



# ***THERMOTEST-100 COOLING CONSTANT TEMPERATURE CALIBRATION BATH***

*Operating manual*

**!** *Before using this instrument, carefully read the operating manual.*

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This manual provides the information needed to operate THERMOTEST-100 cooling constant temperature calibration bath.

## INTRODUCTION

### Intended Use

THERMOTEST-100 cooling constant temperature calibration bath is intended for utility or precision thermometer testing and calibration.

### Environmental Conditions

Indoor use only.

Ambient temperature: +10...+35 °C.

Air humidity: max. relative humidity 80 % for temperatures up to +31 °C,

Max. mains fluctuation of  $\pm 10$  % are permissible.

### Safety recommendations

The instrument ensures safe operation when installed, operated, and maintained according to operating manual. Thoroughly study this manual prior to beginning operation.

Do not store the instrument in aggressive atmosphere.

Protect the instrument from contamination.

Always use only recommended thermal fluids. Don't use acid or corroding materials.

Avoid strikes to the housing, vibrations, damage to the operating element panel (keypad, display), and contamination.

Take care that the mains supply features a low impedance to avoid any negative affects on the instrument being operated in the same mains.

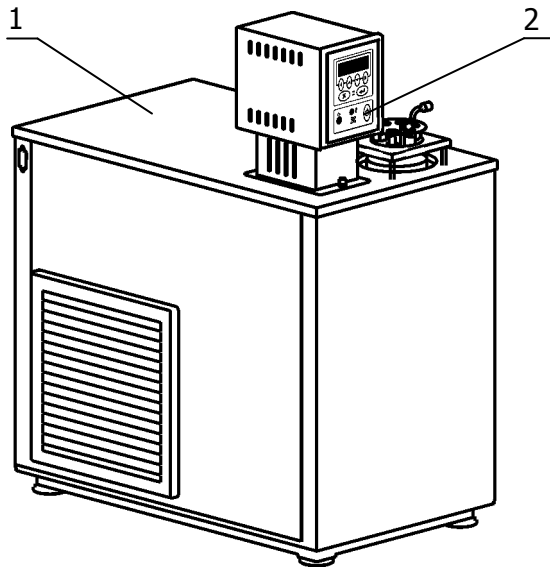
The instrument is designed for operation in a controlled electromagnetic environment. This means that transmitting devices (e.g. cellular phones) should not be used in the immediate vicinity. Magnetic radiation may influence other units with components susceptible to magnetic fields (e.g. a monitor).

Make sure the instrument is regularly checked for proper condition.

Only qualified personnel are authorized to perform configuration, installation, maintenance and repairs of the instrument.

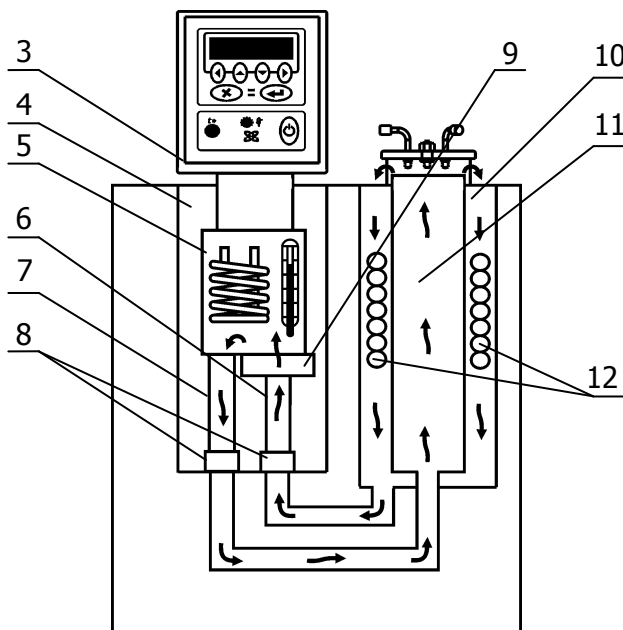
**!** *CAUTION: The instrument is not for use in explosive atmosphere.*

## Appearance and parts names



THERMOTEST-100 consists of heating immersion circulator 2 and bath tank 1. The bath tank contains main 4, operating 11 and supplementary 10 baths and a refrigerating machine. The main bath includes heating immersion circulator 3 with input 6 and output 7 pipes, and connecting sockets 8. Supplementary bath 10 includes coil 12, which is used to pump coolant for refrigerating machine.

The operating principle of THERMOTEST-100 is based on supporting a preset constant temperature of flowing thermal fluid in the bath tank and providing a good temperature uniformity of operating bath 11. The circulation of the thermal fluid is provided by rotary pump 9, located in the heating immersion circulator.



Maintaining of the preset temperature by means of heating is provided by immersion circulator 3.

The cooling of the thermal fluid is carried out by means of coil 12, located in supplementary bath 10.

