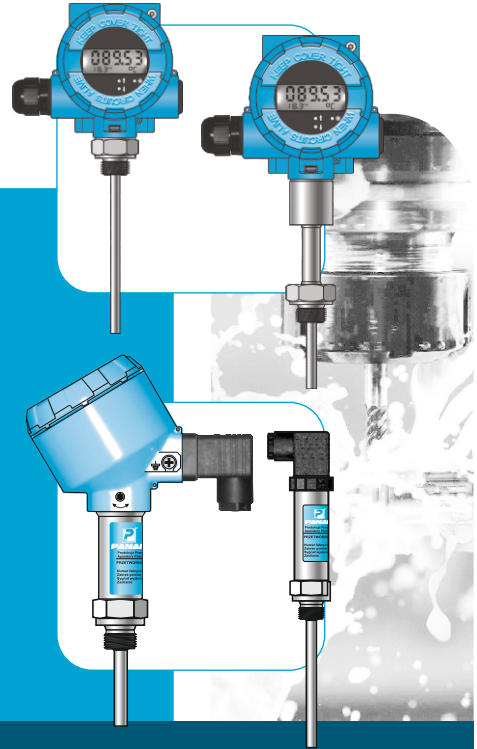# PANAM®

ENGINEERING BEYOND LIMITS

Temperature Transmitters

- **PANAM®** Temperature Transmitters are available with Programmable range, zero shift, characteristic and damping ratio with adjustment from local panel keys
- Measuring element RTD or thermocouple (programmable)
- Intrinsic safety (ATEX), Explosion proof (ATEX, IECEX) version
- Safety integrity level (SIL) certificate available
- Output signal 4 to 20 mA with HART protocol
- Display with backlight available

HART COMMUNICATION PROTOCOL · SIL CERTIFICATION · Ex · IECEx

📞 +91 22 4146 9000   ✉ sales@panam.in   @ www.panam.in

Rev/01/2025

Introduction

Since its inception in 1998 to present day, **PANAM**® has added new product every year and has broadened its product portfolio and its clientele base by supplying to potential customers worldwide. Key core values like Timely Delivery, Quality Consistency, Product Improvisation and after sales service has been instrumental in the phase wise evolution of company. Continuous improvement is the key to success, Customer feedback are taken with positive attitude and product are constantly upgraded to new quality and performance level to cope up with the market dynamics. Our products are known for providing high-quality, high-reliability, low-cost options for the oil, gas & power industry. Over the year, the company has evolved from a product based company to a complete system solution provider. Over the years the company has attained state of the art operational efficiency for maintaining a competitive edge, with the increase in the utilization of its products in oil, gas and power sector.

PANAM® is having state of the art manufacturing facility span over an area of 1,65,000 sqft with a fleet of CNC machines, VMC machines, Semi-Automatic Lathe machines, High pressure test bench with SCADA control, Configuration and calibration lab for transmitters . **PANAM**® has a dedicated R & D Team for continuous product development & up-gradation to take care of market demand and technology evolution.

PANAM® offers Temperature Transmitters with IECEx, ATEX and SIL 2/3 certificates. A wide range of Temperature Transmitters and Thermowells are available to meet customer's requirements.

Contents

HART
COMMUNICATION PROTOCOL

- ✓ Output signal 4…20mA with Hart protocol
- ✓ Galvanic insulation (In, Out)
- ✓ Programmable sensor type
- ✓ Programmable measuring range
- ✓ RTD lead wire compensation
- ✓ Compensation of thermocouple cold junction
- ✓ Autodiagnostic system
- ✓ Intrinsic safety certificate (ATEX, IECEx)
- ✓ Explosion proof certificate (ATEX, IECEx)
- ✓ Safety version SIL2/SIL3
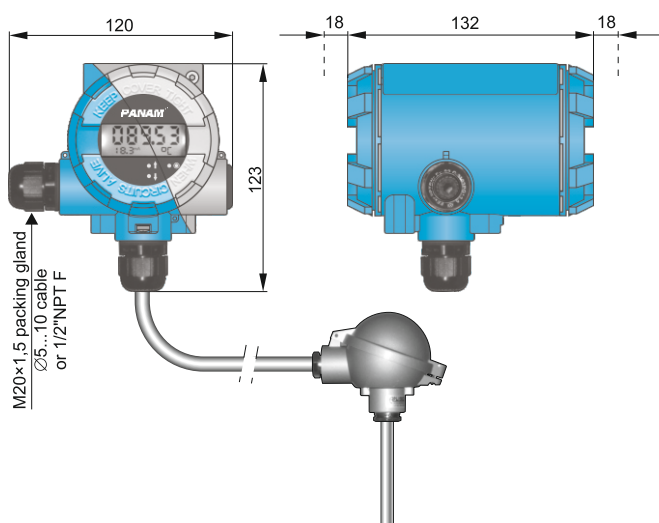
PTT-301 with remote mounted temperature sensor

PTT-301 with direct mounted temperature sensor

Application and function

Transmitter PTT-301 is designed for field use. PTT-301 can be used with temperature sensors connected directly with transmitter's casing or with external sensors connected with cable. The temperature transmitter PTT-301 converts resistance of RTD or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate channels enabling measurement of temperature difference, average, average with redundancy, max. or min. temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature. Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with HART/USB converter and *PANAM*®
RAPORT 2 configuration software. On request *PANAM*® can set temperature transmitter parameters like measuring range, type of sensor etc.

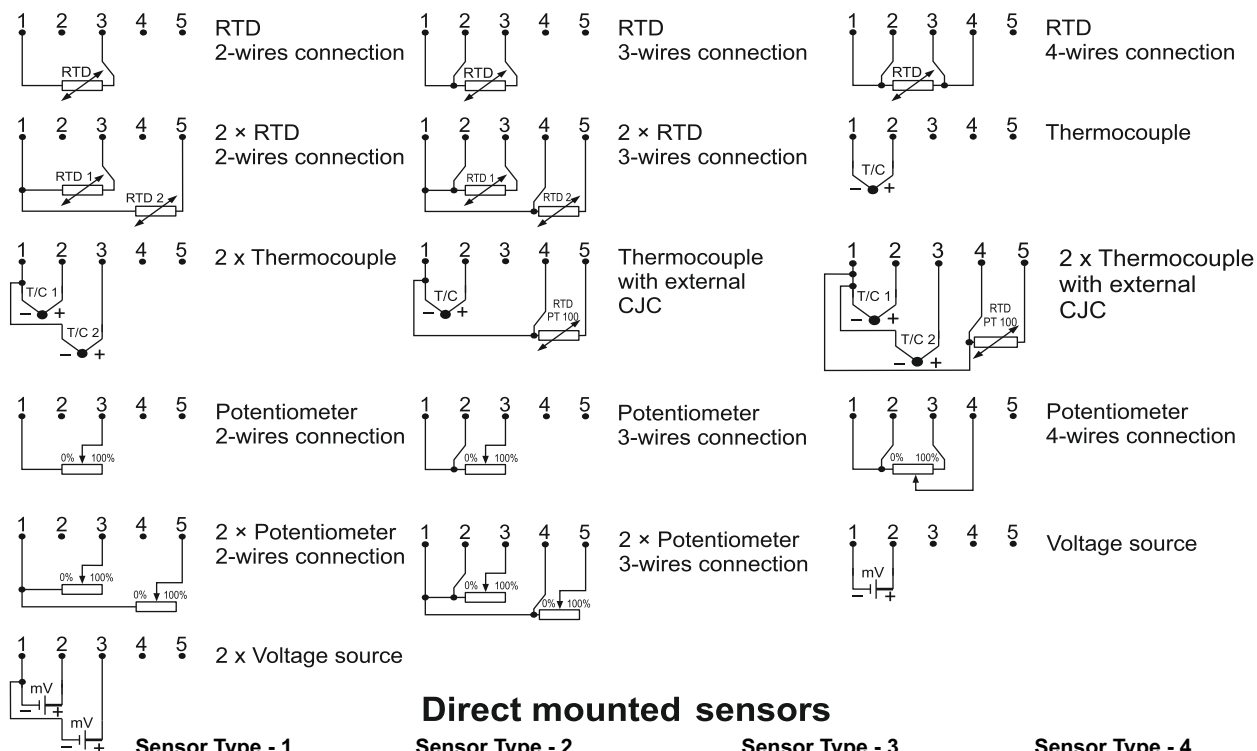*PANAM*® In technical collaboration with ⌐PLISEN⌐® S. A. - Poland

