

# TMS

## PLASTICS THERMAL CONTROLLER



- SMART TUNE - PID CONTROL
- UNIVERSAL, 3 WIRE - TC, RTD
- 3 RELAY/ SSR UNIVERSAL OUTPUTS
- 2 INDEPENDENT SET POINT RAMP UP/ DOWN PROFILES
- SOFT START- POWER LIMITER
- CT INPUT
- LOAD CURRENT DISPLAY WITH OUTPUT FAILURE ALARM
- IP 65 AND NEMA 4X FRONT PROTECTION

ROELECTRONIC

## PRODUCT SPECIFICATIONS

<b>Case:</b>	PC/ABS black
<b>Self-extinguishing degree:</b>	V-0 according to UL - VDE CSA.
<b>Front protection:</b>	designed and tested for IP 65 (*) and NEMA 4X (*) for indoor locations (when panel gasket is installed). (* Tests were performed in accordance with CEI 70-1 and NEMA 250-1991 STD.
<b>Dimensions:</b>	48x96mm, depth 89mm
<b>Power supply:</b>	- from 100 to 240V AC - 50/60Hz (-15% to +10% o the nominal value) or - 24V AC/DC ( $\pm 10\%$ of the nominal value).
<b>Common mode rejection ratio:</b>	> 120dB @ 50/60Hz.
<b>Normal mode rejection ratio:</b>	> 60dB @ 50/60Hz.
<b>Temperature drift:</b>	< 200ppm/°C (RJ excluded) < 400ppm/°C for RTD input with -19.9/99.9°C range.
<b>Reference junction accuracy:</b>	0.1°C/°C .
<b>Insulation resistance:</b>	>100M $\Omega$ according to IEC 1010-1
<b>Insulation voltage:</b>	1500V according IEC 348.
<b>EMC/Safety:</b>	this instrument is marked CE. It conforms to council directives 89/336/EEC (reference harmonized standard EN-50081-2 and EN-50082-2), 73/23/EEC and 93/68/EEC (reference harmonized standard EN61010-1).
<b>Installation category:</b>	II.
<b>Sampling time:</b>	500mSec.
<b>Accuracy:</b>	$\pm 0.2\%$ of the input span or $\pm 1^\circ\text{C}$ (@ 25°C ambient temperature).
<b>Operating temperature:</b>	from 0 to +50°C.
<b>Storage temperature:</b>	from -20 to +70°C.
<b>Humidity:</b>	from 20% to 85% RH non condensing.

## MEASURING INPUTS

### Thermocouples

<i>Line resistance:</i>	max. 100 $\Omega$ with error $\leq \pm 0.1\%$ of the input span.
<i>Engineering unit:</i>	°C or °F programmable.
<i>Reference junction:</i>	automatic compensation of the ambient temperature from 0 to +50°C.
<i>Burn-out:</i>	up scale or down scale programmable.
<i>Calibration:</i>	according IEC 584-1 and DIN 43710 - 1977 (TC type L).

### Standard range table

TC type	°C	°F
L	0 / +800	0 / +999
J	0 / +800	0 / +999
K	0 / +999	0 / +999
N	0 / +999	0 / +999

### RTD

<i>Input type:</i>	Pt 100 3 wire connection.
<i>Measuring current:</i>	150 $\mu\text{A}$ .
<i>Line resistance:</i>	automatic compensation up to 20 $\Omega$ /wire with error $\leq \pm 0.1\%$ of the input span for range -19.9 to 99.9°C. no measurable error for all other ranges.
<i>Engineering units:</i>	°C or °F programmable.
<i>Burn-out:</i>	open circuit indication. On RTD input, a special test is provided to signal OVERRANGE when input resistance is less than 15 $\Omega$ (Short circuit sensor detection).
<i>Calibration:</i>	according to DIN 43760.

### Standard range table

RTD type	°C	°F
Pt 100	-199 / 500	-199 / +999
Pt 100	-19.9 / +99.9	-

## Current transformer input

<i>Ranges:</i>	10A, 25A, 50A, 100A.
<i>Indication:</i>	in engineering units.
<i>Resolution:</i>	0.1A for 10A range; 1A for all the other ranges.
<i>Active period:</i>	NO or NC programmable (logic level 1 or 0 for SSR output).
<i>Minimum period duration:</i>	50 mSec.

