SERIES T7D

T7D series are Smart electronic differential pressure transmitters with 4 ÷ 20 mA output and HART® digital communication protocol.

Sensors are always calibrated individually together with their own seal.

These transmitters allow the measurement of differential pressure, level and volumetric flow in industrial, marine and off-shore.

Configurations and adjustments can be made locally by means of push buttons and display or remotely using HART® protocol compatible communicators.

The transmitters are intended for direct mounting on pipe or tank.

When remote seal and capillary are supplied, a bracket for wall or for 2" stand pipe mounting is also supplied.

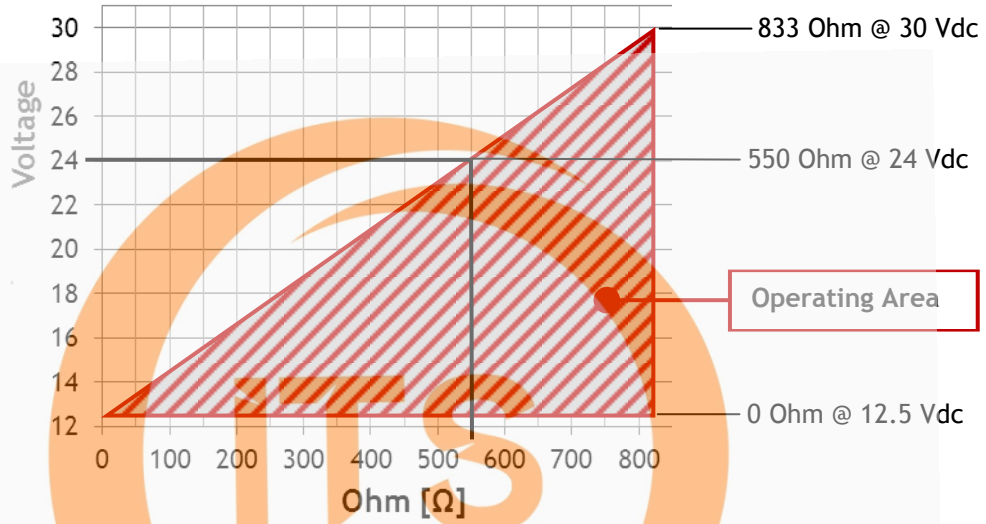
APPLICATION FIELDS

- Differential pressure, level and volumetric flow;
- Installation on chemical, Oil & Gas, pharmaceutical, alimentary, marine plants etc;
- Installation in areas with persistence of potentially explosive mixtures

TECHNICAL FEATURES

Electrical parameters

Supply:	12.5 ÷ 30 Vdc
Output signal:	4 ÷ 20 mA + Hart® Rev6
Alarm values:	3.85 mA \ 21 mA
Maximum load:	As per chart 220 Ω < R_L < 600 Ω (Hart®)



Measurement performance

Total accuracy (*):	< 0.20 % FS (-25 ÷ 0°C) < 0.07 % FS (0 ÷ 80°C)
Measured value update frequency:	4 ÷ 20 mA + Hart®: ≈ 1 s Hart®: ≈ 500 ms (On request)
Polling time:	4 ÷ 20 mA + Hart®: ≈ 800 ms Hart®: ≈ 500 ms (On request)
Response time:	< 256 ms (Standard Hart®)
Allowable de-range:	Down to 30 times the Nominal Range
Damping:	0 ÷ 60 s
Long term stability:	< 0.1 % FS for year

Notes

(*) Including hysteresis, non-linearity, non-conformity and non-repeatability (IEC 60770) Accuracy and drifts are given for instruments with integral sensor and diaphragm; they may vary according to sensor type and diameter, thickness and material of the diaphragm.

