



SMART PRESSURE TRANSMITTER BPT3251 (with HART® Protocol)

- 4 – 20, 0-20 or 0-5mA output + HART® Protocol
- Digital PROFIBUS PA signal
- 0.075% (0,05% accuracy on request)
- Rangeability 100:1
- 0 - 0,0005 bar (0-0,5kPa) till -1/0 - 1000 bar
- ATEX Certificate Exia and Exd
- Local zero, span and damping adjustment
- ATEX, IECEx Certificate Exia and Exd
- Display with backlight
- SIL 2 certificate
- Marine certificate-DNV, BV
- PED Conformity (97/23/EC)
- MID certificate acc. to 2004/22WE
- OIML R140:2007 recommendations
- Indication in engineering units
- AISI 316L or Hasteloy C276
- Gold plated diaphragm (Au)
- Small and light weight
- Weather-proof housing IP67

GENERAL DESCRIPTIONS

BASI Model BPT3251 Smart pressure transmitters are 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. 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 by 90°, rotation of the casing by 0–355° relative to the sensor, and a choice of cable direction..

TECHNICAL SPECIFICATIONS

Functional Specifications

Process fluid	: Liquid, gas or vapor
Range	: 0-0,0005 to -1-0-1000bar
Output signal	: Two-wire 4-20,20-4 mA and 0-20, 0-5, 4-20mA HART® Protocol
Power supply	: 12 - 55 VDC (Ex ia:10,5...28 VDC; Ex d: 13,5...45 VDC)
Load limitation	: 0 - 600Ω for 24VDC
Indicator	: LCD indicator with backlight
Hazardous area	: IP67 weather-proof, intrinsically safe and explosionproof EEx ia, T4, T5 EExd IIC,T6, T5 for Zon 0 IIA,IIB,IIC
Zero and span	: Non-interactive local adjustment
Ambient.temp	: -40 to 85°C
Process.temp	: -40 to 120°C,
Storage.temp	: -40 to 85°C
Turn-on time	: Performs within specifications in less than 120 milliseconds after power is applied.
Overpressure	: 400%
Humidity limits	: 0 - 100% RH
Damping adj.	: Adjustable
Configuration	: By pushbutton on the transmitter or HHT, PC using HART® Protocol



Performance Specifications

Accuracy	: ±0.075% (0,05% on request)
Temperature effect	: ± 0,1%/10K Zero and Span
Power supply effect	: Negligible between 12 and 45 VDC
Mounting position effect	: Any position. No span effect.
EMC	: EN 50081-1, EN 50082-2, 89/336/EEC

Physical Specifications

Electrical connection	: M20x1,5 or ½"-14NPT
Process connection	: G½, G1/4", M20, G½ NPT, M30, 1"
Wetted parts	: SS 316L or Hasteloy C276
Filling fluid	: Silicone oil
Electronic housing	: Injected aluminum with polyester painting (RAL 5014) NEMA 4X, IP67
Identification plate	: 304 SST
Approximate weight	: 1,6 kg
Mounting	: Directly supported by piping or optionally with mounting bracket for 2" pipes or with direct or remote seals.

