FLUID T

PORTABLE TEMPERATURE CALIBRATOR -35/+250°C

The new **FLUID T** are portable thermostatic liquid calibrators used for checking thermocouples, platinum resistance and glass thermometers in the laboratory as well as in the field.

It consists of an aluminium liquid bath whose capacity is about 400 cc and it is constantly kept homogeneous by a magnetic mixer whose speed is adjustable according to the viscosity of the fluid used.

Low-temperature models with subzero field do not employ external cooling fluids; the equalization block is heated and cooled by a static Peltier cell system.

They are equipped with a new 32-bit PID microprocessor-based controller with resolution up to 0.001 °C, unit setting in °C °F and K, programming of ascendent/descendent ramps and storage of the thermostats operative temperature.

The new **FLUID T** series of calibrators is equipped with an innovative touch-sensitive display, where the various icons are graphically displayed, making it easier to select different instrument settings.

The calibrators are also available in the **3I version**, in which the instruments are equipped with an acquisition card having three configurable inputs inputs to be able to connect all types of sensors:

- EXT and REF to be able to connect thermocouples type B, E, J, K, N, R, S, T and RTDs type PT100, PT1000
- ANALOG for probes with 0-10V or 4-20 mA output

The REF input is provided for the reference sample probe, thus obtaining a complete calibration system which can be certified by Accredia centres, in compliance with ISO 9000 regulations. The EXT input is provided for probes that are being tested; hence, the instrument can display the temperature of the well, the temperature of the sensor to be checked and the temperature of the reference sample probe, at the same time.

The calibrators are equipped with B type USB serial interface to operate in automatic mode connected to the PC by means of the Aq2Sp2 software which is capable to automate control procedure and allow to print reports, so they are easily traceable in compliance with ISO 9000 standards.

APPLICATIONS:

- Control and calibration of temperature sensors, in the laboratory and in the field, in accordance with ISO 9000 standards
- Control of thermostatas
- Control of glass thermometers
- Automatic computer-controlled calibrations

MAIN CHARACTERISTICS:

- Operating range
  -35°C /250°C
  -31°F/+482°F
- 4 different models
- Hight stability and precision
- Screen Touch Display
- Display resolution up to 0.001
- Light weight and compactness
- Holder for sensors under test
- Multi-hole inserts available
- Automatic ramp function
- USB connection

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TESTING EXPERTISE

FLUID 100T and FLUID100+T

They do not use external cooling fluids; the internal liquid bath, respectively 54 and 60 mm in diameter with a depth of 170 mm, are heated and cooled by a static Peltier cell system.
Magnetic stirring ensures proper heat transmission and excellent stability and uniformity values; the large size of the bath (60 mm) makes it possible to test sensors of various lengths and diameters.

FLUID 200T and FLUID200+T

The internal liquid bath is heated with two electrical resistances and cooled by a fan.

As in FLUID100+T and FLUID100, magnetic stirring evens out the internal temperature.

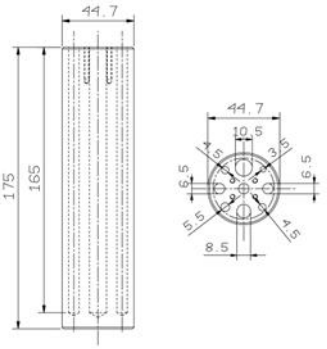
FLUID T are equipped with adjustable holders to support the probes under test and glass thermometers.

Extention Tube

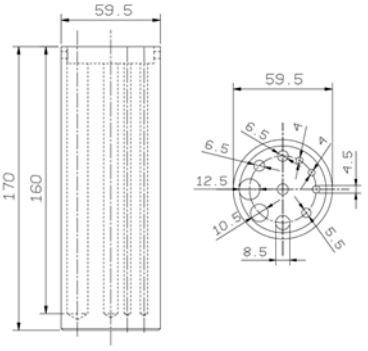
The extension tube is suitable for increasing the depth of the liquid tank. Total depth: 230 mm

Inserts

The FLUID T can be equipped with Anticorodal inserts with holes on demand to be used as dry calibrators.



