

## Process transmitter With welded metallic measuring cell Models IPT-20, IPT-21

WIKA data sheet PE 86.06



for further approvals  
see page 7



### Applications

- Chemical and petrochemical industries
- Process engineering
- Pharmaceutical industry
- Food and beverage industry
- Hazardous areas

### Special features

- Ex protection per ATEX and IECEx
- For applications to SIL 2 (SIL 3)
- Welded metallic measuring cell
- Seven different case variants
- Configuration via EDD and DTM (Device Type Manager) in accordance with the FDT (Field Device Tool) concept, e.g. PACTware



**Fig. left: Model IPT-20, with pressure port**

**Fig. right: Model IPT-21, with flush diaphragm**

### Description

With its 4 ... 20 mA, 4 ... 20 mA HART®, PROFIBUS® PA or FOUNDATION Fieldbus™ output signals, combined with either intrinsic safety or flameproof enclosure ignition protection type (in accordance with ATEX and IECEx), the model IPT-2x is ideally suited to applications with the highest demands on the measurement technology.

#### Versatile in application

As a result of the available measuring ranges of 0 ... 0.1 bar to 0 ... 4,000 bar (0 ... 0.15 to 0 ... 60,000 psi) and a freely selectable turndown, the instrument can be used in almost any application. The large number of process connections and the extensive possibilities offered by the metallic measuring cell enable use in all industries.

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 as standard. 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.

## Instrument versions and measuring cells

Version	Measuring cell
Standard version	Metallic measuring cell with piezoresistive sensor or thin-film sensor (depending on measuring range)
Version with cooling element (extended medium temperature range)	Metallic measuring cell with piezoresistive sensor or thin-film sensor (depending on measuring range)
High-temperature version	Ceramic/metallic measuring cell (for medium temperatures up to 200 °C, see operating conditions)

## Measuring ranges

Gauge pressure				
bar	0 ... 0.1 <sup>2)</sup>	0 ... 0.4	0 ... 1	0 ... 2.5
	0 ... 5	0 ... 10	0 ... 25	0 ... 40
	0 ... 100	0 ... 250	0 ... 600	0 ... 1,000 <sup>1)</sup>
	0 ... 1,600 <sup>1)</sup>	0 ... 2,500 <sup>1)</sup>	0 ... 4,000 <sup>1)</sup>	
psi	0 ... 1.5 <sup>2)</sup>	0 ... 5	0 ... 15	0 ... 30
	0 ... 75	0 ... 150	0 ... 300	0 ... 500
	0 ... 1,450	0 ... 3,000	0 ... 9,000	0 ... 15,000 <sup>1)</sup>
	0 ... 30,000 <sup>1)</sup>	0 ... 50,000 <sup>1)</sup>	0 ... 60,000 <sup>1)</sup>	

Absolute pressure				
bar	0 ... 0.1 <sup>2)</sup>	0 ... 0.4 <sup>2)</sup>	0 ... 1	0 ... 2.5
	0 ... 5	0 ... 10	0 ... 25	0 ... 40
psi	0 ... 1.5	0 ... 5	0 ... 15	0 ... 30
	0 ... 150	0 ... 300	0 ... 500	

Vacuum and +/- measuring range				
bar	-0.05 ... +0.05 <sup>2)</sup>	-0.2 ... +0.2	-0.5 ... +0.5	-1 ... 0
	-1 ... +1.5	-1 ... +10	-1 ... +25	-1 ... 40
psi	-0.7 ... +0.7	-3 ... +3	-7 ... +7	-14.5 ... 0
	-14.5 ... +20	-14.5 ... +75	-14.5 ... +150	-14.5 ... +300
	-14.5 ... +500			

1) Only for model IPT-20

2) Only for high-temperature version

Other measuring ranges can be set via turndown (scaling).

Maximum setting range of the pressure value: -20 ... +120 %

For example, a 0 ... 10 bar (0 ... 150 psi) instrument can also be used from -1 ... +10 bar (-14.5 ... +150 psi).

Values of less than 0 bar abs. (0 psia) cannot be set or measured.

Vacuum/overload safety	
Vacuum safety	Yes (not for oxygen applications)
Overload safety (standard version, version with cooling element)	
Measuring range ≤ 40 bar (500 psi)	3 times
Measuring range 40 ... 1,000 bar (500 ... 15,000 psi)	2 times
Measuring range = 1,600 bar (30,000 psi)	1.5 times
Measuring range = 2,500 bar (50,000 psi)	1.4 times
Measuring range = 4,000 bar (60,000 psi)	1.25 times

Vacuum/overload safety	
Overload safety (high-temperature version)	
Measuring range = 0.1 bar (1.5 psi)	15 bar (220 psi)
Measuring range = 0.4 bar (5 psi)	30 bar (430 psi)
Measuring range = 1.0 bar (15 psi)	35 bar (510 psi)
Measuring ranges from 2.5 ... 25 bar (30 ... 300 psi)	50 bar (720 psi)

## Output signals

Output signals	
Signal types	4 ... 20 mA
	4 ... 20 mA with a superimposed HART® communication signal (option: SIL qualification) HART® specification: 7.3
	FOUNDATION™ Fieldbus
	PROFIBUS® PA
	Slave electronics for electrical differential pressure (option: SIL qualification)
Load in $\Omega$	$(U_B - U_{Bmin}) / 0.022 \text{ A}$  $U_B$ = Applied power supply (see table "Power supply") $U_{Bmin}$ = Minimum power supply (see table "Power supply")
Damping	0 ... 999 s, adjustable After the set damping time the instrument outputs 63 % of the applied pressure as output signal.  Example: A pressure impulse increases from 0 to 10 bar with a damping of 2 seconds. After the 2 seconds a pressure of 6.3 bar is displayed.
Step response time	< 80 ms (= Dead time < 25 ms + rise time 10 ... 90 % < 55 ms)

## Voltage supply

### Power supply (non-Ex and Ex d)

Signal type	Backlighting	
	inactive	active
4 ... 20 mA	DC 9.6 ... 35 V	DC 16 ... 35 V
4 ... 20 mA with a superimposed HART® communication signal	DC 9.6 ... 35 V	DC 16 ... 35 V
FOUNDATION™ Fieldbus	DC 9 ... 32 V	DC 13.5 ... 32 V
PROFIBUS® PA	DC 9 ... 32 V	DC 13.5 ... 32 V

### Power supply (Ex ia)

Signal type	Backlighting	
	inactive	active
4 ... 20 mA	DC 9.6 ... 30 V	DC 16 ... 30 V
4 ... 20 mA with a superimposed HART® communication signal	DC 9.6 ... 30 V	DC 16 ... 30 V
FOUNDATION™ Fieldbus	DC 9 ... 24 V (DC 9 ... 17.5 V Fisco)	DC 13.5 ... 24 V (DC 13.5 ... 17.5 V Fisco)
PROFIBUS® PA	DC 9 ... 24 V (DC 9 ... 17.5 V Fisco)	DC 13.5 ... 24 V (DC 13.5 ... 17.5 V Fisco)

