

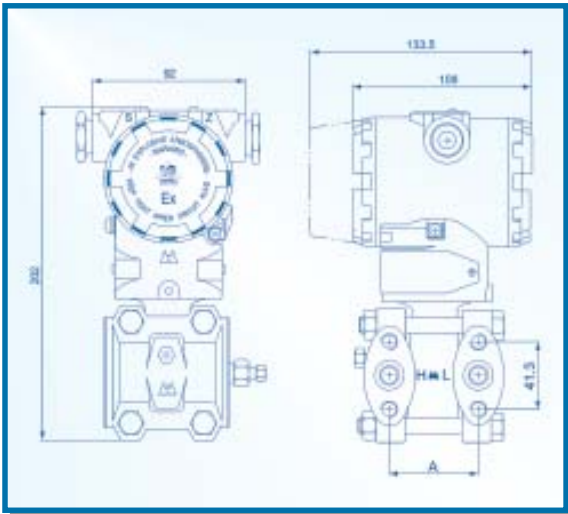
WT2000

Smart Pressure Transmitter

865B044C

Features

- Transmitter of:
 - Differential pressure (DP)
 - High static pressure (HP)
 - Gauge pressure (GP)
 - Absolute pressure (AP)
 - Level (LT)
- Accuracy: $\pm 0.075\%$
- Conformable with HART protocol
- Local span and zero adjustment
- EEPROM memory
- Digital led indicator
- IP66 mechanical protection
- Certification:
 - Explosion Proof Exd II CT4
 - Intrinsic Safety Exi II CT6



- Compact digital system, power supply 12÷45Vdc, suitable for liquid, gas and vapour applications.
- Ranges from 0÷0.00125bar (0÷125Pa) to 0÷413.7 bar (0÷41370KPa)
- Accuracy: $\pm 0.075\%$
- BEEL202 FSK technology

General

Transmitters (**WT2000** Transmitter for short) are more stable in performance with the automatic temperature compensation function. Compact construction, small and light, conformable with HART protocol, the **WT2000** transmitter are widely used in petrochemical, iron and steel, power plant, chemical, light industry and other industries

Operation principle

Process pressure is transmitted through an isolation diaphragm and oil fill fluid to a sensing diaphragm located in the center of the d-Cell. The reference pressure is transmitted similarly to the other side of the sensing diaphragm. The sensing diaphragm moves to a position which is proportional to the difference in pressure. The position of the sensing diaphragm is detected by the capacitance plates on both sides of the sensing diaphragm. The capacitance between the sensing diaphragm and either side capacitor plate is approximately 150 pf. The sensor is driven by an oscillator of 32 KHz frequency and 20 Vpp. The output is then rectified through a de-modulator.



GESINT.

1. Functional Specifications

1.1 - Service

Liquid, gas, and vapour applications.

1.2 - Ranges

For the range and the range code see tab.1-1.

Codice Range	Ranges (URL) bar	WT2000DP	WT2000HP	WT2000GP	WT2000AP	WT2000LT
2	0~0.00125 ÷ 0.015	O	-	-	-	-
3	0~0.013 ÷ 0.075	O	-	O	-	-
4	0~0.062 ÷ 0.374	O	O	O	O	O
5	0~0.311 ÷ 1.864	O	O	O	O	O
6	0~1.17 ÷ 6.895	O	O	O	O	O
7	0~3.45 ÷ 20.68	O	O	O	O	-
8	0~11.70 ÷ 68.90	O	-	O	O	-
9	0~34.5 ÷ 206.80	-	-	O	-	-
10	0~68.9 ÷ 413.70	-	-	O	-	-

Tab.1-1

Nota: **O**, is available; **N**, is not available. 1bar = 100KPa

1.3 - Output signal

2-wire 4÷20mA dc overlapped with HART digital signal, linear or square-root selectable

1.4 - Power supply

Standard 24 VDC, 12÷45Vdc with the load resistance in the area shown in fig.1.5.

1.5 - Load character

$RL = (Vs - 12V) / 23mA$. Where RL is the maximum load, Vs is the voltage of the power supply.

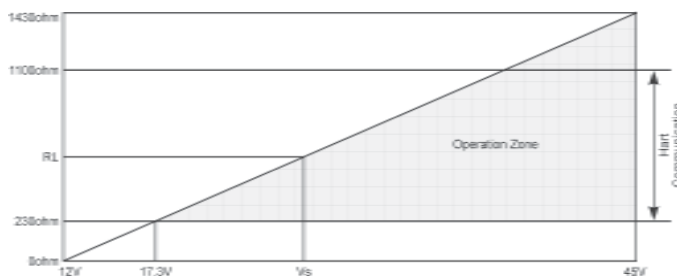


Fig.1.5

1.6 - Indication

M1 - Linear analog meter, 0÷100% scale

M2 - Square root analog meter, 0÷100% flow scale

M3 - 1/2 linear lcd meter, 0÷100%, 13mm high letters

1.7 - Span and zero

Local adjustment with the keys on the housing or with HART communicator.

