

Differential pressure transmitter Model DPT-10

WIKA data sheet PE 86.21



for further approvals see
page 10



Applications

- Process engineering
- Chemical industry
- Petrochemical industry
- Food and beverage industry
- Machine building and plant construction

Special features

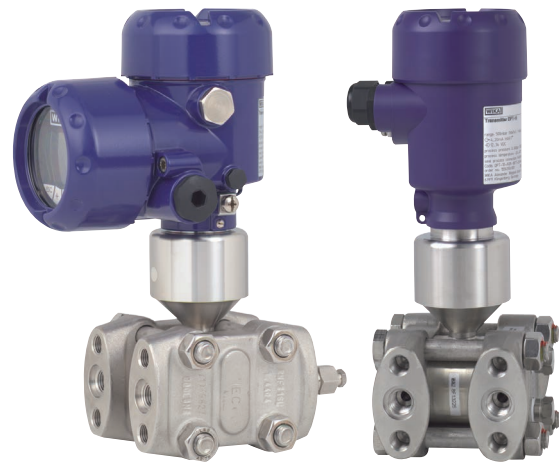
- High measurement accuracy
- Freely scalable measuring ranges
- Different Ex approvals
- Seven different case variants
- Configuration via DTM (Device Type Manager) in accordance with the FDT (Field Device Tool) concept (e.g. PACTware)

Description

The DPT-10, with its 4 ... 20 mA, 4 ... 20 mA HART® or PROFIBUS® PA output signals, combined with the intrinsically safe or flameproof enclosure ignition protection type, is ideally suited for application in appropriate systems. The electronics of all of these transmitters, even for the flameproof variant, are intrinsically safe. Thus it is possible to make adjustments on the instrument in Ex areas while the instrument is live.

Versatile in application

The DTP-10 is suitable for many industrial measuring requirements, such as flow measurement using differential pressure transducers, level measurement or filter and pump monitoring. With mounted diaphragm seals, the DTP-10 is also suitable for harsh process conditions. As a result of the available measuring ranges from -10 ... +10 mbar to -40 ... +40 bar and a static pressure limitation of up to 420 bar, the instrument can be used in almost any application. The internal digital signal processing, combined with proven sensors, guarantees high accuracy and the best long-term stability.



Differential pressure transmitter model DPT-10

There are seven different case variants available, and thus it is possible to select a variant suited to every operating environment. The case itself can be rotated through 330° and is available in plastic, aluminium and stainless steel.

An electropolished stainless steel case (316L) is available to meet the high demands of the food and pharmaceutical industries.

Easy configuration and operation

Service and configuration at the instrument is carried out using the optional display and operating module, which can be fitted in four positions. The operating menu has a simple and self-explanatory structure and has nine selectable languages. Alternatively, the operating parameters can be set using the PACTware™ free and non-proprietary configuration software. An instrument-specific DTM enables easy integration into corresponding process control systems.

Specifications							
Measuring range ¹⁾	-10 mbar ... +10 mbar	-30 mbar ... +30 mbar	-100 mbar ... +100 mbar	-500 mbar ... +500 mbar	-3 bar ... +3 bar	-16 bar ... +16 bar	-40 bar ... +40 bar ²⁾
Max. static working pressure	160 bar	160 bar	160 bar	160 bar ³⁾	160 bar ³⁾	160 bar ³⁾	160 bar ³⁾
Smallest possible span	0.25 mbar	0.3 mbar	1 mbar	5 mbar	30 mbar	160 mbar	400 mbar
Lowest static pressure ⁴⁾	0.1 mbar abs., with application for oxygen the static pressure should not be lower than 10 mbar abs.						
Overload on one side	160 bar			160 bar (option: 420 bar)			
Overload on both sides	240 bar			240 bar (option: 630 bar)			

1) Other measuring ranges can be set via the respective turndown.

2) Measuring range 40 bar, "-" side with one-sided overload safety up to 100 bar.

3) Option: 420 bar

4) Valid at reference conditions per IEC 60770.

