



LCB 30 & LCB 50

**MICRO CALIBRATION
BATH MANUAL**



INSTRUMENTS
leyro

Leyro Instruments® doesn't accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

Version manual: 3.15

© Copyright Leyro Instruments ® All rights reserved.



INDEX

MICRO CALIBRATION BATH

TEMPERATURE LCB 30/50

INDEX

1. General Information

- 1.1. Symbolology

2. Safety

- 2.1. Use as planned
- 2.2. Staff qualifications
- 2.3. Personal protective equipment
- 2.4. Specific Risks
- 2.5. Safety instructions for using calibration liquids
- 2.6. Explanation of symbols

3. LCB 30 and 50 Micro calibration baths

4. Design and function

- 4.1. Description
- 4.2. Supply volume
- 4.3. Overview of the different models of the device
- 4.4. Isometric views of micro calibration bath series LCB
- 4.5. Description of command elements

5. Transport, packaging and storage

- 5.1. Transport
- 5.2. Packaging
- 5.3. Storage

6. Commissioning, operation

- 6.1. Checking temperature sensors
- 6.2. Starting Procedure
- 6.3. Starting the Micro calibration bath
- 6.4. Viewing the reference temperature and the nominal temperature
- 6.5. Regulation of reference temperature to the maximum
- 6.6. Operating position
- 6.7. Inner sleeves
- 6.8. Preparation of micro calibration bath
 - 6.8.1. Properties of calibration liquids
 - 6.8.2. Filling the micro calibration bath
 - 6.8.3. Operating the magnet stirrer and basket

7. Micro calibration bath handling

- 7.1. Operation in calibration mode in each operating mode
- 7.2. Calibration (calibration mode)
- 7.3. Calibration (main menu)
- 7.4. Set Point (Main menu)

8. Cooling Micro Calibration Bath

9. Maintenance, cleaning and Re calibration

- 9.1. Maintenance
- 9.2. Cleaning
 - 9.2.1. Cleaning of calibrators with inner cap
 - 9.2.2. Cleaning of the fan grille
 - 9.2.3. Internal cleaning of the Calibration bath
 - 9.2.4. External cleaning of the Calibration bath
- 9.3. Re calibration

10. Accessories included LCB 30/50

- 10.1. Additional options

11. Failures

12. Disassembly, Return and disposal of waste

- 12.1. Disassembly
- 12.2. Return
- 12.3. Disposal of waste

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

1. General Information

- This instruction manual provides important information about the instrument operation. In order to work with this instrument safely it is essential to comply with all safety and handling instructions provided.
- Always comply with the regulations on accident prevention and safety rules in force at the place of use of the instrument.
- The instruction manual is an integral part of the instrument and must be stored in the vicinity thereof so specialized staff can refer to it at any time.
- The qualified personnel must have read and understood the instruction manual before starting any work.
- The manufacturer is discharged from any liability for damages caused by usage not according to the intended purpose of use, non-observance of this manual, handling by insufficiently qualified personnel as well as unauthorized modification of the instrument.
- General conditions of sale included in the sales documentation apply.
- Technical modifications reserved.
- Factory calibration and calibration by the Spanish association of calibration (ENAC / ISO 17025) are performed in accordance with international standards.

For more information refer to:

- Web page: www.leyro.net
- Relevant technical sheet: LCB 30, LCB 50
- Technical service: +34 91 283 5502
info@leyro.net

1.1. Symbology



DANGER

Indicates an immediately dangerous situation which causes death or serious injury if not avoided.



WARNING

It indicates a potentially dangerous situation which may cause death or serious injury if not avoided.



WATCH OUT

It indicates a potentially dangerous situation which may cause death or minor or medium injury or material or environmental damage if not avoided.



INFORMATION

Marks useful tips and recommendations as well as information for efficient and fault-free use.



DANGER

Indicates hazards caused by electric current. There is a risk of serious or deadly injuries if safety instructions are not observed.



WARNING

It indicates a possibly dangerous situation which may cause burns due to hot surfaces or liquids if not avoided.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

2. Safety



WARNING

Switch off the instrument at ambient temperature (approximately 25°C / 77°F)

Before installation commissioning and operation make sure you have selected the appropriate micro calibration bath respect to measuring range, version and specific measurement conditions.

Risk of serious injury and / or property damage if not avoided.



The different chapters of this manual contain other important safety instructions observed.

2.1. Use as planned

The micro calibration bath is a portable unit for technical service, industrial and laboratory tasks. Leyro Instruments' micro temperature baths or micro calibration baths are provided for calibrating thermometers, switches / thermostats thermos, pyrometers electrical resistance and thermocouples.

The product has been designed and built only for the purpose described here and should be used in accordance to it. Meet the technical specifications of this manual. An inappropriate handling or use of the equipment is not in accordance with the technical specifications requires the immediate service and verification by an authorized Leyro Instruments technician.

Handle the electronic precision instrument with due diligence (protects against humidity, strong impacts magnetic fields, static electricity, extreme temperatures; Do not introduce any objects into the openings instrument). Pins must be protected against dirt.

If the instrument is moved from a cold to a warm environment, a malfunction due to condensation can occur. In this case you have to wait until the temperature of the instrument suits the room temperature before putting it back into operation.

No claim due to inappropriate handling is admitted.

2.2. Staff qualification

WARNING



Risk of injury due to insufficient qualification!

Improper handling can cause considerable personal and property damage. The activities described in this manual should be performed only by qualified personnel with the appropriate qualifications.

Specialized staff

Because of their professional training, their knowledge, control and measurement technology, as well as their experience and knowledge of regulations, standards and guidelines in the country of use, specialized staff is able to perform the works described and recognize possible dangers by themselves.

Some specific usage conditions require additional knowledge about aggressive environments.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

2.3. Personal protective equipment

The personal protective equipment protects qualified personnel from hazards which may harm their health and safety during work. The specialized personnel must wear personal protective equipment during the different works on and with the instrument.