Technical data

Input signal	Resistance: Pt100,Ni100 Voltage: K, J,S,B,N,T, R, E
Limit process	-10mV< E<100mV or -100mV< E<1000mV 0Ω<R<400Ω or 0Ω<R<2000Ω
Min. measuring range	10mV or 10Ω or 10K
Output signal	4 - 20 mA + Hart
Power supply	13,5*…55 VDC Exia: 13,5*…30 VDC Exd: 13,5*…45 VDC Safety, Safety Exd: 12,5…36 VDC Safety Exia: 12,5…30 VDC *- with display illumination switched on +3V, display backlight can be switched on only during production
Max. wires resistance	500Ω
Alarm signal	3,75mA / 21,5mA (NORMAL) or 3,6 mA / 21 mA (NAMUR NE89) or setting by user
Sensor current	0,42mA Safety: 0,25mA
Galvanic insulation	Optoelectrical
Accuracy	acc. to below table
Time constant	0,3s
Additional electronic damping	0..30s
Ambient temperature	-40…+80°C Exia: -40…+80°C Exd: -40…+75°C Safety: -40…+85°C Safety Exia, Safety Exd: -40…+75°C

PTT-301/Safety can be programed only with HART protocol. Local buttons allows only change of display sttings.
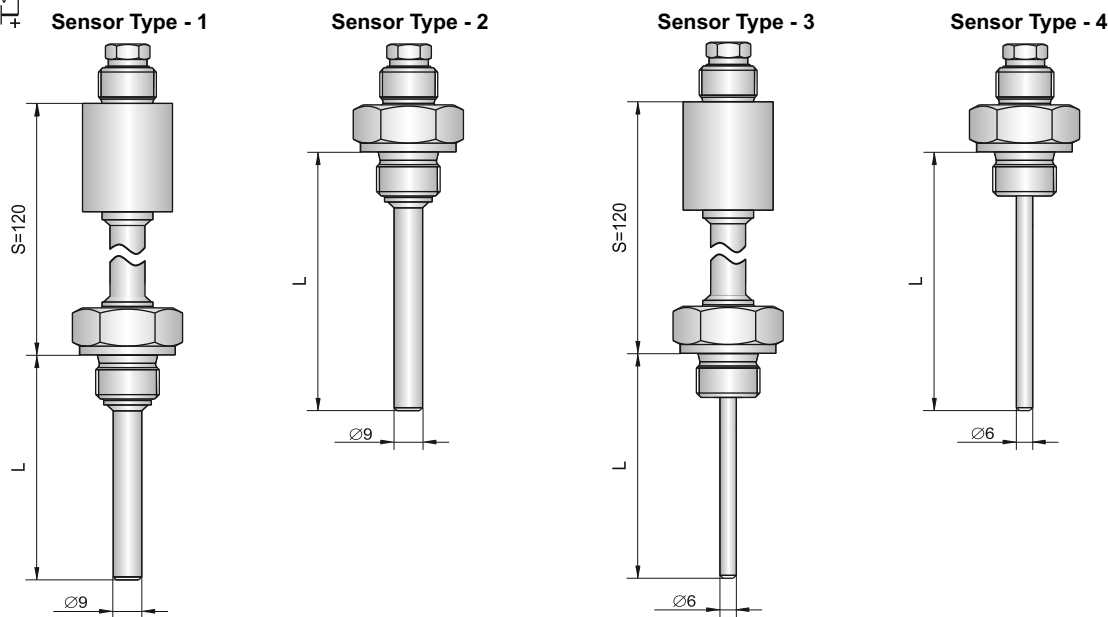
Type of input signals and metrological parameters

RTD sensors			Thermocouples		
Thermal resistance sensors Sensor current Maximum wires resistance	2, 3 or 4 wires connection ~250 µA 25 Ω		Input impedance Maximum wires resistance Cold junctions compensation	>10MΩ 500 Ω (wires + thermocouple) Internal sensor, external sensor Pt100, constant value	
Sensor type	Basic range (FSO)	Min. range span	Sensor type	Basic range (FSO)	Min. range span
	°C	K		°C	K
Pt100	-200÷850	10	B	500÷1820	50
Pt200	-200÷850	10	E	-150÷1000	50
Pt500	-200÷850	10	J	-210÷1200	50
Pt1000	-200÷266	10	K	-150÷1372	50
Ni100	-60÷180	10	N	-150÷1300	50
Cu100	-50÷180	10	R	50÷1768	50
			S	50÷1768	50
			T	-150÷400	50
Resistance (resistor, potentiometer)			Voltage		
	Ω	Ω		mV	mV
Measuring range No.1	0÷400	10	Measuring range No.1	-10÷100	10
Measuring range No. 2	0÷2000	10	Measuring range No. 2	-100÷1000	10

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Electrical diagrams

RTD 2-wires connection	RTD 3-wires connection
RTD 4-wires connection	
2 × RTD 2-wires connection	2 × RTD 3-wires connection
Thermocouple	
2 x Thermocouple	Thermocouple with external CJC
2 x Thermocouple with external CJC	
Potentiometer 2-wires connection	Potentiometer 3-wires connection
Potentiometer 4-wires connection	
2 × Potentiometer 2-wires connection	2 × Potentiometer 3-wires connection
Voltage source	
2 x Voltage source	

Direct mounted sensors

Sensor Type - 1   **Sensor Type - 2**   **Sensor Type - 3**   **Sensor Type - 4**

Sensor type	Standard dimensions of sensor			Sensor material	Available process connection
	⌀[mm]	L[mm]	S[mm]		
1	9	100, 160, 250, 400	120	316 SS	M20x1,5; G1/2''; 1/2''NPT
2	9	100, 160, 250, 400	-	316 SS	M20x1,5; G1/2''; 1/2''NPT
3	6	100, 160, 250, 400	120	316 SS	M20x1,5; G1/2''
4	6	100, 160, 250, 400	-	316 SS	M20x1,5; G1/2''

Sensor Type - 1, Sensor Type - 2 - welded sensors / Sensor Type - 3, Sensor Type - 4 spring loaded sensors
(to use with additional thermowell)

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PTT-301-AL-01-0~40-H-1-1-1-1-0-2-500-8G

Model

PTT - **PANAM**® Temperature Transmitters

Model Description

301 - Temperature Transmitter with 2 Separate Channels (SMART)

Material of Construction of Housing

AL - Aluminum housing, IP66,with display, output 4-20mA + Hart
S6 - Stainless steel housing, IP66, with display, output 4-20mA + Hart