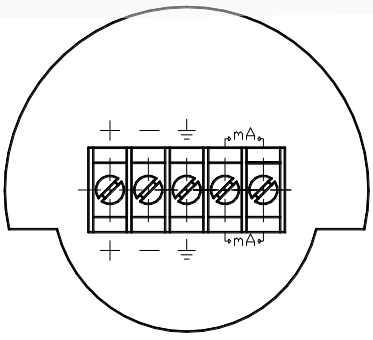
ENVIRONMENTAL FEATURES

Environmental Conditions	
Ambient temperature:	-40 ÷ +85°C ATEX T6, T85°C: -40°C ≤ Tamb ≤ 60°C ATEX T5, T100°C: -40°C ≤ Tamb ≤ 75°C
Process temperature:	-40 ÷ +85°C Capillary: T_{MAX} = 283°C
LCD working temperature:	-10 ÷ +65°C
Storage temperature:	-40 ÷ +90°C
Ingress protection degree:	AISI 316 Housing: IP67 Aluminum Housing: IP66
Vibration Test:	in accordance with IEC 60068-2-6
Relative Humidity:	< 98% RH not condensing

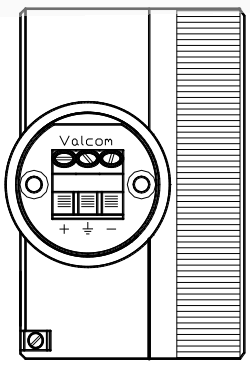
APPROVALS

Type approvals		
Directive 2014/34/EU (ATEX)	Ⓔx II 1G Ex ia IIC T6, T5 Ga and Ⓔx II 1D Ex ia IIIC T85°C, T100°C Da or Ⓔx II 1/2G Ex ia IIC T6, T5 Ga/	
Directive 2014/68/EU (PED)	Up to Category II, for fluids in Group 1	
Directive 2014/30/EU (EMC)	Adequate level of electromagnetic compatibility	
Functional Safety	SIL2 SFF = 78.13 %	PFH [Hours^{-1}] = 9.2352·10^{-8} DC = λ_{DD} / (λ_{DD} + λ_{DU}) = 83.7 %
Marine type approval	In compliance with applicable requirements of RINA type approval system	