Accuracy			
Measuring ranges	< 0.5 bar		≥ 0.5 bar
Long-term stability	±0.18 % URL/year		±0.05 % URL/year
Reference accuracy ¹⁾			
	Measuring ranges 10, 30 mbar: from TD 1:1 ±0.15 % of span x TD		to TD 15:1 ±0.075 % of span TD from 15:1 ±(0.0015 x TD + 0.053) % of span
	Measuring range 100 mbar: to TD 4:1 ±0.075 % from TD 4:1 ±(0.012 x TD + 0.027) %		
Total performance ^{2) 3)}	±0.15 %		±0.15 %
Influence of the system pressure ³⁾			
Zero point	±0.35 % URL/70 bar Measuring range 10 mbar: 0.15 % URL/7 bar		±0.075 % URL/70 bar
Span	±0.14 % URL/70 bar Measuring range 10 mbar: 0.035 % URL/7 bar		±0.14 % URL/70 bar
Influence of the medium and ambient temperature ³⁾			
-10 ... +60 °C	10 mbar and 30 mbar 100 mbar	±(0.31 x TD + 0.06) % ±(0.18 x TD + 0.06) %	0.5 bar, 3 bar, 40 bar 16 bar ±(0.08 x TD + 0.05) % ±(0.1 x TD + 0.1) %
-40 ... -10 °C/+60 ... +85 °C	10 mbar and 30 mbar 100 mbar	±(0.45 x TD + 0.1) % ±(0.3 x TD + 0.15) %	0.5 bar, 3 bar 16 bar 40 bar ±(0.12 x TD + 0.1) % ±(0.15 x TD + 0.2) % ±(0.37 x TD + 0.1) %
Mounting position influence	≤ 4 mbar		

1) Includes non-linearity following terminal method, hysteresis and non-repeatability in accordance with IEC 1 60770.

2) Includes non-linearity, hysteresis, non-repeatability, thermal change of zero point and static pressure influence (Pstat= 70 bar) in the temperature range -10 ... +60 °C.

3) Values are not valid for tantalum diaphragm.

URL = basic measuring range

TD = turndown; turndown = basic measuring range : scaled measuring range

Permissible temperature ranges		
Ambient	-40 ... +80 °C (without display)	-20 ... +70 °C (with display)
Storage/Transport	-40 ... +80 °C	
Process temperature depending on the sealing material	<ul style="list-style-type: none"> ■ FKM/NBR: -20 ... +85 °C ■ PTFE, copper: -40 ... +85 °C ■ FKM, oil and grease free: -10 ... +85 °C <p>For oxygen applications (max. static pressure: 160 bar):</p> <ul style="list-style-type: none"> ■ Copper, PTFE: -20 ... +60 °C ■ FKM: -10 ... +60 °C 	
Temperature limits	With differential pressure lines longer than 100 mm: -40 ... +120 °C	

Material	
Wetted parts	Process connection: 316L (option: Hastelloy C276) Diaphragm: 316L (option: Hastelloy C276, tantalum, gold-rhodium-coated Hastelloy C276, Monel 400) Sealing: FKM (option: NBR, PTFE, copper)
Internal transmission fluid ¹⁾	Silicone oil (halocarbon oil for oxygen applications)
Case	Plastic (PBT; polyester), (option: Aluminium, stainless steel 316L)
Weight	approx. 4.2 ... 4.5 kg depending on the process connection and case version

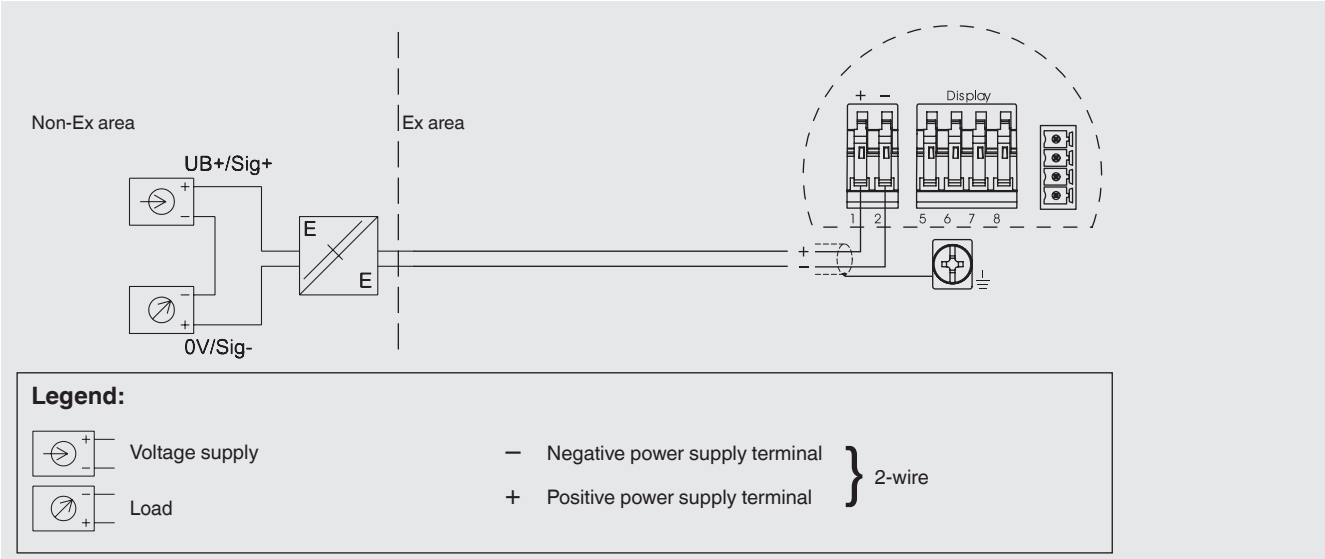
1) With application for oxygen or when using halocarbon oil, the static pressure should not be lower than 10 mbar abs.