Sensor Type to be Connected to Transmitter

01 - B Thermocouple type of sensor type B
02 - E Thermocouple type of sensor type E
03 - J Thermocouple type of sensor type J
04 - K Thermocouple type of sensor type K
05 - N Thermocouple type of sensor type N
06 - R Thermocouple type of sensor type R
07 - S Thermocouple type of sensor type S
08 - T Thermocouple type of sensor type T
09 - Cu100 Resistant type of sensor Cu100
10 - Ni100 Resistant type of sensor Ni100
11 - Pt100 Resistant type of sensor Pt100
12 - Pt200 Resistant type of sensor Pt200
13 - Pt500 Resistant type of sensor Pt500
14 - Pt1000 Resistant type of sensor Pt1000

Range

Min to Max Unit - Write range in the format - min/max unit

Alarm

H - High   L - Low

Electrical Connection

1 - M20x1.5   2 - 1/2" NPTF

Transmitter Certificates (User Can Select Multiple Options)

1 - SIL Certificate   3 - Exd Certificate
2 - Exia Certificate   4 - IP 67

Accessories

0 - No Accessory
1 - Tag Plate
2 - Mounting bracket type AL for 2" pipe, material stainless steel
3 - Mounting bracket type AL for 2" pipe, material zinced steel
4 - Thermowell , add model code as per **PANAM**® Catlogue
RXX - Cable length for remote mounted sensor (Write cable length in meters)

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PTT-301-AL-01-0~40-H-1-1-1-1-0-2-500-8G

Sensor by *PANAM*® Yes/No

0 - Version without sensor
1 - Version with remote sensor
2 - Version with direct mount sensor

If the above model code is selected as 1/2 (version with remote / direct mount sensor)

Sensor Wiring / Grounding

0 - Ungrounded Thermocouple
1 - Grounded Thermocouple
2 - 2 - Wire Type RTD
3 - 3 - Wire Type RTD
4 - 4 - Wire Type RTD

Sensor Details

1 - Version with extension S=120, Sensor diameter Ø9[mm], Wetted part 316 SS
2 - Version without extension S=0, Sensor diameter Ø9[mm], Wetted part 316 SS
3 - Version spring loaded sensor (used with thermowell), sensor diameter Ø6[mm],
    with extension S=120, Wetted part 316 SS, other extension lengths can be denoted in brackets ( )
4 - Version spring loaded sensor (Used with Thermowells) Sensor Ø6[mm],
    without extension S=0, Wetted part 316 SS

Stem Length

SXX - Mention Stem Length in mm

Connection Thread

8G - Thread G1/2''
8N - Thread 1/2''NPT
12G - Thread G3/4''
M20 - M20x1.5

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- ✓ **Programmable measuring range**
- ✓ **Output signal 4 to 20 mA**
- ✓ **Stainless steel casing**

Application and construction

Smart temperature transmitter type PPT-302 is designed for temperature measurement in range from -50 to +80°C (up to +140°C in special version). Resistance signal from RTD element is converted to standard 4 to 20mA output signal. Casing of transmitter is made in stainless steel. Standard electrical connection is DIN EN 175301-803 connector with ingress protection class IP 65.

Configuration

Transmitter is delivered with measuring range according to customer's order, however it can be changed by user. For configuration user will need: PC computer, RS converter, PPT-302 converter and AT software. Beside changes of measuring range customer will be able to do calibration of the transmitter and make correction of output characteristic. Configuration is available only in transmitters with DIN EN 175301-803.

Electrical connections

Connector DIN EN 175301-803
IP65
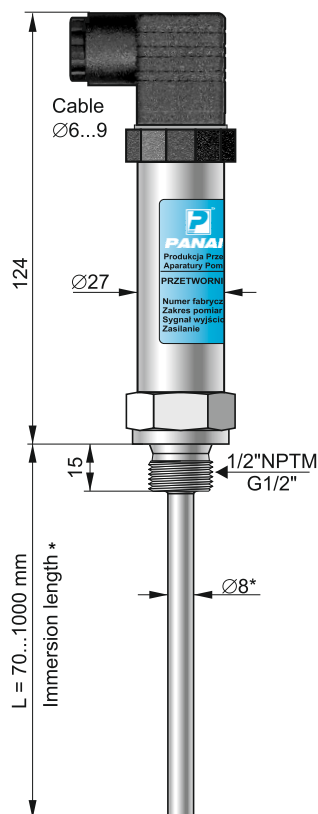
**Connector M12x1**
IP67
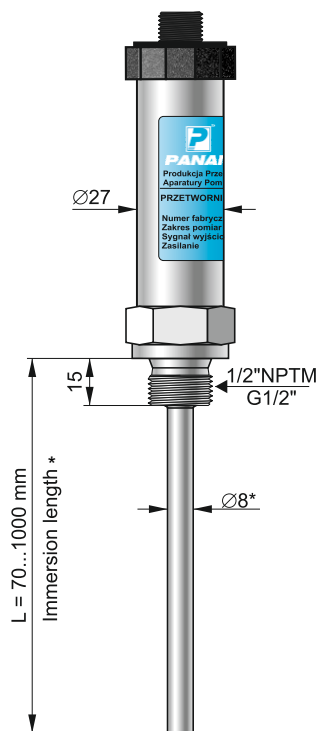
* - other diameters on request

Electrical connection type ALW

Aluminum casing with programable local display. The design of the casing enables the use of a local display, rotation of the display, rotation of the casing by 0–340° relative to the sensor.
Electrical connection DIN EN 175301-803, IP65.

Display with backlight allows to read:
- measured temperature in user units or % of measuring range
- current in output loop in mA
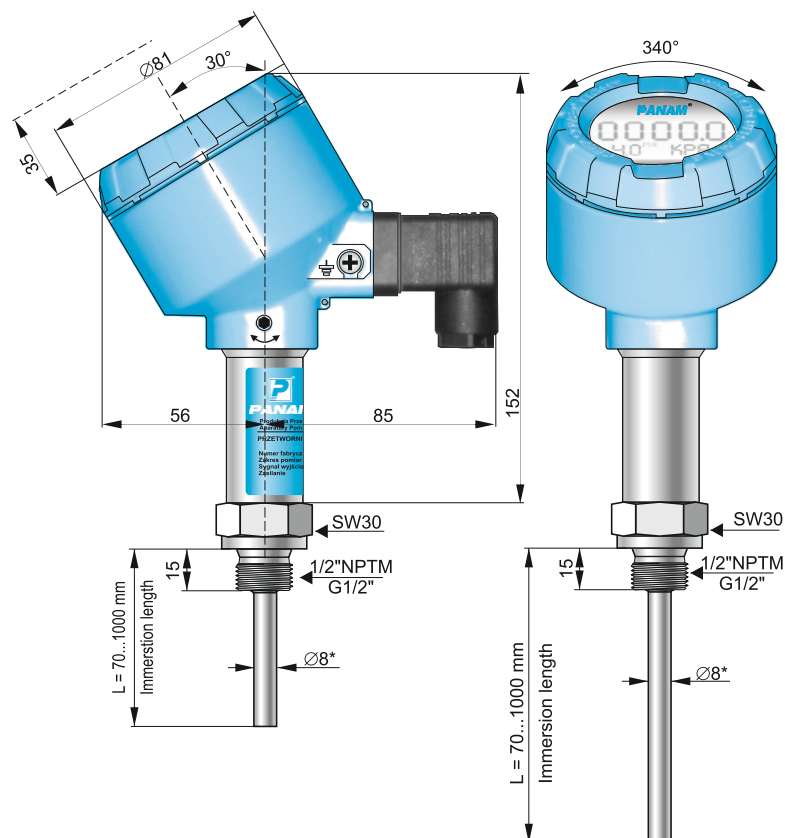
Technical data

