

TPT300V IR Pyrometer



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

DESCRIPTION

TPT 300 is a contact-less 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

- Contact less 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		30	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
Emission Coefficient	ϵ	Adjustable via RS232	0.1		1	

OPERATING CONDITIONS

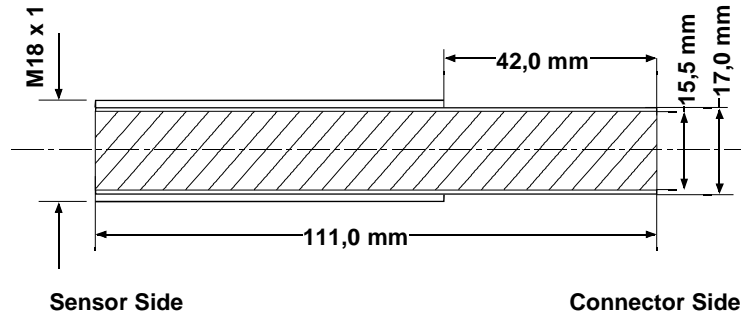
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Field of View	FOV			± 5		°
Spectral Sensitivity	S			8 .. 14		μm
Supply Current	I	Full ambient temp. range, no output load		22		mA
Digital Output Rate					10	Hz
Digital Output Settings					9600 Baud, 8 Bit, No Parity, 1 Stop Bit	

OPERATIONAL CHARACTERISTICS

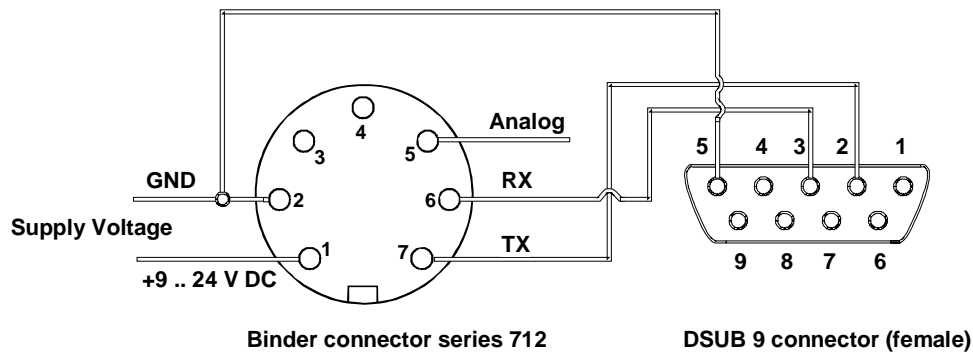
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Object Temperature Range	Tobj		0		300	°C
Ambient Temperature Range	Tamb		0		85	°C
Accuracy of Target Temp. Measuring		Tambient = 25°C			$\pm 1\%$ of Full Scale Range resp. $\pm 3^\circ\text{C}$	
Accuracy of Target Temp. Measuring		Full ambient temp. range			$\pm 1.5\%$ of Full Scale Range resp. $\pm 4.5^\circ\text{C}$	
Resolution Digital				0.3		°C
Analog Output Characteristics				$T[^\circ\text{C}] \times 5\text{V}/300^\circ\text{C}$		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, Current)	Analog Output
6	RX/A	Receive Data (RS232)	Digital Input/Output
7	TX/B	Transmit Data (RS232)	Digital Input/Output

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FUNCTION

RS232 SETTINGS

The port settings are fixed at:

Parameter	Setting
Baudrate	9600
Data Bits	8
Parity	None
Stopp Bits	1

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.

PROTOCOL DEFINITION

REQUEST SOFTWARE VERSION AND SERIAL NUMBER

User System → TPT Sensor	TPT Sensor → User	Notes
„V“	<Version and Serial Number>	ASCII- Format

<Version and Serial Number> is given as follows:

HL-Planartechnik TPT V2.1 0414001-2 <CR> <LF>

HL-Planartechnik	manufacturer company
TPT	product family (pyrometer)
V2.1	software version
0414001-2	serial number, format: yy ww nnn – c which means: year (2 digits), week of year (2 digits), consecutive number in the week (3 digits), product code ("2" is the code for TPT 300 V/2-B)
<CR> <LF>	carriage return, linefeed

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SET OUTPUT MODE

Set "Free Running" Mode		
User System → TPT Sensor	TPT Sensor → User	Notes
"F"	"F" Echo	ASCII- Format

Free Running Mode means, that result data is cyclically updated at analog and digital output.

Set "On Request" Mode		
User System → TPT Sensor	TPT Sensor → User	Notes
"f"	"f" Echo	ASCII- Format

On Request Mode means, that the sensor only sends data, if the user has sent any request telegram before.

SET OUTPUT FORMAT

Set "Format Object and Ambient Temperature"		
User System → TPT Sensor	TPT Sensor → User	Notes
"I"	"I" Echo	ASCII- Format

Set "Format Object Temperature"		
User System → TPT Sensor	TPT Sensor → User	Notes
"i"	"i" Echo	ASCII- Format

SET EMISSIVITY FACTOR

Step	User System → TPT Sensor	TPT Sensor → User	Notes
1	"e"	"e" Echo	ASCII- Format
2	<Emissivity>	<Emissivity> Echo	Binary- Format

Emissivity is adjustable in range of 1 – 100 %. Parameter <emissivity> must be given as one-byte integer value. For instance: E=100% corresponds to 64hex respectively ASCII "d".

READ EMISSIVITY FACTOR

Step	User System → TPT Sensor	TPT Sensor → User	Notes
1	"E"	"E" Echo	ASCII- Format
2	<Emissivity>	<Emissivity> Echo	ASCII- Format

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REQUEST RESULT DATA

User System → TPT Sensor	TPT Sensor → User	Notes
„R“	<Result Data>	ASCII- Format

There are two output formats available.

If “Format Object and Ambient Temperature” is selected, the <Result Data> is given as follows:

+255:+784 <CR> <LF>

+255

:

+784

<CR> <LF>

sensor temperature in tenth of degree C

colon (delimiter)

object temperature in tenth of degree C

carriage return, linefeed

If “Format Object Temperature” is selected, the <Result Data> is given as follows:

+784 <CR> <LF>

+784

<CR> <LF>

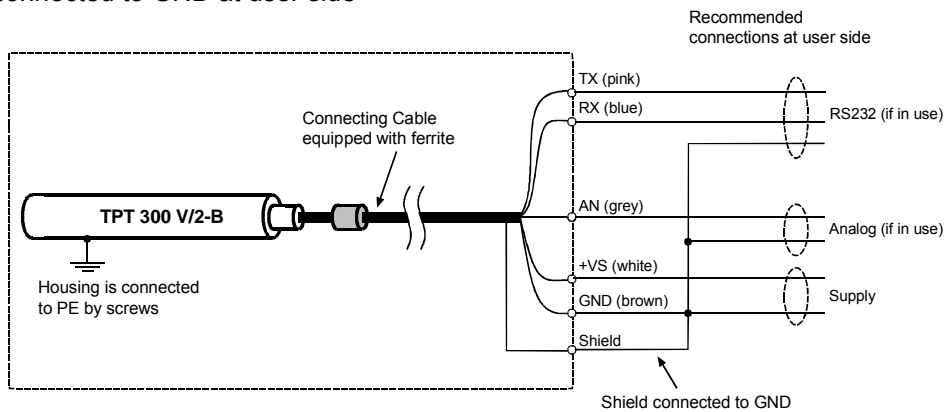
object temperature in tenth of degree C

carriage return, linefeed

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
- HL 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.

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ORDERING INFORMATION

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