## Accuracy specifications

Accuracy specifications	
<b>Accuracy at room temperature <sup>1)</sup></b>	
Measuring range ≤ 1,000 bar (15,000 psi)	0.1 % of span (options: 0.075 % / 0.2 %)
Measuring range > 1,000 bar (15,000 psi)	0.5 % of span
<b>Adjustability</b>	
Zero point	-20 ... +95 % (downwards, the adjustability is always limited by the minimum pressure of 0 bar abs.)
Span	Measuring range ≤ 1,000 bar (15,000 psi): -120 ... +120 % with a difference between zero point and span of max. 120 % of the nominal measuring range  Measuring range > 1,000 bar (15,000 psi): max. (0 bar abs.) ... +105 % (downwards, the adjustability is always limited by the minimum pressure of 0 bar abs.)
Turndown	no limits Measuring range ≤ 1,000 bar (15,000 psi): Maximum recommended turndown 20:1 Measuring range > 1,000 bar (15,000 psi): Maximum recommended turndown 2:1 Max. turndown for SIL applications 10:1
<b>Non-linearity</b>	Measuring range ≤ 1,000 bar (15,000 psi): ≤ 0.05 % of span BFSL (IEC 61298-2) Measuring range > 1,000 bar (15,000 psi): ≤ 0.25 % of span BFSL (IEC 61298-2)
<b>Non-repeatability</b>	Measuring range ≤ 1,000 bar (15,000 psi): ≤ 0.1 % of span Measuring range > 1,000 bar (15,000 psi): ≤ 0.5 % of span
<b>Behaviour with turndown</b>	
1:1 ... 5:1 with measuring range 0.1 ... 1,000 bar	No change in accuracy
> 5:1 with measuring range 0.1 ... 1,000 bar	< 0.015 % x turndown
1:1 ... 2:1 with measuring range > 1,000 bar (15,000psi)	< 0.5 % x turndown
<b>Long-term stability at reference conditions (standard version, version with cooling element)</b>	
Measuring range < 1 bar (15 psi)	≤ (0.35 % x turndown) / year
Measuring range = 1 bar (15 psi)	≤ (0.15 % x turndown) / year
Measuring range > 1 bar (15 psi)	≤ (0.10 % x turndown) / year
Measuring range > 1,000 bar (15,000 psi)	≤ (0.50 % x turndown) / year
<b>Long-term stability at reference conditions (high-temperature version)</b>	≤ (0.05 % x turndown) / year
<b>Rated temperature range</b>	
without digital indicator	-40 ... +80 °C (-40 ... +176 °F)
with digital indicator	-15 ... +70 °C (5 ... +158 °F)
<b>Thermal change, zero point and span (reference temperature 20 °C (68 °F))</b>	
in compensated range 10 ... 70 °C	Measuring range ≤ 1,000 bar (15,000 psi): < 0.075 % / 10 K (max. 0.15 %) Measuring range > 1,000 bar (15,000 psi): No compensated range
outside compensated range	Measuring range ≤ 1,000 bar (15,000 psi): < 0.15 % + 0.075 % / 10 K Measuring range > 1,000 bar (15,000 psi): < 0.5 % + 0.2 % / 10 K
<b>Thermal change of the current output (reference temperature 20 °C (68 °F))</b>	< 0.05 % / 10 K (max. 0.15 %) for 4 ... 20 mA output at -40 ... +80 °C (-40 ... +176 °F)

<sup>1)</sup> Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2). Calibrated in vertical mounting position with process connection facing downwards.

## Reference conditions (per IEC 61298-1)

Reference conditions (per IEC 61298-1)	
Temperature	18 ... 30 °C (64 ... 86 °F)
Atmospheric pressure	860 ... 1,060 mbar (86 ... 106 kPa, 12.5 ... 15.4 psig)
Air humidity	45 ... 75 % r. h.
Characteristic curve determination	Terminal method per IEC 61298-2
Curve characteristics	linear
Reference mounting position	vertical, diaphragm points downward

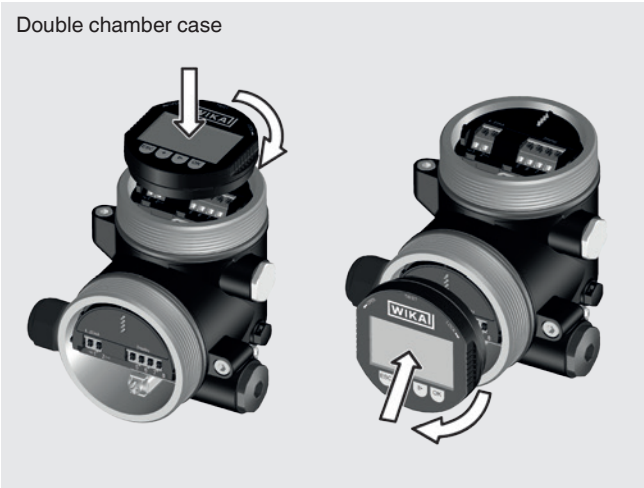
## Operating conditions

Operating conditions	
<b>Permissible temperature ranges (standard version, version with cooling element)</b>	
Ambient	-20 ... +70 °C (-4 ... 158 °F) (with digital indicator) -40 ... +80 °C (-40 ... 176 °F) (without digital indicator)
Medium	-40 ... +105 °C (-40 ... 221 °F) -20 ... +150 °C (-4 ... 302 °F) (version with cooling element) -20 ... +60 °C (-4 ... 140 °F) (for oxygen applications)
Storage	-60 ... +80 °C (-76 ... 176 °F)
<b>Restrictions to medium temperature due to sealing material</b>	For oxygen applications max. 60 °C (140 °F)
FKM	-20 ... +105 °C (option: -20 ... +150 °C) -4 ... +221 °F (option: -4 ... +302 °F)
EPDM	-20 ... +105 °C (option: -20 ... +150 °C) -4 ... +221 °F (option: -4 ... +302 °F)
NBR	-15 ... +105 °C (5 ... 221 °F)
FFKM	-15 ... +105 °C (option: -15 ... +150 °C) 5 ... 221 °F (option: 5 ... 302 °F)
FEPM	-5 ... +105 °C (23 ... 221 °F)
<b>Permissible temperature ranges (high-temperature version)</b>	
Ambient	-12 ... +70 °C (-4 ... 158 °F) (with digital indicator) -12 ... +80 °C (-40 ... 176 °F) (without digital indicator)
Medium	-12 ... +180 °C (-10.4 ... +356 °F) -12 ... +200 °C (-10.4 ... +392 °F) (with shield sheet)
Storage	-60 ... +80 °C (-76 ... 176 °F)
<b>Vibration resistance per EN 60068-2-6 (vibration under resonance)</b>	4 g (5 ... 200 Hz) per GL characteristic curve 2 Double chamber case from stainless steel: 0.75 g per GL characteristic curve 1
<b>Shock resistance per IEC 60068-2-27</b>	Measuring range ≤ 1,000 bar (15,000 psi): 50 g (2.3 ms) per IEC 60068-2-27 Measuring range > 1,000 bar (15,000 psi): 20 g (4.6 ms) per IEC 60068-2-27 Double chamber case from stainless steel with cooling element: 20 g
<b>Instrument safety</b>	
Ingress protection per IEC/EN 60529	IP66/67 IP66/IP68 (0.2 bar) for absolute pressure sensors Option: IP66/IP68 (1 bar) or IP66/IP68 (25 bar)
Electrical safety	Overvoltage category III, protection class II
SIL per IEC 61508:2010	Single-channel operation up to SIL 2 Multi-channel operation (homogeneous, redundant) up to SIL 3

