

TPT300V IR Pyrometer



✓RoHS

CE

- Contactless Temperature Measurement
- High Accuracy
- Wide Temperature Range
- Digital and Analogue Interface
- Industrial Usage (IP65)

DESCRIPTION

TPT 300 is a contactless temperature measuring system - called pyrometer - based on the detection of infrared radiation.

TPT 300 is equipped with a lens and an infrared sensor (Thermopile) in front. It has to be pointed at the target object.

The basic working principle is:

- Detection of infrared radiation with a Thermopile sensor
- Further analogue signal processing
- Calculation of the objects temperature using a microcontroller
- Providing the objects temperature at digital or analogue output

The main fields of applications are temperature measuring in industrial applications i.e. at moving or inaccessible parts.

FEATURES

- 0°C – 300°C Measurement Range
- 9V – 24V Supply Voltage Range
- RS232 Interface & Analogue Voltage Output
- IP65 protected

APPLICATIONS

- Contactless Temperature Measurement
- Industrial Process Control

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ABSOLUTE MAXIMUM RATINGS

Absolute maximum ratings are limiting values of permitted operation and should never be exceeded under the worst possible conditions either initially or consequently. If exceeded by even the smallest amount, instantaneous catastrophic failure can occur. And even if the device continues to operate satisfactorily, its life may be considerably shortened.

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---------------------|--------|---------------------|-----|-----|-----|------|
| Supply Voltage | Vcc | Measured versus GND | -1 | | 28 | V |
| Storage Temperature | Tstor | | -20 | | 85 | °C |

OPERATING CONDITIONS

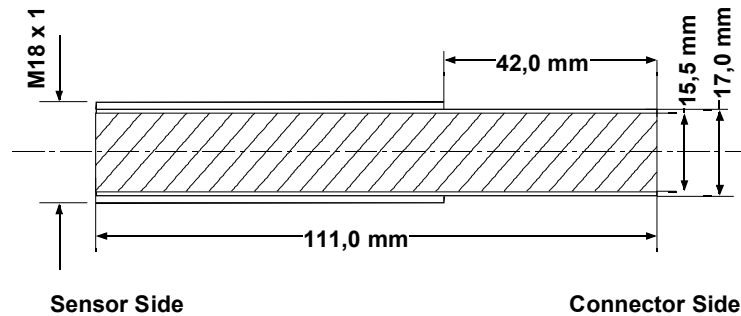
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|------------|--|---|-----|-----|------|
| Supply Voltage | Vcc | Measured versus GND | 9 | | 24 | V |
| Supply Current | I | Full ambient temp. range, no output load | | 22 | | mA |
| Thermal Emission Coefficient of Object | ϵ | Adjustable via RS232 | 10 | | 100 | % |
| Field of View | FOV | | | ±5 | | ° |
| Digital Output Rate | | adjustable | 0.1 | | 10 | Hz |
| Digital Output Settings | | | 9600 Baud, 8 Bit, No Parity, 1 Stop Bit | | | |

OPERATING CHARACTERISTICS

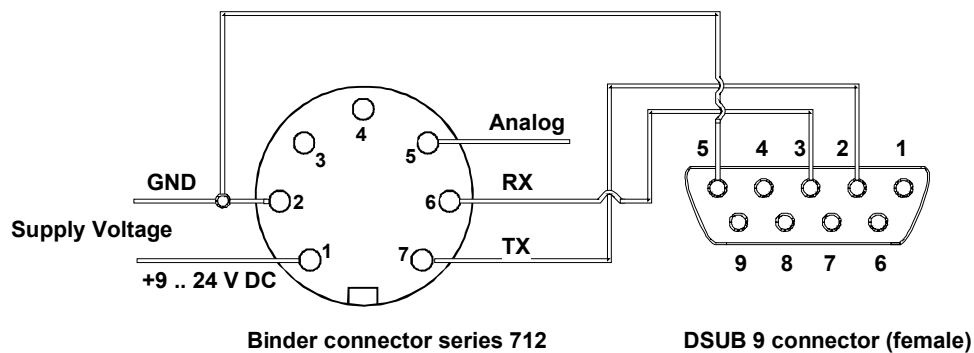
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|------------------------------------|------------------|--------------------------|--|-----|-----|---------------|
| Object Temperature Range | Tobj | | 0 | | 300 | °C |
| Ambient Temperature Range | Tamb | | 0 | | 85 | °C |
| Spectral Sensitivity | S | | 8 | | 14 | μm |
| Accuracy of Target Temp. Measuring | Acc ₁ | Tambient = 25°C | ± 1% of Full Scale Range resp. ± 3°C | | | °C |
| Accuracy of Target Temp. Measuring | Acc ₂ | Full ambient temp. range | ± 1.5% of Full Scale Range resp. ± 4.5°C | | | °C |
| Resolution Digital | Res | | 0.3 | °C | 14 | μm |
| Analog Output Characteristics | | | T[°C] x 5V/300°C | | | V |
| Analog Output Range | | | 0.2 – 4.8 | | | V |
| Resolution Analog | | | 0.3 | | | °C |
| Analog Output Source Resistance | | | 40 | | | Ω |
| Housing | | | Stainless steel | | | |
| Protection class | | | IP 65 | | | |

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MECHANICAL DIMENSIONS



TERMINALS



Please take care: pin numbers are marked on the Binder and on most DSUB connectors!

| Pin | Symbol | Description | Typ |
|-----|--------|-------------------------|----------------------|
| 1 | +VS | Supply Voltage | Supply |
| 2 | GND | Ground potential | Supply |
| 3 | NC | | |
| 4 | NC | | |
| 5 | AN | Analog Output (Voltage) | Analog Output |
| 6 | RX | Receive Data (RS232) | Digital Input/Output |
| 7 | TX | Transmit Data (RS232) | Digital Input/Output |

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FUNCTION

RS232 PROTOCOL

Fixed RS232 settings: 9600 Baud, 8 Bit, No Parity, 1 Stop Bit

TPT MODES

There are two modes implemented in TPT sensors: the Free Running mode and the On Request mode.