WT2000 - Specification

1.8 - Zero elevation and suppression

DP - The maximum zero suppression is the difference between URL and span.
The maximum zero elevation is URL.

GP - The maximum zero suppression is the difference between URL and span.
The maximum zero elevation is less than atmosphere.

AP - The maximum zero suppression is the difference between URL and span.
There is no zero elevation.

1.9 - Allarm

The diagnostic program detects the malfunction and output 22mA for high or 3.8mA for low alarming signal. The alarming, high or low, is selectable by placing the jump on the circuit board.

1.10 - Write-Protect of the transmitter's status

Adjust the jump in case of changing the configuration

1.11 - Temperature limits

Electronics: -40°C ÷ +85°C

Sensor with fill silicon oil: -40°C ÷ +104°C

Sensor with fill inertial oil: -18°C ÷ +71°C

1.12 - Storage temperature

-10°C ÷ +71°C

1.13 - Turn-on time

2s maximum.

1.14 - Damping

0÷16s electronic damping, adjustable by 0.1s interval. Time constant is 0.2s. 0.4s for range code 4.

1.15 - Volumetric displacement

<0.16cm³ with minimum damping.

1.16 - Performance specification

(No zero elevation and suppression, reference operation conditions, silicon fill, and 316L stainless steel isolation diaphragm.)

1.16.1 - Accuracy

Accuracy vs. range code:

Transmitter Type	Range code	Accuracy %	Max. Static Pressure (bar)	Note
DP	03; 04; 05; 06; 07; 08	0.075	≤140 (≤69 for Code 2)	Range code 3/4/5: ±0.075% (10:1) ±(0.025+0.005URL/Span)% of the span (>10:1)
GP	03; 04; 05; 06; 07; 08; 09; 10	0.075		
AP	04; 05; 06; 07; 08	0.075		
HP	04; 05; 06; 07	0.075	≤320	
LT	04; 05; 06	0.075	≤25	
Remote seal DP	04; 05; 06; 07; 08	0.25	25 or 100	
Remote seal GP	04; 05; 06; 07; 08	0.25		

1.16.2 - Insensitive zone

None

1.16.3 - Stability

Not greater than the accuracy of the transmitter for 24 month

1.16.4 - Temperature effect for DP

At full range per $\Delta T=100^{\circ}\text{C}$

Range Code or Description	Accuracy
02	/
03	$\leq \pm 0.20\%$
04; 05; 06; 07; 08; 09; 10	$\leq \pm 0.20\%$
LT, Remote Seal	/

1.16.5 - Static pressure effect for DP

Per 140Kbar (14MPa)

Range Code or Description	Accuracy
02	/
03	$\leq \pm 0.20\%$
04; 05; 06; 07; 08	$\leq \pm 0.20\%$
HP: 04; 05; 06; 07	/

1.16.6 - Vibration effect

0.1% of URL, 10÷60Hz, S=0.07 in any direction.

1.16.7 - Power supply effect

Less than 0.005% of output span/V.

1.16.8 - EMI / RFI effect

0.1% of URL, tested from from 27 to 500MHz, field strength up to 30V/m.

1.16.9 - Mounting position effect

Zero shift of up to 0.0024bar if the sensing diaphragm is not vertical mounted, which can be calibrated out. No span effect.

1.16.10 - Construction materials

- See the “**Ordering Information**” for selecting the wetted parts: Flange/Adapter, Drain/Vent Valve, and Isolating Diaphragm.
- **Bolts** Zinc-plated carbon steel.
- **Electronic Housing** Low-copper aluminum.
- **Paint** Epoxy-polyester

1.16.11 - Process connections

1/4 NPT on the Flanges, 1/2 NPT on the Adapters. The size of the centers between adapters is selectable from one of the three: 51mm, 54mm, and 57mm.

1.16.12 - Electrical connections

Two M20x1.5 on the housing for connecting the conduit. Screw terminals and a plat for test to connect the communicator.

1.16.12 - Weight

3.5 Kg excluding accessories and flange mounted transmitters.

2. WT2000DP

Differential pressure transmitter
 HART Communication
 Best accuracy: $\pm 0,075\%$
 Ranges from 0÷1,3kPa to 6890kPa (0÷0,013 to 68,9bar)
 IP66 mechanical protection
 Certifications: Explosion-Proof; Intrinsic Safety
 Overall dimension: see fig.2.a