# Digital indicator (option)

Specifications				
Backlighting	Yes			
Background	Grey, black digits			
Upgradable	Yes (for order numbers, see "Accessories")			
Menu languages	German English French Spanish	Polish Italian Dutch Japanese	Chinese Russian Portuguese Czech	Turkish
Display size	5-digit measured value display, adjustable (option: bar graph display) Max. 5 digits, size 7 x 13 mm (0.28 x 0.51 in)			
Ingress protection per IEC/EN 60529	IP20 (loose) IP40 (built-in without cover)			
Material	Case from ABS, window from polyester film			

## Mounting positions



## Materials

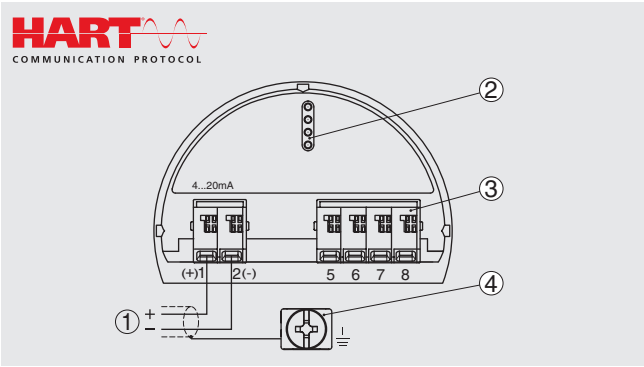
Materials	
<b>Wetted parts (standard version, version with cooling element)</b>	
Model IPT-20	
Measuring ranges $\leq 40$ bar (500 psi)	Stainless steel 316L/1.4404
Measuring ranges $> 40$ bar (500 psi)	Stainless steel 316L/1.4404 + Elgiloy 2.4711 Option: Hastelloy C276/2.4819 + Elgiloy 2.4711
Measuring ranges $> 1,000$ bar (15,000 psi)	Stainless steel 904L/1.4534
Model IPT-21	Stainless steel 316L/1.4404 Option: Hastelloy C276/2.4819 Option: Gold-plated 20 $\mu$ Option: Gold-/rhodium-plated 5 $\mu$ /1 $\mu$
<b>Wetted parts (high-temperature version, models IPT-20 and IPT-21)</b>	Stainless steel 316L / Hastelloy HC276
<b>O-ring (only for model IPT-21)</b>	NBR, FKM, EPDM, FFKM, FEPM
<b>Single chamber case, plastic</b>	PBT, polyester
<b>Single chamber case, aluminium</b>	Die-casting AlSi10Mg, powder-coated on PE basis
<b>Single chamber case, cast stainless steel</b>	Stainless steel 316L
<b>Single chamber case, electropolished stainless steel, deep-drawn</b>	Stainless steel 316L
<b>Double chamber case, plastic</b>	PBT, polyester
<b>Double chamber case, aluminium</b>	Die-casting AlSi10Mg, powder-coated on PE basis
<b>Double chamber case, cast stainless steel</b>	Stainless steel 316L

Stainless steel 316L, corresponds to 1.4404 or 1.4435  
Stainless steel 316Ti, corresponds to 1.4571

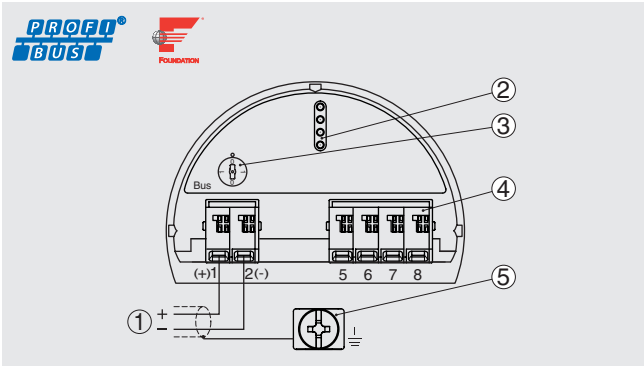
## Electrical connection

Specifications	
<b>Spring-loaded terminals</b>	Wire cross-section: Wire or strand: 0.2 ... 2.5 mm <sup>2</sup> (AWG 24 ... 14) Strand with end splice: 0.2 ... 1.5 mm <sup>2</sup> (AWG 24 ... 16)
<b>Cable glands M20 x 1.5</b>	
Plastic, PA	Sealing from NBR Cable diameter: 5 ... 9, 6 ... 12, 10 ... 14 mm
Brass, nickel-plated	Sealing from NBR Cable diameter: 9 ... 13 mm (for armoured cable)
Stainless steel	Sealing from NBR Cable diameter: 7 ... 12 mm
<b>Cable glands ½ NPT</b>	
sealed with blind plug	
Plastic, PA	Cable diameter: 5 ... 9 mm
Brass, nickel-plated	Cable diameter: 6 ... 12 mm
Brass, nickel-plated	Cable diameter: 9 ... 13 mm (for armoured cable)
<b>Electrical safety</b>	Reverse polarity protection