Stainless Steel Housing



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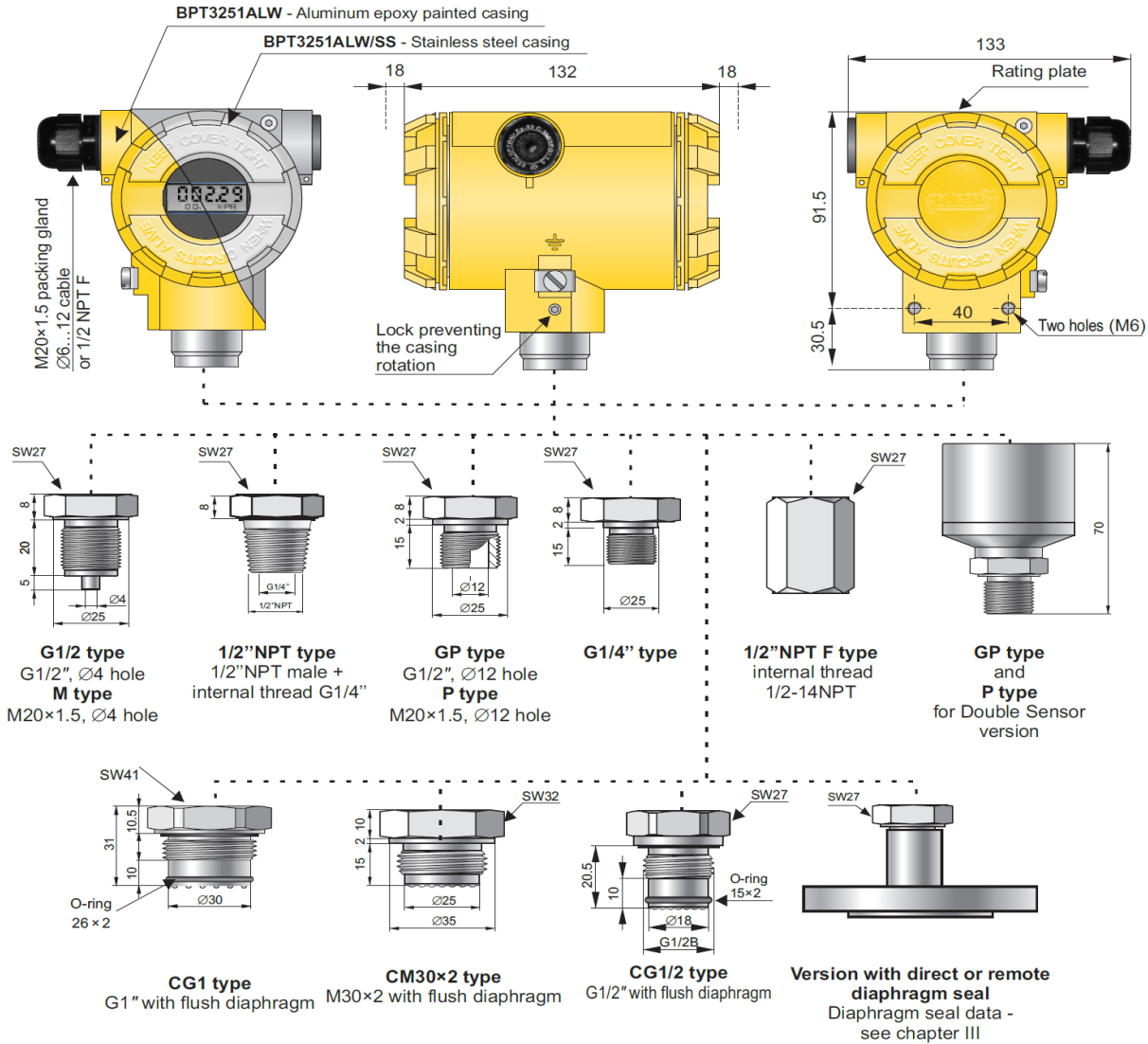
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Smart Pressure Transmitter

BPT3251

No. DS 24:2-E Issue: 5 23/02/15

MECHANICAL SPECIFICATIONS



Measuring ranges

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

* only for transmitters without diaphragm seal; not available in Exd version
 ** only for transmitters in Double Sensor version
 *** overpressure limit can be different for version according to PED norm No. 97/23/EC



SMART PRESSURE TRANSMITTER BPT3251ALW version with MID

Application

Smart pressure transmitter BPT3251ALW MID is applicable to the measurement of the pressure and absolute pressure in application designed according to directive 2004/22/EC (MID), harmonized standard PN-EN12405-1:2005 + A2:2010 and recommendation OIML R140:2007. Device subcomponent suitable for custody transfer measurement of gas with MID approval. Mechanical construction and installation of the transmitter enclosure shall comply with the transmitter BPT-3251ALW are described on page I/ 3 of catalogue. Pressure transmitters BPT3251ALW MID are produced only with nominal ranges according to the table. Transmitter due to factory blockade of transmitter's configuration cannot be configurable by user. Electrical connection of the transmitter is according to drawing on page I/ 3. Available are only terminals SIGNAL + and SIGNAL -. Note! For custody transfer applications, the cover clamp screws have to be locked with seal wire.

