

PAT1101

Temperature transmitter for high accuracy measurements

Main features

- Sensor: Pt100 4-wire class A (IEC 60751)
- Output: 4-20 mA, 2-wire
- Measuring range: -40...+200 °C
- Degree of protection: IP67/IP69
- Output accuracy: Down to ± 0.25 °C

Design

Pt100 temperature sensor with 4-20 mA analog output. Compact all stainless steel housing with standardized M12-connection.

Example of use

Temperature measurements of gases and liquids in applications such as Food & Beverage, Laboratory & Medical and other applications that require high accuracy.

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Measuring accuracy

Reference conditions	Ambient temperature +23 ± 5 °C Surface temperature +23 ± 5 °C Supply voltage 24 VDC
Accuracy	±0.25 °C (-20...160 °C) ±0.3 °C (-40...-20 °C) ±0.35 °C (160...200 °C)
Warm-up time	2 min
Measuring range	-40...+200 °C
Temperature coefficient	0.003 °C/°C
Long term stability	±0.03 °C/year

Materials specification

Transmitter housing	EN 1.4404 (AISI 316L)
Sensor	EN 1.4404 (AISI 316L)
Surface roughness (wetted part)	Ra ≤ 0.8
M12-connector	Polyamid (housing), gold plated
Cable insulation*	PVC
Weight	Approx. 50g for direct mounted approx. 70g for cable variant
Dimensions	See drawing next page

* Applicable for cable variant only

Electrical characteristics

Supply voltage	10...32 VDC
Sensor current	0.37 mA
Reverse polarity protection	yes
Isolation	>1 GΩ (up to 1000 VDC depending of sensor tip) between housing and M12 connector

Compliance and approvals

EMC	2014/30/EU (EN 61326-1:2013)
RoHS3	2015/863/EU
WEEE	2012/19/EU
UKCA	SI 2016 No. 1091, SI 2012 No.3032
3A	74-07 if used together with 3A thermowell
EHEDG	For information regarding EHEDG certification, visit our website: www.pentronic.se

Diagnostics

Standard	NAMUR NE43
Open sensor circuit	21.5 mA
Below measuring range	3.5 mA
Above measuring range	21.5 mA

Environment conditions

Operating temperature	-30...80 °C (IEC 60068-2-1:2007, IEC 60068-2-2:2007)
Storage temperature	-30...80 °C (IEC 60068-2-1:2007, IEC 60068-2-2:2007)
Humidity range	5...98 % RH, with condensation (IEC 60068-2-30:2005, IEC 60068-2-78:2012)
Ingress protection	IP67/IP69 (IEC 60529:1989 + A1:1999 + A2:2013)
Vibration	Sinusoidal: 3...200 Hz, 10 mm or 30 m/s ² (IEC 60068-2-6:2007) Random: 10...100 Hz, 1 m/s ² /Hz 100...200 Hz -3 dB/octave 200...500 Hz 0.5 m/s ² /Hz (IEC 60068-2-64:2008) Shock: 6 ms, 250 m/s ² (IEC 60068-2-27:2008)

Performance

Switch-on delay	1.5 s
AD converter	24 bit
Interference suppression	Normal mode rejection: >90 dB at 50/60 Hz Common mode rejection: >110 dB at 50/60 Hz
Sample rate	7 Hz
Response time w. tip directly in process media (T ₉₀)	2.5 s (IEC 60751)
Response time w. tip in 3A thermo-well(T ₉₀)	13.5 s (IEC 60751)
Response time w. tip in 3A thermo-well filled w. Heat Transfer Compound, HTC(T ₉₀) (Thermal conductivity for HTC: 0.9 W/mK)	3.5 s (IEC 60751)
Nominal filling volume	40 µl for 25 mm tip 30 µl for 15 mm tip