Connection compartment for single chamber case

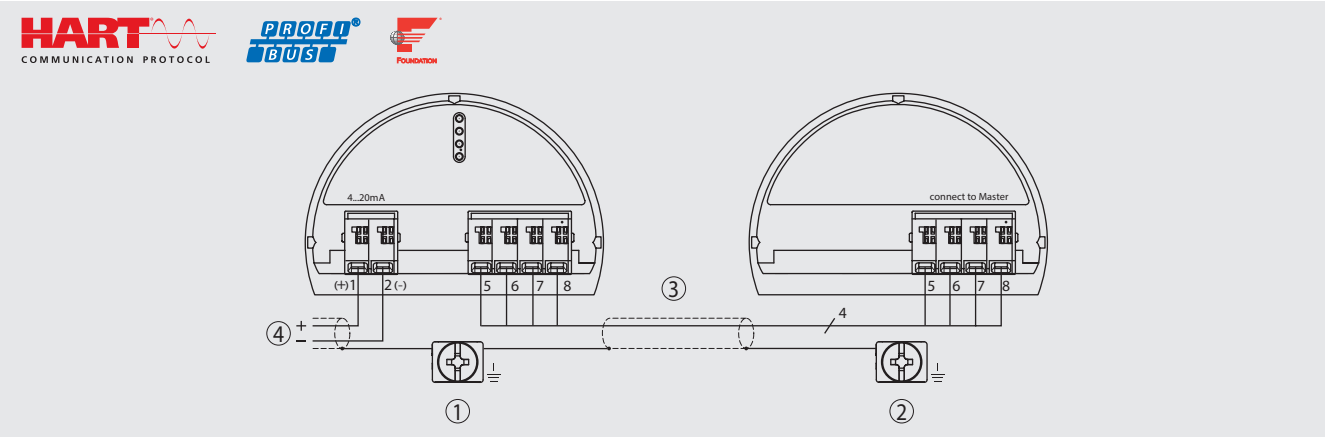


4 ... 20 mA / HART®	
①	Voltage supply / signal output
②	Interface of digital indicator
③	Connection terminals for external display and operating unit
④	Ground terminal for cable shield



PROFIBUS® PA / FOUNDATION™ Fieldbus	
①	Voltage supply / signal output
②	Interface of digital indicator
③	Simulation switch (1 = operation with simulation release)
④	Connection terminals for external display and operating unit
⑤	Ground terminal for cable shield

Differential pressure measurement, master/slave



Master/slave	
①	Master
②	Slave
③	Connection cable (master/slave)
④	Voltage supply / signal output (master)



## Process connections

### Standard process connections for model IPT-20

EN 837	G ½ B M20 x 1,5 G ¼ B female, G ½ B male (for high-temperature version with metallic/ceramic measuring cell)
ANSI / ASME B1.20.1	½ NPT ½ NPT female ¼ NPT female, ½ NPT male

### Standard high-pressure connections for model IPT-20 from 1,600 bar

-	M16 x 1.5 female M20 x 1.5 female 9/16-18 UNF female
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### Aseptic process connections for model IPT-21

Flush	G ½ B G 1 B G 1 ½ B G 1 hygienic
ANSI / ASME B1.20.1	½ NPT (for high-temperature version)
	M44 x 1.25 with union nut (for version with cooling element) M44 x 1.25 with union nut (for high-temperature version)
Tri-clamp	1 ½" 2"
VARIVENT®	Form F Form N
Grooved union nut DIN 11851	DN 25 DN 40 DN 50
NEUMO BioControl®	Size 50 Size 65
Clamp connection per DIN 11864-3	DN 40 DN 50

BioControl® is a registered trademark of NEUMO.

### Pressure transmission medium

#### Standard version and extended medium temperature range

Model IPT-20	Measuring range ≤ 40 bar (500 psi): Synthetic oil, halocarbon oil Measuring range > 40 bar (500 psi): Dry measuring cell
Model IPT-21	Synthetic oil, halocarbon oil
<b>High-temperature version</b>	
Models IPT-20 and IPT-21	Medicinal white mineral oil

Halocarbon oil generally with oxygen applications, not with vacuum and absolute pressure < 1 bar abs.

Optionally FDA-listed media for the food industry are available.




All media are silicone-free.

### Diaphragm seals

The process transmitter can be adapted to the harshest conditions in the process industry by using diaphragm seals. Thus, the transmitter can 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.




## Approvals

Logo	Description	Country
 	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ Pressure equipment directive</li> <li>■ RoHS directive</li> <li>■ ATEX directive</li> </ul> <b>Hazardous areas</b> <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [II 1G Ex ia IIC T6...T1 Ga]</li> <li>Zone 1 gas, mounted to zone 0 [II 1/2G Ex ia IIC T6 ... T1 Ga/Gb]</li> <li>Zone 1 gas [II 2G Ex ia IIC T6 ... T1 Gb]</li> <li>Zone 20 dust [II 1D Ex ia IIC T135 Da]</li> <li>Zone 21 dust [II 2D Ex ia IIC T135 Db]</li> <li>- Ex d Zone 1 gas, mounted to zone 0 [II 1/2G Ex db ia IIC T6...T1 Ga/Gb]</li> <li>Zone 2 gas [II 2G Ex db ia IIC T6...T1 Gb]</li> <li>Zone 21 dust [II 2D Ex db ia IIC T135 Db]</li> </ul>	European Union
	<b>IECEx</b> <b>Hazardous areas</b> <ul style="list-style-type: none"> <li>- Ex i Zone 0 gas [Ex ia IIC T6...T1 Ga]</li> <li>Zone 1 gas, mounted to zone 0 [Ex ia IIC T6 ... T1 Ga/Gb]</li> <li>Zone 1 gas [Ex ia IIC T6 ... T1 Gb]</li> <li>Zone 20 dust [Ex ia IIC T135 Da]</li> <li>Zone 21 dust [Ex ia IIC T135 Db]</li> <li>- Ex d Zone 1 gas, mounted to zone 0 [Ex db ia IIC T6 ... T1 Ga/Gb]</li> <li>Zone 2 gas [Ex db ia IIC T6 ... T1 Gb]</li> <li>Zone 21 dust [Ex db ia IIC T135 Db]</li> </ul>	International