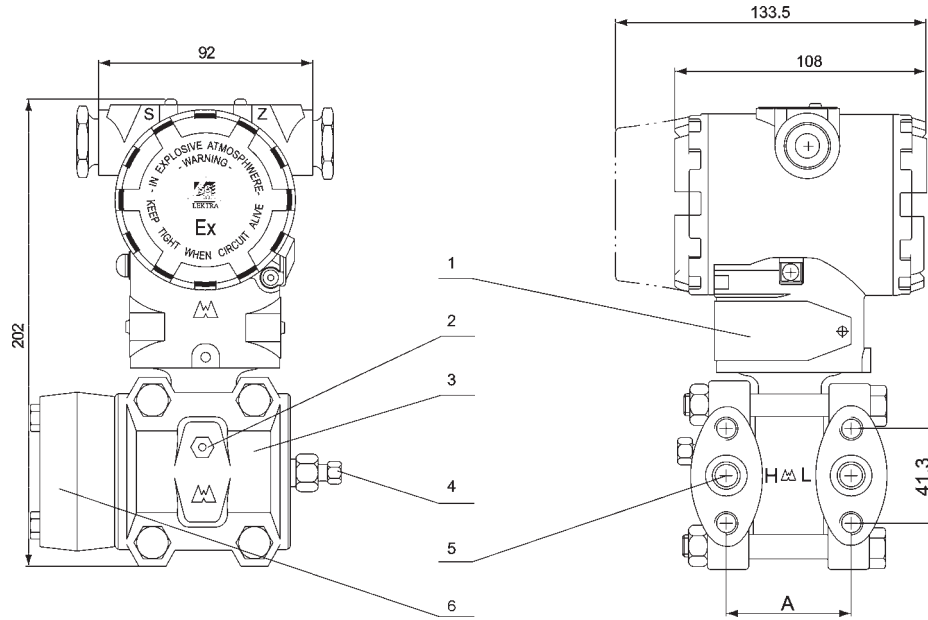


Fig.2.a

Range code	02; 03; 04; 05	06; 07	08
A (mm)	54.0	55.6	57.2

LEGEND	
1	Product lable
2	Drain/Vent (optional)
3	Process connection
4	Drain/Vent
5	1/4 NPT connection
6	NPT1/2 connection

WT2000 - Specification and order codes

WT2000DP	Code	Range																														
	02	0÷0,125...1,5kPa; 0÷0,00125...0,015bar																														
	03	0÷1,3...7,5kPa; 0÷0,013...0,075bar																														
	04	0÷6,2...37,4kPa; 0÷0,062...0,374bar																														
	05	0÷31,1...186,8kPa; 0÷0,311...1,868bar																														
	06	0÷117...690kPa; 0÷1,17...6,90bar																														
	07	0÷345...2068kPa; 0÷3,45...20,68bar																														
	08	0÷1170...6890kPa; 0÷11,70...68,9bar																														
	Code	Output																														
	S1	4÷20mA/HART pressure measure(linear)																														
	S2	4÷20mA/HART flow measure (Square Root)																														
	Code	Construction materials																														
		<table border="1"> <thead> <tr> <th></th> <th>Flange/Adapters</th> <th>Drain/vent</th> <th>Diaphragm</th> <th>Fill Fluid</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>316 SST</td> <td>316 SST</td> <td>316 SST</td> <td rowspan="6">Silicone</td> </tr> <tr> <td>23</td> <td>316 SST</td> <td>316 SST</td> <td>Astelloy C</td> </tr> <tr> <td>24</td> <td>316 SST</td> <td>316 SST</td> <td>Monel</td> </tr> <tr> <td>33</td> <td>Astelloy C</td> <td>Astelloy C</td> <td>Astelloy C-217</td> </tr> <tr> <td>35</td> <td>Astelloy C</td> <td>Astelloy C</td> <td>Tantalum</td> </tr> <tr> <td>44</td> <td>Monel</td> <td>Monel</td> <td>Monel</td> </tr> </tbody> </table>		Flange/Adapters	Drain/vent	Diaphragm	Fill Fluid	22	316 SST	316 SST	316 SST	Silicone	23	316 SST	316 SST	Astelloy C	24	316 SST	316 SST	Monel	33	Astelloy C	Astelloy C	Astelloy C-217	35	Astelloy C	Astelloy C	Tantalum	44	Monel	Monel	Monel
	Flange/Adapters	Drain/vent	Diaphragm	Fill Fluid																												
22	316 SST	316 SST	316 SST	Silicone																												
23	316 SST	316 SST	Astelloy C																													
24	316 SST	316 SST	Monel																													
33	Astelloy C	Astelloy C	Astelloy C-217																													
35	Astelloy C	Astelloy C	Tantalum																													
44	Monel	Monel	Monel																													
	Code	Maximum Pressure																														
	A	100bar (for range code 4,5,6,7,8) > DEFAULT <																														
	B	40bar (for range code 3)																														
	D	140bar (for range code 4,5,6,7,8)																														
	Code	Optional Selection																														
	M01	0÷100% linear meter																														
	M02	0÷100 square root meter																														
	M03	LCD display, linear 3½ digits																														
	W04	PTFE O-rings																														
	B01	Bracket, 2" pipe mount, carbon steel																														
	B02	Bracket, panel mount, carbon steel																														
	B03	Flat bracket, 2" pipe mount, carbon steel																														
	B04	Bracket, 2" pipe mount, stainless steel																														
	B05	Bracket, Panel mount, stainless steel																														
	B06	Bracket Flat, 2" pipe mount, stainless steel																														
	D01	Side drain/vent, tope																														
	D02	Side drain/vent, bottom																														
	A00	NPT½ connection > DEFAULT <																														
	C12	NPT½ connectors, n.2																														
	C02	M20x1.5 connection																														
	C21	M20x1.5 connectors, n.2																														
	d00	Explosion Proof EXdIIBT4 certificate																														
	i00	Intrinsic Safety EXialICT6 certificate																														
	Z99	Special																														