ELECTRICAL WIRING

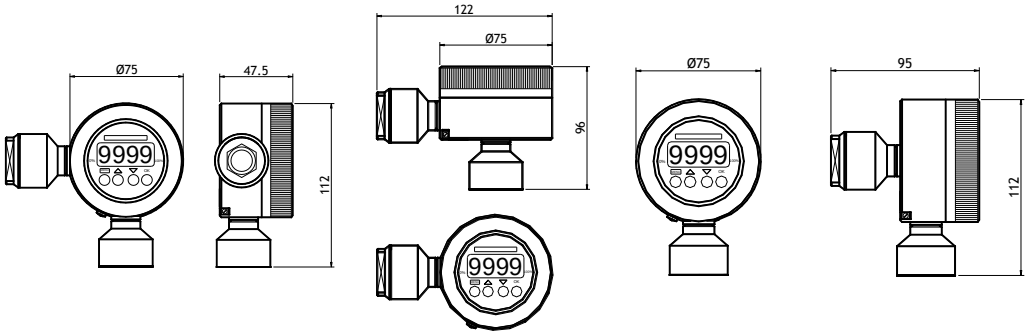


AISI 316 Housing 2 covers &
Aluminum Housing



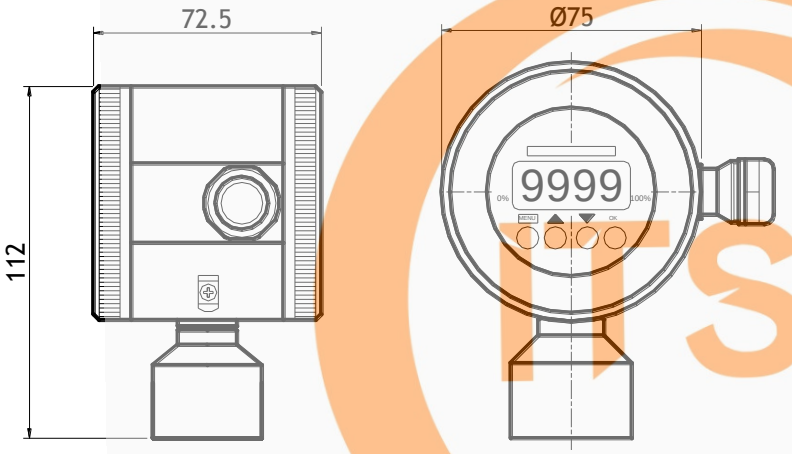
AISI 316 Housing 1 cover

HOUSING MATERIAL AND TYPE



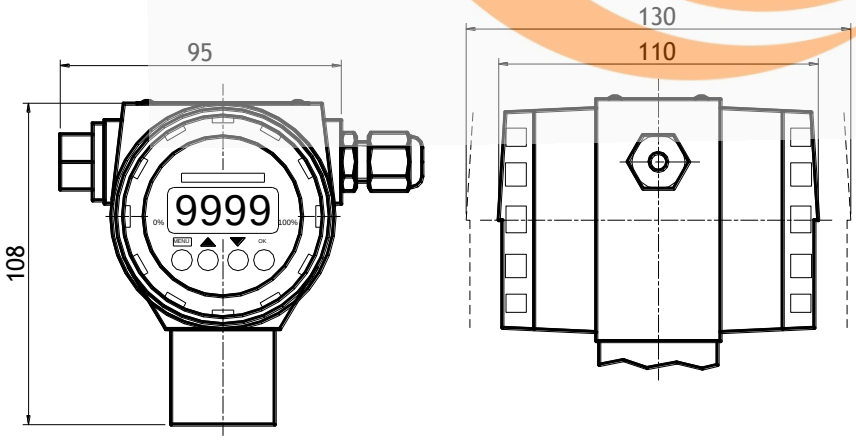
- **Material:** AISI 316
- **Zone:** Ⓔx II 1GD
- **Protection Degree:** IP67

