

PT 602, 1 or 2 channels

Transducer for measuring Temperature (Equivalent resistance)



Fig. 1 .PT 602, 1 channel version, in housing S17 clipped on to a top - hat rail.



Fig. 2 PT 602, 2 channel version, in housing S17 hole mounting brackets pulled out.

Application

The transmitter PT 602 (Fig. 1 and 2) Converts the input variable-a signal from a resistance thermometer Pt 100- to a temperature linear output signal.

The analogue output signal is either an impressed current or superimposed voltage which is processed by other devices for purposes of displaying, recording and / or regulating a constant.

Versions are available for two, three or four - wire connection.

DIP switches are provided for the coarse setting of the measuring range and the fine adjustment is accomplished using the potentiometers.

Red LED's signal an open or short-circuit feeler. In both cases, the output signal adopts its maximum value.

In the case of an current output, provision is made for switching between 0... 20 mA and 4... 20 mA.

The transmitter fulfil all the important requirements and regulations concerning electromagnetic compatibility EMS & safety (IEC 1010 resp. EN 61 010). It was developed & is manufactured & tested in strict accordance with the quality assurance standard & ISO 9001

Features / Benefits

- Measuring ranges configurable with DIP switch and potentiometer .
- Non - Standard user - specific ranges available .
- Red LED's indicator : an open or short - circuit.
- Electric isolation between input & output 2.3 kV and power supply & all other circuits 3.7 kV - Fulfils EN 61 010.
- Universal (DC / AC) power supply.
- Provision for either snapping the transmitter onto top-hat rails or securing it with screws to a wall or panel.
- Housing only 17.5 mm wide (size S17) / low space requirement

Technical data

Measuring input resp. measuring inputs \ominus

Resistance thermometer	Type Pt 100 (DIN IEC 751)
Measuring current	< 1 mA
Input resistance	R _i > 4 MΩ
Lead resistance	Two - wire connection ≤ 25 Ω per lead (total 50 Ω) Three - / four - wire connection ≤ 25 Ω per Lead
Temperature range	Two - wire connection - 150 ... 800°C Three - / four - wire connection - 170 ... 800°C
Min. span	50°C
Max. span	700°C

Example 1 : Range -150°C to 800°C

Lower side possible range is -150°C to 550°C (Span=700°C)

Higher side possible range is 100°C to 800°C (Span=700°C)

Example 2 : Range 0°C to 45°C or -20°C to 10°C

These ranges are not possible because Min span required is 50°C whereas available span is less than 50°C

Max. initial value : Two - wire connection 400°C
Three-/four - wire connection 500°C

Max. ratio between offset and span

$$\frac{T_A}{T_E - T_A} < 10 \quad (T_A \text{ and } T_E \text{ in } ^\circ\text{C})$$

Measuring range settings

— Coarse setting with DIP switches
— Fine adjustment with potentiometer "Zero" and "Span"

Potentiometer setting range

Dependent on temperature range, typical values :
— Span, approx. ± 60% of full scale
— Offset, approx. ± 100°C
(12 - turn helical potentiometer)

Measuring output resp. measuring outputs \ominus

DC current	0 / 4 ... 20 mA switchable by plug - in jumper
Burden voltage	10 V
Open-circuit voltage	< 20 V
External resistance	R _{ext} max. ≤ 500 Ω
Residual ripple	< 1.5% p.p., DC...10 kHz
DC voltage	0...10 V
Short-circuit current	≤ 40 mA
Load capacity	R _{ext} min. ≥ 2 kΩ
Residual ripple	< 1.5% p.p., DC...10 kHz
Response time	≤ 500 ms

Open-circuit sensor circuit and short-circuit supervision

Pick-up level	— At open - circuit approximately 1 to 400 kΩ — At short - circuit approximately 0...30 Ω
Fault signaling mode	— Frontplate signals Red LED for signaling fault — Output signal at 0 / 4...20 mA, output approx. 25 mA at 0...10V, output approx. 12.5 V

Accuracy data (acc. to DIN/IEC 770)

Basic accuracy	Max. error ≤ + 0.5% including linearity and repeatability errors for a standard range 0 ... 100°C and for reference conditions.
Additional error (additive)	< ± 0.35 % for linearised characteristic.
Influence of lead resistance	— Two - wire connection : Compensated by potentiometer — Three - wire connection : 0.15 K of measuring range per 10 Ω Lead resistance ≥ 0.375 K total — Four - wire connection : 0.1 K of measuring range per 10Ω Lead resistance ≥ 0.375 K total
Selector switch for 0...20 / 4...20 mA	± 0.1%

Reference conditions

Ambient temperature 23°C, ± 2 K
 Power supply 24 VDC ± 10% and 230 VAC ± 10%
 Output burden Current: 0.5 · R_{ext} max.
 Voltage: 2 · R_{ext} min.
 An external supply fuse must be provided for DC supply voltages supply > 125 V.