Electrical data	
Supply voltage U_B	<ul style="list-style-type: none"> ■ Non-Ex: DC 14 ... 36 V ■ Ex ia: DC 14 ... 30 V ■ Ex d: DC 20 ... 36 V ■ (Option: PROFIBUS[®] PA 12 ... 32 V DC (not with Ex ia))
Output signal	4 ... 20 mA, 2-wire, (option: 4 ... 20 mA, 2-wire with superimposed communication signal HART [®] , PROFIBUS [®] PA)
Dead time	100 ms
Time constant (63 %)	180 ms (measuring ranges 10, 30 mbar: 250 ms)
Dampening	0 ... 999 s, adjustable
Permissible max. load	$R_A = (U_B - U_{Bmin})/0.023 \text{ A}$

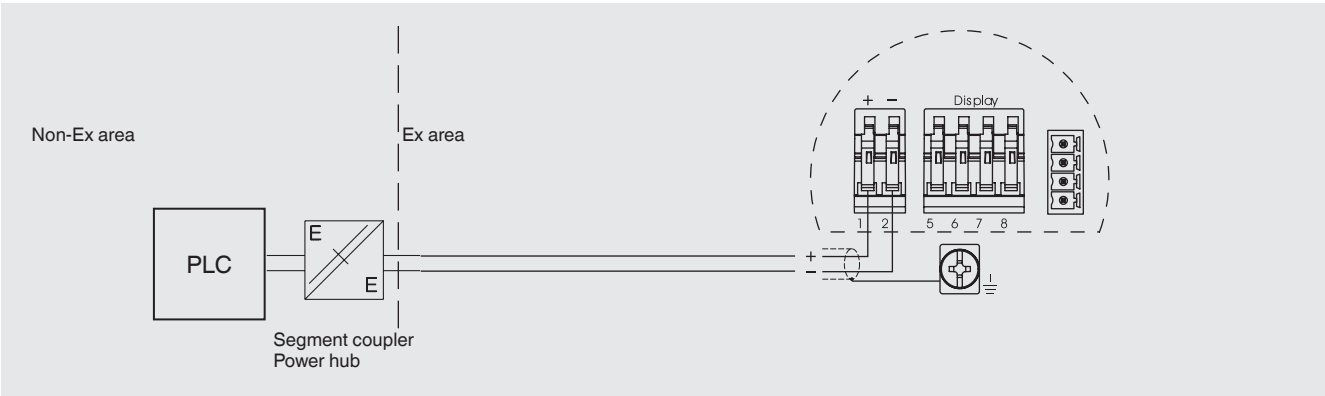
Ambient conditions	
Shock resistance	100 g per IEC 60068-2-27 (mechanical shock)
Vibration resistance ¹⁾	4 g (5 ... 100 Hz)
Ingress protections	<ul style="list-style-type: none"> ■ Overvoltage category III, protection class II ■ IP66/67 (standard case)

1) Tested in accordance with the directives GL characteristic curve 2 (not for double chamber cases from stainless steel).