A10 - AISI 316 Ø 75 mm back connection
A11 - AISI 316 Ø 75 mm bottom connection



- **Material:** AISI 316
- **Zone:** Ⓔx II 1GD
- **Protection Degree:** IP67

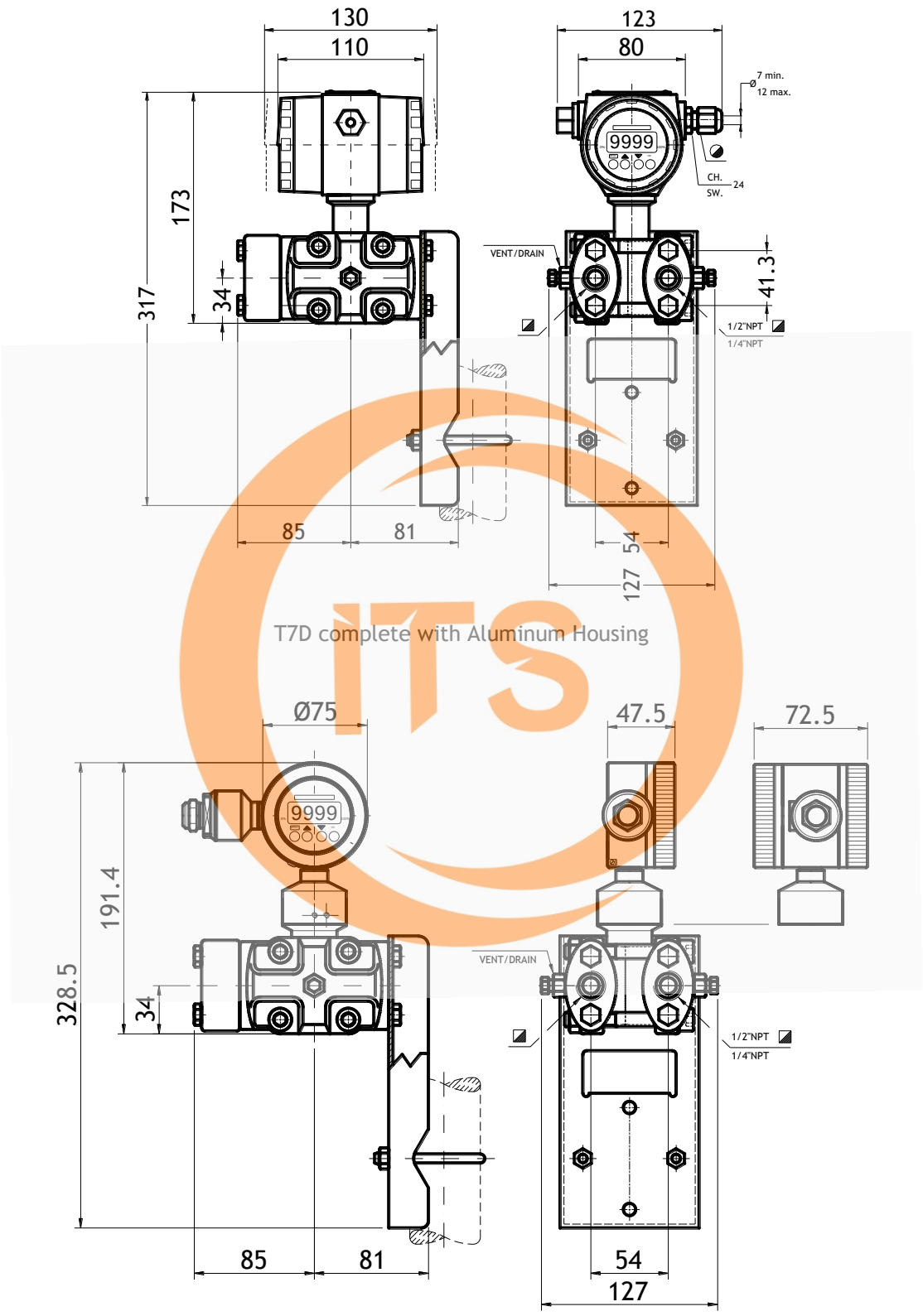
A16 - Fixed head
A17 - Rotating head



- **Material:** Aluminum
- **Zone:** Ⓔx II 1/2G
- **Protection Degree:** IP66

D04 - Alluminum housing

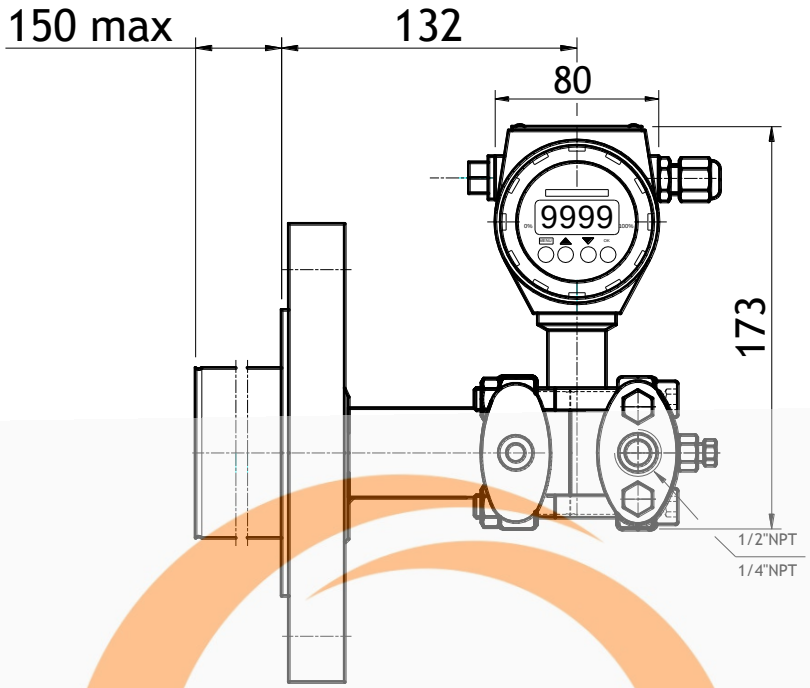
DIMENSIONAL DRAWINGS



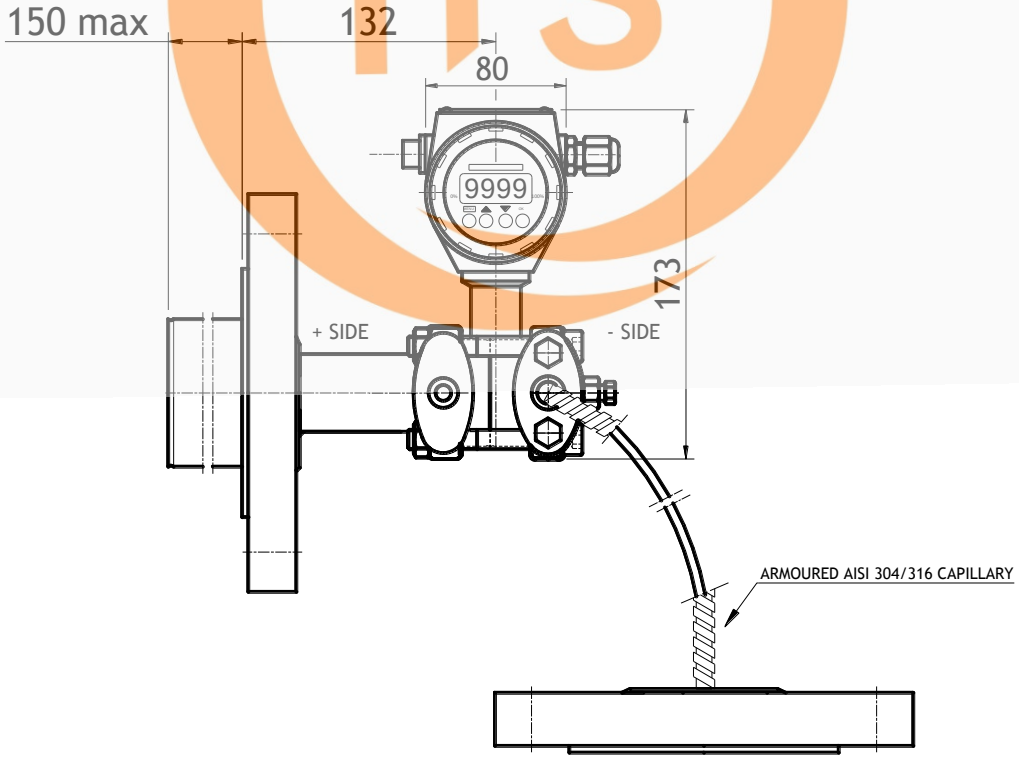
T7D complete with Aluminum Housing

T7D complete with St.Inox housing

DIMENSIONAL DRAWINGS



T7D complete with Aluminum Housing for level measurement in open vessels



T7D complete with Aluminum Housing for level measurement in closed vessels

ORDERING CODE

T7D Electronic Smart differential pressure transmitter

01 Type of measure

D	Differential Pressure

02 Sensor type

PI	Piezoresistive Integral

03 Measuring range

S01	18 mbar	Piezo	Overpressure: 50 bar
S02	60 mbar	Piezo	Overpressure: 50 bar
S03	350 mbar	Piezo	Overpressure: 140 bar
S04	350 mbar	Piezo	Overpressure: 210 bar
S05	1000 mbar	Piezo	Overpressure: 140 bar
S06	1000 mbar	Piezo	Overpressure: 210 bar
S07	2500 mbar	Piezo	Overpressure: 140 bar
S08	2500 mbar	Piezo	Overpressure: 210 bar
S09	5 bar	Piezo	Overpressure: 140 bar
S10	5 bar	Piezo	Overpressure: 210 bar
S11	10 bar	Piezo	Overpressure: 140 bar