Approvals and certificates, see website

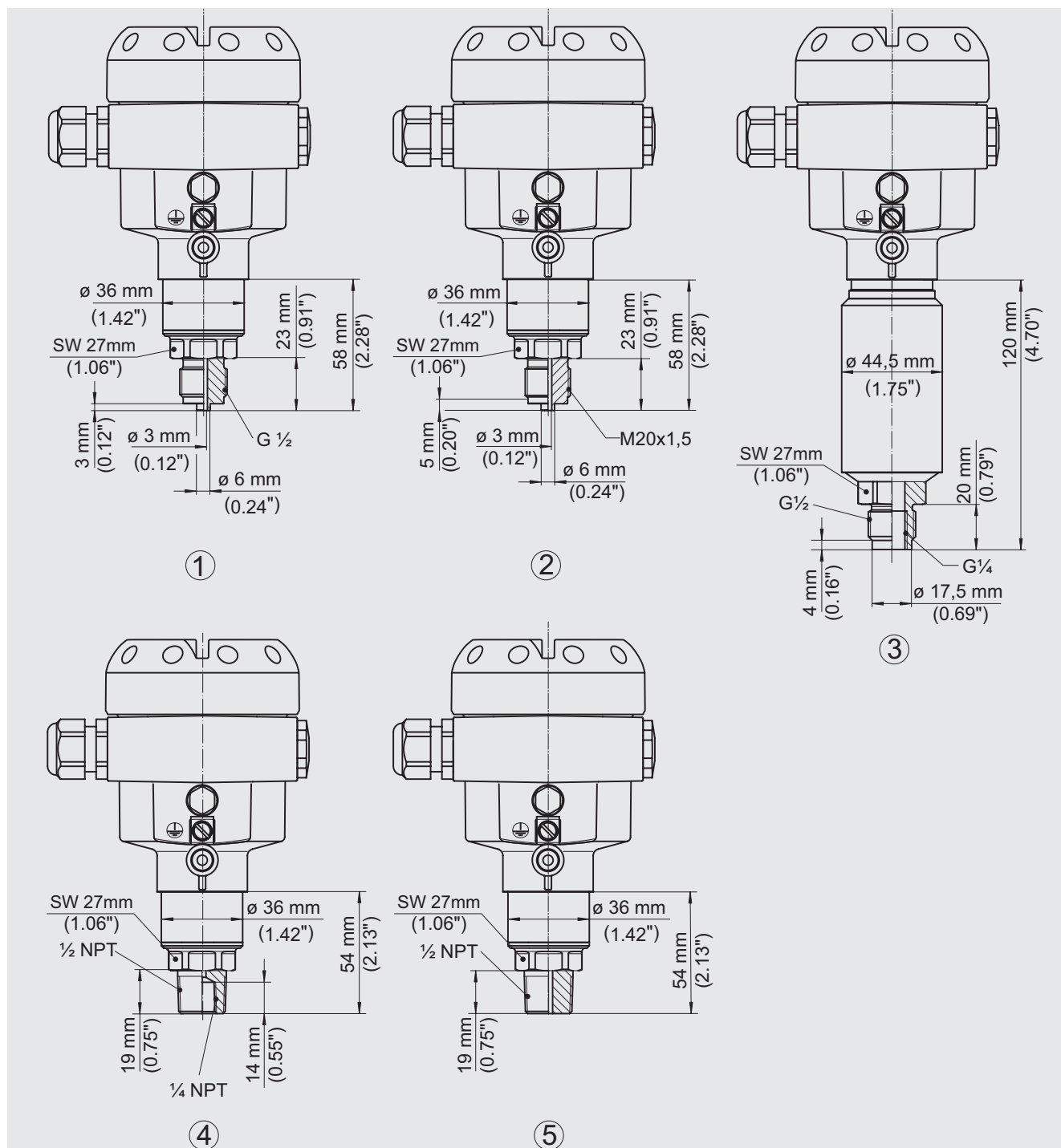
## Manufacturer's information and certificates

Logo	Description
	<b>SIL 2 (option) <sup>1)</sup></b> Functional safety
-	<b>NAMUR recommendations</b> NE21 - Electrical compatibility of equipment NE43 - Signal level for failure information NE53 - Compatibility of field instruments NE107 - Self-monitoring and diagnostics

1) only for output signal 4 ... 20 mA with HART®

## Dimensions in mm (inch)

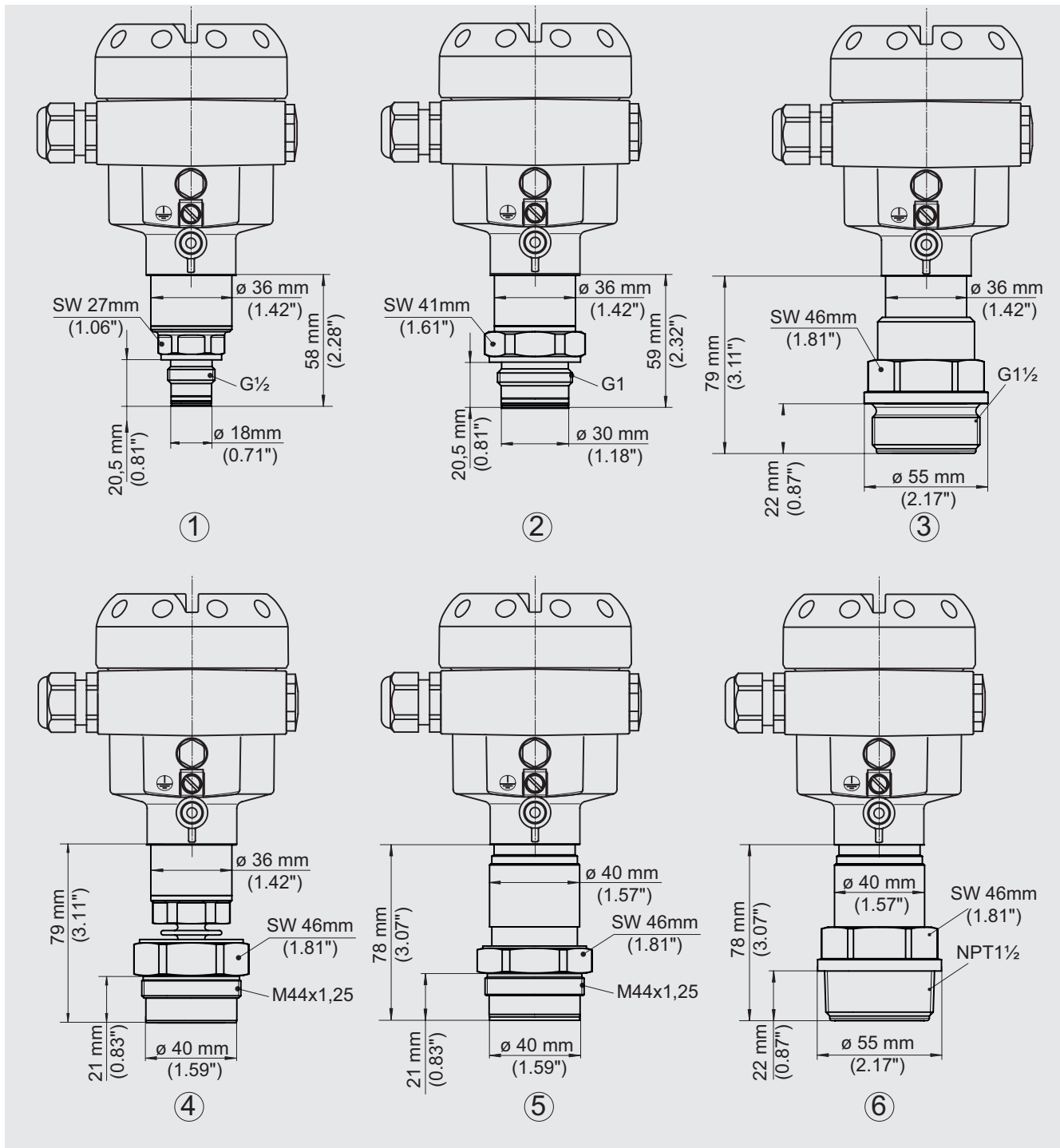
### Standard process connections for model IPT-20