Perforated insert for FLUID100T/200T
Codice: 2D2846



Perforated insert for FLUID100+T
Codice: 2D4566

Kit supports for holding the probes under test.

Plugs and leads for connecting external probes and thermostat test.

Silicon Oil

Bottles of silicon oils available in addition to the standard equipment.

Codes:

SILICONE200C5 (-40°C/+130°C)
SILICONE47V10 (-30°C/+150°C)
SILICONE47V20 (-20°C/+200°C)
SILICONE47V50 (30°C/+230°C)
SILICONE47V100 (50°C/+250°C)

COMPARATIVE TABLE				
Specifications	**FLUID100+T**	**FLUID100T**	**FLUID200T**	**FLUID200+T**
Temperature range*	-35℃ ÷ +120℃	-18℃ ÷ +140℃	Temp. Amb. ÷ +200℃	Temp. Amb. ÷ +250℃
Display	SCREEN TOUCH			
Dysplay accuracy**	±0.15℃		±0.2℃	
units of measure	℃ - ℉ - K			
Display resolution	0.1° / 0.01° / 0.001℃			
Mean heating time (stabilization included)	from T_{amb} to 140℃ approx 40 min.	from T_{amb} to 140℃ approx 55 min.	from T_{amb} tu 200℃ approx 30 min.	
Mean cooling time (stabilization included)	from 120℃ to T_{amb} approx 1 1100 min.	from 140℃ a T_{amb} approx 50 min.	from 200℃ to 50℃ approx 75 min.	
Stability ***	±0.02℃ at 0℃		±0.03℃ full temperature range	
Axial uniformity	±0.05℃		±0.01℃ +140℃	
Radial uniformity measured from the bottom up to 40 mm	±0.02℃ at 0℃	±0.07℃ at 140℃	±0.06℃ at 140℃	
Hole diameter	45 mm	60 mm		
Hole depth	170 mm			
Insert material	Anticorodal			
Swich test, voltage	On/Off 4.5 V DC			
Adjustable ramp function	from 0.1℃ /min.			
PC interface	B type USB			
External probes	Pt100 at 3/4 wires- Pt1000,Thermocouples: J,K,N,R,S,E,T,B - Sensors with 0-10 V or 4-20 mA output			
Automatic calibration	on 5 points			
Operating voltage	230 o 115 VAC			
Electric power	350 VA	300 VA	500 VA	
Calibrator size	160x360x350 mm			
Calibrator weight with standard equipment	11 Kg		8.3 kg	

Diameter sensor_ 6 mm - the achievement of stabilization is confirmed by a signal÷
* values measured at room temperature 20°C
** temperature deviation between the display and the reference probe
*** maximum temperature difference at a stable temperature over 30 minutes

Touch Display

Touch-sensitive display with graphic visualization of the various functions allowing the various functions to be activated intuitively without having to consult the user manual.
The new 32-bit microprocessor-based PID controller allows a resolution down to 0.001 °C

Cordura® Soft Bag

Code:
2TRMBAG-FLUID
Dimensions: 410x220x380 mm
Weight: 1.45 kg
Packaging dimensions: 600x370x500 mm

Pratical and sturdy Cordura® bag with two side pokets for inserts, a front pocket for documents, shoulder carrying strap, particulary lightweight, it is suitable for carryng and protecting the calibrator with its inserts.

Aluminium rigid case

Code:
2DC505-000
Dimensions: 450x280x380 mm
Weight: 4.8 kg
Packaging dimensions: 600x370x500 mm

Sturdy aluminium case that provides maximum safety for carrying the instrument.