¡Comply with the indications about personal protective equipment in the work area!

The owner must provide personal protective equipment.

Wearing protective glasses!

These protect the eyes from projected parts and splashes.

2.4. Specific Risks

WARNING



In the case of dangerous substances to be measured, e.g. oxygen, acetylene, flammable toxic substances, as well as in refrigeration premises, compressors, etc., the relevant provisions must be observed in each case, plus all general rules.

DANGER

Risk of death by electric current. There is direct danger of death from touching live parts.



- The installation and assembly of electric products must only be performed by a qualified electrician
- Before replacing the fuse circuit breakers, cleaning and maintenance / conservation and in the case of danger, disconnect the micro calibration bath network by removing the power cord from the electrical outlet.

WARNING



Residual media in dismantled instruments can cause risks to people, the environment and installation. Take appropriate precautions.

Overheating protection

WARNING



For your safety and the micro calibration bath is equipped with a protection on independent temperature that disconnect the power supply of heating in case of excessive temperature inside the housing. After cooling, must send the micro bath to control to Leyro Instruments.

WARNING



The micro calibration bath is designed as a product of measurement and regulation. You need to take further protective measures if the micro calibration bath for applications not explicitly mentioned in this manual is used.

Do not use the micro calibration bath in atmospheres hazardous (**flammable or explosive atmosphere**)

If a malfunction of micro calibration bath can cause personal injury or property damage, it is necessary to ensure the subsequent installation of electromechanical protection devices.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

2.5. Safety instructions for using calibration liquids



Calibration liquid water

Only use distilled water, otherwise Tartar forms and micro bath deposit gets dirty.



Calibration liquid silicone oil

WARNING

- Only use the silicone oil recommended in this manual.
- Read the safety data sheet before starting to work with silicone oil. The data sheet is available from the manufacturer or distributor.
- Ensure that the room is well ventilated when working with silicone oil because harmful substances may escape.
- Because the silicone oiling is hygroscopic, always close the micro bath with the transport cover after use.
- The transportation cover is equipped with a safety valve. If the micro calibration state is closed in hot condition, unacceptable pressures may occur, to avoid overpressure that can destroy the liquid bath; the safety valve is activated with an accuracy of about 2.5 bars. Hot steam may escape.



Wearing safety glasses!

Make sure that the silicone oil does not get in touch with the eyes.



WARNING Risk of burns



Before transporting or touching the micro-bath it is necessary to ensure that it is sufficiently cool because otherwise there is a risk of burns.

2.6. Explanation of Symbols



It is absolutely necessary to read the instruction manual before installation and commissioning of the equipment!



EC European Community

Instruments with this mark comply with applicable European directives.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

3. LCB 30 and 50 Micro calibration baths

	LCB 30	LCB 50
Temperature range	-35 ... 165 °C / -31 ... 329 °F (1)	
Accuracy	± 0.1 °C / 0.5 °F	± 0.13 °C / 0.5 °F
Uniformity	± 0,05 °C / 0.09 °F	± 0,05 °C / 0.09 °F
Screen Resolution	0.1 °C / 0.1 °F	0.1 °C / 0.1 °F
Heating time	- 5 to 100 °C: <u>12 min.</u> 23 to 212 °F: <u>12 min.</u>	30 to 220 °C: <u>62 min.</u> 86 to 428 °F: <u>62 min.</u>
Cooling time	25 to - 30 °C: <u>35 min.</u> (2) 77 to - 22 °C: <u>35 min.</u> (2)	220 to 100 °C: <u>35 min.</u> 428 to 212 °C: <u>35 min.</u>
Immersion depth	190mm	190mm
Volume	Approximately 0.7 liters	Approximately 0.7 liters
Tank dimensions	60x190 mm	60x190 mm
Power	88 A 264 VAC, 45-65 HZ	88 A 264 VAC, 45-65 HZ
Electricity consumption	310 W MAX	600 W MAX
Connection cable	AC 320 for Europe	AC 320 for Europe
Instrument dimensions	280x280x400 (ANXAlxP)	280x280x400 (ANXAlxP)
Weight	12.8 kg	12,8 kg

(1) AT 55 °C / 131 °F below ambient temperature.

(2) The probe of the reference thermometer with which measurement is made has a diameter of 6mm at an ambient temperature of 20 °C ± 3 °C / 68 °F ± 5.4 °F.

(3) To change the unit of measurement of the temperature from degrees Centigrade to degrees Fahrenheit, contact with Leyro Instruments.

Silicone oil	Temperature range	Flashpoint	LCB 30	LCB 50
AC 10	- 30...160 °C / - 22...320 °F	170 °C / 338 °F	Recommended	Not recommended
AC 20	- 20...200 °C / - 4...392 °F	240 °C / 464 °F	Recommended	Recommended
AC 50	30...220 °C / 86...428 °F	280 °C / 536 °F	Not recommended	Recommended
AC 100	70...288 °C / 158...550 °F	315 °C / 599 °F	Not recommended	Recommended

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

4. Design and function

4.1. Description

The micro calibration bath is a portable unit for technical, industrial service task at the laboratory. Leyro Instruments' micro calibration baths are provided for calibrating thermometers, switches / thermostats, electrical resistance pyrometers and thermocouples. The operational safety of the equipment is only guaranteed when used as planned (control of temperature sensors).

The limit values specified should not be exceeded under any circumstances (see Chapter 3 "Technical Data").

The corresponding equipment must be selected according to the application. The product is then properly connected and tests must be conducted and monitor the proper maintenance of all components.

The product is manufactured in several versions. The version is indicated on the nameplate on the micro calibration bath.

4.2. Supply volume

The micro calibration baths are shipped in a special safety packaging. The packaging must be kept to send the micro calibration bath safely to the manufacturer for repair or recalibration.

