

SERIES T7T



T7T series are Smart electronic transmitters with 4 ÷ 20 mA output and HART® digital communication protocol.

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 with or without thermowell.

For remote sensor version are supplied a bracket for wall or for 2" stand pipe mounting is also supplied.

APPLICATION FIELDS

- Temperature measurement;
- Installation on chemical, Oil & Gas, pharmaceutical, alimentary, marine plants etc;
- Installation in areas with persistence of potentially explosive mixtures.



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TECHNICAL FEATURES

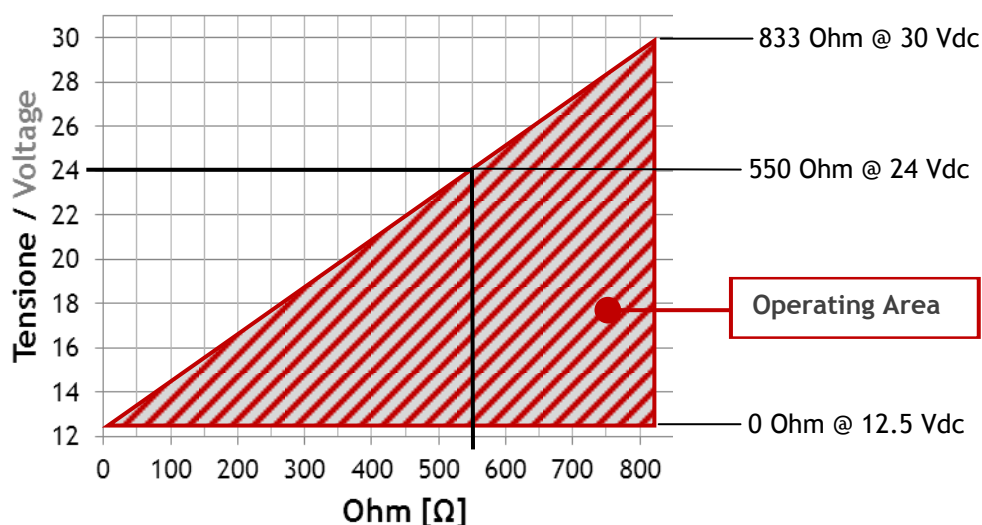
Electrical parameters

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 (*): εDGT + εPT100 [± °C]

Digital accuracy [εDGT]: < ± 0.1 % FS

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®)

Damping: 0 ÷ 60 s

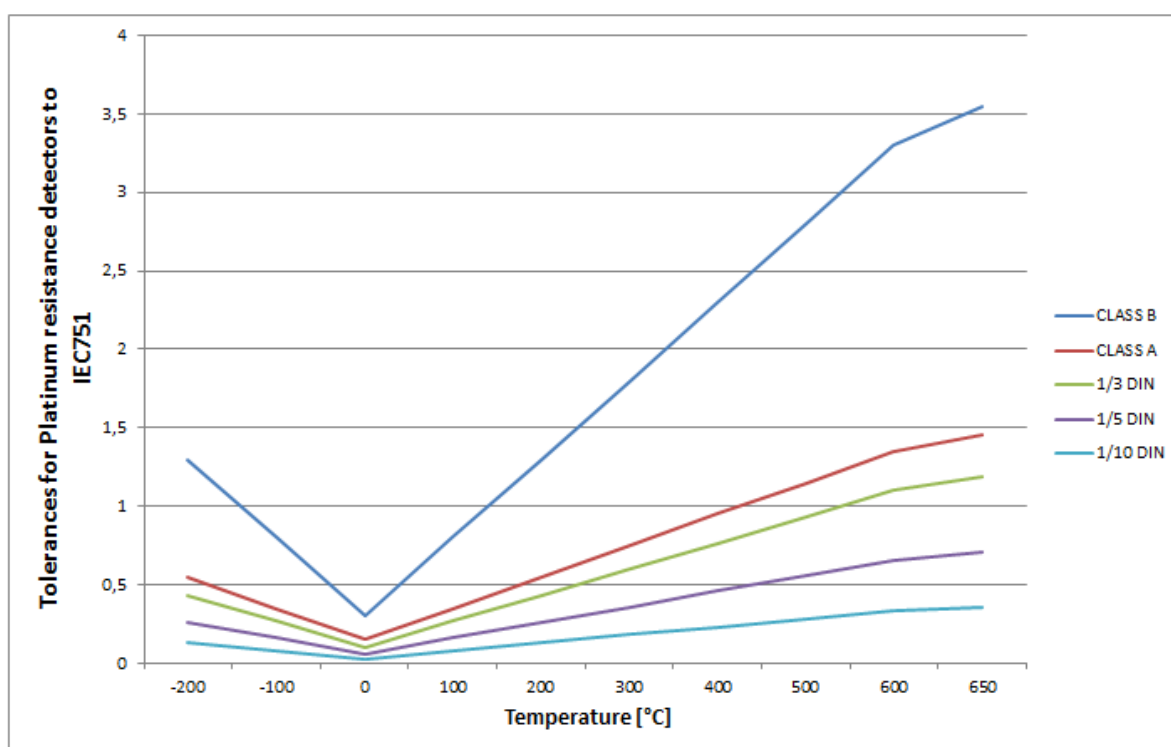
Long term stability: < 0.1 % FS for year

