THERMYS 150

Advanced field documenting
thermometer / temperature calibrator

THERMYS 150 is an all-in-one high accurate documenting thermometer / temperature calibrator for thermocouples (14 types), resistive probes (12 types) and thermistors with a high accuracy of up to 0.005% RDG._ _

Description

THERMYS 150 is an all-in-one high accurate documenting thermometer / temperature calibrator for thermocouples (14 types), resistive probes (12 types) and thermistors with a high accuracy:

- Thermocouples: Up to 0.005% RDG
- RTDs: Up to 0.006% RDG
- Thermistors: Up to 0.006% RDG

It is designed for field and lab use for advanced temperature maintenance and use on test bench in all industries.

- Simultaneous measurement and emission of temperature (IN / OUT)
- Simultaneous measurement over two channels for comparison calibration (IN / IN)

The second channel can be used either for temperature generation or measurement. When used as a dual input thermometer, THERMYS 150 is the perfect tool for temperature comparison calibration and differential measurement. When the second channel is used as an output, the instrument can be used to control temperature recorders, indicators, handheld thermometers. Using this user-friendly instrument, calibration tasks can be quickly carried out over the whole process chain. Take the 900 g documenting process calibrator to the field with you during the whole week with **10 calibration procedures stored** in the device. Run the procedure after connecting the probes to the instrument (Easy connect system®) and save the results for onsite easy and quick calibration. Back to the office, you can then upload the data on a computer in order to **issue customized calibration certificates** with dedicated calibration software DATACAL. Providing **extended functionalities** (temperature simulation, scaling, steps, synthesizer, statistical functions...) and audit trails, THERMYS 150 complies with both 21 CFR

Part 11 and NADCAP Heat Treatment standards and makes advanced data exploitation and full data traceability easier. IP 54, fully protected by an antichoc rubber holster, THERMYS 150 integrates "easyconnect" terminals and a wide backlite display that makes it easy to use in any severe or dark conditions. THERMYS 150 has also the capability to drive baths and dry-blocks when associated with the specific cable (ref. ACL600).

Easy connection system

Connect your probes by simply pushing on the terminal top and insert wires of up to 3 mm or 10 AWG diameter and compensated thermocouple connectors. Wires are held tight between two brass plates ensuring thermal stability and a very good cold junction compensation for thermocouples. This system also enables 4 mm banana plugs and security connectors to be connected on the terminal top.

Specifications

Specifications and performances in temperature @23°C ±5°C

Uncertainty is given in % of reading (THERMYS 150 display) + fixed value.

Resistive probes: Measurement and simulation

Sensor	Range (Input and Output)	Resolution	Accuracy / 1 year (Measurement)	Accuracy / 1 year (Simulation)
Pt50 (α = 3851)	-220°C to +850°C	0.01°C	0.006% RDG + 0.04°C	0.006% RDG + 0.04°C
Pt100 (α = 3851)	-220°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt100 (α = 3916)	-200°C to +510°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt100 (α = 3926)	-210°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt200 (α = 3851)	-220°C to +850°C	0.01°C	0.006% RDG + 0.04°C	0.006% RDG + 0.04°C
Pt500 (α = 3851)	-220°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Pt1000 (α = 3851)	-220°C to +850°C	0.01°C	0.006% RDG + 0.03°C	0.006% RDG + 0.03°C
Ni100 (α = 618)	-60°C to 180°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C
Ni120 (α = 672)	-40°C to +205°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C
Ni1000 (α = 618)	-60°C to +180°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C
Cu10 (α = 427)	-50°C to 150°C	0.10°C	0.006% RDG + 0.18°C	0.006% RDG + 0.18°C
Cu50 (α = 428)	-50°C to +150°C	0.01°C	0.006% RDG + 0.05°C	0.006% RDG + 0.05°C

Resistive probes measurements in 2, 3 or 4 wires: automatic recognition of number of connected wires, with indication on screen Accuracies are given for 4-wire mounted probes Take into account particular error of temperature sensor used and implementation conditions Admissible measuring current: 0.01 mA to 1 mA In