**note:** the "heater break-down" alarm function is available for the main output only.

## OUTPUTS

### Output 1 - Heating type

<i>Relay:</i>	with SPDT contact; contact rating 3A/250V AC on resistive load.
<i>Logic voltage:</i>	for SSR drive: logic level 1: 24V $\pm$ 20% @ ; 1mA ; 14V $\pm$ 20% @ 20mA logic level 0: < 0.5V. (The selection between relay or SSR is made by internal jumper).

### Output 2

#### Cooling or Alarm 1 type

<i>Relay:</i>	output with SPST contact; contact rating 2A/250V AC on resistive load.
<i>Logic voltage:</i>	for SSR drive. - logic level 1: 24V $\pm$ 20% @ ; 14V $\pm$ 20% @ 20mA. - logic level 0: < 0.5V. (The selection between relay or SSR is made by internal jumper).

### Output 3

#### Alarm 2 or Heater break-down

<i>Output type (optional):</i>	relay SPST.
<i>Contact rating:</i>	2A/250V AC (on resistive load) NO contact only.

### Output programmability

- 1) Heating + alarm 1 + alarm 2
- 2) Heating + cooling + alarm 2
- 3) Heating + alarm 1 + heater break-down
- 4) Heating + cooling + heater break-down
- 5) Heating + alarm 1
- 6) Heating + cooling

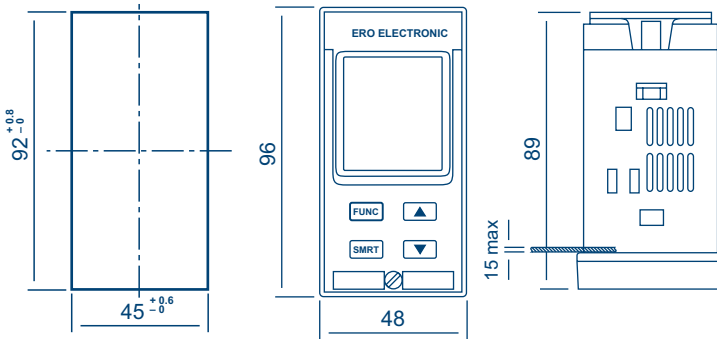
## CONTROL PARAMETERS

<b>Proportional band:</b>	-for 1 control output; programmable from 1.0% to 99.9% of the selected input span. -for 2 control outputs; programmable from 1.5% to 99.9% of the selected input span. Setting PB = 0 the control action becomes ON/OFF.
<b>Hysteresis (for ON/OFF control action):</b>	from 0.1% to 10.0% of the input span.
<b>Integral time:</b>	from 10 seconds to 20 minutes or excluded.
<b>Derivative time:</b>	from 0 to 9 minutes and 59 seconds or excluded.
<b>Heating cycle time:</b>	from 1 to 200 seconds.
<b>Cooling cycle time:</b>	from 1 to 200 seconds.
<b>Relative cooling gain:</b>	from 0.20 to 1.00.
<b>Overlapping/dead band:</b>	from -20% to 50%.
<b>Programmable ramp for set point changes:</b>	from 1 to 100 units/minute.

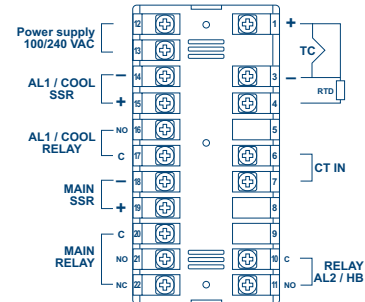
## HOW TO ORDER

MODEL	INPUT	CONTROL ACTION	OUTPUT 1 (Heating)	OUTPUT 2 (Cooling or Alarm 1)	OPTIONS	POWER SUPPLY	CUSTOMISATION
TMS	4 TC and RTD programmable	3 PID + SMART	1 + Relay or SSR drive programmable	1 + Relay or SSR drive programmable	0 no provided 1 Alarm 2 2 Alarm 2 / Heater break-down alarm	3 from 100 to 240V AC - 50/60Hz 5 24V AC/DC	000 Std ERO Label N00 Neutral version
<b>TMS</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>1</b>			

## DIMENSIONS AND PANEL CUT - OUT



## REAR TERMINAL BLOCK



## HOW TO ORDER CURRENT TRANSFORMER

MODEL	PRIMARY CURRENT
CTR current transformer	1 10A 2 25A 4 50A 5 100A
<b>CTR</b>	

## DIMENSIONS