Standard supply volume of the micro calibration bath model LCB.

- Micro calibration bath
- Transport cover
- Basket for sensor
- Magnetic stirrer
- Power connection cable
- Calibration certificate
- Instructions Manual

Compare by packing list if all parts have been delivered.



WARNING

Use only the supplied power cable.

4.3. Overview of the different models of the device

Both the micro calibration bath LCB 30 (heat / cold) and LCB 50 (heat) has the following characteristics:

- The micro calibration bath is comprised of sturdy steel painted grey and provided with a carrying handle.
- The back contains a bore accessible from above for the introduction of mass.
- The liquid bath includes heating and cooling components for determining the reference temperature.
- The bath liquid has a thermal insulation.
- The front of the envelope contains the entire electronic control module for adjusting the reference temperature and a potentiometer.
- For handling heating or cooling towers networks semiconductor (SSR) are used.
- On the front panel is the controller, which is equipped with a 7-segment LED (2 rows and 4 digits to indicate the reference and nominal temperature.
- The micro calibration bath further comprises a turning knob to control the stirring speed.

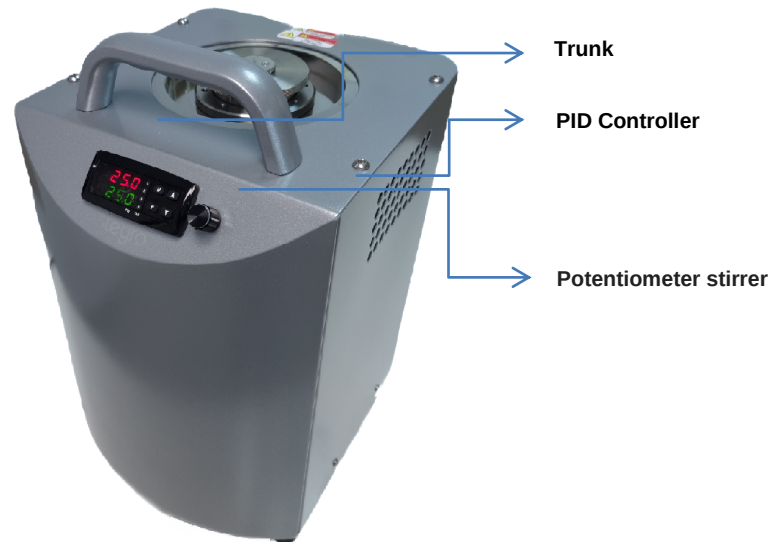
MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

4.4. Isometric views of micro calibration bath series LCB

Front and top model LCB 30/50

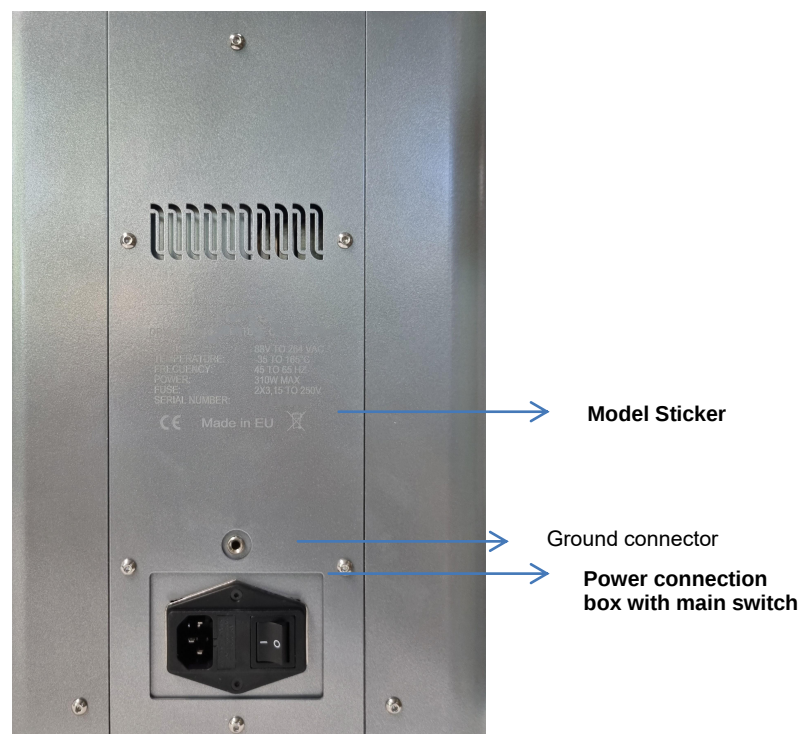
At the top of the calibration is the refill opening (60 mm x 110m).

The controller with the display and control elements is located on the front of the micro bath.