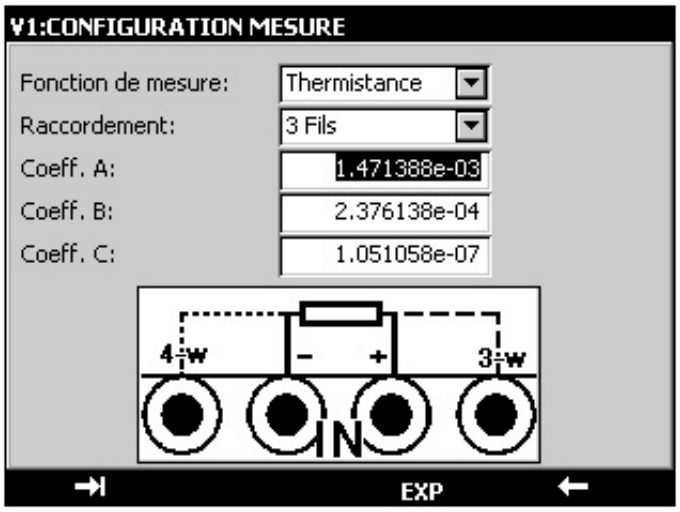
simulation mode, specifications given for 1 mA measuring current (Pt50 / 100, Ni100 / 120, Cu10 / 50) or 0.1 mA (Pt200 / 500 / 1000, Ni1000) Establishing time: <1ms for simulation (simulation on quick transmitters) Temperature coefficient: < 10% of accuracy /°C

Thermocouples: Measurement and simulation

Type	Input range	Resolution	Accuracy / 1 year (Measurement)	Output range	Resolution	Accuracy / 1 year (Simulation)
K	-250 to -200°C -200 to -120°C -120 to +1372°C	0.10°C 0.05°C 0.01°C	0.50°C 0.15°C 0.005% RDG + 0.08°C	-250 to -50°C -50 to +120°C +120 to +1020°C +1020 to +1370°C	0.01°C 0.01°C 0.01°C 0.01°C	0.15% RDG 0.06°C 0.005% RDG + 0.05°C 0.007% RDG + 0.05°C
T	-250 to -200°C -200 to -100°C -100 to +80°C +80 to +400°C	0.1°C 0.01°C 0.01°C 0.01°C	0.50°C 0.05% RDG + 0.06°C 0.015% RDG + 0.07°C 0.06°C	-250 to -100°C -100 to +0°C +0 to +400°C	0.01°C 0.01°C 0.01°C	0.1% RDG + 0.05°C 0.02% RDG + 0.06°C 0.055°C
J	-210 to -120°C -120 to +60°C +60 to +1200°C	0.01°C 0.01°C 0.01°C	0.15°C 0.005% RDG + 0.07°C 0.0025% RDG + 0.06°C	-210 to +0°C +0 to +50°C +50 to +1200°C	0.01°C 0.01°C 0.01°C	0.03% RDG + 0.08°C 0.05% RDG + 0.07°C 0.005% RDG + 0.04°C
R	-50 to +150°C +150 to +550°C +550 to 1768°C	0.20°C 0.10°C 0.01°C	+0.60°C +0.30°C +0.30°C	-50 to +0°C +0 to +350°C +350 to +1768°C	0.01°C 0.01°C 0.01°C	0.35% RDG + 0.4°C +0.4°C +0.25°C
S	-50 to +150°C +150 to +550°C +550 to +1450°C +1450 to +1768°C	0.20°C 0.10°C 0.05°C 0.05°C	0.80°C 0.30°C 0.30°C 0.35°C	-50 to +0°C +0 to +350°C +350 to +1768°C	0.01°C 0.01°C 0.01°C	0.25% RDG + 0.4°C 0.30°C 0.25°C
B	+400 to +900°C +900 to +1820°C	0.10°C 0.05°C	0.005% RDG + 0.4°C 0.005% RDG + 0.2°C	+400 to +900°C +900 to +1820°C	0.01°C 0.01°C	0.005% RDG + 0.4°C 0.005% RDG + 0.2°C
U	-200 to	0.01°C	+0.13°C	-200 to	0.05°C	+0.09°C

	-100°C -100 to +660°C	0.01°C	+0.09°C	+400°C +400 to +600°C	0.05°C	+0.11°C
N	-240 to -190°C -190 to -110°C -110 to +0°C +0 to +400°C +400 to +1300°C	0.10°C 0.05°C 0.01°C 0.01°C 0.01°C	0.25% RDG 0.10% RDG 0.04% RDG + 0.06°C 0.08°C 0.005% RDG + 0.06°C	-240 to -200°C -200 to +10°C +10 to +250°C +250 to +1300°C	0.01°C 0.01°C 0.01°C 0.01°C	0.15% RDG +0.10°C +0.08°C 0.008% RDG + 0.05°C

Thermocouples: PlatineL, Mo, NiMo/NiCo, G, D, L, C: For specifications, refer to the instruction manual (Available on request) Accuracy is given for reference @ 0°C. When using the internal reference junction (except couple B) add an additional uncertainty of 0.2 °C at 0 °C. It is possible (thermocouple B excepted) to choose by programming the cold junction localization: External at 0°C, internal (temperature compensation of instrument's terminals) or manually entered. Temperature coefficient: <10% of accuracy /°C Display unit: °C and F.



