PRESYS®

Dry Block Temperature Calibration Furnace

TG-1200P

Technical Manual

WARNING!

- Use only a power cable with a grounding pin.
- Never connect the equipment to an electrical network without an effective ground connection.

WARNING!

High voltage is present inside these equipment. It can cause significant damage and injury.
Do not perform any repair work inside the equipment without disconnecting it from the electrical network.

WARNING!

Excessive electromagnetic noise can cause instability to the equipment.The equipment is supplied with electromagnetic interference filters that protect not only the network, but also the equipment itself against noise. These filters are ineffective if the equipment is not connected to a proper ground.

WARNING!

High temperatures are reached in these equipment.Be aware of the risk of fire and explosion if safety measures are not taken. Mark hazardous areas due to high temperatures with warning signs.
Do not place the equipment on flammable surfaces or materials that may deform due to high temperatures.
Do not block any ventilation areas to avoid the risk of fire in the equipment.

WARNING!

The instruments described in this technical manual are equipment intended for use in specialized technical areas.The user is responsible for configuring and selecting the parameter values for the instruments.The manufacturer warns against the risk of incidents causing injury to people or damage to property resulting from incorrect use of the instrument.


WARNING!

Never remove the insert from the block or the thermoelements from the insert while they are at temperatures far from the ambient temperature. Wait until they reach ambient temperature so that the heterogeneous cooling of the parts does not cause jamming. In case of jamming, refer to the section «Instructions for Insert Jamming" to proceed correctly.

Furnace Disposal:

DO NOT DISPOSE OF IT IN HOUSEHOLD WASTE!!

TG series temperature furnaces are made of various different materials. They should not be discarded as household waste.

The warranty conditions are available on our website:
https://en.presys.com.br/warranty

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1 - Introduction

1.1 - General

TG-1200P

The TG-1200P Dry Block Temperature Calibration Furnace is a dry furnace designed to generate temperatures between 50 and 1200 °C for the calibration of thermoelements (thermocouples, resistance thermometers, thermal systems, glass thermometers, etc.).

The front panel features a microprocessor-based digital controller that regulates the temperature through a precision Pt-100 sensor installed inside the thermal block. The temperature and setpoint are displayed on two four-digit displays with a resolution of 0.1°C.

The thermal block includes an insert system (test blocks), which consists of interchangeable blocks with holes for calibrating a wide range of standard or special thermoelements (as per request). Independent of the main temperature control, there is a high-temperature safety and protection system that automatically locks the heating activation.

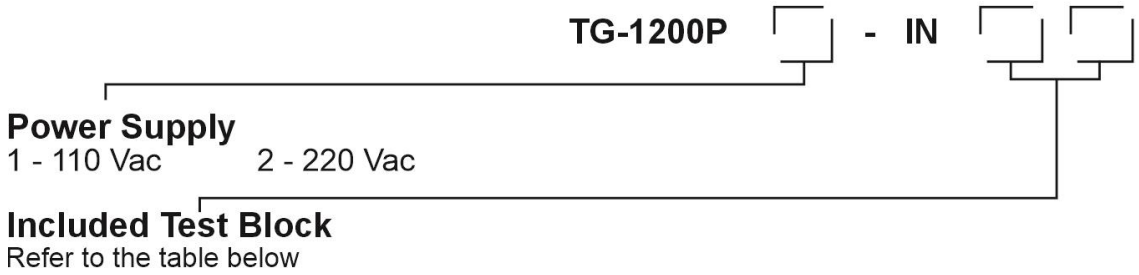
The furnace provides the necessary temperature stability for calibrating thermocouples and resistance thermometers in comparison with an external sensor when connected to a measuring instrument. Accuracy depends on the correct use of the equipment, as the thermoelement must fit tightly into the test block; otherwise, significant errors may occur. A careful reading of this manual is strongly recommended.

It features RS-232 communication with microcomputers, enabling temperature monitoring.

1.2 - Technical Specifications

	TG-1200P
Operating Range Ambient temperature: up to 23 ºC	150 ºC to 1200 ºC
***Display* Accuracy**	± 3,8 ºC
Resolution	0,1 °C up to 999,9 °C 1,0 °C above 1000 °C
Stability	± 0,2 ºC
Axial Uniformity (20 mm)	± 0,50 °C @ 1100 °C
Radial Uniformity	± 0,25 °C @ 1100 °C
Heating Time	100 min (100 ºC to 1200 ºC)
Cooling Time	4 hours (1200 ºC to 300 ºC)
Well Diameter x Depth	Ø 34 mm x 130 mm
Dimensions (HxWxD)	340 x 200 x 320 mm
Weight	12,5 kg
Power Consumption	800 Watts
Traceable Calibration	at 150 °C, 750 °C and 1100 °C