Notes

(*) Including hysteresis, non-linearity, non-conformity and non-repeatability (IEC 60770)

TOLERANCE CLASSES

Temp. [°C]	C. B [± °C]	C. A [± °C]	1 / 3 DIN [± °C]	1 / 5 DIN [± °C]	1 / 10 DIN [± °C]
-200	1.3	0.55	0.44	0.26	0.13
-100	0.8	0.35	0.27	0.16	0.08
0	0.3	0.15	0.1	0.06	0.03
100	0.8	0.35	0.27	0.16	0.08
200	1.3	0.55	0.44	0.26	0.13
300	1.8	0.75	0.6	0.36	0.18
400	2.3	0.95	0.77	0.46	0.23
500	2.8	1.15	0.94	0.56	0.28
600	3.3	1.35	1.1	0.66	0.33
650	3.6	1.45	1.2	0.72	0.36



The total instrument accuracy ε_{TOT} is given by the formula $\varepsilon_{TOT} = \varepsilon_{PT100} + \varepsilon_{DGT} [\pm ^\circ C]$ where ε_{PT100} is the thermoelement accuracy and ε_{DGT} is the digital accuracy.

ENVIRONMENTAL FEATURES

Environmental Conditions

Temperature class:	-40 ÷ +85 °C T6, T85 °C: -40 °C ≤ Tamb ≤ 60 °C T5, T100 °C: -40 °C ≤ Tamb ≤ 75 °C
Process temperature:	-40 ÷ +85 °C Nipple-Union-Nipple: T _{MAX} = 150 °C Remote: T _{MAX} = 350 °C or 500 °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

Note \ Notes

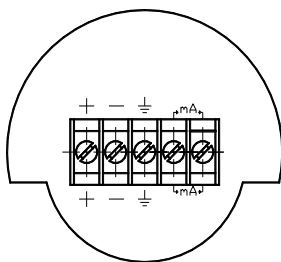
(**) T_{MAX} = 350 °C is about the installation without thermowell, T_{MAX} = 500 °C is complete with thermowell.

APPROVALS

Type approvals

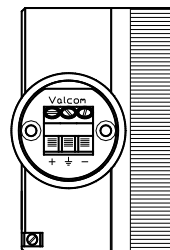
Directive 2014/34/EU (ATEX)	Ex II 1G Ex ia IIC T6, T5 Ga and Ex II 1D Ex ia IIIC T85 °C, T100 °C Da or Ex II 1/2G Ex ia IIC T6, T5 Ga/	
Directive 2014/68/EU (PED)	Up to Category III, for fluids in Group 1	
Directive 2014/30/EU (EMC)	Adequate level of electromagnetic compatibility	
Functional Safety	SIL2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