ACCESSORIES

Standard Equipment:

FLUID100T / FLUID100+T

- Bottle 500 cc of silicon oil 47V10
- Closure cap for transport
- Fluid emptying system
- Holder for glass thermometers
- Power supply cable
- Fuses kit
- Thermostat connection cables
- Instruction manual
- Kit of clamp connection (only 3I version)
- Cordura® Soft Bag

FLUID200T /200+T

- Bottle 500cc of silicon oil 47V20 (200T)
- Bottle 500 cc of silicon oil 47V50 (200+T)
- Closure cap for trasport
- Fluid emptying system
- Hulder for glass thermometers
- Power supply cable
- Fuses kit
- Thermostat connection cables
- Instruction manual
- Kit of clamp connection (only 3I version)
- Cordura® Soft Bag

Silicon oils available

Bottle 500 cc of silicon oil 200C5 (-40°/+130°C)
BOTTLE200C5

Bottle 500 cc of silicon oil 47V10 (-30°C/+150°C)
BOTTLE47V10

Bottle 500 cc of silicon oil 47V20 (-20°C/+200°C)
BOTTLE47V20

Bottle 500 cc of silicon oil 47V50 (30°/+230°C)
BOTTLE47V50

Bottle 500 cc of silicon oil47V100 (50°C/ +250°C)
BOTTLE47V100

Accesories on demand:

- Aluminium insert - 2D2846.
- Blind aluminium insert - 2d2678
- Insert with customizable holes
- Tub insert – 2D5314
- Extension Tube
- Aq2Sp2 software
- USB cable
- ACCREDIA certificate (only 3I version) performed with sample probe connected to FLUID
- water-cooling coil - 0FLUIDCOOLING (only FLUID200T/200+T version)
- Aluminium rigid case 2DC505-000

Extension Tube

The extension tube is used to increase the depth of tanks and consequently the immersion of probes. Total length 230 mm.
Code: PROLUNGAFLUID

Water-coling coil

Water cooling coil to speed up the descent time to room temperature.
Code: 0FLUIDCOOLING

How to order:

FLUID100T / FLUID100+T

- Standard version

-00-1 115V 50/60 Hz
-00-2 230V 50/60 Hz

- Version with 3 configurable input

-3I-1 115V 50/60 Hz
-3I-2 230V 50/60 Hz

FLUID200T /FLUID200+T

- Standard version

-00-1 115V 50/60 Hz
-00-2 230V 50/60 Hz

- Version with 3 configurable input

-3I-1 115V 50/50 Hz
-3I-2 230V 50/60 Hz

Tub insert

This insert allows the oil to be removed from the calibrator or replaced with other oil without having to turn the calibrator upside down to drain it, the oil is contained in special removable inserts so that it can be replaced with a dry insert or with another insert containing a different oil.
Code: 2D5314

ISO 9001

CERTIFICATION:
All instruments are supplied with final testing, stability and accuracy report traceable to Accredia standards.

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ACCESSORIES
FOR FLUID 100T/200T/200+T

TUB INSERT – code. 2D5314

This insert allows the oil to be removed from the calibrator or replaced with a different oil without having to tilt the calibrator to empty it.
The oil is contained in special removable inserts, making it possible to replace it with a dry insert or with another insert containing a different oil.
The operation is performed easily by extracting the insert and the oil contained within it, without transferring the oil directly from the calibrator, but simply by removing the insert so that another one can be inserted.
The operation of removing the low-temperature oil to replace it with another high-temperature oil is thus facilitated.
Having two or more of these inserts simplifies calibration procedures, preventing waste, decanting, or oil spillage.