Rear of the equipment

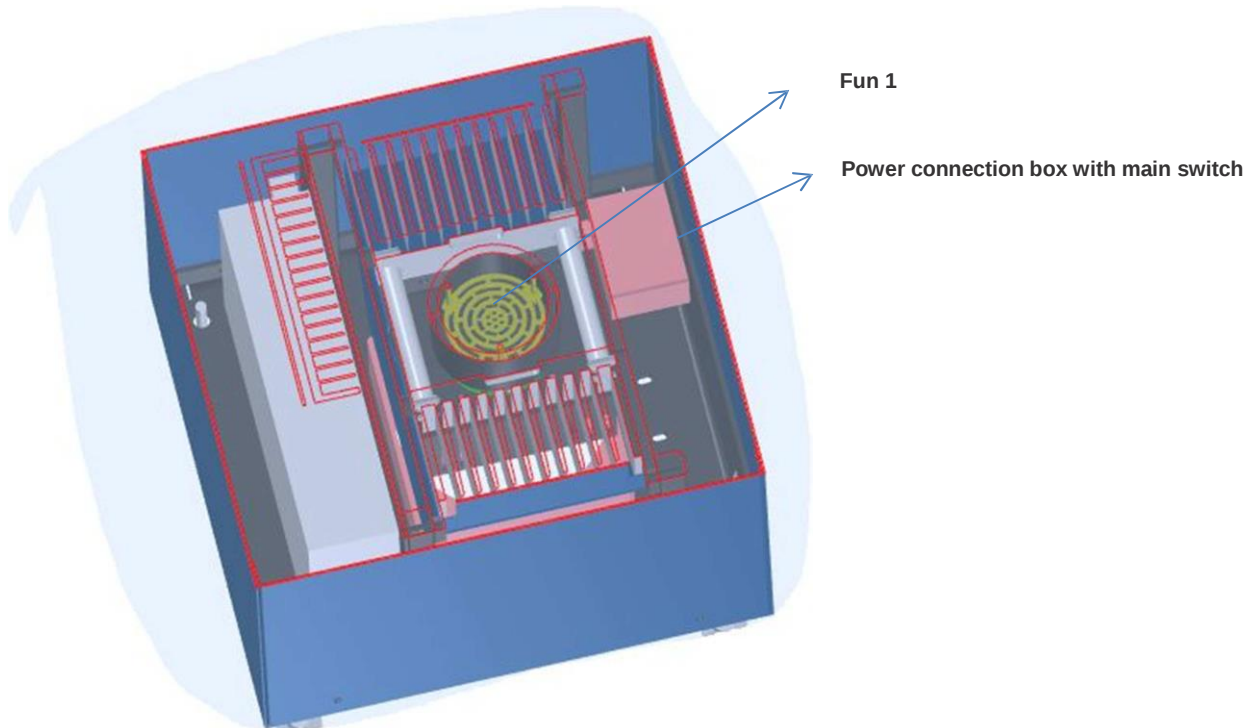
At the rear of the instrument is the nameplate with the most important information about the specific model.



MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

Bottom of the instrument

The air inlet opening should not be blocked any way.



4.5. Description of command elements

Front Controller PID



MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

Overview of the control elements of the regulator front

- 1) **P key:** Access to the defined nominal temperature
Access to menu items and parameters
Confirmation of introduction
- 2) **6 key:** Reduction of the adjustable values
Selection of each menu item
It goes back 1 level in the menu
- 3) **5 key:** Increase of the adjustable values
Selection of each menu item
It goes back 1 level in the menu
- 4) **U key:** Recovery of saved nominal temperatures
- 5) **LED OUT 1:** Indicates the status of the output for temperature regulation
If the LED OUT 1 illuminates micro calibration bath is heated
If it does not illuminate the LED OUT 1 micro calibration bath is not heated
- 6) **LED OUT 2:**
 - a) **Heating equipment**
Indicates the status of the output for fan control

If the LED lights OUT 2 the fan rotates faster
If it does not illuminate the LED OUT 2 The fan rotates at a slower speed
 - b) **Heating and cooling equipment**
Indicates the status of the output for temperature regulation

If the LED lights OUT 1 micro calibration bath is cooled
If the LED OUT 1 does not illuminate micro calibration bath is not cooled
- 7) **PV indicator:** The current reference temperature is displayed
Each one of the modes and parameters menu items are displayed
- 8) **SV indicator:** Visualization of the nominal temperature
Certain parameters are displayed in each of the modes and menu items
- 9) **LED SET:** Flashing indicates access to each of the menu items and parameters

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

5. Transport, packaging and storage

5.1. Transport

Check if the micro calibration bath shows any damage caused during transport. Report evident damages immediately.

5.2. Packaging

Do not remove the packaging until just before installation.

Keep the packaging as it is the ideal protection during transport (e.g., if the installation site changes or if the product is shipped for possible repairs).

5.3. Storage

Permissible conditions at the place of storage

- Storage temperature: -10 ... + 60°C.
- Humidity: 30 ... 95% RH (non-condensing).

Avoid the following

- Direct sunlight or proximity to hot objects.
- Mechanical vibration, mechanical shock (sudden standing).
- Soot, steam, dust and corrosive gases.
- Potentially explosive environment, flammable atmospheres.

6. Commissioning, operation

6.1. Checking the temperature sensors

To check the temperature sensors, connect a measuring instrument distinct of the checking sensor. By comparing the temperature indicated on the external measuring instrument with the reference temperature, you can check the status of the checking sensor. Watch that the sensor requires little time to reach the temperature.



WARNING

Thermocouples with grounding cannot be calibrated because they are grounded, so measurements could lead to erroneous results.

6.2. Starting Procedure

If the calibrator is not used for a long period, it is possible that moisture penetrates in the heating towers due to the materials used (magnesium oxide). After transportation or storage of micro-bath in humidity environment, heating towers must be preheated slowly. During the drying process it is assumed that the micro-bath has not yet reached the required isolation voltage for the protection class.

6.3. Starting the Micro calibration bath

- 1) Connect the instrument to the power.
- 2) Press the switch on. The controller is activated. At the top PV screen the word TEST appears. On the lower display the version number is displayed, for example RI 2.7.
- 3) After about 5 seconds activation has been completed and the calibration mode is automatically displayed. Mounted heating and cooling towers regulate micro-bath's temperature automatically modifying the room temperature to match the adjusted nominal temperature on the regulator.
- 4) Activate the magnetic stirrer using the potentiometer, turning it to the right completely (100%).

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

6.4. Viewing the reference temperature and the nominal temperature

Upper indicator

The 4 digit – seven segments red indicator displays the current temperature of the micro-bath.

Lower indicator

On the 4 digit-7 segment green indicator the current nominal temperature of the micro-bath is displayed. After reaching the nominal temperature, the issue of heat energy generated by the micro-bath continues through start pulses in order to maintain the temperature level inside stable.

6.5. Regulation of reference temperature up to the maximum

The red LED OUT 1 indicates that the heating is on. During the heating phase a constant light indicates the input of heat energy. A flashing LED means that the reference temperature (adjusted nominal temperature) will be reached soon and thus the heat energy will only enter at short intervals.