Electrical connection



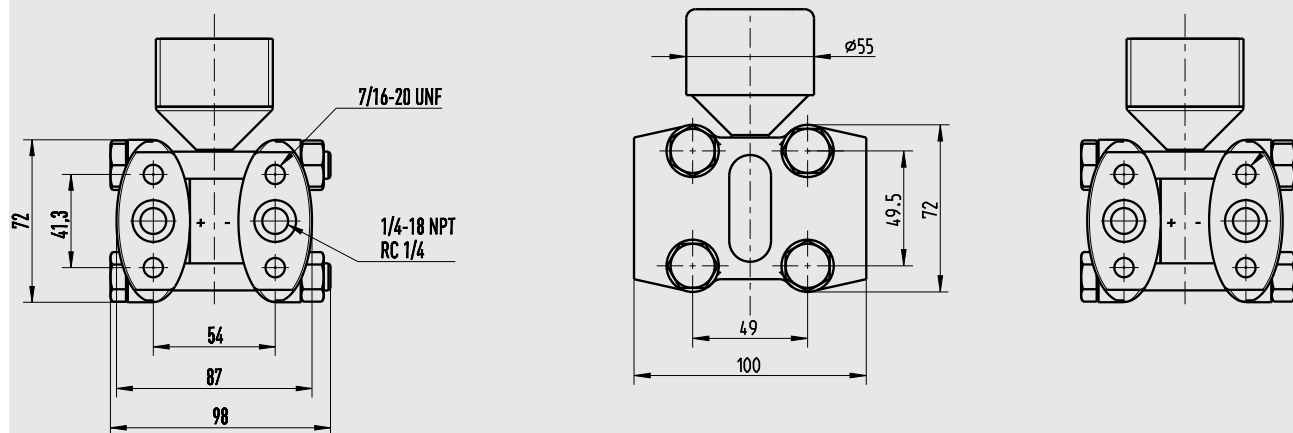
Electrical connection



Process connections

Oval flange, connection 1/4-18 NPT or RC 1/4 with rear venting

Measuring ranges ≥ 100 mbar

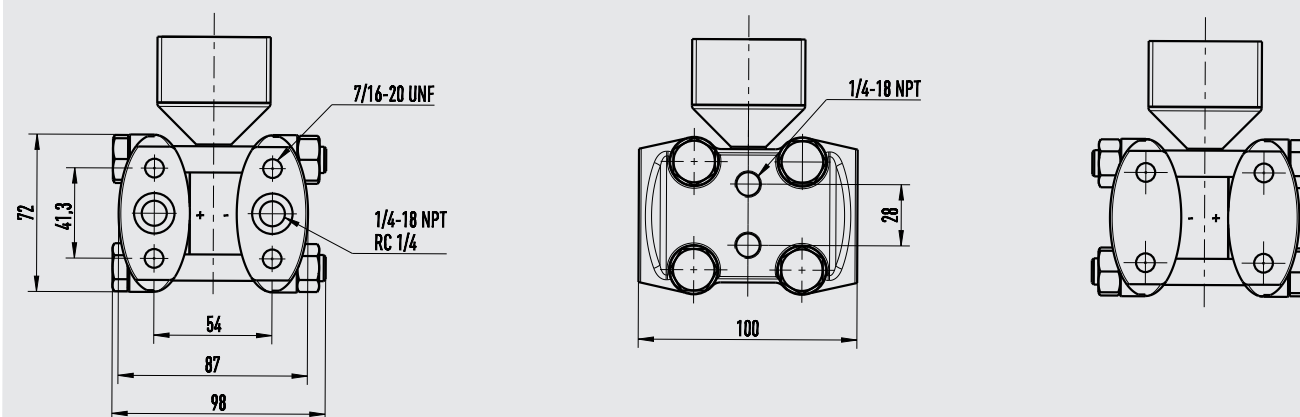


Connection	Mounting	Material	Equipment
1/4-18 NPT IEC 61518	7/16-20 UNF	AISI 316L	2 vent valves ¹⁾
1/4-18 NPT IEC 61518	7/16-20 UNF	Hastelloy C276	Without valves/plugs
RC 1/4	7/16-20 UNF	AISI 316L	2 vent valves ¹⁾
1/4-18 NPT IEC 61518	PN 160: M10; PN 420: M12	AISI 316L	2 vent valves ¹⁾
1/4-18 NPT IEC 61518	PN 160: M10; PN 420: M12	Hastelloy C276	Without valves/plugs

1) Material: AISI 316L/1.4404

Oval flange, connection 1/4-18 NPT or RC 1/4, with lateral venting

Measuring ranges ≥ 100 mbar

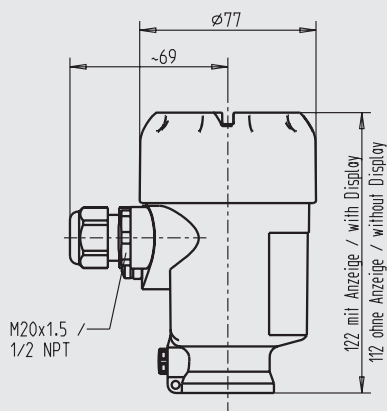


Connection	Mounting	Material	Equipment
1/4-18 NPT IEC 61518	7/16-20 UNF	AISI 316L	2 vent valves, 4 plug screws ¹⁾
1/4-18 NPT IEC 61518	7/16-20 UNF	Hastelloy C276	Without valves/plugs
RC 1/4	7/16-20 UNF	AISI 316L	2 vent valves, 4 plug screws ¹⁾