Measuring range	-50...+80°C
Minimal width of measuring range	30°C
Transmitter accuracy	±0,16%
Sensor accuracy	$\pm(0,15 + 0,002 \cdot |t|)°C$
	$|t|$ – absolute value of the measured temperature °C
Error due to ambient temp. changes	0,1% / 10°C
Error due to supply voltage changes	0,1%
Output signal	4 ÷ 20 mA, 2-wires
Power supply U$_{zas}$	7...29 V DC
APT-28/ALW	10…29 V DC
Additional voltage drop when backlight is on	3V
Load resistance	$R[\Omega] \leq \dfrac{U_{zas}[V] - 7\,V}{0,023\,A}$
Alarm signal	3,8 mA or 23 mA
	factory setting: 23 mA
Ambient temperature	-25...+80°C
Materials: sensor shield and process connection	ss321
casing	ss304
Ingres protection class	IP65, IP67

Electrical diagrams
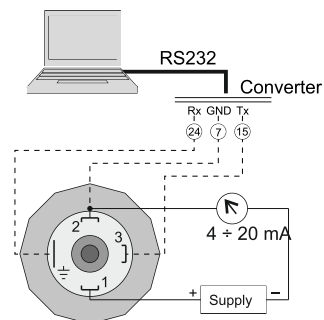
✓ **Output signal 4 to 20mA**
✓ **Stainless steel casing and wetted parts**
✓ **Factory configured**

Application and construction

Temperature transmitter type PTT-303 is designed for temperature measurement of liquid and gaseous media in range from -50 to +100°C. Resistance signal from RTD element is converted to standard 4 to 20mA output signal. Casing of transmitter and wetted parts are made in stainless steel. Transmitter is manufactured in two versions: with removable measuring insert and not removable measuring insert which has additional protection against vibrations. Available electrical connections are angular connector DIN EN 175301-803 or connector M12x1.

Connector
DIN EN 175301-803
IP65

Connector M12x1
IP67
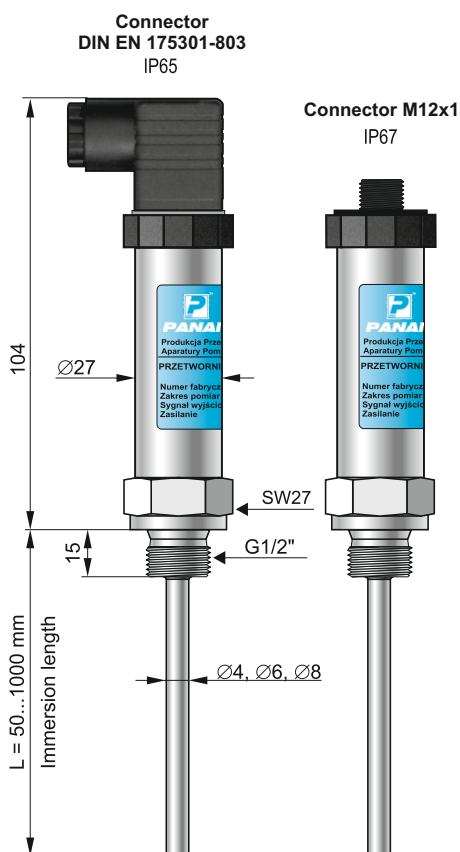
Technical data

Output signal	4...20mA
Measuring range	0...50°C, 0...100°C,
	-50...50°C, -50...100°C,
	25...75°C, 50...100°C
	other on request
Minimum span	25K
Accuracy	± 1%
Power supply	8...35 V DC
Alarm signal	<3,1mA or >26,1mA
Wetted parts material	316
Sensor diameter	$\varnothing$4, $\varnothing$6, $\varnothing$8mm
Process connection	G1/2", other on request
Immersion length	50...1000mm
Extension neck	on request
Ingress protection	IP65, IP67

104
$\varnothing$27
SW27
15
G1/2"
L = 50...1000 mm
Immersion length
$\varnothing$4, $\varnothing$6, $\varnothing$8

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Ordering Information for Smart Temperature Transmitters (PTT-302 & PTT-303)

PTT-302-AL-01-500-00-8-8GM-05-H-00

Model

PTT - **PANAM**® Temperature Transmitters

Model Description

302 - Temperature Transmitter - Smart Temperature Transmitter
    for RTD Input
303 - Temperature Transmitter for RTD Input

Material of Construction of Housing

AL - Aluminum with display (Available with PTT-303 Only)
S6 - Stainless Steel - SS 316

Electrical Connection

01 - Connector DIN EN 175301-803 (IP65)
02 - Connector M12x1 (IP67)
02 - Connector DIN EN 175301-803 - AL Housing (IP65)
    (Available with PTT-302 Only)

Mounting Length

XXX - To be specified by the customer

Electronic Extension Length

00 - Extension S=0 (Available with PTT-303 Only)
01 - Extension S=120mm (Available with PTT-303 Only)
02 - Extension S=250mm

Sensor Diameter

4 - 4 mm (Available with PTT-303 Only)
6 - 6 mm (Available with PTT-303 Only)
8 - 8 mm

Connection Thread

8GM - G 1/2" Male
8NM - 1/2" NPT Male
M20 - M20x1.5 Male

Temperature Range

01 - 0 to 50° C (Available with PTT-303 Only)
02 - 0 to 100° C (Available with PTT-303 Only)
03 - -50 to 50° C (Available with PTT-303 Only)
04 - -50 to 100° C (Available with PTT-303 Only)
05 - -50 to 80° C (Available with PTT-303 Only)
06 - 25 to 75° C (Available with PTT-303 Only)
07 - 50 to 100° C (Available with PTT-303 Only)
08 - Customised Temperature Range as per client requirement,
    enter range in bracket after 08 model code (Available with PTT-302 Only)

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PTT-302-AL-01-500-00-8-8GM-05-H-00

Alarm Signal

H - High
L - Low (Available with PTT-302 Only)

Measuring Insert

00 - No Insert
01 - Removable (Available with PTT-303 Only)
02 - Non-Removeable (Available with PTT-302 Only)

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✓ Galvanic insulation (In, out)
✓ Programmable sensor type
✓ Programmable measuring range
✓ Thermoresistance line compensation
✓ Compensation of thermocouple cold junction
✓ Output signal 4…20mA + Hart protocol
✓ Ambient temperature from -25 to +75 °C
✓ Hart protocol
✓ Autodiagnostic system
✓ Safety version SIL2/SIL3
✓ Intrinsic safe version