To ensure proper temperature stability the cycle time of the regulator is adjusted to a low level and the regulation output is activated with high frequency.

6.6. Operating position

The vertical service position of the micro calibration bath is optimal as this position guarantees the ideal distribution of the temperature in the micro-bath.

The position should never be horizontal.

6.7. Inner sleeves

After use remove the inner sleeve with the aid of a tool for sleeves and then proceed to cleaning. This prevents sleeves from adhering to the micro-bath.

6.8. Preparation of micro calibration bath

To achieve maximum accuracy of a micro calibration bath, fill with an appropriate calibration liquid.

6.8.1. Properties of calibration liquids

Due to the specific features of the different calibration liquids different calibration results are obtained. A compensation of calibration liquids should be performed, even in factory by the manufacturer if necessary. Recommended calibration liquids for the different temperature ranges:

Water as calibration liquid

Use only distilled or demineralized water. Otherwise tartar is formed and the deposit of micro bath gets dirty.

Silicone oil as calibration liquid

Only use the silicone oil recommended in this manual.

Ensure that the room is well ventilated when working with silicone oil because harmful substances may escape.

Because the silicone oil is hygroscopic, always close the micro bath after use with the transport cover.



Only use clean calibration liquids. Checking the temperature sensors and other temperature measuring means may generate dirt in the fluid. This calibration can cause abrasions dirt on the floor of the tank caused by movement of the rotary magnetic stirrer.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

¡Wearing protective glasses!



Ensure that the silicone oil does not come into contact with eyes.

- Clean the trunk.
- Clean sensors before performing the calibration.
- Replace worn-out magnetic stirrer.
- Replace the tainted and muddy calibration liquid.

6.8.2. Filling the micro calibration bath

1. Remove the cover transport LID first.
2. Insert the testers in the basket for the sensor.
3. Fill the trunk with calibration liquid.

The following maximum filling heights are recommended by type:

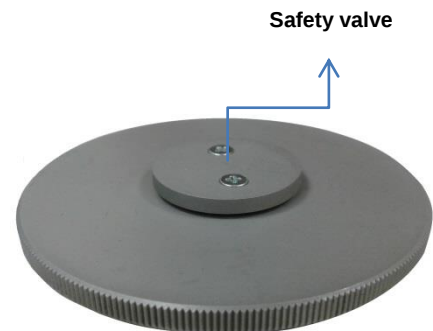
Micro bath type	Maximum filling height
LCB 30	150 mm
LCB 50	150 mm

The following aspects have to be taken into account in terms of the maximum filling height:

- Measure from the bottom of the basket for the sensor.
- No tank filled.
- Leyro Instruments standard filling medium.
- Filling from the Factory with the optimum height.



The transport lid is equipped with a safety valve. If the micro-calibration bath is closed in a hot state, inadmissible pressures may occur. To avoid the overpressure that can destroy the liquid bath, the safety valve is activated with a precision of approximately 2.5 bars. In this way, hot vapours can escape.



6.8.3. Operating the magnet stirrer and basket

The maximum homogeneity is obtained with the magnetic stirrer bar at maximum speed.

Adjust the agitation speed with the potentiometer, to the right the speed is increased and to the left it is decreased.

The basket is removable.



The magnetic stirrer bar is a wear part.



**Magnetic stirrer inside
and basket**

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

7. Micro calibration bath handling

For handling three modes are available.

Calibration mode: In this normal operating state calibration of the tester can be performed.

Nominal values mode: Enter the nominal temperatures in this mode.

Main menu: Perform all settings like the nominal temperature given and the adjustment of the control parameters in this mode.

7.1. Operating in calibration mode in each operation mode

Operation mode of operation

- The equipment must be turned off
- Place the magnetic stirrer and the basket for the sensor
- Fill the calibration micro bath with the necessary fluid
- Switch on the equipment
- Activate the magnetic stirrer bar with the potentiometer
- Introduce probes to calibrate
- Adjust the speed of the magnetic stirrer to achieve the most highest homogeneity

Cleaning operating mode

- Stop the speed of the magnetic stirrer bar
- Switch off the instrument at ambient temperature (approximately 25°C / 77°F)
- Remove the liquid with a syringe
- Remove the basket and the magnetic stirrer bar
- Remove excess fluid
- Clean the tank with alcohol or water
- Once clean, introduce the magnetic stirrer and the basket again

7.2. Calibration (Calibration Mode)

The trunk is constructed to achieve the best result. The drilling depth of the PT100 probe is set to a sensitive length. If a separate external reference is used for a comparative calibration, ensure that the sensitive length is known and it is located in center of the surface and calibration.

Once activated micro calibration bath, is in the calibration mode after initialization. In the upper indicator current reference temperature is shown. The nominal temperature appears in the lower display.

If the OUT 1 LED lights up, the temperature rises.

If the OUT 1 LED is not lit, the heating is off.

If the OUT 2 LED lights up, the temperature drops.

If the OUT 2 LED is not lit, the cooling is off.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

Heating instrument

The LED OUT 2 indicates the status of the output for fan control.

- If the LED lights OUT 2 the fan rotates faster.
- If it does not illuminate the LED OUT 2 the fan rotates at a slower speed.

Heating and cooling instrument

There are two methods to adjust the nominal temperature:

- You can set a temporary nominal temperature.
- You can save fixed nominal temperatures in the main menu.