1.3 - Order Code



1.4 - Accessories

- **Test Blocks (Insert)**

Description	Holes	Order Code
IN01	1 x 3/4''	06.04.0011-00
IN02	1 x 1/2''	06.04.0012-00
IN03	1 x 6,0 mm and 3 x 1/4''	06.04.0013-00
IN04	3 x 6,0 mm and 1 x 1/4''	06.04.0014-00
IN05	4 x 6,0 mm	06.04.0015-00
IN06	2 x 6,0 mm and 2 x 1/4''	06.04.0016-00
IN07	1 x 6,0 mm, 1 x 8,0 mm and 1 x 3/8''	06.04.0017-00
IN08	1 x 6,0 mm, 1 x 3,0 mm and 2 x 1/4''	06.04.0018-00
IN09	No holes, to be machined by the customer.	06.04.0019-00
IN10	Others, custom-made.	06.04.0020-00
IN1P	1 x 3,0 mm, 1 x 6,0 mm, 1 x 8,0 mm and 1 x 1/4''	06.04.0121-00
IN1A	1 x 1/8", 1 x 3/16'', 2 x 1/4" and 1 x 3/8"	06.04.0122-00
IN1E	1 x 4,0 mm, 1 x 6,0 mm, 1 x 8,0 mm, 1 x 10,0 mm and 1 x 1/4"	06.04.0123-00

- **Included Items:**
  - Insert (to be selected), insert extractor, handle, power cable, and manual.

- **Optional Accessories:**
  - **Carrying Bag:** Order Code: **06.01.0006-00**.

2 - Operation

The TG-1200P furnace uses a controller for temperature monitoring and control of the thermal block (displayed on the upper screen) and for setting the desired temperature value (setpoint on the lower screen). Both values correspond to temperatures in degrees Celsius with one decimal place.

The setpoint value is adjusted directly using the UP and DOWN keys within the range of 50°C to 1200°C. This value is stored in the controller's memory, so when the furnace is powered on, it will resume controlling the last used setpoint before being turned off.

The figure below shows the controller's front panel:

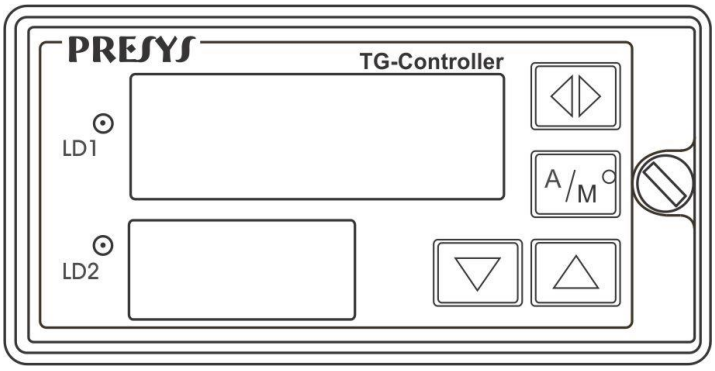


Fig. 1 - Controller Front Panel

The ENTER and A/M keys are not used in furnace operation.
Apart from the user-selected setpoint, no additional parameter configurations are required.

3 - Recommendations for Measurement Accuracy

PRESYS dry-block temperature calibrators are high-accuracy instruments, requiring strict adherence to the procedures in this section to ensure optimal conditions for accurate calibrations.

- The sensor to be calibrated must fit snugly into the appropriate insert hole. If there is too much clearance, measurement accuracy can be significantly affected.
- The concept of clearance between the sensor and its corresponding hole should be understood subjectively, where good judgment is crucial.
- The sensor must fit tightly into the insert hole (both perfectly clean), ensuring a secure and stable placement.
- Once inserted, the sensor should not move or wobble, but should not be forced in, as this may cause jamming.

3.1 - Extracting Maximum Accuracy from the Furnace

The temperature control is based on measuring the temperature of an internal sensor embedded in the thermal block.

This control sensor, together with the controller, is factory-adjusted using a high-accuracy standard thermometer. At the factory, accuracy is transferred from the standard thermometer to the thermal block calibrator's display. This transfer is only successfully performed when there is perfect temperature equalization (thermostatic equilibrium) between the internal control sensor and the standard thermometer. Therefore, there must be no gaps between the insert and the thermal block or between the probe and the insert. Additionally, the internal sensor and the probe must be positioned at the same depth.

The user will achieve the maximum accuracy of the furnace, as specified in the technical manual, if they can replicate the factory calibration conditions using the same insert as in the factory, ensuring no gaps, maintaining the same depth, etc.

The key takeaway for achieving maximum accuracy with a dry-block temperature calibrator is to replicate the process the factory used to calibrate the furnace itself.

If higher accuracy than specified in the technical manual is required, an external thermometer can be used as a reference or standard for comparison with the thermoelement being calibrated. Since it has stability superior to its accuracy, the user can take advantage of this by using a two-hole insert to compare the temperature of the standard thermometer with that of the thermoelement being calibrated.

4 - Safety Instructions

- Do not leave the location where the calibrator is operating without proper identification and warning signs.
- Before turning off the calibrator, lower the thermal block temperature to values close to room temperature.
- Never remove the insert from the thermal block, nor the thermoelements from the insert, while they are at high temperatures. Wait until they have cooled to room temperature. Otherwise, the uneven cooling of the parts could cause mechanical jamming between them.
- Never transport the furnace with the metallic insert inside, as the insert may strike the ceramic tube, permanently damaging it.

5 - Maintenance

5.1 - Hardware Maintenance Instructions

There are no parts or components inside the temperature calibrator that can be repaired by the user.

Only the two 10 A power fuses, located next to the power socket, can be replaced by the user.

A blown fuse may be caused by a power surge in the electrical network or by a failure in a calibrator component. Replace the fuse once.

If a second fuse blows, the issue is likely due to an internal component failure in the calibrator. In this case, return the calibrator to the factory for repairs.