S12	10 bar	Piezo	Overpressure: 210 bar
S13	30 bar	Piezo	Overpressure: 400 bar
S14	100 bar	Piezo	Overpressure: 400 bar
S15	400 bar	Piezo	Overpressure: 400 bar
P51	10 mbar	Piezo	No overpressure
P52	55 mbar	Piezo	No overpressure
P53	206 mbar	Piezo	No overpressure

NOTES

1) Negative or compound ranges are possible.

04 Filling oil

1	Siliconic Oil for high temperature -40/+308°C
6	Fluoride and Inert Oil -40/+200°C
8	Standard siliconic Oil -40/+200°C
9	Oil for food use -10/+220°C
Z	Special

05 Process temperature limits

B	-40 ÷ 85°C Standard
M	-40 ÷ 283°C Capillary
Z	Special

06 Housing material and type

...	See “Housing material and type” section
Z99	Special

07 Process connection

S16	Screwed 1/4" NPT-F x 2 distance between axes 54 mm
F97	Oval Flanges 1/2" NPT-F with bolts and gaskets
F44	Flange Non Rotating
F45	Flange Rotating
F47	Flange with extension on Ø75 Non Rotating
F48	Flange with extension on Ø75 Rotating
Z02	1 welding connection for capillary
Z03	2 welding connections for capillary

08 Extension length

L02	Diaphragm extension < 50 mm
LZZ	Diaphragm extension L = special
N00	No extension

ORDERING CODE

09	**Sensor material (diaphragm)**
A	AISI 316
B	AISI 316 L
K	Hastelloy C
10	**Process gasket material**
C	EPDM
D	FKM Viton
G	PTFE
11	**Wetted parts material**
A	AISI 316
