Cable Length - 3m)
13 - Surge arrestor (With Exia Version only)
14 - Set of adapters from Ø 6mm elastic pipe for M20x1,5 M thread (only version with 08)

Applicable Only for 205 PDPT

XXX - C1 Cable Length
XXX - C2 Cable Length

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Ordering Information (Diaphragm Seal)

PDS-FF-SSL-0-1-01-100-D01-01

Number of Valves

PDS - PANAM® Diaphragm Seal

Model Description

FF - Flange Flush
ED - Extended Diaphragm
TD - Threaded Diaphragm
CF - Chemical Flange with Flush Diaphragm

Material of Construction of Wetted

SSL - SS 316L
HC - Hastelloy C276
NI - Nickel
TA - Tatalum
TI - Titanium

PTFE Coating

0 - No
0 - Yes

Diaphragm Seal No

1 - Single - Diaphragm Seal Model
2 - Dual - Diaphragm Seal Model

Process Connection

01 - 2" 150 RF
02 - 3" 150 RF
03 - 4" 150 RF
04 - 2" 300 RF (SS 316L)
05 - 3" 300 RF (SS 316L)
06 - 4" 300 RF (SS 316L)
07 - 2" 600 RF (SS 316L)
08 - 3" 600 RF (SS 316L)
09 - DN50 PN40 (SS 316L)
10 - DN80 PN 40 (SS 316L)
11 - DN100 PN40 (SS 316L)
12 - 1/2" NPT Male (SS 316L)
13 - 1/2" BSPP Male (SS 316L)
14 - 2" 900 RF (SS 316L)
15 - 2" 1500 RF (SS 316L)
16 - 3/4" 150 RF (SS 316L)

Flange Extension Length

000 - No Extension
050 - 50 mm
100 - 10 mm
150 - 150 mm
XXX - Customized Length Available upon request, customer to provide the exact value

Capillary

D00 - Direct Mounting
R05 - 5 m
R10 - 10 m
R20 - 20 m
RXX - Customized Length Available upon request, customer to provide the exact value

Accessories

01 - 1/2" NPT Female Flushing Ring
02 - 1/2" NPT Female Flushing Ring with Hex Nipples
03 - Flushing Ring Needle Valve - 1/2" Male/Female
04 - Flushing Ring Ball Valve - 1/2" Male/Female

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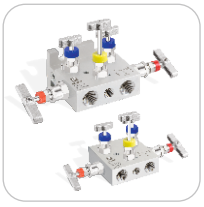
Notes

Other Products


2-3-5 VALVE MANIFOLDS


BELLOW SEAL VALVES


GAUGE ROOT VALVES


NEEDLE VALVES


HP NEEDLE VALVES


BALL VALVES


HP BALL VALVES


DOUBLE BLOCK & BLEED VALVES


MONO FLANGE VALVES


CHECK VALVES


RELIEF VALVES


FILTERS


TUBE FITTINGS


PIPE FITTINGS


HP PIPE FITTINGS


SWIVEL FITTINGS


JIC FITTINGS


WELD FITTINGS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