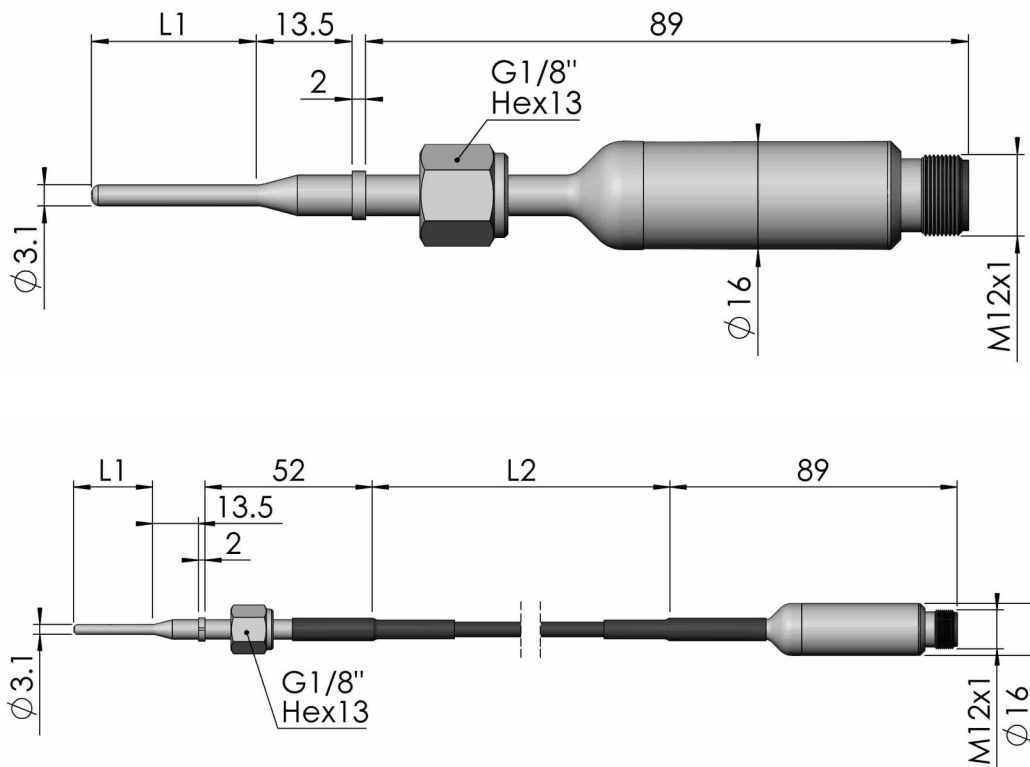
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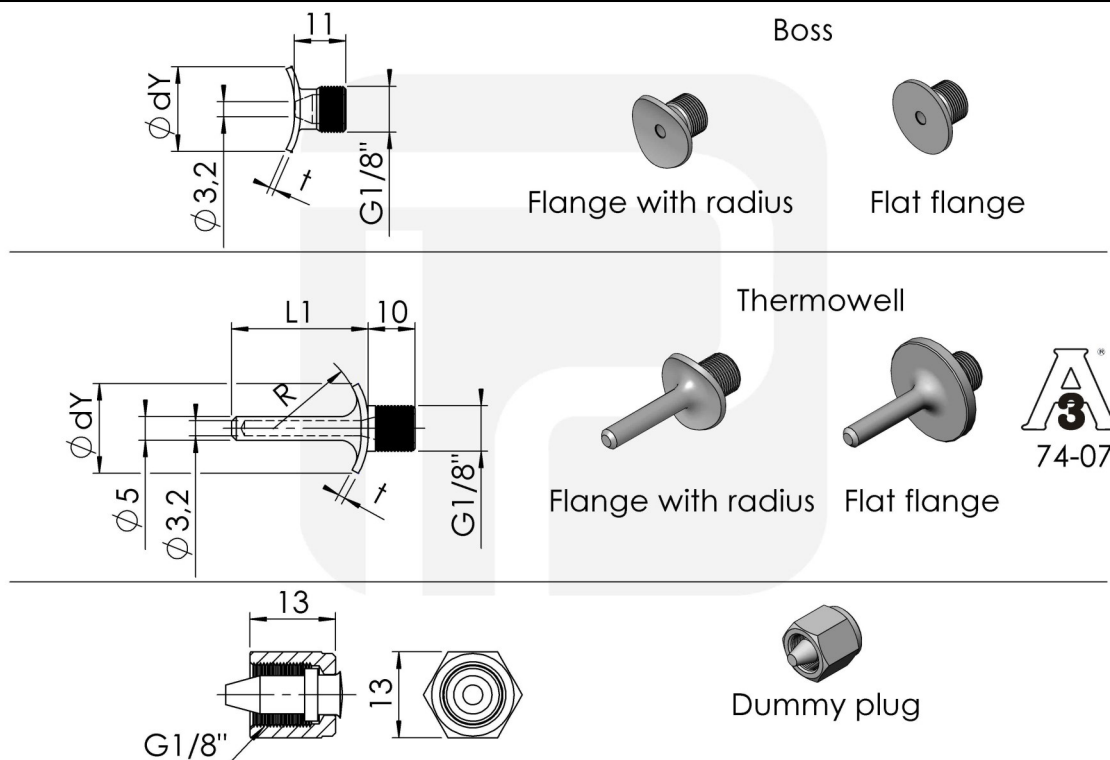
Part Number	Tip length L1	Cable length L2	Temperature range
3110572-001	15 mm	-	0...160 °C
3110572-003	15 mm	-	0...100 °C
3110575-001	25 mm	-	0...160 °C
3110575-002	25 mm	-	0...150 °C
3110575-003	25 mm	-	0...100 °C
3110575-005	25 mm	-	0...350 °F
3110575-007	25 mm	-	0...200 °C
3110575-008	25 mm	-	-20...140 °C
3110500-001	25 mm	500 mm	0...160 °C
3110500-007	25 mm	500 mm	0...200 °C

