

# CALIBRATION

## TM 6602 / TM 6612 / TM6630

### Thermometers

3 models:

TM6602: Thermocouple,

TM6612: RTD

TM6630: Thermocouple and RTD

Protected for on-site use

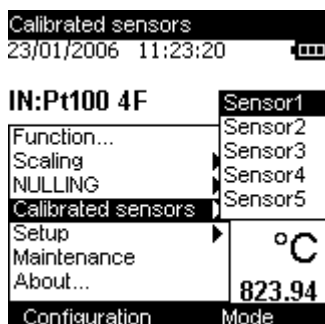
Metrological and control tool

- Well adapted for different process job procedures thanks to their ranges and specific functions as data recording
- High accuracy: 0,02% of reading
- Very low temperature coefficient: 10 ppm /°C in thermocouples and 7 ppm/°C in resistance even in bad outside environmental conditions accuracies are not modified
- Measurement of 14 thermocouples and 12 RTD types
- Display in °C, °F, mV and Ohms
- Data recording and onscreen exploitation

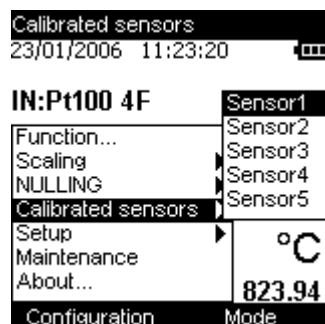
User friendly, robust, these tools have been designed to simplify temperature transmitters and probes maintenance and commissioning. They measure in thermocouple and/or RTD's.



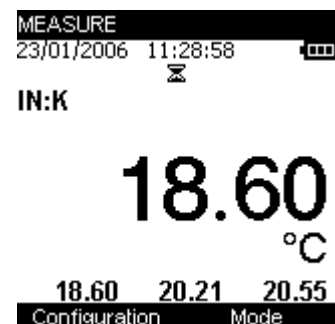
Thermometers of series TM use a graphic display making easier programming and reading.



Function menu



Calibrated sensor menu



Reading display

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Process transmitters and other sensors are more and more reliable and accurate, therefore calibrators performances need to be at the same level. That is the reason why AOIP provides 0,02% of accuracy for thermocouples and Rtd for these onsite instruments.

The resolution is programmable, by user for better reading, upto 1mΩ or 1μV,.

## Specifications (@ 23°C±5°C and between 45% and 75% of relative humidity)

### DC VOLTAGE

Function	Range	Resolution	Accuracy / 1Yr	Range
IN	100 mV	1 μV	0,020% r + 3μV	-10 mV /100mV

Temperature coeff < 15 ppm R /°C  
from 0°C to 18°C and 28°C to 50 °C.

### Temperature with Thermocouples

Type	IN range	Resolution	Accuracy / 1 yr
K	- 250 to - 200°C - 200 to - 120°C - 120 to - 50°C -50 to + 1 372°C	0,20°C 0,10°C 0,05°C 0,05°C	0,90°C 0,3°C 0,02 % r+ 0,12°C 0,02 % r+ 0,11°C
T	- 250 to - 200°C - 200 to - 50°C - 50 to + 400°C	0,2°C 0,05°C 0,05°C	0,80°C 0,25°C 0,02 % r+ 0,09°C
J	- 210 to - 200°C - 200 to - 120°C - 120 to + 60°C + 60 to + 1 200°C	0,05°C 0,05°C 0,05°C 0,05°C	0,30°C 0,25°C 0,020 % r+ 0,11°C 0,020 % r+ 0,09°C
E	- 250 to - 200°C - 200 to - 100°C - 100 to + 450°C +450 to + 1 000°C	0,1°C 0,05°C 0,05°C 0,05°C	0,55°C 0,20C 0,020 % r+ 0,07°C 0,020 % r+ 0,05°C
R	- 50 to + 150°C + 150 to + 550°C +550 to + 1 768°C	0,50°C 0,20°C 0,10°C	0,95°C 0,40°C 0,020 % r+ 0,30°C
S	- 50 to + 150°C + 150 to + 550°C +550 to + 1 768°C	0,5°C 0,2°C 0,1°C	0,85°C 0,020 % r+ 0,4°C 0,020 % r+ 0,3°C
B	+ 400 to + 900°C +900 to + 1 820°C	0,2°C 0,1°C	0,95°C 0,50°C
U	- 200 to - 100°C - 100 to + 600°C	0,05°C 0,05°C	0,35°C 0,20°C
L	- 200 to - 100°C - 100 to + 900°C	0,05°C 0,05°C	0,30°C 0,20°C
C	- 20 to + 900°C +900 to + 2 310°C	0,1°C 0,1°C	0,30°C 0,020 % r+ 0,15°C
N	- 240 to - 190°C - 190 to - 110°C - 110 to - 0°C + 0 to + 1 300°C	0,2°C 0,1°C 0,05°C 0,05°C	0,60°C 0,25°C 0,15°C 0,020 % r+ 0,07°C
Platine	- 100 to + 1 400°C	0,05°C	0,3°C
Mo	0 to + 1 375°C	0,05°C	0,020 %r+ 0,10°C
NiMo/NiCo	- 50 to + 1 410°C	0,05°C	0,020 %r+ 0,35°C

CJC accuracy : ± 0,3°C

Temperature Coefficient:<20ppm/°C from 0 to 18°C and 28 to 50°C

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## RTD Specifications (@ 23°C±5°C and between 45% and 75% of relative humidity)

### Resistance

Function	Range	Resolution	Accuracy / 1yr	Range	Notes
In	400 Ohm	1 mΩ	0,012% r + 10 mΩ	0 Ω to 400 Ω	Automatic detection : 2, 3 or 4 wires.
	3600 Ohm	10 mΩ	0,012% r + 100 mΩ	0 Ω to 3600 Ω	Automatic detection : 2, 3 or 4 wires.