### Standard process connections for model IPT-20

①	EN 837	G 1/2 B
②	EN 837	M20 x 1.5
③	EN 837	G 1/4 B female, G 1/2 B male (for high-temperature version with metallic/ceramic measuring cell)
④	ANSI / ASME B1.20.1	1/4 NPT female, 1/2 NPT male
⑤	ANSI / ASME B1.20.1	1/2 NPT

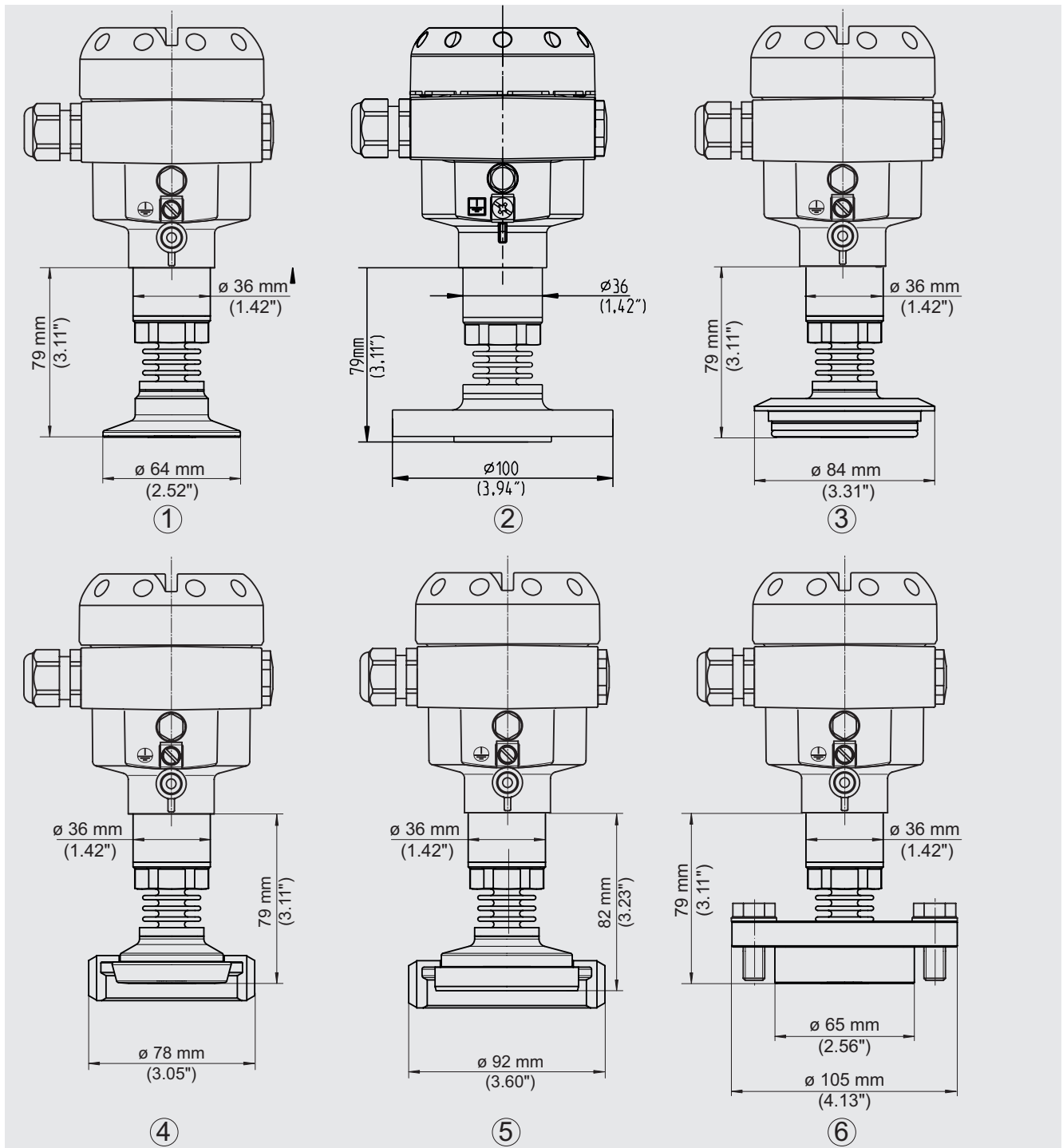
## Flush process connections for model IPT-21