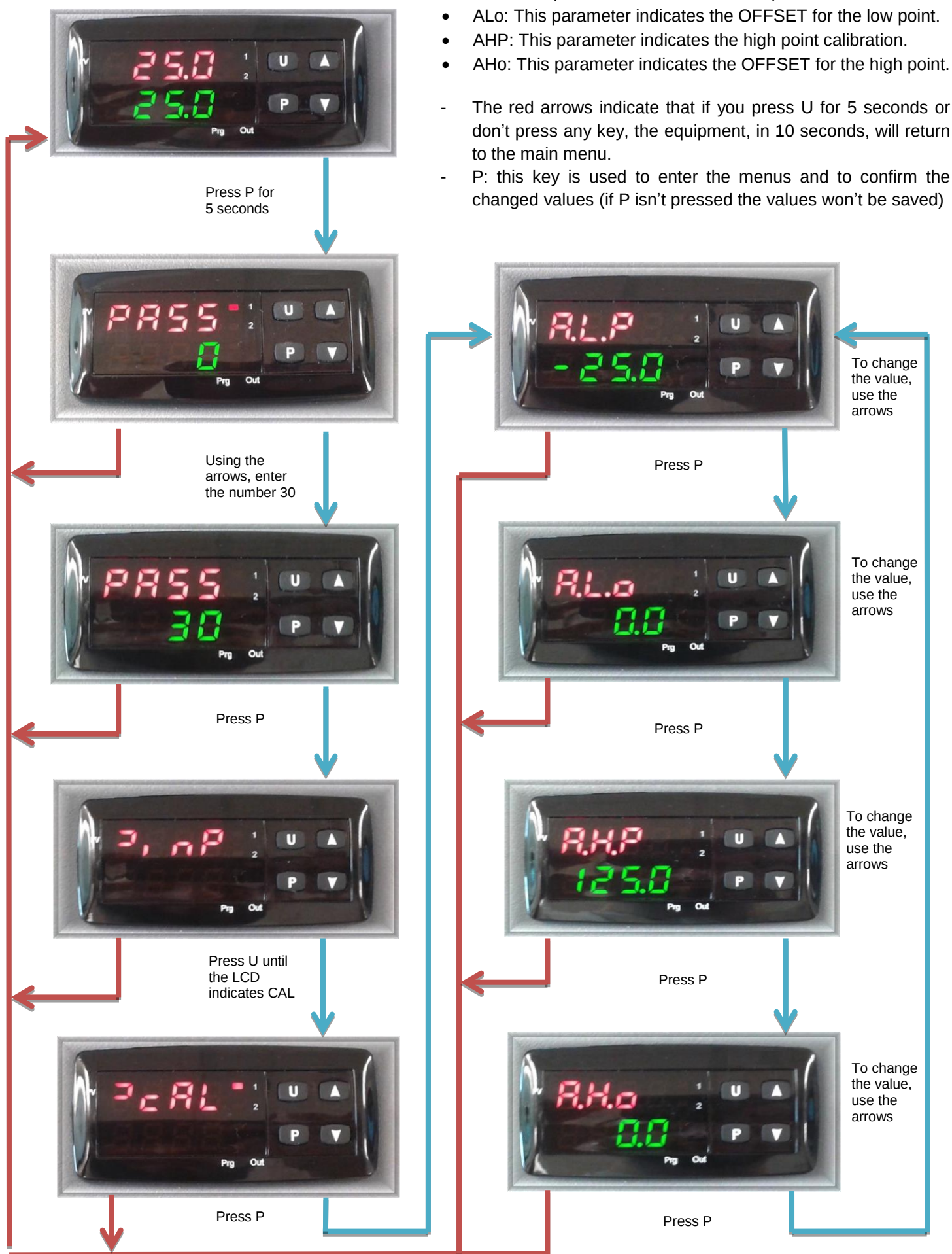
Setting a temporary set temperature (nominal values mode)

To temporarily modify a nominal temperature stored in this state of operation follow these steps:

- 1 Briefly press the P key indicator in the upper memory currently active nominal values shown.
The corresponding nominal temperature appears in the lower display.
- 2 Pressing the key  nominal temperature is increased.
Pressing the key  nominal temperature is reduced.
- 3 Pressing the key P again the nominal value confirm new set.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

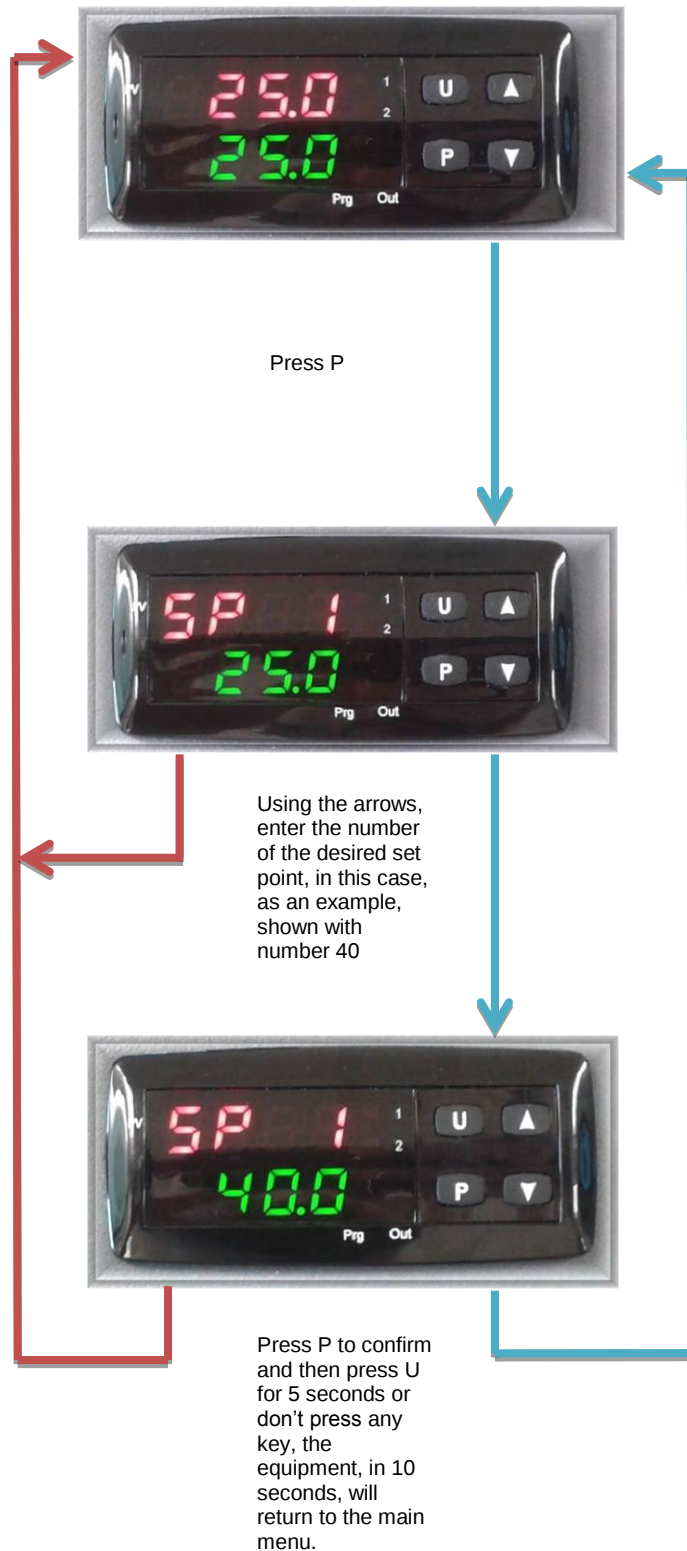
7.3. Calibration (main menu)



MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

7.4. Set Point (Main menu)

- The red arrows indicate that if you press U for 5 seconds or don't press any key, the equipment, in 10 seconds, will return to the main menu.
- P: this key is used to enter the menus and to confirm the changed values (if P isn't pressed the values won't be saved)



MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

8. Cooling the Micro Calibration bath

WARNING RISK OF BURNS

Before transporting or touching the calibration micro-bath, it is necessary to ensure that it is sufficiently cold because, otherwise, there is a risk of burns both in the micro-bath and in the voucher. In order to bring the calibration micro-bath from a high temperature to a low temperature as quickly as possible, the nominal temperature must be adjusted to a temperature lower than the ambient temperature.

The fan integrated in the heating instruments slowly increases the speed of rotation thus creating more cooling air.

ATTENTION



After turning off or removing the network connection the built-in fan does not generate more cooling air. However, sufficient thermal decoupling between the micro bath and enclosure is guaranteed.

9. Maintenance, Cleaning and Re calibration

9.1. Maintenance

The instruments described here do not require maintenance. All repairs must be made only by the manufacturer. The change of the fuse is excluded. Before changing this, turn off the calibrator and the calibration micro-bath and disconnect them from the network by removing the network cable from the electrical outlet.

9.2. Cleaning



ATTENTION



- Cool the calibration micro-bath.
- Before cleaning the calibration bath, turn it off and disconnect it from the network.
- Clean the instrument with a damp cloth.
- Make sure that the electrical connections do not get wet.
- Once the instrument has been disassembled, it must be rinsed and cleaned before returning it to protect people and the environment against waste from the measuring medium.
- Residual media in the disassembled instrument can cause risks for people, the environment and installation. Take correct protection measures.



See chapter 11.2 "Return for more information about the return of the instrument.

9.2.1. Cleaning of calibrators with inner cap

In gauges with insert bushing a small amount of metal powder is produced, which can clog the nozzle and the bushing. To prevent this, disassemble the inner bushes periodically and before any long period out of service. Clean the perforation of the micro bath with pressurized air and with a dry cloth the perforation and the cap.

9.2.2. Cleaning of the fan grille

All the micro-bathrooms have a fine mesh grid inside, through which cooling air enters the micro-bath. Clean the grille regularly depending on air pollution with a vacuum cleaner or brush.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

9.2.3. Internal cleaning of the Calibration bath

Remove all the silicone from the tank. Remove the sensor basket from the tank and clean the tank, the magnetic stirrer and the tank by applying water with a large amount of cleaning substances. Allow all components to dry. If distilled water is used, remove the calibration fluid and let dry the sensor basket, the magnetic stirrer and the tank.

9.2.4. External cleaning of the Calibration bath

Clean the outside of the calibration micro-bath with a damp cloth and a little water or with a non-aggressive cleaning product without solvent.

9.3. Re calibration

ISO /17025 Certificate

The calibration micro-bath has been adjusted and checked before shipment using standard quality internationally recognized measuring instruments. According to ISO / 17025 the calibration micro-bath has to be checked at appropriate periodic intervals depending on the use. It is recommended to calibrate the instrument by the manufacturer at periodic intervals of approximately 12 months or every 500 hours of approximate operation. All Factory Re-calibration also includes an exhaustive and free check of all system parameters in terms of specifications. Any deviation from the basic values is corrected. The bases of the Re-calibration are the guidelines of ISO / 17025. The measurements detailed in this document must be observed and applied during the Re calibration.

10. Accessories included LCB 30/50

- Syringe for the insertion or extraction of fluid.
- 1,5 mm network cable with connector type F according to CEE7/4.
- Basket.
- Magnetic stirrer and metal screw cap.

10.1. Additional options

- Embossed aluminium case with handle and reinforced wheels.
- Methacrylate cap with perforations.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

11. Failures

Failure	Causes	Solutions
- - - -	The reference sensor stops or is defective	Send the instrument to the manufacturer or service center for repair
uuuu	Measured temperature below the limit value of the internal reference sensor (below the range -200°C)	Send the instrument to the manufacturer or service center for repair
0000	Measured temperature above the limit value of the internal reference sensor (above the range + 850 ° C)	Send the instrument to the manufacturer or service center for repair
EREP	Possible failure in the EEPROM memory of the controller	Press the Key P
The fan does not work	The fan is defective or blocked.. It is possible that the temperature switch has switched and thus cut the power supply to the heating cartridges	Send the instrument to the manufacturer or service center for repair
The end temperature is not reached	The semiconductor relay is defective or the heating or cooling tower have shorted or got old.	Send the instrument to the manufacturer or service center for repair
No indication	The regulator is defective	Send the instrument to the manufacturer or service center for repair
No function	The network connection is not successful or fuse is defective	Check power connection and fuse



ATTENTION

If it is not possible to correct the defects by means of the measures detailed above, the instrument must be immediately put out of service and prevent erroneous commissioning. In this case, the manufacturer should be consulted. If you wish to return the instrument notes the indications in the "return" chapter.