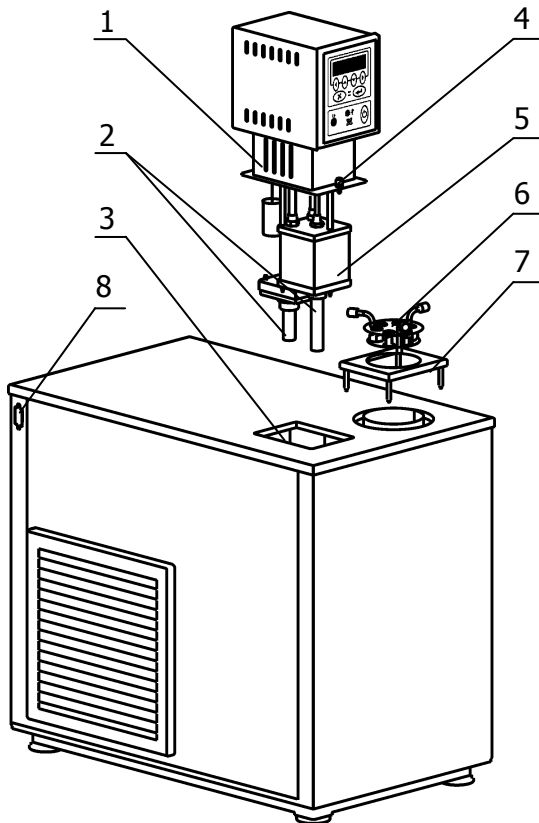
Pump 9 of immersion circulator 3 pours thermal fluid from outer bath 10 to chamber 5 with heater and temperature sensor by means of input pipe 6. In the chamber thermal fluid temperature is adjusted and poured into operating bath 11 through output pipe 7, connected to socket 8. Then thermal fluid returns to supplementary bath 10 by overflowing.

## USING THERMOTEST-100

**!** *NOTE: Throughout this manual, keystrokes are represented in **bold type**; references to messages on the display are in "quotes."*

Before using the bath, carefully read the operating manual.

## Preparation



Carefully select a spot for installing instrument with free air access for circulator and refrigerating machine ventilation. Make sure it is far away from any kind of heat source. Place the instrument on an even surface with a pad, made of nonflammable material.

Insert input and output pipes 2 in corresponding sockets of the circulator 1 (they can be installed at the factory) and secure them with screws. Output pipe has to be inserted in chamber 5 socket up to the stop with diagonal cut. Place the circulator in the main bath. Pipes 2 should be inserted in the clutches on the bottom of the bath. Secure the circulator with screws 4 on the bath cover. Attach the circulator and the refrigerating machine using cable from the delivery package. Attach a draining hose to overflow socket 12 and put it in a tank not less than 1.5 L in volume to collect thermal fluid excess.

Fill the baths up with thermal fluid through the hole in the lid. Stop filling the baths when the thermal fluid starts to drain from socket 12.

Insert stand 7 with its pegs inside the apertures on the bath. Place holder for thermometers 6 on top of the stand.

Connect the electrical cable from delivery package with the corresponding ports 8 of immersion circulator and bath tank.

Insert the cable plug into power outlet 11, located on the back panel of the bath tank. Connect the bath to the power supply. In order to do that, an electric outlet from the delivery package should be installed.

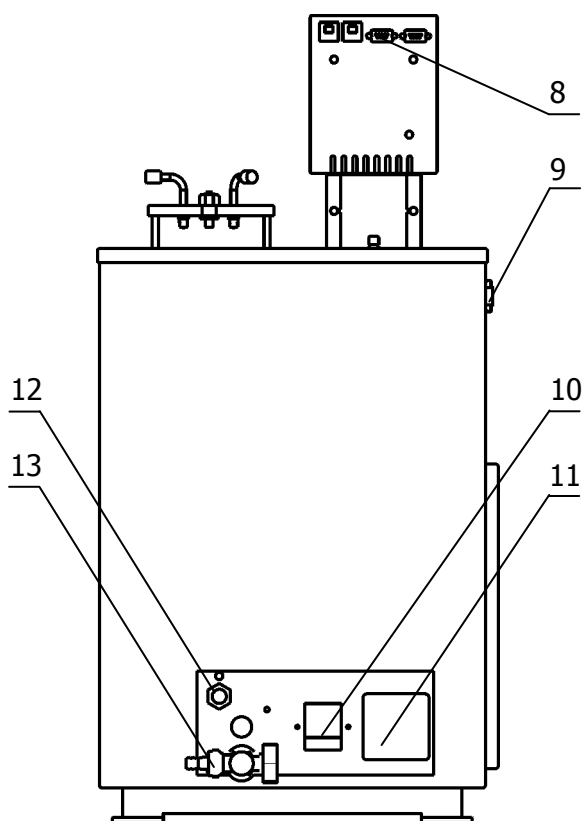
Turn on automatic switch 10.

Switching the circulator on activates the pump, which lowers the thermal fluid level. Add enough thermal fluid to make it run from the drain socket 12.

It is necessary to add more thermal fluid every 10 °C of bath cooling until draining it from the overflow socket.

If the bath with PMS-10 thermal fluid is operated a lot in the negative temperatures, it is necessary to heat it up to 100 °C for 15 minutes every week to eliminate condensed moisture.

When cleaning the bath, drain the thermal fluid using tap 13 and draining hose.



To operate the instrument, read the "M10 Heating Immersion Circulator. Operating manual."

Recommended PID controller parameters for the various thermal fluids are shown below:

Thermal fluid	Proportional gain Kp	Integral time Ti	Derivative time Td
Ethylene Glycol coolant	100.0	10.0	2.0
Polymethylsiloxane fluid PMS-10	40.0	40.0	2.0

## GENERAL SPECIFICATIONS

Working temperature range:	-30...+100 °C
Recommended thermal fluids	Polymethylsiloxane fluid PMS-10 Ethylene Glycol coolant
Set-point resolution	0.01 °C
Display resolution	0.01 °C
Temperature stability	±0.01 °C
Temperature uniformity	±0.01 °C
Digital setting accuracy	±0.2 °C
Digital setting repeatability	±0.02 °C
Heating capacity	2000 W
Cooling capacity at -30 °C	250 W
Bath volume	14 Liters
Dimensions, W×D×H	395×700×810 mm
Bath opening	Ø90 mm
Bath depth	435 mm
Weight	58 kg
Power supply	230 V, 50/60 Hz, 3.5 kW
Warranty	2 years