### Flush process connections for model IPT-21

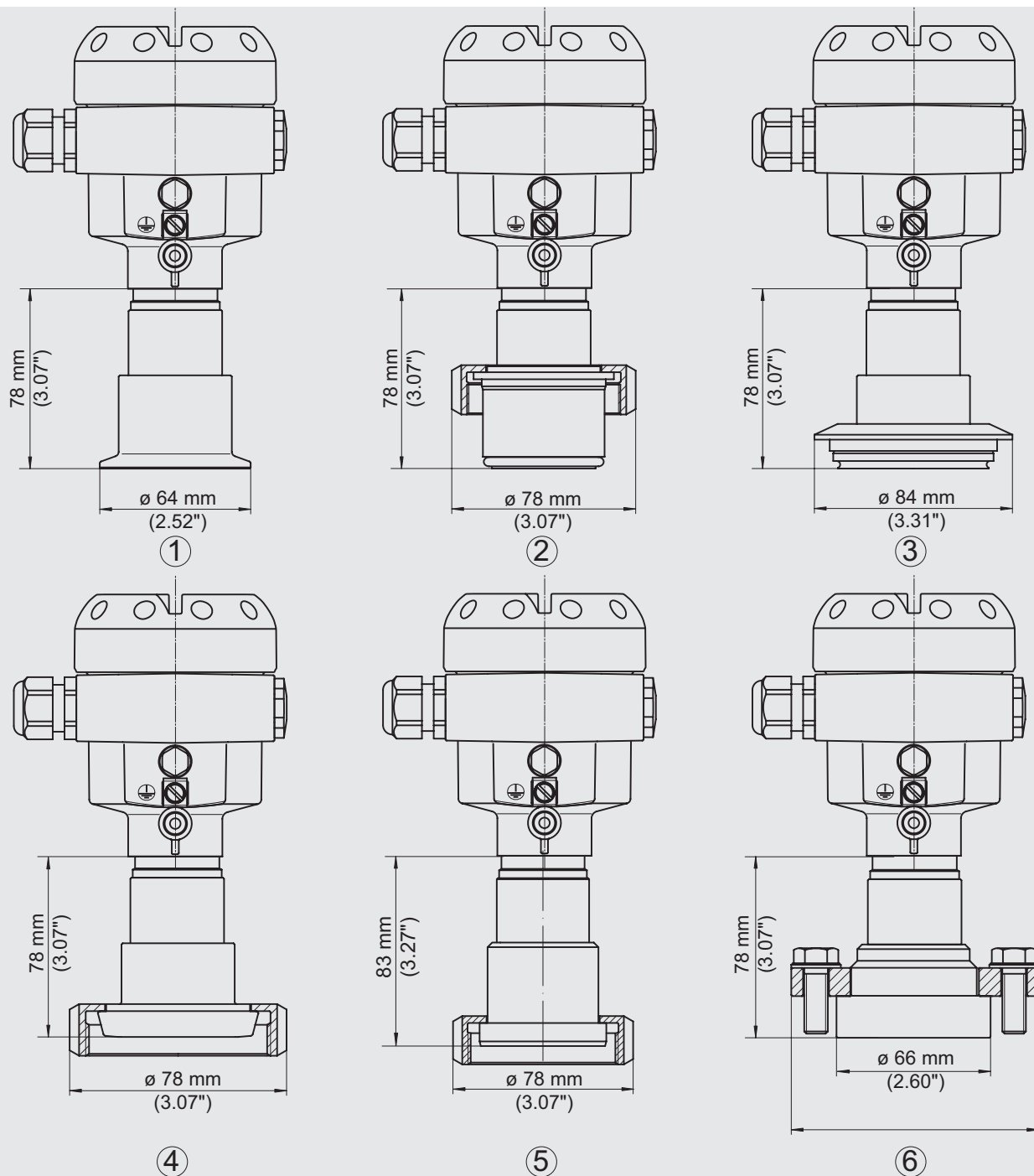
①	EN 837	G ½ B flush with O-ring
②	EN 837	G 1 B flush with O-ring
③	EN 837	G 1 ½ B flush without ring
④	-	M44 x 1.25 with union nut (for version with cooling element)
⑤	-	M44 x 1.25 with union nut (for high-temperature version)
⑥	ANSI / ASME B1.20.1	½ NPT (for high-temperature version)

## Aseptic process connections for model IPT-21



### Aseptic process connections for model IPT-21 (version with cooling element)

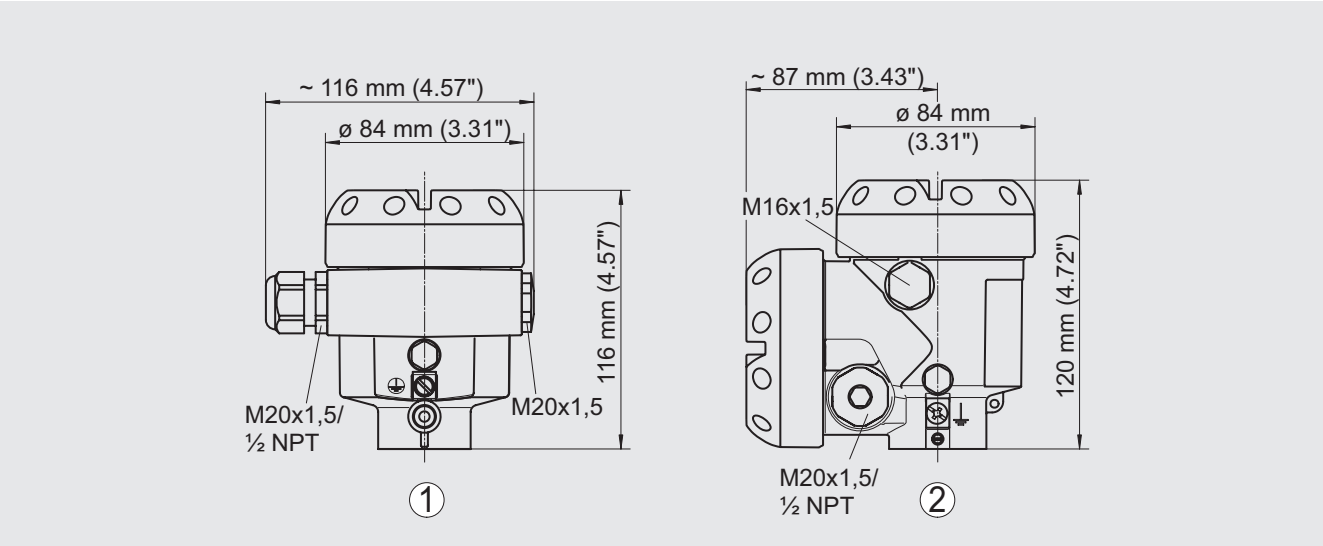
①	DIN 32676, ISO 2552	Clamp 2", PN 16
②	NEUMO BioConnect	Flange DN 40, form V
③	VARIVENT	F50-40, PN 25
④	DIN 11851	Liner DN 50, PN 40
⑤	SMS connection	DN 76, PN 6
⑥	DIN 2501	Flange DN 65, PN 40, form C



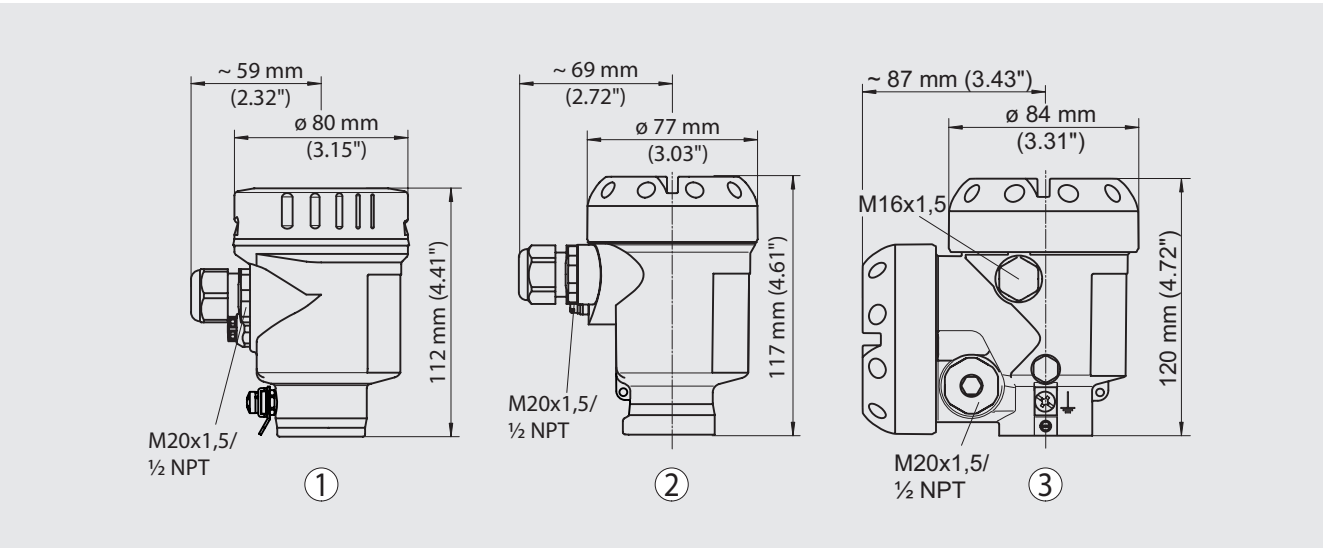
#### Aseptic process connections for model IPT-21 (high-temperature version)