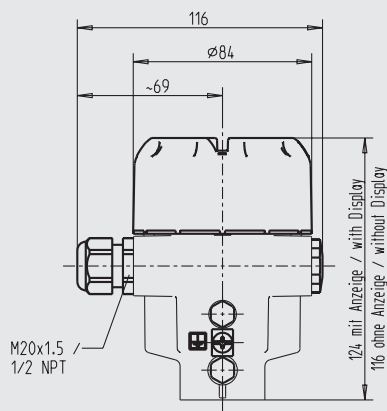
1) Material: AISI 316L/1.4404

Case variants

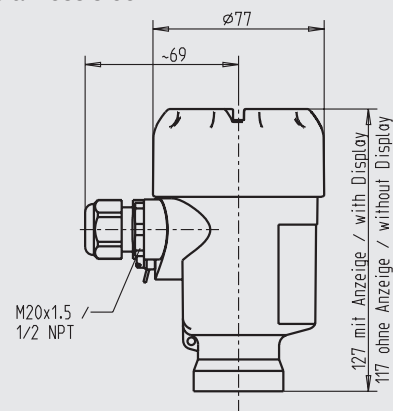
Single chamber case, plastic



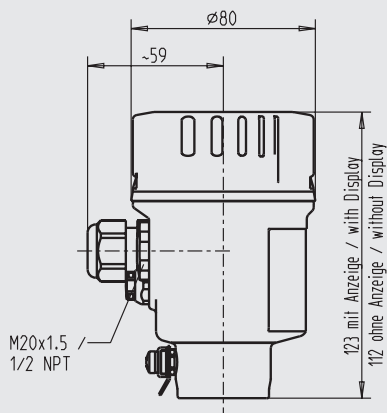
Single chamber case, aluminium



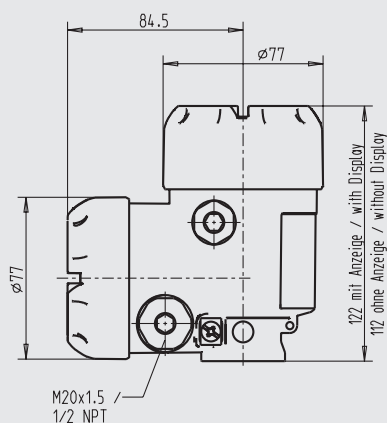
Single chamber case, cast stainless steel



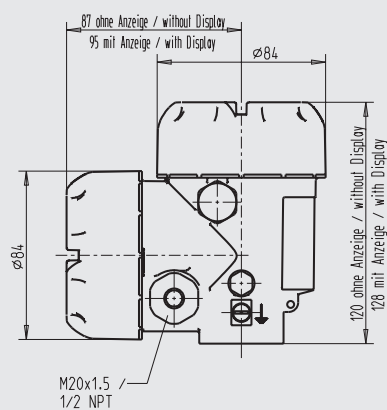
Single chamber case, deep-drawn stainless steel