Influencing factors

Temperature < ± 0.2 % per 10 K
 Burden < ± 0.1 % for current output
 < 0.2 % for voltage output,
 if R_{ext} > 2 · R_{ext} min.
 Long-term drift < ± 0.3 % / 12 months
 Switch-on drift < ± 0.5 %

Power supply H→○ :

AC/DC power pack (DC and 45...400 Hz)

Table 3: Rated voltages and permissible variations

Nominal voltages U _N	Permissible variation
24... 60 V DC / AC	DC -15... + 33% AC ± 15%
85...230 V ¹ DC / AC	

Power consumption 1 Channel version
 ≤ 1.2 W respectively ≤ 2.3 VA
 2 channel version
 ≤ 1.8 W respectively ≤ 3.4 VA

Environmental Conditions

Commissioning temperature —10 to + 55 °C
 Operating temperature —25 to + 55 °C
 Storage temperature —40 to + 70 °C
 Annual mean relative humidity ≤ 75%

Standard

Electromagnetic Compatibility The standard DIN EN 50 081-2 & DIN EN 50 082-2 are observed
 Protection (acc. to IEC 529 resp. EN 60 529) Housing IP 40
 Terminals IP 20
 Electrical standards Acc. to IEC 1010 resp. EN 60 010
 Operating voltages < 300 V between all insulated circuit
 Pollution degree 2

Electrical insulation

All circuits (measuring inputs / measuring outputs / power supply) are electrically insulated
 Permissible vibrations 2 g acc. to EN 60 068-2-6
 Shock 50 g
 3 shocks each in 6 directions
 acc. to EN 60 068 - 2 - 27
 Weight 1 channel approximately 180 g
 2 channel approximately 200 g

Installation Category

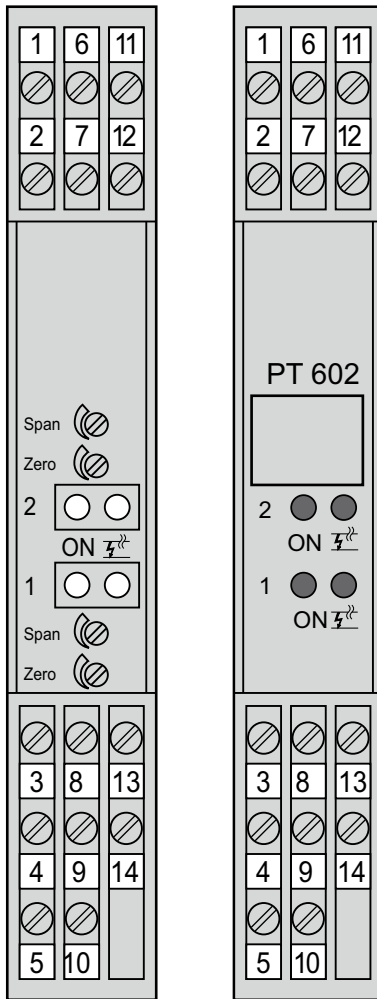
acc. to IEC 664 III for power supply
 II for measuring input and measuring output
 Double insulation: — Power supply versus all circuits
 — Measuring input versus measuring output
 Test voltage: Power supply versus:
 — all 3.7 kV, 50 Hz, 1 min.
 Measuring inputs versus:
 — measuring outputs 2.3 kV, 50 Hz, 1 min.
 Measuring input 1 versus:
 — measuring input 2
 2.3 kV, 50 Hz, 1 min.
 Measuring output 1 versus:
 — measuring output 2
 2.3 kV, 50 Hz, 1 min.

Installation Data

Mechanical design Housing S17
 Refer to Section "Dimensional drawings" for dimensions
 Material of housing Lexan 940 (Polycarbonate)
 Flammability class V-0 acc. to UL 94, self - extinguishing, non - dripping, free of halogen
 Mounting For snapping onto top - hat rail (35X15 mm or 35X7.5 mm) acc. to EN 50 022
 or directly onto a wall or panel using the pull - out screw hole brackets
 Mounting position Any
 Terminals DIN / VDE 0609
 Screw terminals with wire guards for light PVC wiring and max. 2 X 0.75 mm² or 1 X 2.5 mm²

