TB400 Temperature bath

DATA SHEET

- **Fast and accurate temperature control with adjustable control parameters**
- **Big volume with homogeneous and stable temperature**
- **Timer for auto-start**
- **Security systems with auto-stop**
- **PC software for control of one or several baths**
- **Adapted to the requirements of EN 1434**
- **Optimized for the test station PST400T**

Application

An advanced calibration bath system with outstanding temperature control using a PC Windows program for operation and regulation.

Designed for testing of up to 20 sensors simultaneously.

The temperature bath is optimized for accurate and rapid testing of temperature sensors in production quantities.

The temperature range of the bath – 10 - 150°C – gives the opportunity to control and pair sensors according to EN1434 over a temperature range of 0 - 180°C.

The sensor measurements are for optimum result made by our testing station PST400T, used by several certified laboratories.

The chosen design gives stability to the whole bath, and provides a minimum temperature variation between the different sensor positions.

The high power heater, together with the ability of the regulation electronics to control the power in small steps, you can achieve either a desired rapid temperature change or a stable regulation when the desired temperature is reached.

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Temperature Control

A control sensor connected to the electronic unit controls the temperature within a few mK.

The control electronics works with a PID regulator with a certain fuzzy function technology, to speed up and stabilize the reaction of the control process.

The control variables in the algorithms can be adjusted to optimize the control for different bath liquids.

The factory setting is optimized for water and glycerine.

Function

A mixer is pushing the liquid up through the circulation tube. Thereafter it turns down on the outside of the tube, passing the heating element and then back through the mixer.

If the bath is prepared with a cooling loop for creating temperatures under +40°C, there is a cooling coil above the heating element. To the cooling coil a circulation cooler will be connected (not included). This cooler will supply the cooling coil with cold water.

The regulation will then be done with the heating element.

The efficient mixing of the liquid will give a very homogeneous temperature in the whole bath.

Security

The bath uses double overheating protectors independent of one another for maximum security. A timer support a supervision system, by which it is possible to auto-stop the bath if it has been un-attended for a set intervals.

Control & regulation equipment

The regulating equipment, incl. PC program but excluding PC, is part of the total equipment.

The control program runs in a PC under Windows 7 (or higher) and handles several baths simultaneously. The temperature level in the baths are logged with the PC and can be followed up on the PC screen.

The communication between the PC and the driver electronics for the heating element is made over a SIOX bus. The PC can be a standard PC.

One COM-port is used to communicate with the bath temperature regulator. The same PC may be used for controlling all baths simultaneously.

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Timer controlling

The built-in timer supports setting start time in advance.

Either the timer can be set to start the bath at a pre-set starting time – or the timer can be set to a time when the temperature should be achieved in the bath (typically when the daily work is planned to start).
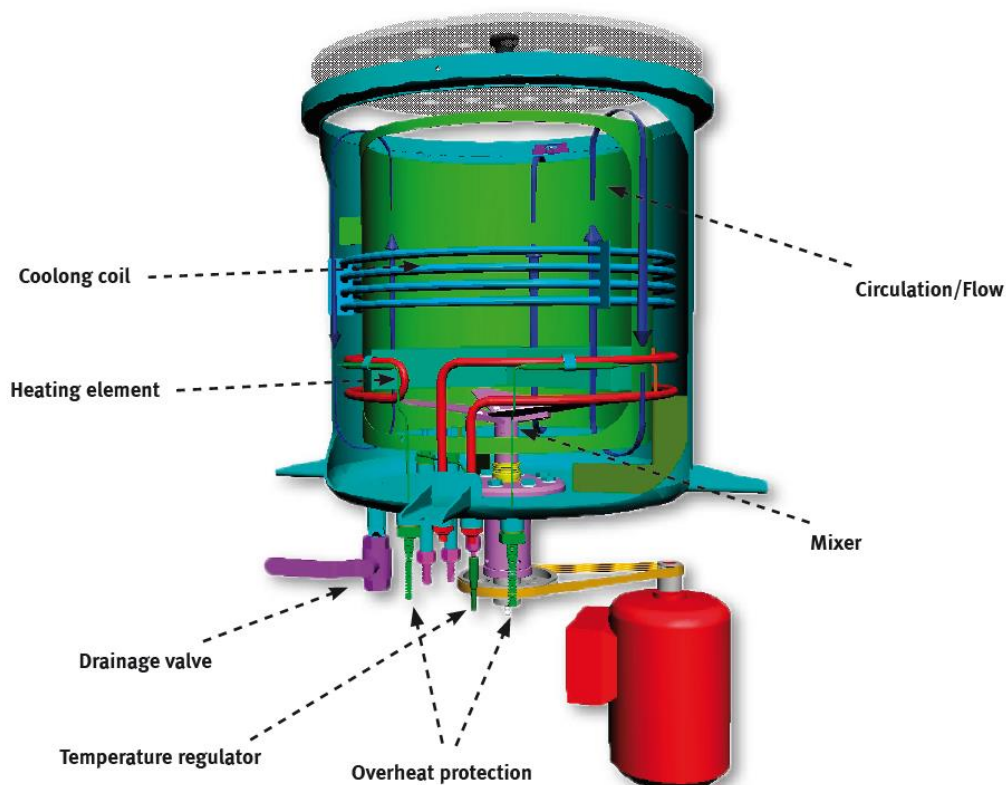
Bath fluid