ELECTRICAL WIRING



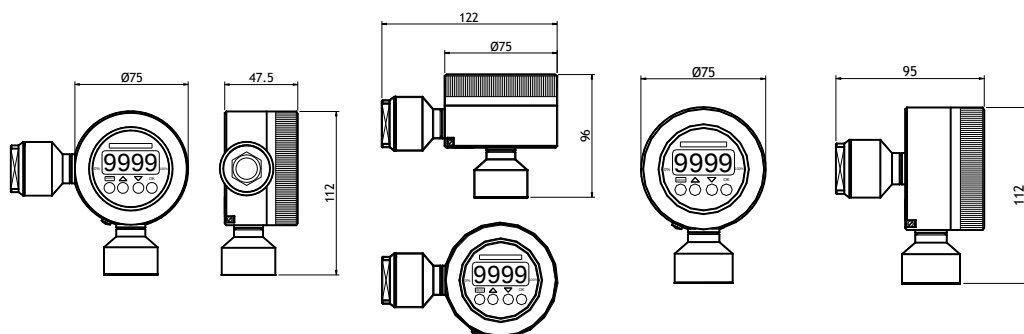
AISI 316 Housing 2 covers

Aluminum Housing



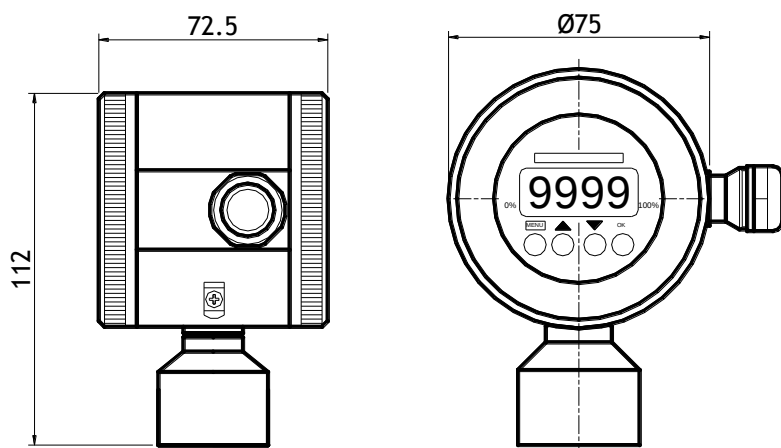
AISI 316 Housing 1 cover

HOUSING MATERIAL AND TYPE



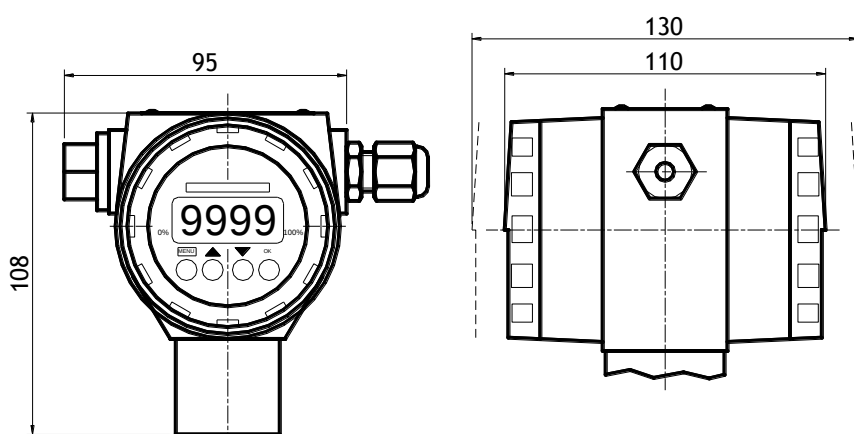
- Material: AISI 316
- Zone: II 1GD Ex
- Protection Degree: IP67