HART
COMMUNICATION PROTOCOL

SIL2/SIL3
Safety version

⟨Ex⟩ I M1 Ex ia I Ma
II 1G Ex ia IIC T4/T5 Ga

IECEx Ex ia I Ma
Ex ia IIC T4/T5 Ga

Technical data

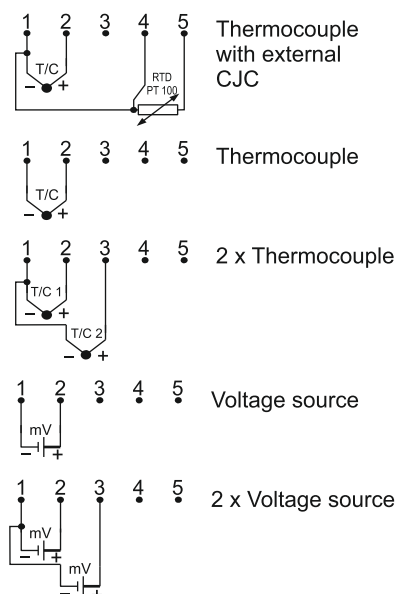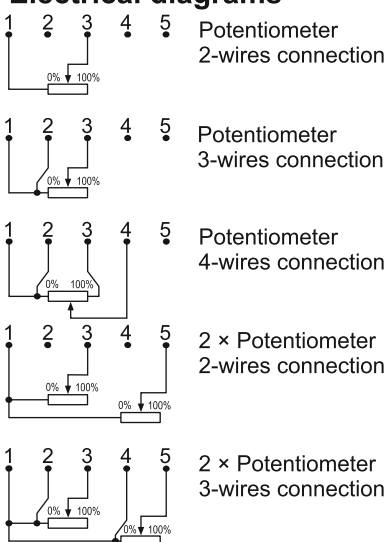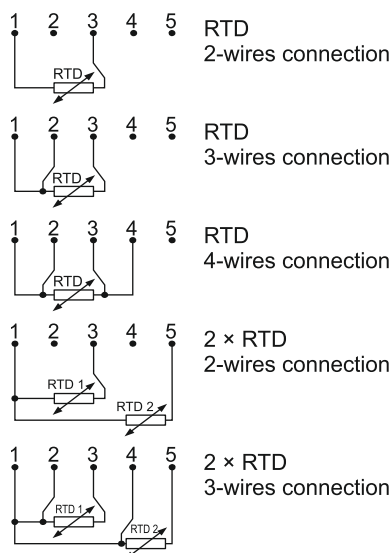|	
Input signal	K, J, S, B, N, T, R, E voltage Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Cu100, resistance
Limit process	- 10mV< E<100mV or -100mV< E<1000mV 0Ω<R<400Ω or 0Ω<R<2000Ω
Min. measuring range	10mV or 10Ω
Output signal	4...20mA + HART
Power supply	10…36V DC Safety: 10...30V DC Ex, Safety Ex: 10...30V DC
Max. Wires resistance	500Ω
Alarm signal	21,6mA or 3,75 mA or setting by user
Sensor current	0,25mA
Accuracy	± 0,1%
Time constant	0,2...1s
Additional electronic damping	0...30s
Ambient temperature	-40…+85°C
Dimensions (WxHxD)	12,5mmx99mmx114,5mm

Application and function

The temperature transmitter PTT-401-01 is used for converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate measuring channels enabling measurement of temperature difference, average, average with redundancy, max or min temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature.

Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with HART/USB converter and Raport 2 configuration software.

On request **PANAM**® can set temperature transmitter parameters like measuring range, type of sensor. This transmitter is suitable for rail mounting.

Electrical diagrams

RTD 2-wires connection

RTD 3-wires connection

RTD 4-wires connection

2 × RTD 2-wires connection

2 × RTD 3-wires connection

Potentiometer 2-wires connection

Potentiometer 3-wires connection

Potentiometer 4-wires connection

2 × Potentiometer 2-wires connection

2 × Potentiometer 3-wires connection

Thermocouple with external CJC

Thermocouple

2 x Thermocouple

Voltage source

2 x Voltage source

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✓ **Programmable sensor type PT100 / Ni100**
✓ **Programmable measuring range.**
✓ **Thermoresistance line compensation (3 wires line)**
✓ **Output signal 4…20mA**
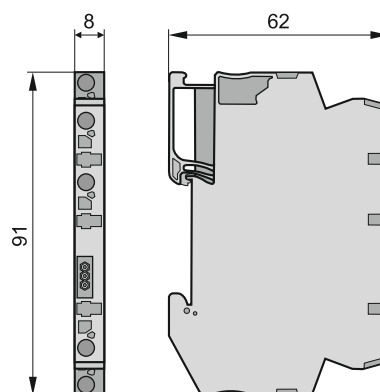✓ **Rail- mounting system.**

Application and function

The temperature economical transmitter PTT-401-03 is applicable to converting resistance of temperature sensor to standard current signal 4...20mA. Most of parameters such as: sensor type, input signal, measuring range may be adapted by user for specific requirements of his measuring system. The transmitter is programmed using PC with RS converter and AT configuration software.

If you define type of sensor, measuring range in the order, then the transmitter is programmed with required parameters and their values are printed on serial number label.

This Transmitter is suitable for rail mounting.

Technical data

Input signal	Pt 100, Ni 100
Limit process	$20Ω <R<380Ω$
Min. measuring range	$10\ Ω$
Output signal	4 – 20 mA
Power supply	6…29V DC
Load resistance	$R_o[kΩ]<(U_z – 7V)/25mA$
Alarm signal	23mA or 3,8mA
Accuracy for $ΔR>20Ω$	± 0,2%
Thermal error	± 0,1% / 10°C
Ambient temperature	-25…+80°C
Error due to supply voltage changes	±0,1%

Electrical diagrams

PANAM® In technical collaboration with APLISENS® S. A. - Poland
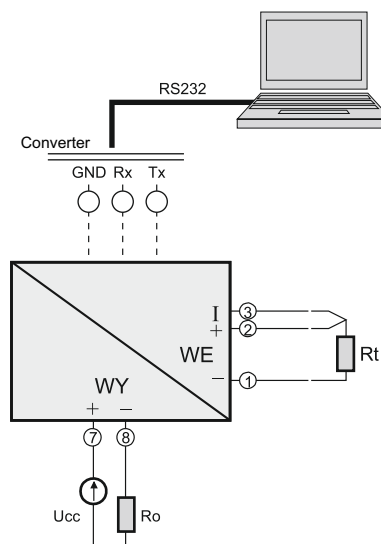
Smart Head Mounted Temperature Transmitter (PTT-402-04) & (PTT-402-05)
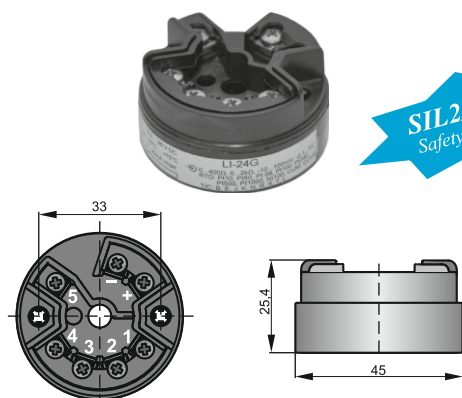
SIL2/SIL3 *Safety version*

HART COMMUNICATION PROTOCOL

✓ Galvanic insulation (In, out)
✓ Programmable sensor type
✓ Programmable measuring range
✓ RTD lead wire compensation
✓ Compensation of thermocouple cold junction
✓ Output signal 4…20mA + Hart protocol
✓ Ambient temperature from -25 to +75 °C
✓ Hart protocol
✓ Safety version SIL2/SIL3
✓ Intrinsic Safety version