WT2000DP	2	S1	22	B	M01 - B01 - C12
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Order code example

N.B. - It's possible to select more than one "Optional Selection" codes-

WT2000 - Specification and order codes

3. WT2000HP

Differential pressure measurement (High static pressure)
 HART Communication
 Best accuracy: $\pm 0,075\%$
 Ranges from 0÷6,2kPa to 2068kPa; (0÷0,062 to 20,68bar)
 IP66 mechanical protection
 Certifications: Explosion-Proof; Intrinsic Safety
 Overall dimension: see fig.2 at pag.5

WT2000HP	Code	Range								
	04	0÷6,2...37,4kPa; 0÷0,062...0,374bar								
	05	0÷31,1...186,8kPa; 0÷0,311...1,868bar								
	06	0÷117...690kPa; 0÷1,17...6,90bar								
	07	0÷345...2068kPa; 0÷3,45...20,68bar								
	Code	Output								
	S1	4÷20mA/HART pressure measure(linear)								
	S2	4÷20mA/HART flow measure (Square Root)								
	Code	Construction materials								
		<table border="1"> <thead> <tr> <th>Flange/Adapters</th> <th>Drain/vent</th> <th>Diaphragm</th> <th>Fill Fluid</th> </tr> </thead> <tbody> <tr> <td>316 SST</td> <td>316 SST</td> <td>316 SST</td> <td>Silicone</td> </tr> </tbody> </table>	Flange/Adapters	Drain/vent	Diaphragm	Fill Fluid	316 SST	316 SST	316 SST	Silicone
Flange/Adapters	Drain/vent	Diaphragm	Fill Fluid							
316 SST	316 SST	316 SST	Silicone							
	22									
	Code	Maximum Pressure								
	A	250bar > DEFAULT <								
	F	320bar								
	Code	Optional Selection								
	M01	0÷100% linear meter								
	M02	0÷100 square root meter								
	M03	LCD display, linear 3½ digits								
	W04	PTFE O-rings								
	B01	Bracket, 2" pipe mount, carbon steel								
	B02	Bracket, panel mount, carbon steel								
	B03	Flat bracket, 2" pipe mount, carbon steel								
	B04	Bracket, 2" pipe mount, stainless steel								
	B05	Bracket, Panel mount, stainless steel								
	B06	Bracket Flat, 2" pipe mount, stainless steel								
	D01	Side drain/vent, tope								
	D02	Side drain/vent, bottom								
	A00	NPT½ connection > DEFAULT <								
	C12	NPT½ connectors, n.2								
	C02	M20x1.5 connection								
	C21	M20x1.5 connectors, n.2								
	d00	Explosion Proof EXdIIBT4 certificate								
	i00	Intrinsic Safety EXialICT6 certificate								
	Z99	Special								

WT2000HP	2	S1	22	F	M01 - B01 - C12
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N.B. - It's possible to select more than one "Optional Selection" codes-

Order code example:

4. WT2000GP

Gauge pressure transmitter.
 HART Communication
 Best accuracy: $\pm 0,075\%$
 Ranges from 0÷1,3kPa to 41370kPa (0÷0,013 to 413,7bar)
 IP66 mechanical protection
 Certifications: Explosion-Proof; Intrinsic Safety
 Overall dimension: see fig.5

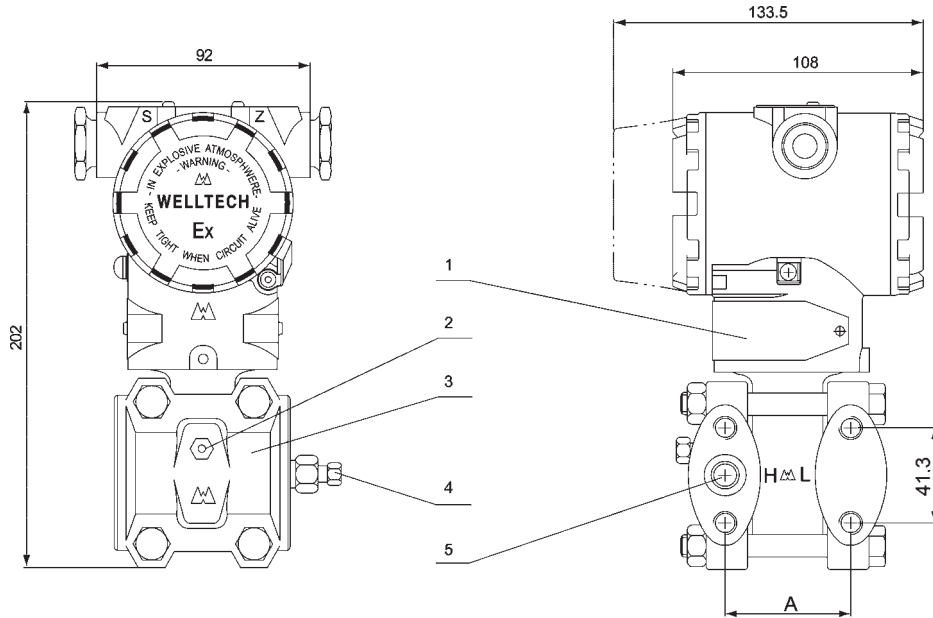


Fig.5

Range code	03; 04; 05	06; 07	08	09	10
A (mm)	54.0	55.6	57.2	57.9	59.1

LEGEND	
1	Product lable
2	Drain/Vent (optional)
3	Process connection
4	Drain/Vent
5	1/4 NPT connection