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



- Material: AISI 316 \ AISI 316
- Zone: II 1GD Ex
- Protection Degree: IP67

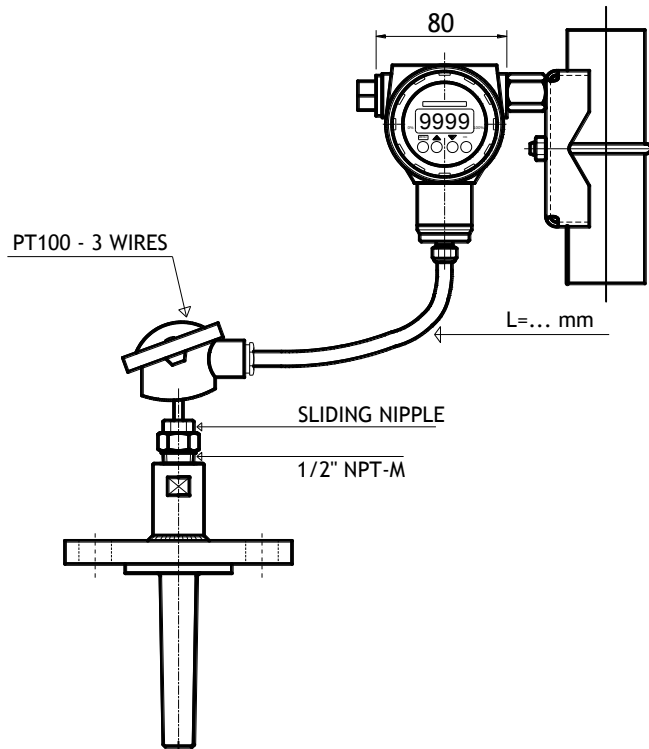
A16 - Fixed head
A17 - Rotating head



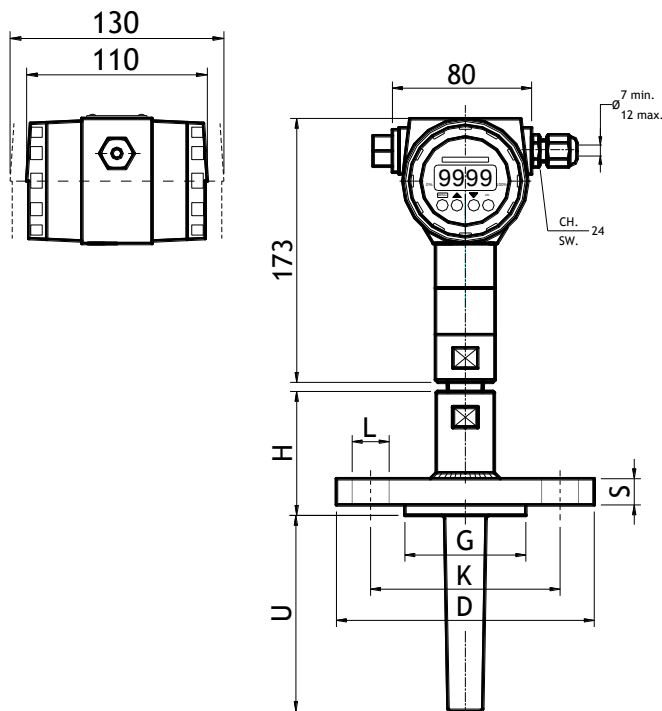
- Material: Aluminum
- Zone: Ex II 1/2G
- Protection Degree: IP66

D04 - Alluminum housing

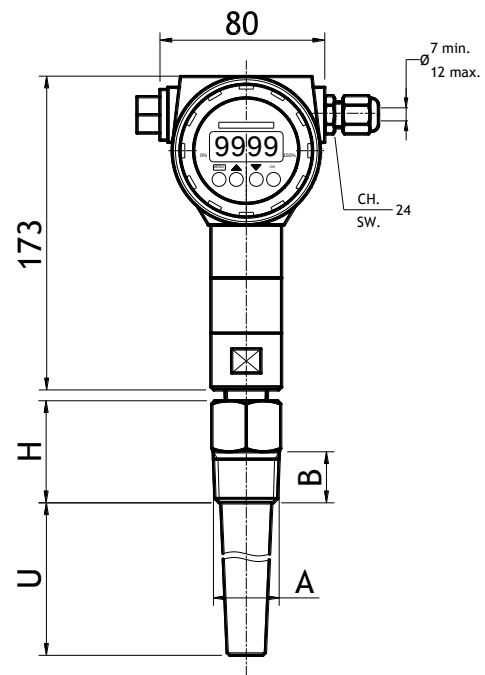
DIMENSIONAL DRAWINGS



T7T with remote sensor for temperatures up to 500°C



T7T coupled with flanged thermowell



T7T coupled with screwed thermowell

ORDERING CODE

T7T Electronic Smart temperature transmitter

01 Type of measure
☐ F Temperature

02 Sensor type
☐ T1 PT100 MGO Ø 3 - 6 mm AISI 316 classe DIN A
☐ T2 PT100 MGO Ø 3 - 6 mm AISI 316 classe DIN B
☐ T3 PT100 MGO Ø 3 - 6 mm AISI 316 classe 1 / 4 DIN
☐ ZZ Special

03 Measuring range
☐ T61 Sensor -200 ÷ 850° C Programmable

04 Filling oil
☐ N No filling

05 Process temperature limits
☐ B -40 ÷ 85° C Standard
☐ D -40 ÷ 150° C Nipple-Union-Nipple
☐ Z Special

06 Housing material and type
☐ A10 Back connection
☐ A11 Bottom connection
☐ A16 Fixed head
☐ A17 Rotating head
☐ D04 Alluminum housing

07 Process connection
☐ A01 Screwed 1/2" NPT - M L=... below process connection (Spring loaded)
☐ A02 Screwed 1/2" NPT - M L=... below process connection (Not spring loaded)

08 Extension length
☐ U01 50 ... 100 mm
☐ U02 100 ... 300 mm
☐ U03 > 300 mm
☐ Z99 Special

09 Sensor material (Thermoelement)
☐ A AISI 316
☐ X No sensor (only electronic head)

10 Process gasket material
☐ T All welded

11 Wetted parts material
☐ A AISI 316
☐ Z Special

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 M20 x 1.5

ORDERING CODE

13 Electrical output	
☐	F With LCD and blind cover
☐	G With LCD and transparent cover
14 Ex type approval	
☐	A1  II 1G Ex ia IIC T6, T5 Ga and  II 1D Ex ia IIIC T85°C, T100°C Da
☐	A5  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
☐	P0 Screwed thermowell in AISI 316
☐	P1 Screwed thermowell in Hastelloy C
☐	P2 Screwed thermowell in Titanium
☐	P3 Flanged thermowell in AISI 316
☐	P4 Flanged thermowell in Hastelloy C
☐	P5 Flanged thermowell in Titanium
☐	S5 Mounting bracket for 2" pipe
☐	NN No options

ACCESSORIES



Cod. TWE
Thermowells



Cod. TRT
Temperature transmitters without display



Cod. ZZ
Flexible temperature elements



Cod. T7M
Multichannel temperature transmitter



Cod. T7V
Digital field indicator

and MORE

- Wall mounting bracket
- Wake frequencies calculations (ASME PT19.3)
- Nipple-Union-Nipple versions

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