⟨Ex⟩
I M1 Ex ia I Ma
II 1G Ex ia IIC T5/T6 Ga
II 1D Ex ia IIIC T105°C Da

IECEx
Ex ia I Ma
Ex ia IIC T5/T6 Ga
Ex ia IIIC T105°C Da

Technical data

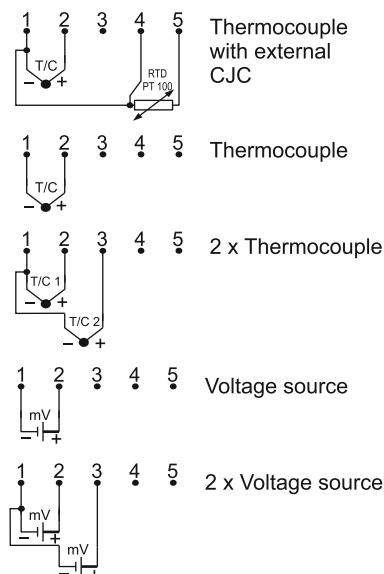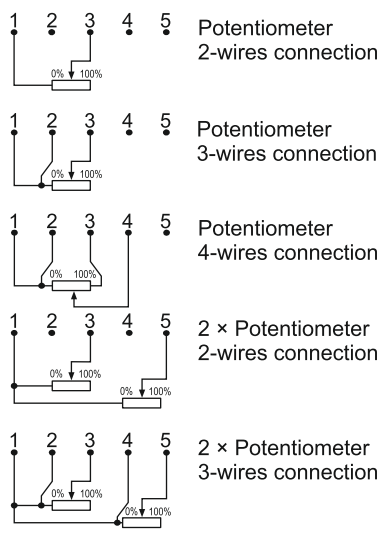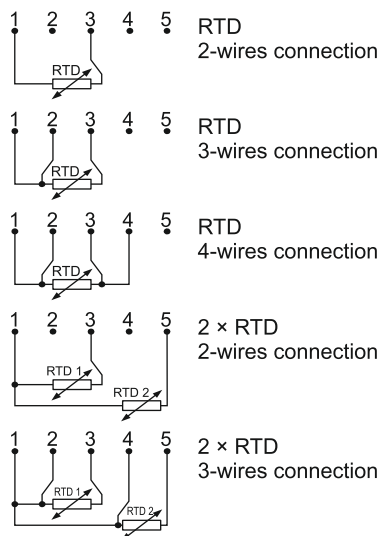|	
Input signal	L, K, J, S, B, N, T, R, E voltage Pt10, Pt50, Pt98, Pt100, Pt200, Pt500, Pt1000, Ni100, Cu50, Cu100, resistance
Limit process	- 10mV< E<100mV or -100mV< E<1000mV 0Ω<R<400Ω or 0Ω<R<2000Ω
Min. measuring range	10mV or 10Ω
Output signal	4...20mA + HART
Power supply	10...36V DC Safety: 10...36V DC Ex, Safety Ex: 10...30V DC
Max. sensor resistance	$150\Omega/200\Omega$
Alarm signal	21,6mA or 3,75 mA or setting by user
Sensor current	0,42mA
Accuracy	± 0,1%
Time constant	0,2...1s
Additional electronic damping	0...30s
Ambient temperature	-40...85°C Ex, Safety Ex: -40...70°C

Application and function

The temperature transmitter PTT-402-04 is used for converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate measuring channels enabling measurement of temperature difference, average, average with redundancy, max or min temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature.

Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with HART/USB converter and Raport 2 configuration software.

On request **PANAM**® can set temperature transmitter parameters like measuring range, type of sensor. This transmitter is suitable for head mounting.

Electrical diagrams.

RTD 2-wires connection

RTD 3-wires connection

RTD 4-wires connection

2 × RTD 2-wires connection

2 × RTD 3-wires connection

Potentiometer 2-wires connection

Potentiometer 3-wires connection

Potentiometer 4-wires connection

2 × Potentiometer 2-wires connection

2 × Potentiometer 3-wires connection

Thermocouple with external CJC

Thermocouple

2 x Thermocouple

Voltage source

2 x Voltage source

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✓ **For sensor Pt100, 2 or 3 wires**
✓ **Possibility of programing measuring range**
✓ **Output signal 4...20mA, two wire**
✓ **LED indicator to indicate failure**

Application and function

The temperature transmitter PTT-402-06 is applicable to converting resistance of temperature sensor Pt100 to standard current signal 4...20mA. Transmitter can compensate for non linearity of the sensor.

Transmitter can be built in head of sensor. Electrical connection is made with cable cross section up to 1,75 mm^2.

Transmitter can be ordered with factory set configuration according to customer request. User has also possibility of changing configuration using PC computer with converter USB-AT-3 and special software.

In addition to change measuring range user has possibility of configuration output of transmitter when sensor is broken and setting compensation of resistance in 2 wire sensor.
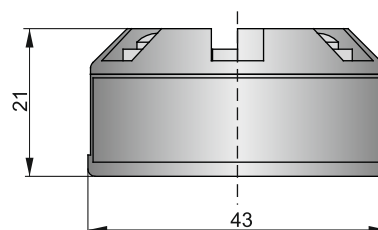
Technical data

Sensor type	Pt100 / 2 or 3 wire
Sensor range	-195 ÷ 845°C (18 ÷ 390 Ω)
Minimum span	25°C
Output signal	2 wire 4 ÷ 20 mA current loop
Response time	1 s
Update time	500 ms
Power supply (U_Z)	10…30 V DC
Load resistance (R_O)	R_O [Ω] ≤ (U_Z − 10 V) / 20 mA
Sensor break alarm (configurable)	3,9 mA or 21,5 mA
factory setting	21,5 mA
Measurement accuracy	±0,2°C±0,05% of reading
Thermal drift	±0,02% /°C (for 20°C)
Loop voltage effect	±0,2 µA/V
Ambient operating range	-40…+85°C
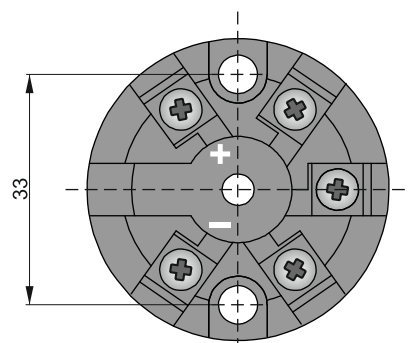
Electrical diagrams
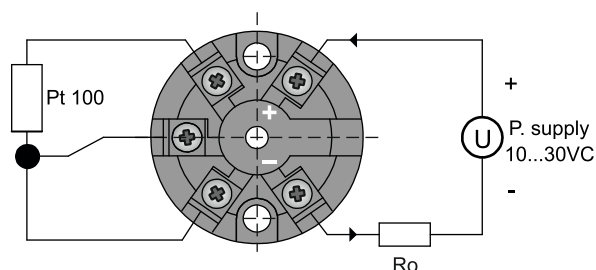
Pt 100

P. supply
10...30VC

Ro

✓ **Sensor type: Pt100, Pt500, Pt1000, Ni100**
✓ **Thermoresistance line compensation**
✓ **Output signal 4…20mA**
✓ **ATEX certificate ⟨Ex⟩ II 1G Ex ia IIC T6**
✓ **Head-mounting system.**

Application and function

The temperature transmitter PTT-402-08 converts resistance of temperature sensor to standard current signal 4...20mA.
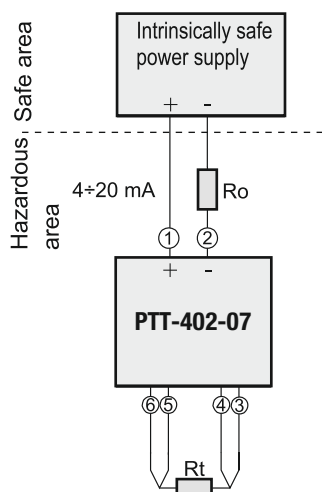
Most of parameters such as: sensor type, input signal, measuring range can be configured by user for specific requirements of his measuring system.