WT2000 - Specification and order codes

5. WT2000AP

Absolute pressure transmitter.
 HART Communication
 Best accuracy: $\pm 0,075\%$
 Ranges from 0÷6,2kPa to 6890kPa (0÷0,062 to 68,9bar)
 IP66 mechanical protection
 Certifications: Explosion-Proof; Intrinsic Safety
 Overall dimension: see fig.5 at pag.9

WT2000AP	Code	Range			
	04	0÷6,2...37,4kPa; 0÷0,062...0,374bar			
	05	0÷31,1...186,8kPa; 0÷0,311...1,868bar			
	06	0÷117...690kPa; 0÷1,17...6,90bar			
	07	0÷345...2068kPa; 0÷3,45...20,68bar			
	08	0÷1170...6890kPa; 0÷11,70...68,9bar			
	Code	Output			
	S1	4÷20mA/HART pressure measure(linear)			
	Code	Construction materials			
		Flange/Adapters	Drain/vent	Diaphragm	Fill Fluid
	22	316 SST	316 SST	316 SST	Silicone
	23	316 SST	316 SST	Astelloy C	
	24	316 SST	316 SST	Monel	
	33	Astelloy C	Astelloy C	Astelloy C-217	
	44	Monel	Monel	Monel	
	Code	Optional Selection			
	M01	0÷100% linear meter			
	M03	LCD display, linear 3½ digits			
	W04	PTFE O-rings			
	B01	Bracket, 2" pipe mount, carbon steel			
	B02	Bracket, panel mount, carbon steel			
	B03	Flat bracket, 2" pipe mount, carbon steel			
	B04	Bracket, 2" pipe mount, stainless steel			
	B05	Bracket, Panel mount, stainless steel			
	B06	Bracket Flat, 2" pipe mount, stainless steel			
	D01	Side drain/vent, top			
	D02	Side drain/vent, bottom			
	A00	NPT½ connection > DEFAULT <			
	C12	NPT½ connectors, n.2			
	C02	M20x1.5 connection			
	C21	M20x1.5 connectors, n.2			
	d00	Explosion Proof EXdIBT4 certificate			
	i00	Intrinsic Safety EXialICT6 certificate			
	Z99	Special			

WT2000AP 4 S1 22 M01 - B01 - C12

Order code example

N.B. - It's possible to select more than one "Optional Selection" codes-

6. WT2000LT

Hydrostatic head level transmitter.
 HART Communication
 Best accuracy: $\pm 0,075\%$
 Ranges from 0÷6,2kPa to 690kPa (0÷0,062 to 6,9bar)
 IP66 mechanical protection
 Certifications: Explosion-Proof; Intrinsic Safety
 Overall dimension: see fig.7