1. Unscrew the plug.

2. Insert oil up to 3 cm from the top.

3. Screw the cap all the way down and place the insert into the calibrator.

4. Once the insert is inserted, unscrew the cap and proceed with calibrations.

5. In case an oil change needed, remove the insert manually.

6. Drain the oil, clean the insert with paper towels, and fill in with the desired oil.

CAUTION: TO AVOID BURNS PERFORM THESE OPERATIONS WITH THE CALIBRATOR AT AMBIENT TEMPERATURE

ALUMINIUM INSERT - code 2D2846

- Range 1: FLUID100T (-18/+140°C)
- Range 2: FLUID 200T/200+T (ambient/+250°C)
- Dimension of the insert: 64,5x170mm
- Number of holes/diameter: 2x4/1x4,5/1x5,5/1x2x6,5/1X8,5/1X10,5/1x12,5mm
- Cooling time from 20 up to -10°C=47'*
- Heating time from –10 up to 110°C=45'*
- Stability: ±0,04
- Radial uniformity at 0°C: ±0,03
- Radial uniformity at 80°C: ±0,06

The insert is suitable for large size probes

INSTRUCTION FOR REMOVING THE MIXER AND SET UP THE INSERT

This operation must be carried out with the calibrator at **room temperature**.
Screw on the drainage device, **turn the calibrator upside down** and empty the liquid (FIG. 2).
Remove the drainage device (FIG. 2-3).
Unscrew the top locking ring of the basin, **remove the internal spring** that locks the bottom grille, and **take out the grille** using the dedicated tool (FIG. 4).
Remove the magnetic bar (FIG. 5).
Clean the inside with a cloth to remove all the liquid.
Insert the aluminum insert and **re-assemble** the basin's locking ring (FIG. 6).

FIG. 1

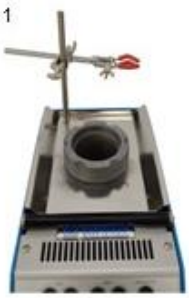

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

TEST in °C	FLUIDT WITH SILICON OIL	ALUMINIUM INSERT	TUB INSERT
MINIMUM TEMPERATURE	-17,5	-13	-16
FROM 20 TO -10	35'	47'	45'
FROM -14 TO 110	36'	45'	40"
FROM 20 TO 121	38'	44'	50'
FROM 110 TO 125	22'	42'	26'
FROM 121 TO 20	42'	37	40'
	Time including stability		

EXTENSIONS TUBE – code. PROLUNGAFLUID

Applications
Use the extension tube to increase the depth of the liquid container in the case of very long thermometric probes or bulbs.

Technical data:
Useful diameter = 60mm Useful depth = 230 mm
Maximum operating temperature with extension = 180 ° C
Minimum temperature reachable with FLUID 100 = 10°C

	FLUID100T	FLUID100+T	FLUID200T	FLUID200+T
LIQUID	SILICON 47V10	SILICON 47V20	SILICON 47V20	SILICON 47V50
Range* **	-10/140°C	-10/140°C	50/180°C	50/180°C
Horizontal uniformity*	±0.1	±0.1	±0.15	±0.15
Vertical uniformity **	±0.1	±0.1	±0.15	±0.15

* Reading at 50 mm from the bottom
** on 150mm starting from the bottom
*** ambient temperature of about 20°C
****working temperature below 0°C

Operational notes
Positioning the probes as much as possible in the centre of the tank, approximately 3 cm from the bottom. Avoid placing the probes on the edge of the tank because agitation is reduced and the uniformity of temperature worsens; keep a distance of at least 1.5cm from the edge of the tank.

INSTRUCTION FOR INSTALLING THE EXTENSIO TUBE

1. Unscrew the nut firmly

2. Screw the aluminium tube making sure the OR are well positioned

3. Insert the insulating tube

4. Screw the ring back

Make sure that the ORING are correctly positioned to ensure the seal of the extension tube

Add the liquid up to about 5cm from the edge of the tube, top up it if necessary, check that no liquid comes out under the tube; if so screw the extension tube again.
At the end of the calibration lower the temperature of the liquid and pour it into its container only when it is at room temperature.

How to empty the FLUID

To empty the container make sure the temperature is close to the environment.
Screw the supplied cap onto the ring nut and pour the liquid.

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