



- *Complete range including basic and advanced control functions*
- *Relay output, static output for SSR, 4-20 mA and 0-10 V analogue outputs*
- *Models with current transformer input and HBA function*
- *Models with RS485 serial interface for MODBUS-RTU protocol*

## TH-T SERIES

The **TH-T** temperature controller series offers a complete range of solutions able to satisfy many varied industrial automation needs, including basic models suitable for more simple and cost-effective applications and advanced models created specifically for the more evolved control and interface systems.

Programming of the temperature controllers is quick and easy as the most frequently-used configurations can be set with few keyboard operations. Models with a RS485 serial interface can send the parameter configuration and receive the controlled values through an industrial PC that can control different units.

Versions with a current transformer input, available as an accessory for measurements reaching 25 or 100 A, can detect even a partial load failure, as for example due to a broken heating element.

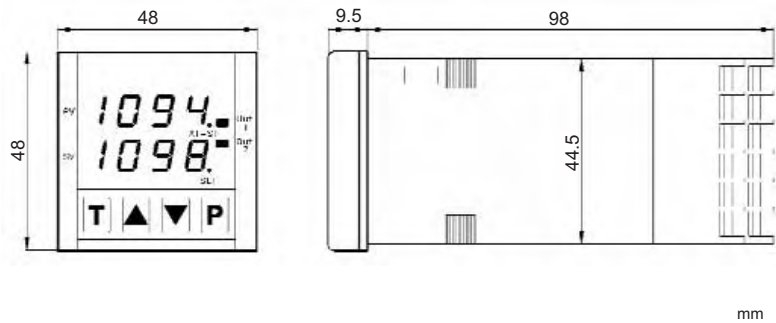
The series includes models with opto-isolated relay and transistor outputs to control static relays, as well as models with 4-20 mA or 0-10 V normalised proportional analogue outputs.



# TH-T TEMPERATURE CONTROLLERS

The temperature controllers are easily programmed by the 4 push-buttons and display indicators present on the front panel, or via the RS485 serial interface. Additionally the accessory device, as compact as a car key, copies the same configuration onto different temperature controllers. The 'T' push-button rapidly activates the Auto-Tuning function when the temperature increases and reaches the set value, alongside the continuous Self-Tuning of the PID control parameters.

## DIMENSIONS



Single-display panel



Double-display panel



Terminal block



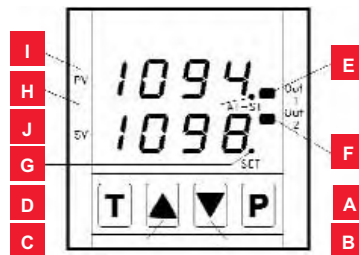
Amperometric transformer



Programming device

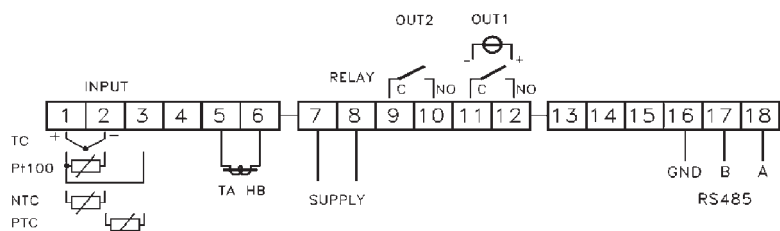


## INDICATORS AND SETTINGS



- A** P push-button for programming access and confirmation
- B** Down push-button for value decrease / parameter selection
- C** Up push-button for value increase / parameter selection
- D** T push-button for Auto-Tuning and Self-Tuning activation
- E** Out1 LED for main output 1 ON status indication
- F** Out2 LED for auxiliary output 2 ON status indication
- G** SET LED for programming access indication (*blinking*)
- H** AT-ST LED Auto-Tuning (*blinking*) and Self-Tuning (*on*)
- I** PV display for process value indication
- J** SV display for set value indication (*only TH-TD vers.*)

## CONNECTIONS



**Note:** For correct installation and use Datasensor SpA can guarantee only the data indicated in the instruction manual supplied with the products.