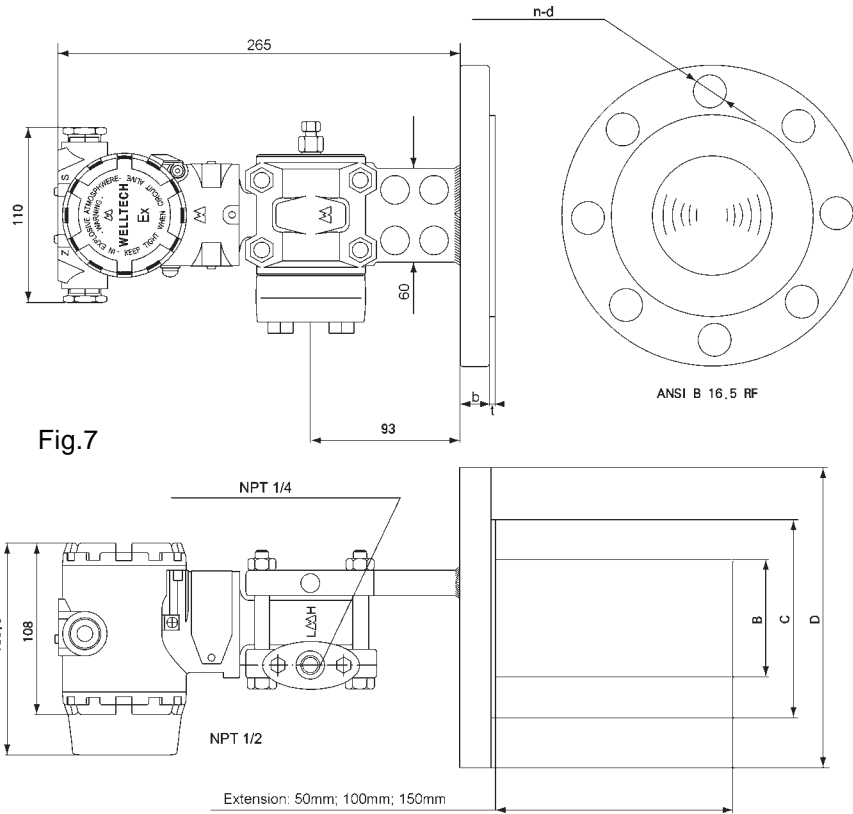


Fig.7

Flangia	Pressione nominale	D (mm)	K (mm)	B (mm)	C (mm)	t (mm)	b (mm)	Bulloneria	
								N.	Passo
DN50 (DIN2526) (DIN2501)	PN 1.6MPa/4MPa	165	125	57	102	3 ^{-0.5}	20	4	M16
	PN 6.4MPa	180	135	57	102	3 ^{-0.5}	26	4	M20
	PN 10MPa	195	145	57	102	3 ^{-0.5}	28	4	M20
DN880 (DIN2526) (DIN2501)	PN 1.6MPa/4MPa	200	160	75	138	3 ^{-0.5}	24	8	M16
	PN 6.4MPa	215	170	75	138	3 ^{-0.5}	28	8	M20
	PN 10MPa	230	180	75	138	3 ^{-0.5}	32	8	M24
DN 2" (ANSI B 16.5 RF)	150Psi	152.4	120.6	57	92.1	3 ^{-0.5}	17.4	4	M18
	300psi	165.1	127.0	57	92.1	3 ^{-0.5}	20.6	8	M18
	600psi	165.1	127.0	57	92.1	6.35	31.75	8	M18
DN 3" (ANSI B 16.5 RF)	150Psi	190.5	152.4	75	127	3 ^{-0.5}	22.2	4	M16
	300psi	209.5	168.3	75	127	3 ^{-0.5}	27.0	8	M20
	600psi	209.5	168.3	75	127	6.35	38.05	8	M20
DN 4" (ANSI B 16.5 RF)	150Psi	229	191	89	157	3 ^{-0.5}	30	8	Ø20
	300psi	255	200	89	157	3 ^{-0.5}	32	8	Ø22

Tab.7

WT2000 - Specification and order codes

WT2000LT	Code	Range
	04	0±6,2...37,4kPa; 0±0,062...0,374bar
	05	0±31,1...186,8kPa; 0±0,311...1,868bar
	06	0±117...690kPa; 0±1,17...6,90bar
		Code Output
	S1	4÷20mA/HART pressure measure (linear)
		Flange side dimension and construction materials (see fig.3pag.12)
	Code	Diameter (mm) Extension (mm) Diaphragm Material
	A0	80 0 316 LSST
	A2	80 50 316 LSST
	A4	80 100 316 LSST
	A6	80 150 316 LSST
	B0	100 0 316 LSST
	B2	100 50 316 LSST
	B4	100 100 316 LSST
	B6	100 150 316 LSST
	C0	80 0 Hastelloy C 276
	C2	80 50 Hastelloy C 276
	C4	80 100 Hastelloy C 276
	C6	80 150 Hastelloy C 276
	D0	100 0 Hastelloy C 276
	D2	100 50 Hastelloy C 276
	D4	100 100 Hastelloy C 276
	D6	100 150 Hastelloy C 276
	E0	80 0 Tantalum
	F0	100 0 Tantalum
	Code	Mounting flange type and material
	A	2" 150lb SST
	B	3" 150lb SST
	C	4" 150lb SST
	D	2" 300lb SST
	E	3" 300lb SST
	F	4" 300lb SST
	G	2" 600lb SST
	H	3" 600lb SST
	L	DN50 PN 1.6MPa/4MPa
	M	DN880 PN 1.6MPa/4MPa
	N	DN50 PN 6.4MPa
	P	DN880 PN 6.4MPa
	R	DN50 PN 10MPa
	S	DN880 PN 10MPa
	Code	Construction materials
		Flange/Adapters Drain/vent Diaphragm Fill Fluid
	22	316 SST 316 SST 316 SST Silicon
	23	316 SST 316 SST Hastelloy C
	24	316 SST 316 SST Monel
	25	316 SST 316 SST Tantalum
	33	Hastelloy C Hastelloy C Hastelloy C
	35	Hastelloy C Hastelloy C Tantalum
	Code	Optional Selection
	M01	0±100% linear meter
	M02	0±100 square root meter
	M03	LCD display, linear 3½ digits
	W04	PTFE O-rings
	D01	Side drain/vent, top
	D02	Side drain/vent, bottom
	A00	NPT½ connection > DEFAULT <
	C12	NPT½ connectors, n.2
	C02	M20x1.5 connection
	C21	M20x1.5 connectors, n.2
	d00	Explosion Proof EXdIIBT4 certificate
	i00	Intrinsic Safety EXiaIICT6 certificate
	Z99	Special