User defines type of sensor, measuring range etc. **PANAM**® programs the transmitter with required parameters and their values are printed on serial number label.

Transmitter is suitable for head mounting.
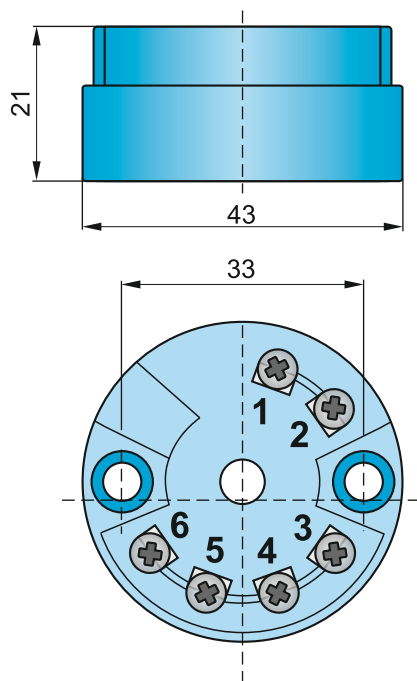
Technical data

Input signal	Pt,Ni
Min.measuring range	10°C
Output signal	4–20mA
Power supply	8…30VDC
Load resistance	$R_d[k\Omega]<(U_z-8V)/22mA$
Alarm signal	21mA or 3.5mA
Accuracy for $\Delta R>20\Omega$	±0.2%
Thermal error	±0,05%/10°C
Ambient temperature	-40…+85°C

Accuracy:

PT100: -100÷200°C	±0,2°C	PT1000: -100÷200°C	±0,2°C
PT100: -200÷850°C	±0,4°C	PT1000: -100÷250°C	±0,4°C
PT500: -100÷200°C	±0,2°C	Ni100: -60÷250°C	±0,2°C

Input parameters

Input terminals 3, 4, 5, 6:

Uo = 9,6V,   Io = 4,5mA,   Po = 11mW,
Lo = 4,5mH dla IIC; 8,5mH dla IIB
Co = 709nF dla IIC; 1300nF dla IIB

Supply terminals 1(+) 2(-):

Ui = 30V, Ii = 100mA, Pi = 750mW, Li ~ 0, Ci ~ 0

Electrical diagrams

PTT-402-07

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✓ **Sensor type PT100 or Ni100**
✓ **Thermoresistance line compensation (3 wires line)**
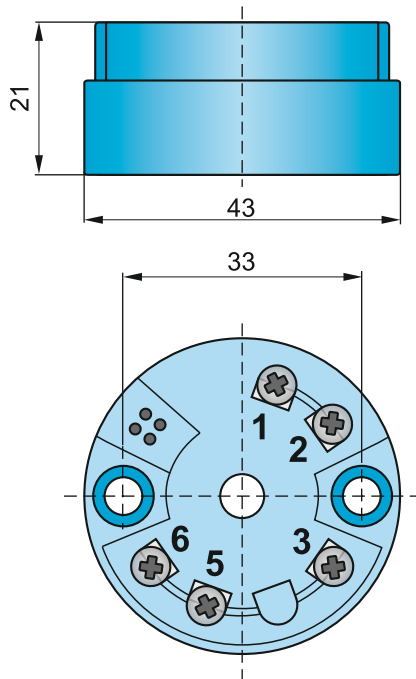✓ **Output signal 4…20mA**
✓ **Head- mounting system.**

Application and function

The temperature transmitter PTT-402-08 is used for converting resistance of temperature sensor to standard current signal 4...20mA.

Most of parameters such as: sensor type, input signal, measuring range can be configured by user for specific requirements of his measuring system.

The transmitter can be programmed by **PANAM**® with required parameters and their values are printed on serial number label.

Transmitter are suitable for head mounting.

21

43

33

Electrical diagrams

Power supply
+   -

4 ÷ 20 mA   Ro

① ②

+   -

PTT-402-08

⑥⑤   ③

Rt
3 wires connection

Rt
2 wires connection

Technical data

Input signal	Pt 100 / Ni 100
Limit process	20Ω <R<380Ω
Min. measuring range	25°C
Output signal	4 – 20 mA
Power supply	7,5…30V DC
Load resistance	$R_d[kΩ]<(U_z – 7,5V)/22mA$
Alarm signal	22mA or 3,6mA
Accuracy for ΔR>20Ω	± 0,1%
Thermal error	± 0,1% / 10°C
Ambient temperature	-40…+85°C
Error due to supply voltage changes	±0,01%/V

Note: for spans smaller than 75°C, the only permissible start values are: -40°C, -20°C, 0°C, +20°C and +40°C.
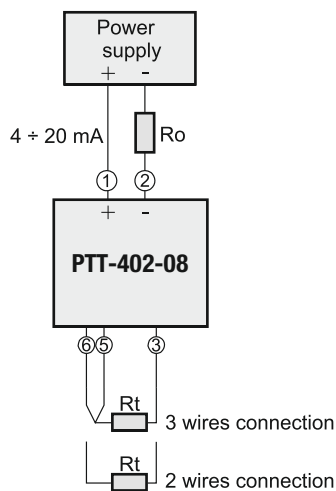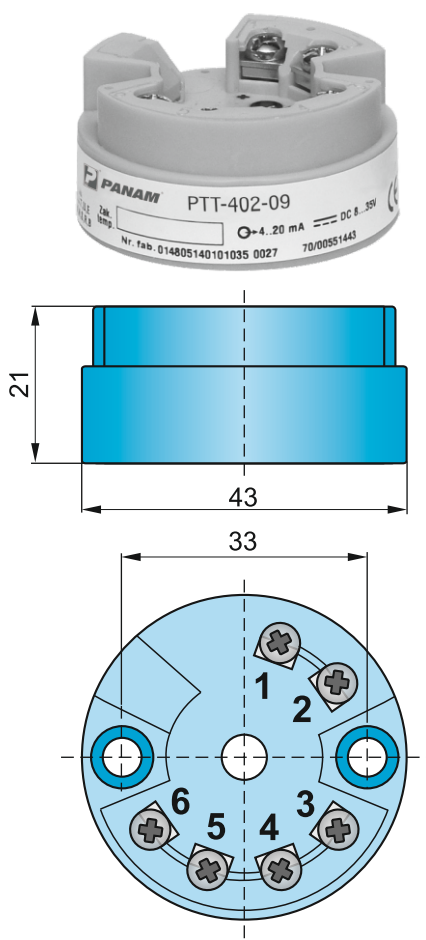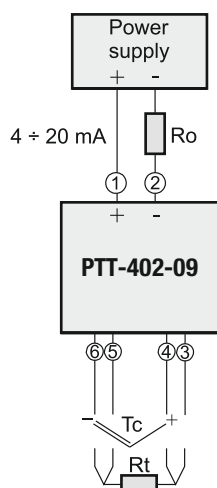
✓ **Galvanic insulation (In, out)e**
✓ **Thermoresistance line compensation (3 and 4 wires line)**
✓ **Compensation of thermocouple cold junction**
✓ **Output signal 4…20mA**
✓ **Head-mounting system**
✓ **Certificate ATEX ⟨Ex⟩II 1G Ex ia IIC T6 (GIX-22-2 version).**

Application and function

The temperature transmitters are used for converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4 to 20 mA.