# TECHNICAL DATA

		BASIC MODELS											ADVANCED MODELS										
		TH-TS-00	TH-TS-10	TH-TS-01	TH-TS-11	TH-TD-00	TH-TD-10	TH-TD-01	TH-TD-11	TH-TD-03	TH-TD-13	TH-TD-04	TH-TD-14	TH-TD-10-RS	TH-TD-01-RS	TH-TD-11-RS	TH-TD-00-HB	TH-TD-10-HB	TH-TD-01-HB	TH-TD-11-HB			
<b>Power supply:</b>	24 Vac/Vdc ±10%, 50/60 Hz 100-240 Vac ±10%, 50/60 Hz	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Consumption:</b>	5 VA 9 VA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>TC and RTD sensor input:</b>	J thermocouple; programmable for J/K/S thermocouples, Pt100Ω/0°C RTDs, J/K I.R. sensors	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>PTC and NTC thermistor input:</b>	PTC KTY81-121 990Ω/25°C, NTC 103AT-2 10kΩ/25°C									●	●	●	●	●	●	●	●	●	●				
<b>Measurement scale:</b>	from -1999 to +9999 °C/°F, programmable lower and upper scale limits, with sensor break detection	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Precision:</b>	±0.5% f.s. ±0.15% f.s.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Refresh time:</b>	every 125 ms, display digital filter programmable from 0 to 20 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Data retention:</b>	non volatile eeprom memory	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Zero and span correction:</b>	0°C; programmable offset from -1999 to +9999 °C/°F, with measurement line rotation from 0000 to 2000 (gain correction)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Set Point number:</b>	1 control point; programmable from 1 to 4 set points	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Setting value:</b>	0°C; programmable from -1999 to +9999 °C/°F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>1st main point function:</b>	control ; programmable also as alarm point (see alarm action)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>1st main point action:</b>	inverse PID; programmable as inverse (heating) or direct (cooling), symmetrical or asymmetrical on/off, PID single or double action with Auto-Tuning and Self-Tuning	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>1st main point output type:</b>	SPST-NO relay 250 Vac 5 A transistor 12 Vdc 7 mA 4-20 mA analogue 0-10 V analogue	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>2nd auxiliary point function:</b>	alarm; programmable also as control point (see control action)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>2nd auxiliary point action:</b>	absolute maximum alarm; programmable as minimum, maximum or window, absolute or relative setting, with stand-by, delay and latch functions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>2nd auxiliary point output type:</b>	SPST-NO relay 250 Vac 5 A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Overshoot control factor:</b>	0.5; programmable from 0.00 to 2.00 (fuzzy control)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Proportional band:</b>	50°C; programmable from 0 to 9999 °C/°F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Integral time:</b>	200 sec.; programmable from 0 to 9999 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Derivative time:</b>	50 sec.; programmable from 0 to 9999 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Cycle time:</b>	20 sec.; programmable from 0.1 to 130.0 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>On/off hysteresis:</b>	1°C; programmable from -1999 to 9999 °C/°F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Set point timing:</b>	inactive; programmable from 0:00 to 99:59 hours:minutes	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Soft Start timing:</b>	inactive; programmable from 0:1 to 7:59 hours:minutes with Soft Start power adjustable from -100 to +100%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Serial communication interface:</b>	RS485 interface, MODBUS-RTU protocol, 1200-38400 baud												●	●	●								
<b>Loop break alarm:</b>	LBA software function for sensor break or short-circuit and load interruption detection, with intervention time setting from 0 to 9999 sec. alarm output activation possibility	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Heater break alarm:</b>	HBA hardware function with 25/0.05 A or 100/0.2 A current transformer input																	●	●	●			
<b>Connection:</b>	terminal block with 2.5 mm <sup>2</sup> screw contacts	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Electrical protection:</b>	class II - front panel, installed according to instructions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Mechanical protection:</b>	IP54 - front panel, installed according to instructions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Housing material:</b>	UL 94 V0 self-extinguishing plastic	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Weight:</b>	225 g	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Operating temperature:</b>	0...+50°C, with 30...95 rH% non condensing humidity	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Storage temperature:</b>	-10...+60°C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
<b>Reference standard:</b>	EN 61010-1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			



## SELECTION TABLE AND ORDER INFORMATION

MODEL	DISPLAY	POWER SUPPLY	MAIN OUTPUT	ADVANCED FUNCTION	ORDER N°
TH-TS-00	single	24 Vac/Vdc	relay	basic	95B030000
TH-TS-10	single	100-240 Vac	relay	basic	95B030010
TH-TS-01	single	24 Vac/Vdc	transistor	basic	95B030020
TH-TS-11	single	100-240 Vac	transistor	basic	95B030030
TH-TD-00	double	24 Vac/Vdc	relay	basic	95B030040
TH-TD-10	double	100-240 Vac	relay	basic	95B030050
TH-TD-01	double	24 Vac/Vdc	transistor	basic	95B030060
TH-TD-11	double	100-240 Vac	transistor	basic	95B030070
TH-TD-03	double	24 Vac/Vdc	4-20 mA	analogue out	95B030080
TH-TD-13	double	100-240 Vac	4-20 mA	analogue out	95B030090
TH-TD-04	double	24 Vac/Vdc	0-10 V	analogue out	95B030100
TH-TD-14	double	100-240 Vac	0-10 V	analogue out	95B030110
TH-TD-00-RS	double	24 Vac/Vdc	relay	RS485	95B030120
TH-TD-10-RS	double	100-240 Vac	relay	RS485	95B030130
TH-TD-01-RS	double	24 Vac/Vdc	transistor	RS485	95B030140
TH-TD-11-RS	double	100-240 Vac	transistor	RS485	95B030150
TH-TD-00-HB	double	24 Vac/Vdc	relay	HBA *	95B030160
TH-TD-10-HB	double	100-240 Vac	relay	HBA *	95B030170
TH-TD-01-HB	double	24 Vac/Vdc	transistor	HBA *	95B030180
TH-TD-11-HB	double	100-240 Vac	transistor	HBA *	95B030190

\* Heater Break Alarm: load failure detection (eg. heating elements) through external current transformer, which can be ordered as an accessory.

## ACCESSORY SELECTION TABLE AND ORDER INFORMATION

MODEL	DESCRIPTION	ORDER N°
THT-AT-25	25/0.05 A current transformer for HBA function	95A301010
THT-AT-100	100/0.2 A current transformer for HBA function	95A301020
THT-KEY	Device for copying the same programming to different temperature controllers	95A301030



CTi Automation - Phone: 800.894.0412 - Fax: 208.368.0415  
 Web: [www.ctiautomation.net](http://www.ctiautomation.net) - e.mail: [info@ctiautomation.net](mailto:info@ctiautomation.net)

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### HEADQUARTERS

#### DATASENSOR SpA

via Lavino, 265 - 40050 Monte San Pietro, BO - Italy  
 Tel. +39 051/6765611 • Fax +39 051/6759324  
[www.datasensor.com](http://www.datasensor.com) • e-mail [info@datasensor.com](mailto:info@datasensor.com)

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