Metrological parameters

Max. permissible error according to EN12405-1 (calculated in relation to the measured value)

- in reference conditions	≤ 0,2%
- nominal operating conditions	≤ 0,5%
special version	≤ 0,3%
Long-term stability	< 0,5% / 5 years
Operating temperature range	-25...55°C
Power supply	13,5...28 VDC

MID Parts Certificate No. 27/12

Measuring ranges

Nominal measuring range		Overpressure limit (without hysteresis)	
10÷100 bar ABS	(1÷10 MPa ABS)	450 bar	(45 MPa)
2÷20 bar ABS	(0,2÷2 MPa ABS)	50 bar	(5 MPa)
2÷20 bar	(0,2÷2 MPa)	50 bar	(5 MPa)
0,9÷7 bar ABS	(0,09÷0,7 MPa ABS)	14 bar	(1,4 MPa)
0,9÷7 bar	(0,09÷0,7 MPa)	14 bar	(1,4 MPa)

Ordering procedure

Model	Code	Description
BPT3251		Smart pressure transmitter
Casing, output signal	/ALW.....	Aluminum housing, IP66/IP67, with display, output 4-20mA + Hart
	/MID.....	MID – certificate acc. to 2004/22/EC directive and OIML R140:2007 recommendations
Versions, certificates	/Exia.....	II 1/2G Exia IIC T4/T5 Ga/Gb , II 1 D Exia IIIC T105C Da
Nominal measuring range	/10÷100 bar ABS	10÷100 bar ABS (10÷100 MPa ABS)
	/2÷20 bar ABS	2÷20 bar ABS (0,2÷2 MPa ABS)
	/2÷20 bar	2÷20 bar (0,2÷2 MPa)
	/0,9÷7 bar ABS	0,9÷7 bar ABS (0,09÷7 MPa ABS)
	/0,9÷7 bar	0,9÷7 bar (0,09÷7 MPa)
Process connections	/M.....	Thread M20x1,5 (male) with Ø4 hole, wetted parts SS316L
	/G1/2.....	Thread G1/2" (male) with Ø4 hole, wetted parts SS316L
	/G1/2(Au).....	Thread G1/2" (male) with Ø4 hole, gold plated diaphragm
	/P.....	Thread M20x1,5 (male) with Ø12 hole, wetted parts SS316L
	/GP.....	Thread G1/2" (male) with Ø12 hole, wetted parts SS316L
	/1/2"NPTM.....	Thread 1/2"NPT Male, wetted parts SS316L
Electrical connection	(without marking)	Packing gland M20x1,5
	/US.....	Thread 1/2"NPT Female
Accessories	/AL.....	Mounting bracket type AL for 2" pipe, material zinc steel
	/AL(SS).....	Mounting bracket type AL for 2" pipe, material stainless steel
	/ST.....	Stainless Steel plate riveted to the housing
	/MT.....	Stainless Steel Tag plate mounted on wire

Example 1: Pressure transmitter with display, output 4...20mA + HART, version Exia, nominal measuring range 10...70bar, process connection G1/2", electrical connection gland M20x1,5, according to MID standard.

BPT3251ALW/MID/Exia/10..70bar/G1/2'



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Smart Pressure Transmitter

BPT3251

No. DS 24:2-E Issue: 5 23/02/15

SMART PRESSURE TRANSMITTER BPT3251AL with Profibus PA protocol

Application and construction

The transmitter electronic system performs the digital processing of measurement and generates the output signal with the communication module according to Profibus PA standard. The transmitter function performance bases on profile 3.0 of Profibus PA standard.