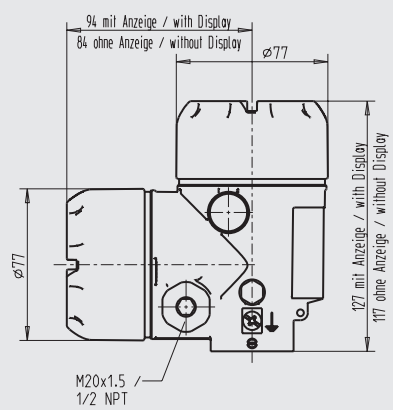
Double chamber case, plastic



Double chamber case, aluminium

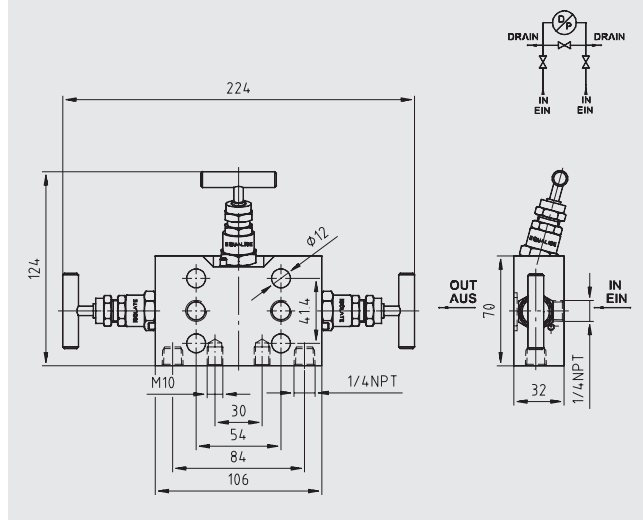


Double chamber case, cast stainless steel



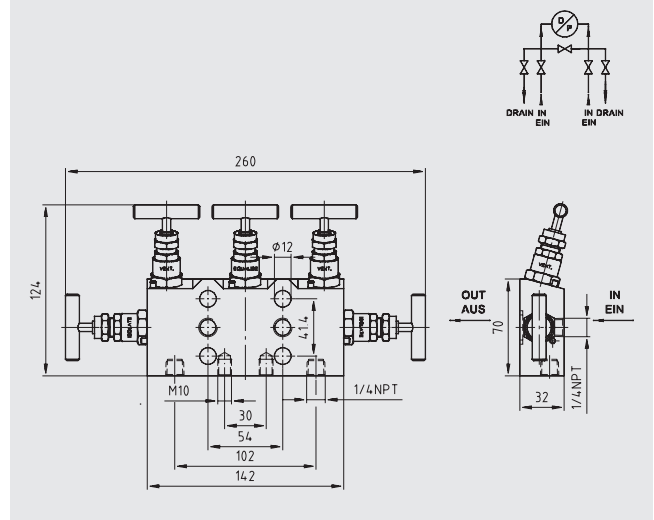
Mounting variants

3-valve manifolds



With upstream pressure compensating valves it is possible to avoid one-sided overpressure loading during both start-up and operation, and also to enable zero point checks during operation. Furthermore, they enable the isolation of the process lines without interference to the running process.

5-valve manifolds



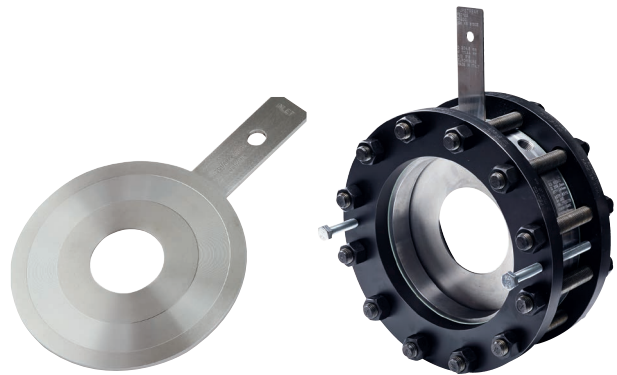
Furthermore, these pressure compensating valves (with integrated shut-off, purge and vent valves) enable the pressure gauge to be vented on one or both sides and the supply line to be purged.

Diaphragm seals



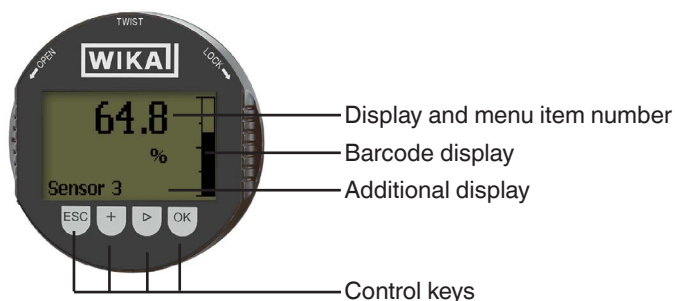
By using diaphragm seals, it is possible to adapt the model DPT-10 differential pressure transmitter to even the most difficult of conditions in the process industry. The transmitters can thus be used at extreme temperatures, and with aggressive, corrosive, heterogeneous, abrasive, highly viscous or toxic media. As a result of the wide variety of aseptic connections, such as clamp, threaded pipe or DIN 11864 aseptic connections, measuring assemblies meet the high demands of sterile process engineering.

Primary flow elements



Primary flow elements for flow measurement are available as accessories. Depending on the application, the differential pressure pressure transducers are designed as simple orifice plates, orifice flanges or complete meter runs.