In the Free Running mode the sensor cyclically sends measuring results via RS232. In this mode no further communication (for instance changing sensor parameters) is possible. The only telegram which is accepted in this mode is the "Set On Request Mode" telegram, which stops sensor output.

In On Request mode the sensor only sends data via RS232 after user has sent any request telegram. Only in this mode the changing of sensor parameters is possible.

NOTE: Updating the analog output is directly correlated with updating the RS232 output. Only if output data are sent via RS232 the analog output is updated. Two cases are possible: the "Request Result Data" telegram causes updating serial and analog output and - on the other hand - the cyclically sending data in Free Running Mode.

FACTORY SETTINGS

After delivery following parameters are set:

| Parameter | Default Setting |
|---------------|--------------------------------|
| Output Mode | Free Running |
| Output Format | Object and Ambient Temperature |
| Output Rate | 100ms |
| Emissivity | 98% |

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COMMANDS

| command | to the sensor | sensor response | explanation |
|--|------------------------------|--|---|
| Request Software Version and Serial Number | „V“ | “HL-Planartechnik “ “TPT V2.2 yywwnnn-2” <CR> <LF> | manufacturer company, software version, serial number with yy =Year, ww = weak of year, nnn = consecutive number, -2 = product code for TPT300V |
| Set Output Mode “Free Running” | “F” | “F” | “Free Running” mode is active |
| Set Output Mode “On Request” | “P” | “P” | “On Request” mode is active |
| Set Output Format “Object and Ambient Temperature” | “I” | “I” | Format “Object and Ambient Temperature” is active |
| Set Output Format “Object Temperature” | “i” | “i” | Format “Object Temperature” is active |
| Set Emissivity Factor | “e” <Emissivity> | “e” <Emissivity> | Emissivity in percentage (10..100), 1 Byte Binary-Format, |
| Read Emissivity Factor | “E” | “99” | Answer Emissivity in percentage (10..100); ASCII-Format |
| Request Result Data (While Output Format “Object and Ambient Temperature”) | “R” | “+255:+784” <CR> <LF> | with +255 = sensor temperature in tenth of degree C (1-3 digit with sign) +784 = object temperature in tenth of degree C (1-4 digit with sign); |
| Request Result Data (While Output Format “Object Temperature”) | “R” | “+784” <CR> <LF> | with +784 = object temperature in tenth of degree C (1-4 digit with sign) |
| Software Reset | “q” | - | No Echo. It takes about 1 second until software reset is done and sensor acts normal (as after power-up) |
| Set Output Data Rate for Output Mode “Free Running” | “O” “(Data Rate Code)” | “O” “(Data Rate Code)” | (Note 1), ASCII-Format |

“” = ASCII-Format, <> = Binary-Format, <CR>= Carriage Return, <LF> = Line Feed

No reset is necessary to activate the new settings.

Note 1:

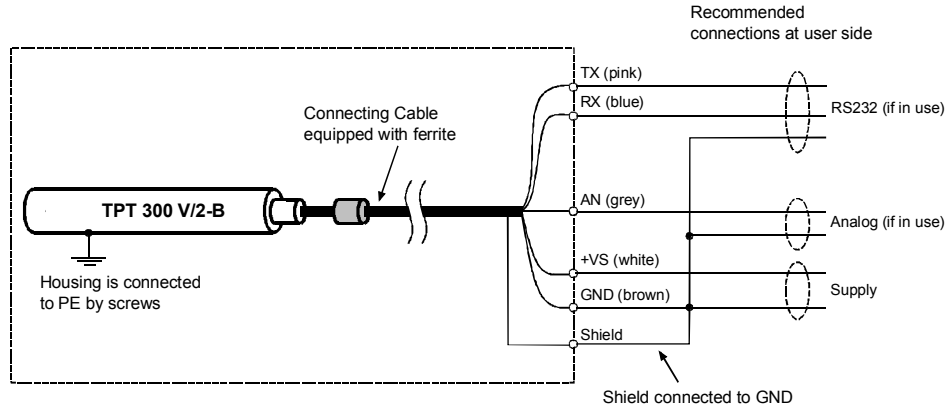
| Data Rate Code | Output Data Rate |
|----------------|------------------|
| “0” | 100 ms |
| “1” | 500 ms |
| “2” | 1000 ms |
| “3” | 5000 ms |
| “4” | 10000 ms |

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CE CONFORMITY

The sensor meets the normative requirements for use in industrial environment. The complete compliance with the norm is given under following conditions:

- Housing is connected to PE by screws
- Meas connecting cable is used
- Shield is connected to GND at user side



If the user intends to employ his own connecting cable, it is recommended to equip this cable with a ferrite near the sensor. A suitable type is Würth #74271112.

TECHNICAL CONTACT INFORMATION

ORDERING INFORMATION

| Part No. | Part Description |
|------------|------------------|
| G-TPSY-002 | TPT300 V |

convenient cable on request

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