TEMPERATURE CONTROLLERS

STANDARD 1/16 DIN BASIC AND ADVANCED CONTROLLERS



- ***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.

DATASENSOR
value through detection

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.

Single-display panel



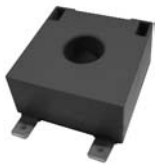
Double-display panel



Terminal block



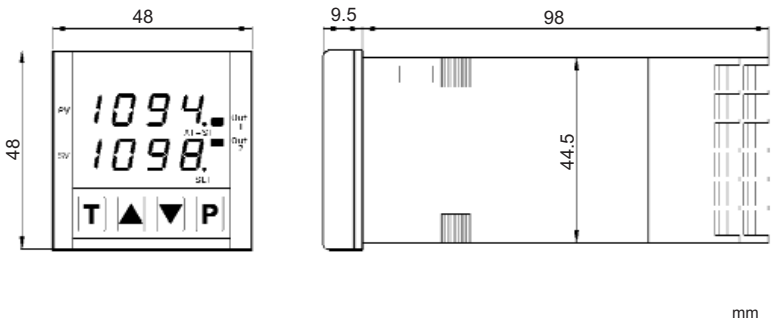
Amperometric transformer



Programming device



DIMENSIONS



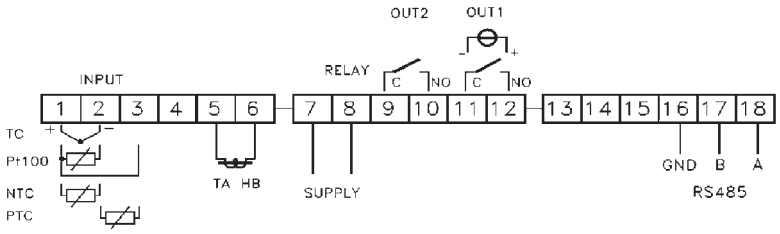
mm

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.

DATASENSOR

Versions and options: refer to **MODEL SELECTION TABLE**

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
Power supply:	24 Vac/Vdc ±10%, 50/60 Hz	●		●		●		●		●		●		●		●		●		●	
	100-240 Vac ±10%, 50/60 Hz		●		●		●		●		●		●		●		●		●		●
Consumption:	5 VA	●	●	●	●	●	●	●	●												
	9 VA									●	●	●	●	●	●	●	●	●	●	●	●
TC and RTD sensor input:	J thermocouple; programmable for J/K/S thermocouples, Pt100Ω/0°C RTDs, J/K I.R. sensors	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PTC and NTC thermistor input:	PTC KTY81-121 990Ω/25°C, NTC 103AT-2 10kΩ/25°C									●	●	●	●	●	●	●	●	●	●	●	●
Measurement scale:	from -1999 to +9999 °C/°F, progammable lower and upper scale limits, with sensor break detection	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Precision:	±0.5% f.s.	●	●	●	●	●	●	●	●												
	±0.15% f.s.									●	●	●	●	●	●	●	●	●	●	●	●
Refresh time:	every 125 ms, display digital filter programmable from 0 to 20 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Data retention:	non volatile eeprom memory	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Zero and span correction:	0°C; programmable offset from -1999 to +9999 °C/°F, with measurement line rotation from 0000 to 2000 (gain correction)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Set Point number:	1 control point; programmable from 1 to 4 set points	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Setting value:	0°C; programmable from -1999 to +9999 °C/°F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1st main point function:	control ; programmable also as alarm point (see alarm action)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1st main point action:	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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1st main point output type:	SPST-NO relay 250 Vac 5 A	●	●			●	●							●	●			●	●		
	transistor 12 Vdc 7 mA			●	●			●	●							●	●			●	●
	4-20 mA analogue									●	●										
	0-10 V analogue											●	●								
2nd auxiliary point function:	alarm; programmable also as control point (see control action)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2nd auxiliary point action:	absolute maximum alarm; programmable as minimum, maximum or window, absolute or relative setting, with stand-by, delay and latch functions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2nd auxiliary point output type:	SPST-NO relay 250 Vac 5 A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Overshoot control factor:	0.5; programmable from 0.00 to 2.00 (fuzzy control)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Proportional band:	50°C; programmable from 0 to 9999 °C/°F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Integral time:	200 sec.; programmable from 0 to 9999 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Derivative time:	50 sec.; programmable from 0 to 9999 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cycle time:	20 sec.; programmable from 0.1 to 130.0 sec.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
On/off hysteresis:	1°C; programmable from -1999 to 9999 °C/°F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Set point timing:	inactive; programmable from 0:00 to 99:59 hours:minutes	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Soft Start timing:	inactive; programmable from 0:1 to 7:59 hours:minutes with Soft Start power adjustable from -100 to +100%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Serial communication interface:	RS485 interface, MODBUS-RTU protocol, 1200-38400 baud													●	●	●	●				
Loop break alarm:	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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heater break alarm:	HBA hardware function with 25/0.05 A or 100/0.2 A current transformer input																	●	●	●	●
Connection:	terminal block with 2.5 mm² screw contacts	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Electrical protection:	class II - front panel, installed according to instructions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mechanical protection:	IP54 - front panel, installed according to instructions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Housing material:	UL 94 V0 self-extinguishing plastic	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Weight:	225 g	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Operating temperature:	0…+50°C, with 30…95 rH% non condensing humidity	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Storage temperature:	-10…+60°C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Reference standard:	EN 61010-1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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DATASENSOR

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

Distributed by:

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