

- *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.

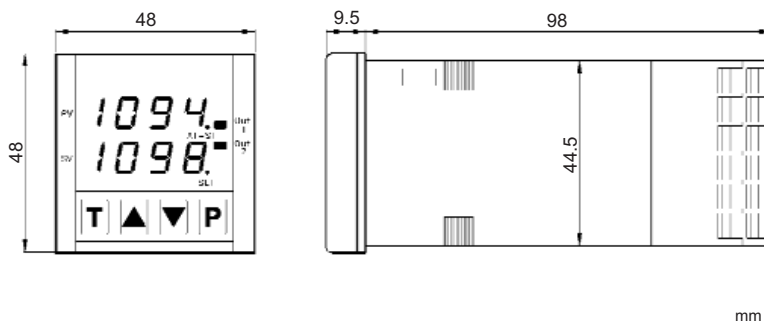
The series includes models with opto-isolated relay and transistor outputs to control static relays, as well as models with 4-20 mA or 0-10 V normalised proportional analogue outputs.



# 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



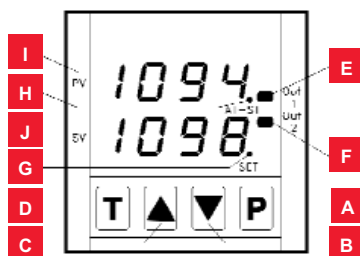
Amperometric transformer



Programming device

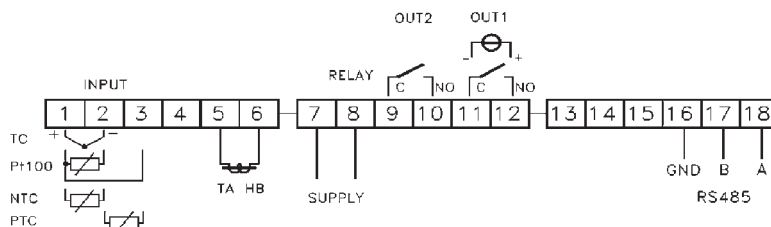


## INDICATORS AND SETTINGS



- 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-00-RS	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 $\pm 10\%$ , 50/60 Hz 100-240 Vac $\pm 10\%$ , 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, Pt100 $\Omega/0^\circ\text{C}$ RTDs, J/K I.R. sensors	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>PTC and NTC thermistor input:</b>	PTC KTY81-121 990 $\Omega/25^\circ\text{C}$ , NTC 103AT-2 10k $\Omega/25^\circ\text{C}$									●	●	●	●	●	●	●	●	●	●	●	●	
<b>Measurement scale:</b>	from -1999 to +9999 $^\circ\text{C}/^\circ\text{F}$ , programmable lower and upper scale limits, with sensor break detection	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>Precision:</b>	$\pm 0.5\%$ f.s. $\pm 0.15\%$ 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 $^\circ\text{C}$ ; programmable offset from -1999 to +9999 $^\circ\text{C}/^\circ\text{F}$ , 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 $^\circ\text{C}$ ; programmable from -1999 to +9999 $^\circ\text{C}/^\circ\text{F}$	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<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 $^\circ\text{C}$ ; programmable from 0 to 9999 $^\circ\text{C}/^\circ\text{F}$	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<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 $^\circ\text{C}$ ; programmable from -1999 to 9999 $^\circ\text{C}/^\circ\text{F}$	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<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 $^\circ\text{C}$ , with 30...95 rH% non condensing humidity	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<b>Storage temperature:</b>	-10...+60 $^\circ\text{C}$	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
<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



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Datasensor SpA endeavours to continuously improve and renew its products; for this reason the technical data and contents of this catalogue may undergo variations without prior notice. For correct installation and use Datasensor SpA can guarantee only the data indicated in the instruction manual supplied with the products.

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# TEMPERATURE CONTROLLERS