B	AISI 316 L
N	Hastelloy C
12	**Electrical connection**
19	AISI 316 Cable Gland PG9 IP67 cable ø 5 ÷ 7 mm
20	AISI 316 Cable Gland PG13 IP67 for cable ø 8 ÷ 12 mm
21	AISI 316 Cable Gland PG16F
36	Nipple AISI 316 1/2" G-F
37	Nipple AISI 316 1/2" NPT-F
39	Nipple AISI 316 M20 x 1.5 F
81	Screwed 2 x M20
13	**Electrical output**
J	4 ÷ 20 mA 2 fili + HART (0.2 % FS) With LCD and blind cover
K	4 ÷ 20 mA 2 fili + HART (0.2 % FS) With LCD and transparent cover
R	4 ÷ 20 mA 2 fili + HART (0.1 % FS) With LCD and blind cover
S	4 ÷ 20 mA 2 fili + HART (0.1 % FS) With LCD and transparent cover
14	**Ex type approval**
A1	Ⓔx II 1G Ex ia IIC T6, T5 Ga and Ⓔx II 1D Ex ia IIIC T85°C, T100°C Da
A5	Ⓔx II 1/2G Ex ia IIC T6, T5 Ga/Gb
N0	No Ex certification
15	**Options and accessories**
02	Marine type approval
22	PED Certificate
21	SIL Certificate
10	Calibration report on 5 points
01	Test and material report according to EN 10204
12	Degreasing
S5	Mounting bracket for 2” pipe
NN	No options

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ACCESSORIES

Cod. M5
Five ways and five valves manifold

Cod. ORI
Calibrated flanges

Cod. SEP
Process seals

Cod. SUN Sunshade
protection

Cod. T7V
Digital field indicator

and MORE

- Degreasing for Oxygen service
- Wall mounting bracket
- SS 316 capillary L=...m
- Armoured capillary