MICRO CALIBRATION BATH TEMPERATURE LCB 30/50

12. Disassembly, Return and disposal of waste



WARNING

Residual mediums in the disassembled instrument can cause risks for people, the environment and installation. Take correct protection measures.

12.1. Disassembly



WARNING

Risk of burns. Let the instrument be cold enough before disassembling it. Danger due to very hot mediums that can escape during disassembly.

To avoid damage

1. Cool the instrument as described in the chapter "Cooling the micro-bath".
2. Turn off the calibration micro-bath.
3. Remove residues of calibration fluid from the micro-bath. See the chapter "Cleaning the micro-bath".

12.2. Return



WARNING

It is essential to observe the following for the delivery of the instrument. All the equipment sent to LEYRO INSTRUMENTS should be free of dangerous substances (acids, bleach, solutions, etc.).

Use the original packaging or a suitable packaging for the return of the instrument.

To avoid damage

1. Place the instrument together with the insulating material in the packaging. Evenly insulate all sides of the transport packaging.
2. If possible attach a bag with blotter.
3. Apply a marker indicating that it is the shipment of a highly sensitive measuring instrument.

12.3. Disposal of waste



Incorrect disposal can cause environmental hazards, Dispose of the components of the instruments and packaging materials in accordance with the regulations on waste treatment and disposal in force in the country of use.

Remove the silicone as it is described in the safety data sheet.



Note: Those Instruments with this mark should not be disposed in domestic garbage for the elimination.

TEST REPORT ACCORDING TO DIN EN 10204/3.1

Date: **02/08/2017**
 Certificate N°: **XXXXXXXXXX**
 Calibration object: **LCB 30**
 Temperature range: **-35 ... 165 °C / -31 ... 329 °F**
 Measurement inaccuracy: **+/- 0,1 K**
 Serial Number: **XXXXXXXX**
 Ambient temperature: **20°C ± 3°C / 68°F ± 5.4 °F**



We herewith certify that above listed products are manufactured in compliance with the latest technical standards. All used materials and components have passed the quality assurance system. Manufacturing, calibration and quality testing are performed according to the Quality Assurance Systems.

The products are calibrated against factory standards traceable to international standard units administrated by the national metrology institutes like ENAC, NIST, PTB, NBL, BEV or other recognized national standard laboratories.

For engineering samples and repair parts extent of certification is restricted to test results only.

Traceable Standards	
Temperature reference	LDT 2000 (class 0.007 K)
Serial Number	XXXXXXXXXX
Certificate ISO 17025 (ENAC)	43907

	Reading on calibration	
Micro bath LCB Temp.	Temperature reference	Deviation
[°C]	[°C]	[°C]
- 25.0	- 24.963	0.037
0.0	0.089	0.089
40.0	39.989	- 0.011
80.0	79.962	- 0.038
125.0	125.057	0.057

The calibrated values are valid under above conditions only at the time of measurement and are referenced to marked reference and working standards.

Technician

Declaración de Conformidad UE EU Declaration of Conformity

Documento N°:

Document No.:

8723416.31

Declaramos bajo nuestra sola responsabilidad, que los equipos marcados CE, según ficha técnica en vigor LC 94, cumplen con los requerimientos esenciales de seguridad de las Directivas Normas aplicadas y armonizadas.

We declare under our sole responsibility that the CE marked products, according to the valid data sheet LC 94, comply with the essential protection requirements of the directives Harmonized standards.

Modelo de equipo:

Type Designation:

LCB 30, LCB 50

LCB 30, LCB 50

Descripción:

Description:

Microbaños de Calibración

Micro Calibration Baths

Homologaciones y certificados, serie LCB, conformidad CE. Normas aplicadas y armonizadas

Directiva de baja tensión

2004/108 CE, EN 61326 Emisión (grupo1, clase B) y resistencia a interferencias (ámbito industrial)

Directiva de baja tensión

2006/95/CE, EN 61010-1, disposiciones de seguridad para instrumentos eléctricos de medición, control, regulación y de laboratorio

Certificado

Certificado de calibración 3.1 según DIN EN 10204

Calibración

Opción: certificado de calibración ENAC ISO 17025

Homologation and certificates, LCB series CE compliance. Harmonized standards.

Low Voltage Directive

2004/108 CE, EN 61326 Emission (Group 1, Class B) and resistance to interferences (industrial locations)

Low Voltage Directive

2006/95 / EC, EN 61010-1, safety regulation for electrical measuring, control, regulation and laboratory instruments

Certificate

3.1 calibration certificate according to DIN EN 10204

Calibration

Option: calibration certificate ISO 17025 ENAC

Firmado en nombre de / Signed for

Leyro Instruments SL

España /Spain 02-08-2017

LEYRO INSTRUMENTS SL
C/ Lanzarote nº13
28703 San Sebastián de los Reyes
Madrid
Tel: +34 912 835 502
info@leyro.net
www.leyroinstruments.com



David Revilla
Production and Calibration Manager

NOTES _____

HEAD OFFICE:

LEYRO INSTRUMENTS SL
C/ Lanzarote nº13
28703 San Sebastián de los Reyes
Madrid
Tel: +34 912 835 502
info@leyro.net
www.leyroinstruments.com



LEYROINSTRUMENTS.COM