Display and operating module

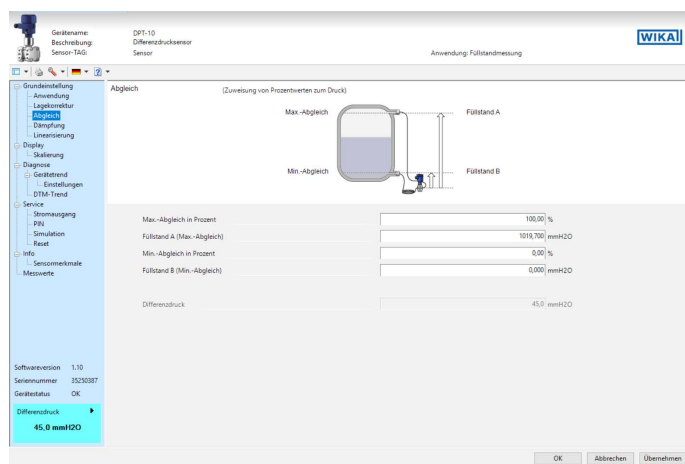


Menu languages:

German
English
French
Spanish
Polish
Italian
Dutch
Japanese
Chinese

User interface DTM

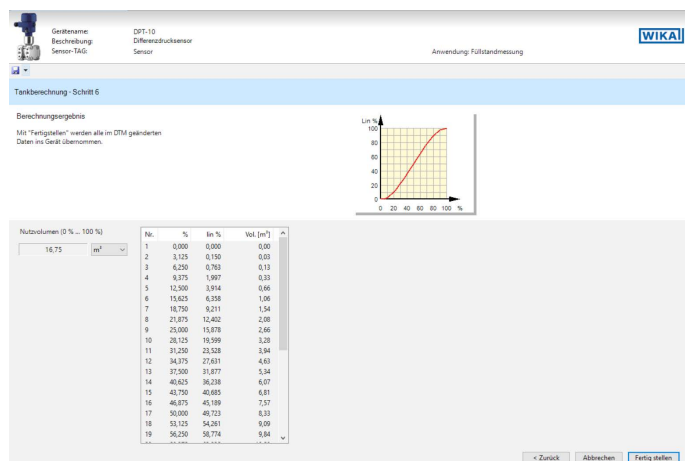
The PACTware™ software, the DTM driver file as well as EDD and DD are available for download on the WIKA homepage.



For HART and Profibus-PA output signals, a DTM is available in accordance with the FDT standard. The DTM provides a self-explanatory and clear user interface for all setup and control processes of the transmitter. For testing purposes, it is also possible to simulate process values and archive the parameter data.

Recording of the measured values is available for diagnostic purposes.

Tank volume calculation












The additional tank volume calculation of the DTM function can be used to reproduce any optional tank geometry. The corresponding linearisation table is generated automatically. The linearisation table can be transferred directly to the transmitter.

Accessories

Model	Description	Order number
DIH52-F 	Display module DIH52-F, 5-digit display, 20-segment bar graph, without separate supply voltage, with additional HART® functionality. Automatic adjustment of measuring range and span. Local-master functionality: Setting the measuring range and unit of the connected transmitter using HART® standard commands possible, explosion protection per ATEX.	on request
Model 010031 	HART® modem for USB interface, specifically designed for use with notebooks	11025166
Model 010001	HART® modem for RS-232 interface	7957522
Model 010041	HART® modem for Bluetooth interface Ex ia IIC	11364254
Model 010031P	PowerXpress HART® modem, with optional power supply	14133234
MFC5150 	Hand-held HART® communicator HART® protocol, universal voltage supply, cable set with 250 Ω resistance, with DOF upgrade, with Ex protection 	on request
	Display and operating module, case cover plastic with window	13315277
	Display and operating module, case cover aluminium with window	12298884
	Display and operating module, case cover electropolished stainless steel with window	13315269
	Display and operating module, case cover cast stainless steel, single chamber, with window	12298906
	Display and operating module, case cover cast stainless steel, double chamber, with window	14045598
	3-valve manifold, form A, ½ NPT female (IEC 61518-A) Stainless steel, PN 420, form A, NACE compliant, 3.1 material certificate	13382498
	3-valve manifold, form A, ¼ NPT female (IEC 61518-A) Stainless steel, PN 420, form A, NACE compliant, 3.1 material certificate	13382510
	5-valve manifold, form A, ½ NPT female (IEC 61518-A) Stainless steel, PN 420, form A, NACE compliant, 3.1 material certificate	13382552
	5-valve manifold, form A, ¼ NPT female (IEC 61518-A) Stainless steel, PN 420, form A, NACE compliant, 3.1 material certificate	13382561
	Oval flange, ¼ NPT, stainless steel (2 pieces) Stainless steel, PN 420, form A, NACE compliant, 3.1 material certificate	13382609
	Oval flange, ½ NPT, stainless steel (2 pieces) Stainless steel, PN 420, form A, NACE compliant, 3.1 material certificate	13382595
	Instrument mounting bracket for wall or pipe mounting with mounting bracket and screws, stainless steel	11553945
	Set of sealing plugs, ¼ NPT, 316L (2 pieces) for the vents at the differential pressure sensor Included in delivery with lateral venting, except for process connection from Hastelloy	14035620
	Set of vent valves, ¼ NPT, 316L (2 pieces) for the vents at the differential pressure sensor Included in delivery, except for process connection from Hastelloy	14368975
	Model DI-PT-E external display and operating module, plastic case	14134247
	Model DI-PT-E external display and operating module, aluminium case	12354954
	Model DI-PT-E external display and operating module, cast stainless steel case	12355101
	Overvoltage protection for transmitters, 4 ... 20 mA, M20 x 1.5, series connection	14002489
	for transmitters, Profibus, M20 x 1.5, series connection	14013659