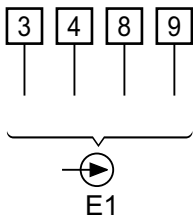
Electrical connections

Front

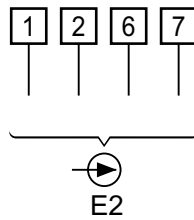


Without transparent cover

With transparent cover

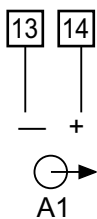


E1

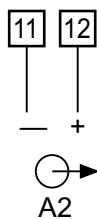


E2

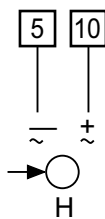
E1 = Measuring input 1 } Terminal allocation acc. to
 E2 = Measuring input 2 } Connection mode, see Table 4
 A1 = Measuring Output 1
 A2 = Measuring Output 2
 H = Power supply



A1



A2



H

Table 4 : Connection of the measuring input leads E1 and E2

	Measuring inputs	Connection mode*	Wiring diagram Terminal arrangement
Version with 1 input	Measuring input ⊖ E1	Two-wire connection	
		Three-wire connection	
		Four-wire connection	
Version with 2 inputs	Measuring input ⊖ E1	Two-wire connection	
		Three-wire connection	
		Four-wire connection	
Version with 2 inputs	Measuring input ⊖ E2	Two-wire connection	
		Three-wire connection	
		Four-wire connection	

* PT 602 units with type designations 602-1XX 1 and 602-1XX 2 can operate with either two or three-wire connections, but units with the type designation 602-1XX 3 only operate with a four-wire connection.

Dimensional Drawings

(All dimensions are in mm)

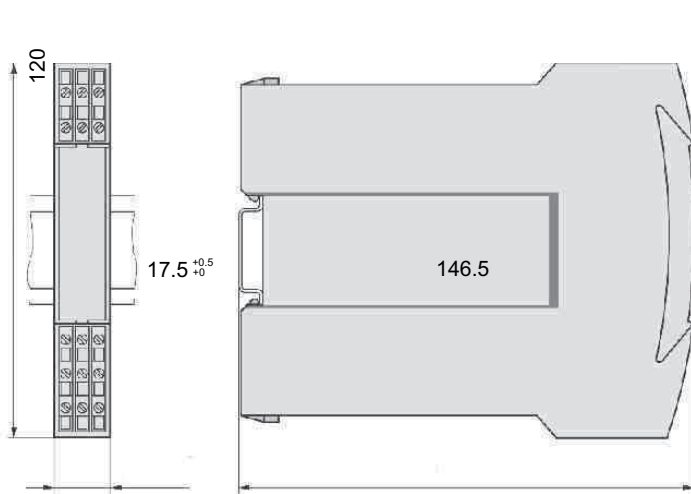


Fig. 3 PT 602 in housing S 17 clipped onto a top-hat rail (35 X 15 mm or 35 X 7.5 mm, acc. to EN 50 022).

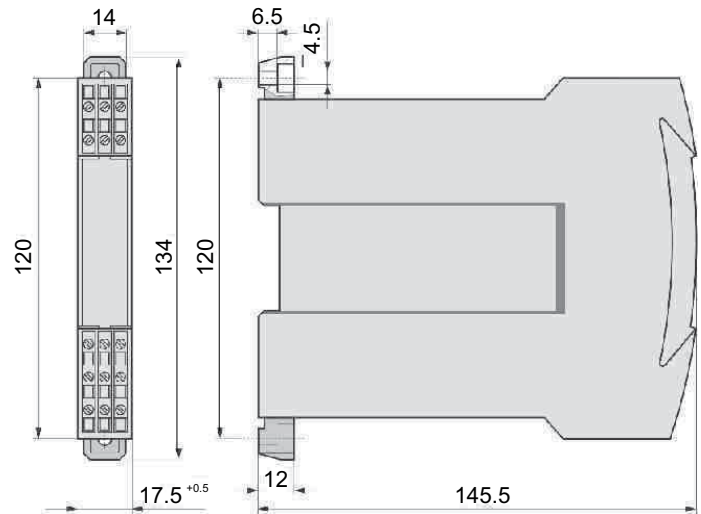


Fig. 4 PT 602 in housing S 17 with screw hole brackets pulled out for wall mounting.

Standard Versions

Inputs (s) set to a range of 0...100°C and output (s) to a range of 4... 20 mA. Configured for three - wire connection. DIP switches enable the temperature range to be configured between a minimum of - 170°C to a maximum of + 800°C; potentiometer for fine calibration of " Zero " and " Span ".

Table 1: Standard version with 1 input 1 output

Input	Output	Power supply DC/AC
0...100 °C	0/4...20 mA	24... 60 V
configurable	$R_{ext.} \leq 500 \Omega$	85...230V

Table 2: Standard version with 2 input 2 output

Inputs 1 & 2	Outputs 1 & 2	Power supply DC/AC
0...100 °C	0/4...20 mA	24... 60 V
configurable	$R_{ext.} \leq 500 \Omega$	85...230V

Standard accessories

- 1 Operating Instructions
- 2 Pull out clamp S17 (for opening the housing)
- 3 Front label