The casing is made of high-pressure casting of aluminium alloy, IP-66/IP67 rated. The casing design allows using a local liquid crystal graphical display, 90° turn of display, 0–355° turn of casing relative to the sensor, and the choice of direction at cable insertion.

The BPT3251AL/Profibus PA transmitter is produced with process connections described on page I/ 2 or, optionally, with Aplisens diaphragm seal.

The measuring ranges, according to the table, page I/ 3.

Communication

The communication with the transmitter is achieved in two ways:

- cyclic – the transmitter sends primary measured value (4 bytes IEEE754) and status containing the information on the current state of transmitter and measurement validity (1 byte);
- acyclic – this way of communication is used to device configuration and to read both primary measured value and the status.

Measurements in the hazardous areas

For pressure measurements in the areas under explosion hazard the Atex intrinsically safe transmitters, $\text{Ex II 1/2G Ex ia IIB T5 Ga/Gb}$ are available

Technical data

Metrological parameters, materials of process connection, diaphragms and casing, and operating conditions – see the description page I/ 4.

Output parameters

Output signal – Digital communication signal Profibus – PA (according to EN 50170)

PA function	slave
Physical layer	IEC61158-2
Transmission rate	31,25kBit/S

Configuration

Full configuration of transmitter settings, adjustment of the display mode, transmitter zeroing and calibration in relation to pressure standards proceeds with the PDM (Process Device Manager) software, by Siemens. The EED program library, worked out by Aplisens for cooperation with this transmitter, is helpful in the configuration.

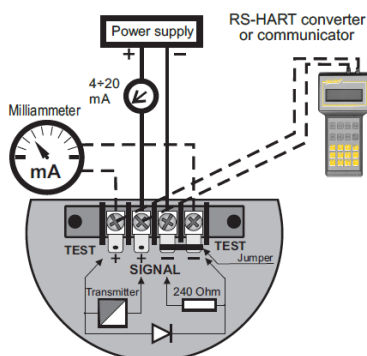
Other commercial configuration software (e.g. Commuwin by Endress and Hauser, DTM/FDT tools) make transmitter configuration possible in the range of basic commands.

Enclosed to BPT3251AL/Profibus PA is GSD file comprising the description of the transmitter basic properties such as transmission rate, type and format of input data, list of additional functions. GSD file is necessary for the software serving as a device for network configuration and makes the correct connection the appliance to Profibus network possible. The universal file GSD, designed for standard pressure transmitters made according to profile at revision 3 Profibus standard, may also be applicable to BPT3251AL/Profibus PA. The pressure transmitter BPT3251AL/Profibus PA does not have the hardware address switch. This address may be adjusted with accessible configuration software.

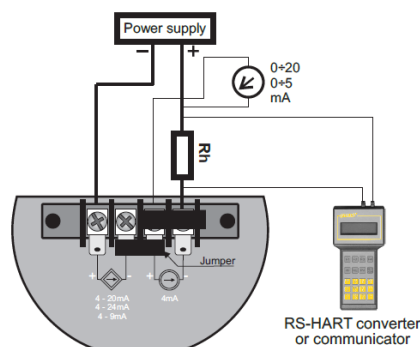
Electrical parameters

Power supply (from DP/PA coupler)	10,5...28 VDC
	12,5...28 VDC - when display illumination switched on.
Current consumption	14 mA

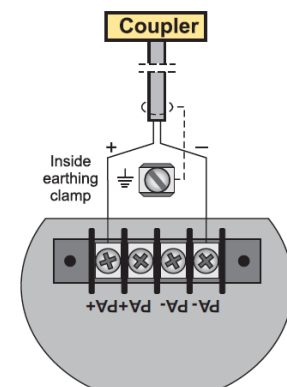
Electrical diagrams for transmitters



Version: BPT3251ALW
output signal: 4-20mA



Version: BPT3251ALE
with 0...5 or 0...20mA output signal



Version: BPT3251AL/ProfibusPA