Thermistors: Measurement

With 50 Kohms range and Steinhart – Hart equation integrated, thermistors can be entered into THERMYS 150 and tested. Steinhart-hart equation is as follows: $\frac{1}{T}$ = A + B (ln(R)) + C(ln(R))3 T Where: A, B and C are usually calculated according to temperature at 0°C, 25°C and 70°C

Thermistors: Simulation

Simulation of thermistors up to 3600 ohms using Steinhart-hart

equation

Further features

Scaling in measurement and simulation modes	Scaling allows process signals to be displayed in % of FS or in all other units. This function also allows sensors to be corrected after a calibration.
Relative measurement	The features allows the following : • Programming a reference value different from the one of the instrument (NUL function). • Subtracting of constant value by measuring or programming it from a measured value (TARE function).
Simulation menu	Simulation value is set by entering value on keypad or by changing the specific digit with the cursor.
Square root	In current measurement and simulation, this function allows taking into account a quadratic signal coming from transmitter of type ΔP.
Statistical functions	Continuous display of average, minimum and maximum value of the signal under monitoring, as well as number of measurements.
Transmitters tests	Transmitters can be verified using user procedures. 20 procedures can be stored as well as test results. Deviation curves are displayed. Edition of comprehensive test reports.
Switch test	In temperature mode, THERMYS 150 can control electronic thermostat and pressostat trigger levels.
Ramps generation	Starting, ending and length time values of simple or cyclic ramps can be set to do simulation. Number of ramps can also be adjusted in case of cyclic ramps for any signals.
Steps simulation	2 modes are available: • Program mode: Starting value, number of steps and the length time have to be set • Manual mode: User has about a hundred preset values In current simulation, user will have some additional preset values in function of range and according to 0%, 25%, 50%, 75% and 100% from selected gauge. Choice is done between gauges: 0-20 mA: linear or quadratic 4-20 mA: linear or quadratic

Synthesizer	With 100 values manually set, THERMYS 150 enables users to draw a generation curve.

General specifications

Size	210 x 110 x 50 mm
Weight	900 g
Display	240 x 320 pixel liquid crystal graphical display with backlite and contrast control Display of result as table of values or trend curve
Power supply	230 V ± 10 %, 50/60 Hz
Battery	Type: Temps de charge: h Endurance : 5,000 mesures à 10 A
Communication ports	USB
Storage capacity	Up to 10 full configurations (Input / output type, range...) 10,000 data into one or several measurement campaigns, i.e. more than one week work with configurations, measurements, calibration procedures and reports

Environmental specifications

Reference range	23°C ± 5°C (RH: 45 to 75 % w/o condensing)
Operating reference range	-10 to 50°C (RH: 20 to 80 % w/o condensing)
Limit operating range	-15°C to +55°C (RH: 10 to 80 % w/o condensing) (70% at 55°C)
Storage temperature limits	-30°C to +60°C
Maximum height	0 to 2000 m
IP protection	IP54 according to EN60529

Safety specifications

Protections	• Electronic protection up to 250 V for ‘voltage’ wires • Fuse protection for ‘current’ wires • Protection against ‘current’ circuit breaking during inductive resistance measurements
Class	In accordance with EN 61010-1 Category II, pollution 2
Rated voltage	60 V
Chocks and vibrations	EN 61010-1
EMC conformity	Immunity:

	• EN 61000-4-2 • EN 61000-4-3 • EN 61000-4-5 • EN 61000-4-6 • EN 61000-4-11 EN 61000-4-4 Conducted and radiated emissions: • EN 55022, class B • EN 61000-3-2 • EN 61000-3-3

Models and accessories

Instrument:

THERMYS150 On-site high accurate documenting temperature calibrator / thermometer Delivered in standard with:

- User manual
- Battery charger
- Set of 6 testing leads
- Carrying strap
- Factory test report

Accessories: AN6050 Transport case for CALYS series ACL9311 Set of 6 measuring cables with removable crocodile clips ACL600 Cable to drive temperature dry blocks and baths for CALYS 150 Please ask before for compliance with your bath/dry block

Software:

DATACAL Calibration software for CALYS 75 / 100 / 150 Supplied with USB cable

Certification:

QMA11EN COFRAC certificate of calibration With all relevant data points where the device has been tested AMS 2750 Compliance certificate to NADCAP AMS 2750 standard

Packing information:

Size 210 mm x 110 mm x 50 mm Weight without packing 900 g