①	DIN 32676, ISO 2552	Clamp 2", PN 16
②	NEUMO BioConnect	Flange DN 40, form V
③	VARIVENT	F50-40, PN 25
④	DIN 11851	Liner DN 50, PN 40
⑤	SMS connection	DN 51, PN 6
⑥	DIN 2501	Flange DN 65, PN 40, form C

# Case dimensions

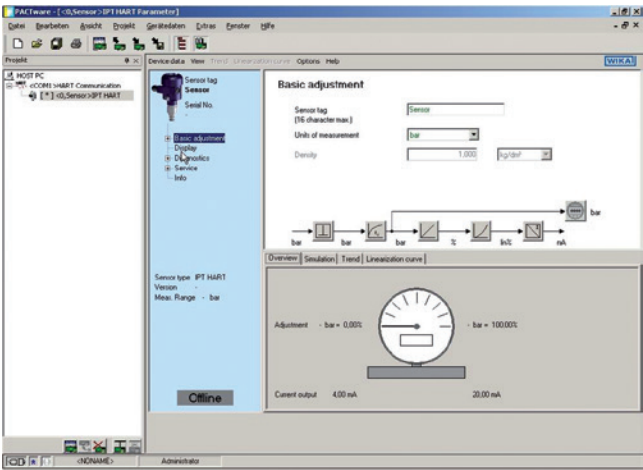


Case (aluminium)	
①	Single chamber case, powder-coated aluminium
②	Double chamber case, powder-coated aluminium

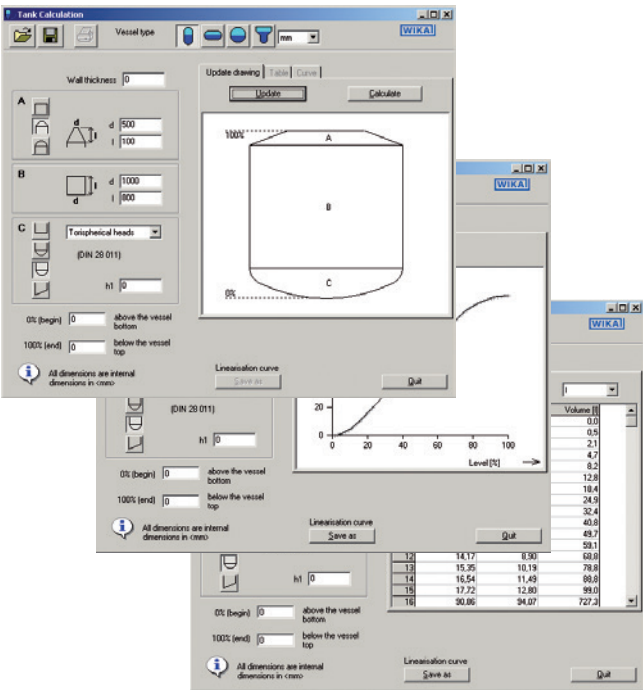


Case	
①	Single chamber case, deep-drawn and electropolished stainless steel, e.g. for hygienic applications
②	Single chamber case, plastic ABS or precision-cast stainless steel
③	Double chamber case, plastic ABS or precision-cast stainless steel

# User interface DTM



For HART®, PROFIBUS® PA and FF 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

	Description	Order no.
	<b>Display module, model DIH52-F</b> 5-digit display, 20-segment bar graph, without separate power supply, with additional HART® functionality. Automatic adjustment of measuring range and span. Secondary-master functionality: Setting the measuring range and unit of the connected transmitter using HART® standard commands possible. Optional: Explosion protection per ATEX	on request
	<b>HART® modem</b> USB interface, model 010031	11025166
	RS-232 interface, model 010001	7957522
	Bluetooth® interface [EEx ia] IIC, model 010041	11364254
	<b>HART® modem, PowerXpress</b> USB interface 2.0 Voltage supply via USB or AC 100/250 V, 50/60 Hz power supply unit Requires Windows 98, 2000, XP (32-bit), VISTA (32-bit), Windows 7(32/64-bit)	14133234
	<b>Hand-held, model FC475HP1EKLUGMT</b> HART® protocol, Li-Ion battery, voltage supply AC 100 ... 240 V, colour display with backlighting, Bluetooth® and infrared interface, ATEX, FM, CSA and IECEx(i)	14025585
	<b>Hand-held, model FC475FP1EKLUGMT</b> HART® protocol and FF Bus, Li-Ion battery, voltage supply AC 100 ... 240 V, colour display with backlighting, Bluetooth® and infrared interface, ATEX, FM, CSA and IECEx(i)	14025730
	<b>Hand-held, model MFC5150X</b> HART® protocol, universal voltage supply, cable set with 250 Ω resistance, with DOF upgrade, ATEX and cULus	14104078
	Welding socket for process connection G 1/2 flush	1192299
	Welding socket for process connection G 1 flush	1192264
	Welding socket for process connection G 1 1/2 flush	2158982
	Welding socket for process connection G 1 hygienic flush	2166011
	<b>Instrument mounting bracket</b> for wall or pipe mounting, stainless steel	14236577
	Overvoltage limit for transmitters, 4 ... 20 mA, 1/2 NPT, series connection, Ex i and Ex d	14013656
	Overvoltage limit for transmitters, 4 ... 20 mA, M12 x 1.5, series connection, Ex i and Ex d	14002489
	Overvoltage limit for transmitters, FF / PROFIBUS, 1/2 NPT, series connection, Ex i and Ex d	14013658
	Model DI-PT-R display and operating module, case cover aluminium with window	12298884
	Model DI-PT-R display and operating module, case cover cast stainless steel with window	12298906
	Model DI-PT-R display and operating module, case cover plastic with window	13315277
	Model DI-PT-R display and operating module, case cover electropolished stainless steel with window	13315269
	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
	Model DI-PT-E external display and operating module, electropolished stainless steel case	14031516
	Model DI-PT-E external display and operating module, plastic case	14134247

**Ordering information**

Model / Measuring range / Output signal / Accuracy / Process connection / Sealing / Electrical connection / Digital indicator / Case version / Approval

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