The bath is to be used with ordinary tap water or glycerine (99,5%) that can be delivered by local suppliers.

No petroleum based liquids are allowed.

If the tap water is calcareous deionized water shall be used.

The TB400 is designed for continuous operation. An operating time counter is included in the equipment.

Principle of circulation

Coolong coil

Heating element

Circulation/Flow

Mixer

Drainage valve

Temperature regulator

Overheat protection

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Technical data TB400

■ **Temperature range**
- Water standard   40°C to 90°C
- Water with cooling   10°C to 40°C
- Glycerine (99,5%)   90°C to 150°C

■ **Temperature stability**   **typical**   **max**
- Drift within 1 min   0,6mK   1mK
- Drift within 24h   2 mK   20 / 4 mK*   *(*Self-calibration done)*
- Drift within 1 year   8 mK   10 mK

■ **Temperature gradients between testing apertures**
- At 10°C to 90°C   1 mK   5 mK
- At 90°C to 150°C   2 mK   5 mK
- Vertical gradient within
  20 to 220 mm   5 mK

■ **Accuracy of self-calibration**   4 mK

■ **Time for temperature change**
- 10 K   ½ Hour
- 50 K   1 ½ Hour

■ **Sensor apertures**
- Alternative 2   20 pcs   Ø 21 mm +0,2 / -0
                   2 pcs   Ø 15 mm
- Diameter 1   210 mm
- Diameter 2   270 mm
- Sensor length   max 220 mm

■ **Dimensions**
- Height x width x depth   900 x 550 x 550 mm
- Height adjustable   ± 15 mm
- Volume   41 liter

■ **Electrical connection**   400V 3-phase 16A
- Heat power   2000 W
- Motor power   120 W

■ **Overheat protection**   2 independent, adjustable

■ **Cabinet temperature**
- Outside, metal parts   max 55°C
- Glass lid   max 110°C
- Glass lid, isolated   max 95°C

■ **Ambient temperature range**   18°C to 28°C

■ **Materials**
- Cabinet   stainless steel
- Inside bath   stainless steel
- Isolation   rockwool
- Stand   aluminium
- Shaft packing   ceramic with EPDM-rubber
- Lid   tempered glass
- Lid isolation   (option)

(Contents may change without any further notice)

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Article number

TB400-01-10	Standard Temperature range 40-150°C
TB400-02-10	Bath with cooling loop and a flexible tube for connection to a circulation cooler. Temperature range 10-40°C.

Included in the delivery:

- 3-phase cable between the first bath and mains outlet (4 m)
- 3-phase cable between bath 1 & 2 and so on (1,6 m)
- SIOX cable for communication
- RS232-SIOX converter with transformer
- USB-stick with regulation program and operating manual
- Glass lid

(PC and circulation cooler are not included. Must be ordered separately.)

A complete system with computer and 3 bath units.

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◼ Contact information

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