WT2000LT 4 S1 A0 A 22 M01 - C12

Order code example

N.B. - It's possible to select more than one "Optional Selection" codes-

7. OPTIONAL

7.1 Brackets

7.1.1 2" pipe mount bracket

B01/B04 optional selection code, see fig.7.1.1

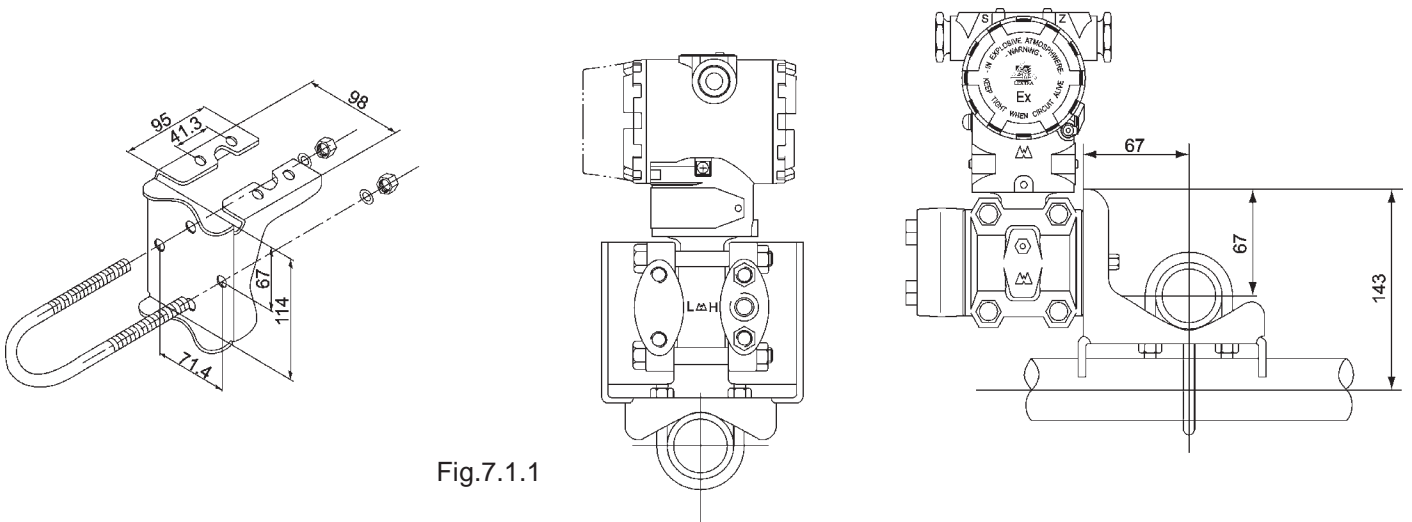


Fig.7.1.1

7.1.2 Panel mount bracket

B02/B05 optional selection code, see fig.7.1.2

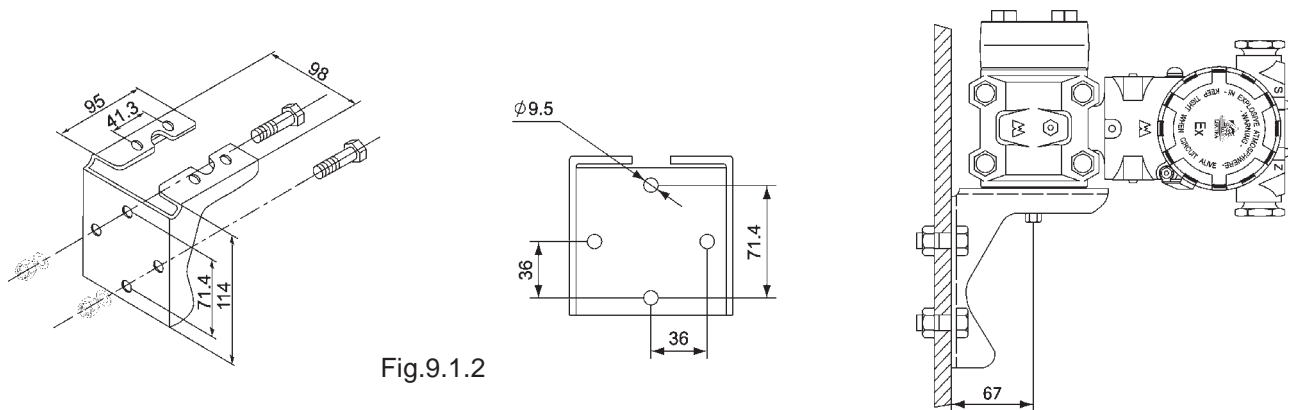


Fig.9.1.2

7.1.3 2" pipe mount flat bracket

B03/B06 optional selection code, see fig.7.1.3

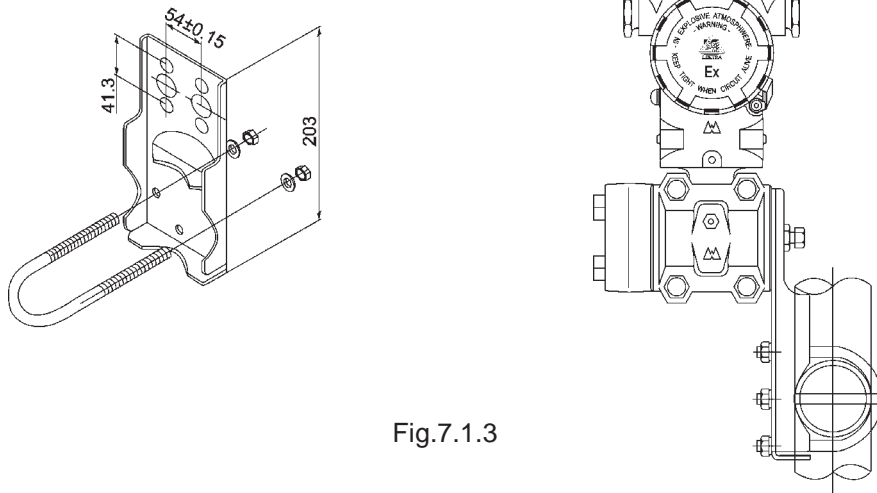
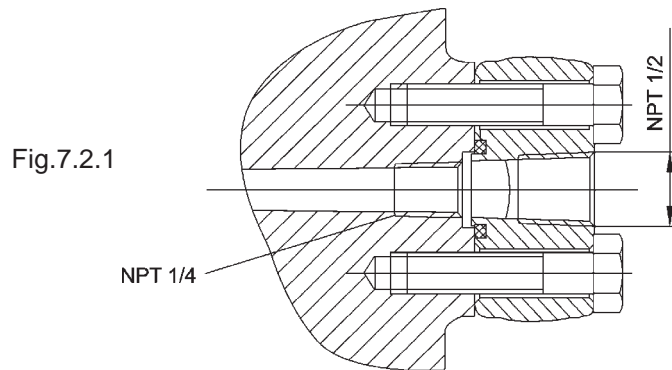