Approvals (option)

Logo	Description	Country
	EU declaration of conformity <ul style="list-style-type: none"> ■ EMC directive, interference emission (group 1, class B) and immunity per EN 61326-1:2013 (industrial application), EN 61326-2-3:2013 ¹⁾ ■ Pressure equipment directive ■ RoHS directive ■ ATEX directive <ul style="list-style-type: none"> - Ex i Zone 0 gas II 1G Ex ia IIC T6...T1 Ga Zone 1 mounting to zone 0 gas II 1/2G Ex ia IIC T6 ... T1 Ga/Gb Zone 1 gas II 2G Ex ia IIC T6 ... T1 Gb - Ex d Zone 1 mounting to zone 0 gas II 1/2G Ex db ia IIC T6 Ga/Gb Zone 1 gas II 2G Ex db ia IIC T6 Gb 	European Union
	IECEX Hazardous areas <ul style="list-style-type: none"> - Ex i Zone 0 gas Ex ia IIC T6 ... T1 Ga Zone 1 mounting to zone 0 gas Ex ia IIC T6 ... T1 Ga/Gb Zone 1 gas Ex ia IIC T6 ... T1 Gb - Ex d Zone 1 mounting to zone 0 Gas Ex db ia IIC T6 Ga/Gb Zone 1 gas Ex db ia IIC T6 Gb 	International
	EAC <ul style="list-style-type: none"> ■ Pressure equipment directive ■ Electromagnetic compatibility ■ Hazardous areas <ul style="list-style-type: none"> - Ex i Zone 0 gas 0 Ex ia IIC T6 ... T1 X Zone 1 gas 1 Ex ia IIC T6 ... T1 X - Ex d Zone 1 gas 1 Ex d ia IIC T6 ... T1 X 	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus
	UkrSEPRO Metrology, measurement technology	Ukraine
	DNOP_MakNII <ul style="list-style-type: none"> ■ Mining ■ Hazardous areas <ul style="list-style-type: none"> - Ex i Zone 0 gas II 1G II 1/2G II 2 G Ex ia IIC T6 ... T1 	Ukraine
	Uzstandard Metrology, measurement technology	Uzbekistan

1) With electrostatic discharge, a short-term, increased error of up to 1 % of the nominal measuring range can occur. This also applies to NAMUR NE21.

Manufacturer's information and certificates

NAMUR recommendations

NAMUR is the automation technology interest group for the process industry in Germany. The published NAMUR recommendations are considered standards in field instrumentation, and also have the character of international standards.

The instrument fulfils the requirements of the following NAMUR recommendations:

- NE21 - Electromagnetic compatibility of equipment
- NE43 - Signal level for failure information for transmitters
- NE53 - Compatibility of field instruments and display and operating components

For further information, see www.namur.net/en

NACE

NACE is a term for an organisation (National Association of Corrosion Engineers) concerned with the topic of corrosion. The results of this organisation are published as NACE standards and regularly updated.

The instruments and, in particular, the weld seams fulfil:

- NACE MR0175 - Oil extraction and processing

Certificates (option)

- Test certificate for the measurement accuracy included in delivery (5 measuring points in the nominal measuring range)
- 2.2 test report
- 3.1 inspection certificate
- DKD/DAkkS calibration per IEC 17025

Approvals and certificates, see website

Ordering information

Approval / Output signal / Stat. pressure / Differential pressure measuring range / Process connection / Sealing / Process temperature / Case / El. connection / Display / Mounting / Additional equipment / Certificates / Configuration

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We reserve the right to make modifications to the specifications and materials.