For more alternatives such as temperature ranges, tip and cable lengths etc. please contact Pentronic.

Installation instructions

The diagram illustrates the installation process. The transmitter is inserted into a pipe and secured with an M12 x 1 nut, requiring a torque of $7 \pm 2 \text{ Nm}$. The cable is terminated using a terminal block, requiring a torque of $0,7 \text{ Nm}$. A circuit diagram shows the transmitter connected to a 4-20mA supply and a 10...30V supply.





Accessories model 3110, 7913/7914 and 7960 Boss, thermowell and dummy plug for hygienic installation

Model 9025001, 9025010, 9026010 and 9026015

Example of use

Installation of hygienic sensors model numbers 3110572/3115075, 7913101/7914101 and 7960000.

Material

Stainless steel 1.4432/316L or equivalent.

Installation to media

Weld-in boss or thermowell. By 3A approved applications the requirement of welding is surface finish $Ra \leq 0.8$.

Insert length = $L1 - t$

3A, 74-07

Weld-in thermo well 9026010 and 9026015

Available marked 3A, 74-07

Designed for CIP/SIP

Maximum temperature: 200 °C

Material: Test certificate as per EN 10204 3.1

Dimensions¹ and part numbers

Part number	Model	L1 mm	Thickness t, mm	Radius R, mm	Outer diam dY, mm	Fits sensor dimensions, mm
9025001-000	Boss		1.25	Flat	18	Ø3.1x15 & Ø3.1x25
9025001-019	Boss		1.25	19	18	Ø3.1x15 & Ø3.1x25
9025001-100	Boss		1.5	Flat	18	Ø3.1x15 & Ø3.1x25
9025001-119	Boss		1.5	19	18	Ø3.1x15 & Ø3.1x25
9025001-200	Boss		2.0	Flat	18	Ø3.1x15 & Ø3.1x25
9025001-219	Boss		2.0	19	18	Ø3.1x15 & Ø3.1x25
9026015-015	Thermowell ²	19	1.25	19	19	Ø3.1x15
9026015-025	Thermowell ²	29	1.25	19	19	Ø3.1x25
9026010-001	Thermowell ²	29	3.0	Flat	25	Ø3.1x25
9025010-000	Dummy plug		-	-	-	-

1) For other dimensions and materials, please contact Pentronic 2)