Fig.7.1.3

7.2 Process connections and connectors

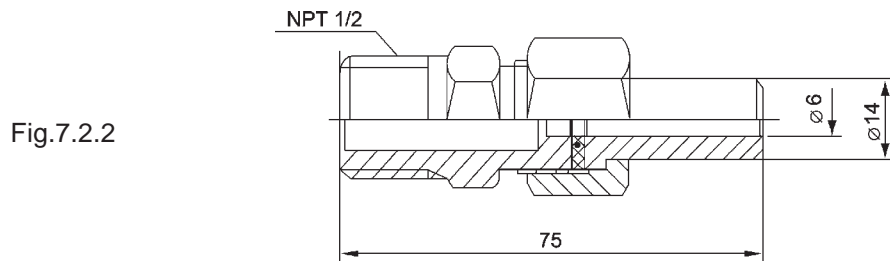
7.2.1 NPT 1/2 connection

A00 optional selection code (default), see fig.7.2.1



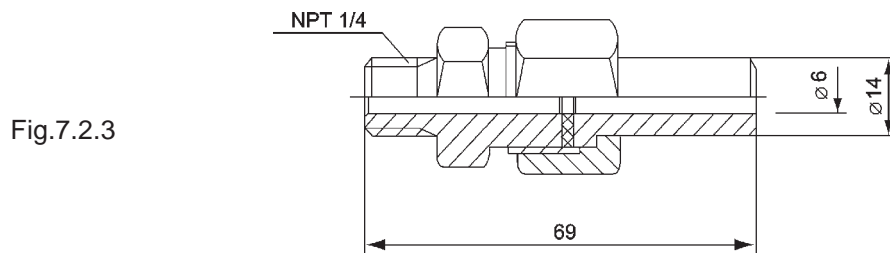
7.2.2 NPT $\frac{1}{2}$ connector

C12 optional selection code, see fig.7.2.2



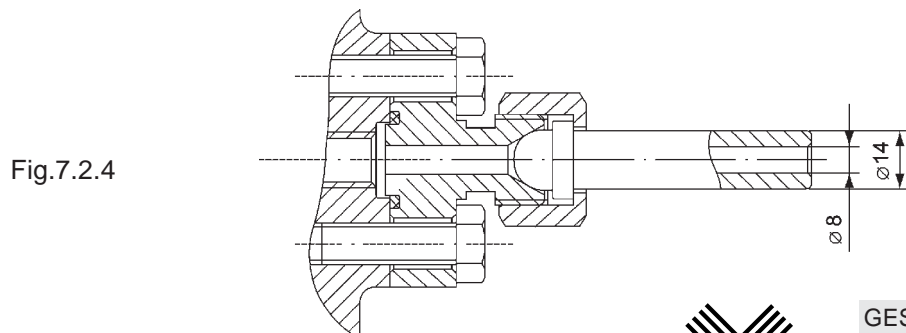
7.2.3 NPT $\frac{1}{4}$ connector

C22 optional selection code, see fig.7.2.3



7.2.4 M20x1.5 connector

C21 optional selection code, see fig.7.2.4



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