Most of parameters such as: sensor type, input signal, measuring range, can be configured by user for specific requirements of his measuring system.

User defined parameters like, type of sensor, measuring range etc. can be programmed by **PANAM**® and their values are printed on serial number label.

Transmitter is suitable for head mounting.

21

43

33

1 2
6 3
5 4

Electrical diagrams

Power supply
+ −

4 ÷ 20 mA   Ro

① ②

+ −

PTT-402-09

⑥⑤   ④③

− Tc +

Rt

Technical data

Input signal	J, L, U, T, E, K, N, S, R, B, Pt, Ni
Min. measuring range	10°C for Pt, Ni
	50°C for J, L, U, T, E, K, N
	500°C for S, R, B
Output signal	4 – 20mA
Power supply	8…35V DC
	8-30V DC for GIX-22-2
Load resistance	$R_0[k\Omega] < (U_z – 11V)/25mA$
Alarm signal	22mA or 3,6 mA
Galvanic insulation	Optoelectrical

Accuracy

PT100: -100÷200°C	±0,2°C	J: -210÷1200°C	±0,5°C over -150°C
PT100: -200÷850°C	±0,4°C	L: -200÷900°C	±0,5°C
PT500: -100÷200°C	±0,2°C	U: -200÷600°C	±0,5°C
PT100: -200÷250°C	±0,4°C	T: -270÷400°C	±0,5°C over -200°C
PT1000: -100÷200°C	±0,2°C	E: -270÷1000°C	±0,5°C over -150°C
PT1000: -100÷250°C	±0,4°C	K:-270÷1372°C	±0,5°C over -140°C
Ni100: -60÷250°C	±0,2°C	N: -270÷1300°C	±1°C over -100°C
		S: -50÷1768°C	±2°C over +20°C
		R: -50÷1768°C	±2°C over +50°C
		B: 0÷1820°C	±2°C over +400°C

Thermal error	±0,05 %/10°C
Voltage error	±0,01%/V
Ambient temperature	-40…+85°C

PTT-401-01-0-01-1-2-0~50-H

Model

PTT - **PANAM**® Temperature Transmitters

Model Description

401 - Rail Mounted Temperature Transmitter
402 - Head Mounted Temperature Transmitter

Transmitter Type

	401	402
01 - Smart DIN-rail mount temperature transmitter	✓	
02 - Smart DIN-rail mount temperature transmitter with ATEX certificate	✓	
03 - Rail Mounted Temperature Transmitter for PT100 & Ni100	✓	
04 - Smart Head mount temperature transmitter		✓
05 - Smart Head mount temperature transmitter with ATEX certificate		✓
06 - Head mount temperature transmitter for resistant sensor Pt100		✓
07 - Head mount temperature transmitter for resistant sensor PT100 with ATEX certificate		✓
08 - Head mount temperature transmitter for resistant sensor Pt100 & Ni100		✓
09 - Universal Head mount temperature transmitter		✓

Safety Integrity Level

	01	02	03	04	05	06	07	08	09
0 - No Safety Intergrity Certificate	✓	✓	✓	✓	✓	✓	✓	✓	✓
1 - Safety Intergrity Level Certificate (SIL - 2)	✓	✓		✓	✓				
2 - Safety Intergrity Level Certificate (SIL - 3)	✓	✓		✓	✓				

Sensor Type

	01	02	03	04	05	06	07	08	09
01 - B Thermocouple type of sensor type B	✓	✓		✓	✓				✓
02 - E Thermocouple type of sensor type E	✓	✓		✓	✓				✓
03 - J Thermocouple type of sensor type J	✓	✓		✓	✓				✓
04 - K Thermocouple type of sensor type K	✓	✓		✓	✓				✓
05 - L Thermocouple type of sensor type L				✓	✓				✓
06 - N Thermocouple type of sensor type N	✓	✓		✓	✓				✓
07 - R Thermocouple type of sensor type R	✓	✓		✓	✓				✓
08 - S Thermocouple type of sensor type S	✓	✓		✓	✓				✓
09 - T Thermocouple type of sensor type T	✓	✓		✓	✓				✓
10 - U Thermocouple type of sensor type U									✓
11 - Cu50 Resistant type of sensor Cu50				✓	✓				
12 - Cu100 Resistant type of sensor Cu100	✓	✓		✓	✓				
13 - Ni100 Resistant type of sensor Ni100	✓	✓	✓	✓	✓		✓	✓	✓
14 - Pt10 Resistant type of sensor Pt10	✓	✓		✓	✓				
15 - Pt50 Resistant type of sensor Pt50	✓	✓		✓	✓				
16 - Pt100 Resistant type of sensor Pt100	✓	✓	✓	✓	✓	✓	✓	✓	✓
17 - Pt200 Resistant type of sensor Pt200	✓	✓		✓	✓				
18 - Pt500 Resistant type of sensor Pt500	✓	✓		✓	✓				✓
19 - Pt1000 Resistant type of sensor Pt1000	✓	✓		✓	✓				✓

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PTT-401-01-0-01-1-2-0~50-H

Transmitter Type	01	02	03	04	05	06	07	08	09
1 - Single Sensor - Simplex	✓	✓	✓	✓	✓	✓	✓	✓	✓
2 - Dual Sensor - Duplex	✓	✓		✓	✓				

Wiring	01	02	03	04	05	06	07	08	09
0 - For thermocouple sensing element									
2 - 2 Wire RTD	✓	✓		✓	✓	✓	✓	✓	✓
3 - 3 Wire RTD	✓	✓	✓	✓	✓	✓	✓	✓	✓
4 - 4 Wire RTD	✓	✓		✓	✓		✓	✓	✓

Range	01	02	03	04	05	06	07	08	09
Min Max Unit - For	✓	✓	✓	✓	✓	✓	✓	✓	✓

Alarm Signal	01	02	03	04	05	06	07	08	09
H - High Alarm	✓	✓	✓	✓	✓	✓	✓	✓	✓
L - Low Alarm	✓	✓	✓	✓	✓	✓	✓	✓	✓

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2-3-5 VALVE MANIFOLDS	BELLOW SEAL VALVES
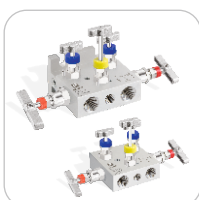
2-3-5 VALVE MANIFOLDS

BELLOW SEAL VALVES

GAUGE ROOT VALVES

NEEDLE VALVES

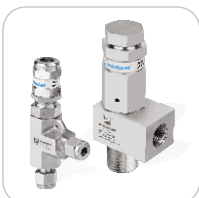HP NEEDLE VALVES

BALL VALVES

HP BALL VALVES

DOUBLE BLOCK & BLEED VALVES

MONO FLANGE VALVES

CHECK VALVES

RELIEF VALVES

FILTERS

TUBE FITTINGS

PIPE FITTINGS

HP PIPE FITTINGS

SWIVEL FITTINGS

JIC FITTINGS

WELD FITTINGS

HIGH PRESSURE FITTINGS

GAUGE SAVERS

GRAB SAMPLING SYSTEM

PRE-FABRICATED HOOK UPS

THERMOWELLS

TEMPERATURE GAUGES

PRESSURE GAUGES

PRESSURE TRANSMITTERS

TEMPERATURE TRANSMITTERS

PRESSURE REGULATORS

CONDENSATE POTS

AIR HEADERS

FLANGE ADAPTERS

SWIVEL GAUGE ADAPTERS

BLEED PLUGS

DIE-ELECTRIC FITTINGS

TUBING

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