Temperature coefficient: <7ppm/°C from 0 to 18°C and 28 to 50°C

Sensor	Range	Resolution	Accuracy / 1yr
Pt 50 ( $\alpha = 3851$ )	- 220°C + 850°C	0,01°C	0,012 % + 0,06°C
Pt 100 ( $\alpha = 3851$ )	- 220°C + 850°C	0,01°C	0,012 % + 0,05°C
Pt 100 ( $\alpha = 3916$ )	- 200°C + 510°C	0,01°C	0,012 % + 0,05°C
Pt 100 ( $\alpha = 3926$ )	- 210°C + 850°C	0,01°C	0,012 % + 0,05°C
Pt 200 ( $\alpha = 3851$ )	- 220°C + 1 200°C	0,01°C	0,012 % + 0,12°C
Pt 500 ( $\alpha = 3851$ )	- 220°C + 1 200°C	0,01°C	0,012 % + 0,07°C
Pt 1 000 ( $\alpha = 3851$ )	- 220°C + 760°C	0,01°C	0,012 % + 0,05°C
Ni 100 ( $\alpha = 618$ )	- 60°C + 180°C	0,01°C	0,012 % + 0,03°C
Ni 120 ( $\alpha = 672$ )	- 40°C + 205°C	0,01°C	0,012 % + 0,03°C
Ni 1 000 ( $\alpha = 618$ )	- 60°C + 180°C	0,01°C	0,012 % + 0,03°C
Cu 10 ( $\alpha = 427$ )	- 70°C + 150°C	0,10°C	0,012 % + 0,18°C
Cu 50 ( $\alpha = 428$ )	- 50°C + 150°C	0,01°C	0,012 % + 0,06°C

Temperature Coefficient: < 10 % of accuracy/°C.

Accuracy is given for a 4 wires connection. Sensor accuracy is not taken into account in this accuracy.

Automatic wires number detection

Measuring current: 0.65 mA

### Measurement functions:

**Calibrated sensors:** A database can be created to design curves for sensors after calibration in relation with the corrections showed on a calibration report.

**Scaling:** This operation allows to correct probes errors. Scaling is performed using up to 10 segments, in order to fit with the real calibrated value.

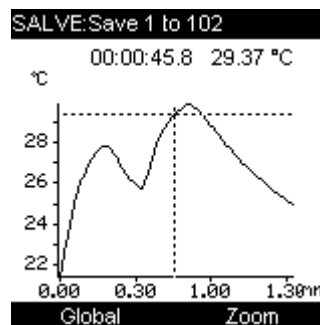
**Data recording:** Data are recorded either manually on event or automatically with programmed frequency. Data are dated and can be displayed as list or curves.

Burst 'SALVE'

Start date: --/--/---- 16:12:36

N°	Time	°C
1»	00:00:00.0	21.45
2	00:00:00.9	21.84
3	00:00:01.7	22.75
4	00:00:02.9	23.39
5	00:00:03.8	23.97
6	00:00:04.7	24.49
7	00:00:05.5	24.94

Graph ...



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## Other functions:

**Interface language:** TM have 5 languages: French, English, German, Italian and Spanish.

**Display contrast:** When dark conditions, user can modify display contrast and switch on display back-light. Back-light timer programmable

**Display resolution:** User can select 3 resolutions (upto 3 decimal places): High, middle or low resolution.

**Date and time display:** These informations are permanently display on the screen

## Statistics:

At the bottom of the screen, maximum, average and minimum values measured are displayed. Reset function allows re-calculating of the values.

**Hold:** To freeze the measuring value.

**Filter:** A filter in seconds can be applied in order to avoid fluctuation of the value.

**Embedded software update:** According to the improvements for these calibrators, AOIP offers you the upgrade of the instrument using USB port free of charge.

## Power supply

In standard TM Series are delivered with 4 AA batteries. An optional rechargeable Batteries + charger allows to use instrument directly connected to the main or with the rechargeable batteries

## Autonomy:

Mode	Measure
Autonomy	40 hours

## Mechanical characteristics and applied standards

Dimensions (Without sheath): 157x85x45 mm

Weight: 306 g

Waterproof: IP 54 acc EN 60529

Environmental conditions

Reference domain: 23°C  $\pm$  5°C, relative humidity: 45 % to 75 %.

Nominal working domain: -10°C to + 50°C, relative humidity: 20 % at 80 % w/o condensation.

Limit working domain: - 10°C to + 55°C, relative hum: 10 % to 80 % (70 % at 55°C).

Transport and storage conditions: - 30°C to + 60°C (without batteries or rechargeable batteries).

Electrical safety: EN 61010

EMC: EN61326

Thermocouples Connection with miniature compensated connector

RTD Connection 4 pin round connector or 4 banana plugs

USB Connection for PC connection (Software upgrade and application with DATACAL)

## Supplied in standard:

Protection sheath, 4 AA batteries, instruction manual, transportation wrist-strap .

Optional external Charger + batteries connectable to the main

## Ordering instructions:

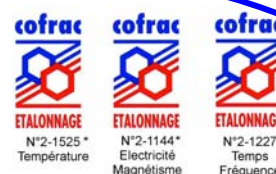
Thermocouple Thermometer	TM 6602
RTD Thermometer	TM 6612
Thermocouple and RTD Thermometer	TM 6630

## Options:

Rechargeable batteries +Charger	AN 6011
Flexible thermocouple type K	T101
Rigid thermocouple type K	T102
Teflon flexible thermocouple type K	T103
Air ambient Pt100	S101D
Waterproof Pt100	S102D



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