LCA 30 & LCA 50

ADVANCED MICRO CALIBRATION BATH MANUAL

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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:	LCA 30, LCA 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

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2. Safety

WARNING

Switch off the instrument at ambient temperature (approximately 25ºC / 77ºF)

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.

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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 dismounted 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.

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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 to 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.

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3. LCA 30 and 50 Micro calibration baths

	LCA 30	LCA 50
Temperature range	-35 … 165 ºC / -31 … 329 ºF **(1)**	30 … 225 ºC / 86 … 437 ºF
Accuracy	± 0.1 ºC / 0.2 ºF	± 0.1 ºC / 0.2 ºF
Uniformity	± 0,05 ºC / 0.09 ºF	± 0,05 ºC / 0.09 ºF
Screen Resolution	0.1, 0.01, 0.001 ºC / ºF	0.1, 0.01, 0.001 ºC / ºF
Heating time	- 5 to 100 ºC: 12 min. 23 to 212 ºF: 12 min.	30 to 220 ºC: 42 min. 86 to 428 ºF: 42 min.
Cooling time	25 to - 30 ºC: 48 min. **(2)** 77 to - 22 ºC: 48 min. **(2)**	220 to 100 ºC: 35 min. 428 to 212 ºC: 35 min.
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 consumptions	310 W MAX	320 W MAX
Connection cable	AC 320 for Europe	AC 320 for Europe
Instrument dimensions	280x370x400 (ANXAlxP)	280x370x400 (ANXAlxP)
Weight	15,2 kg	13,2 kg

(1) AT 55 ºC / 131 ºF 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 ºC ± 3 ºC / 68 ºF ± 5.4 ºF.

(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	LCA 30	LCA 50
AC 10	- 30...160 ºC / - 22…320 ºF	170 ºC / 338 ºF	Recommended	Not recommended
AC 20	- 20…200 ºC / - 4…392 ºF	240 ºC / 464 ºF	Recommended	Recommended
AC 50	30...220 ºC / 86…428 ºF	280 ºC / 536 ºF	Not recommended	Recommended
AC 100	70…288 ºC / 158…550 ºF	315 ºC / 599 ºF	Not recommended	Recommended

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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).
The corresponding equipment must be selected according to the application. The product is then properly connected and tests must be conducted0 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 LCA.

- 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 advanced calibration bath LCA 30 (heat / cold) and LCA 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.
- The micro calibration bath further comprises a turning knob to control the stirring speed.

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4.4. Isometric views of the advance micro calibration bath temperature

Front and top

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.

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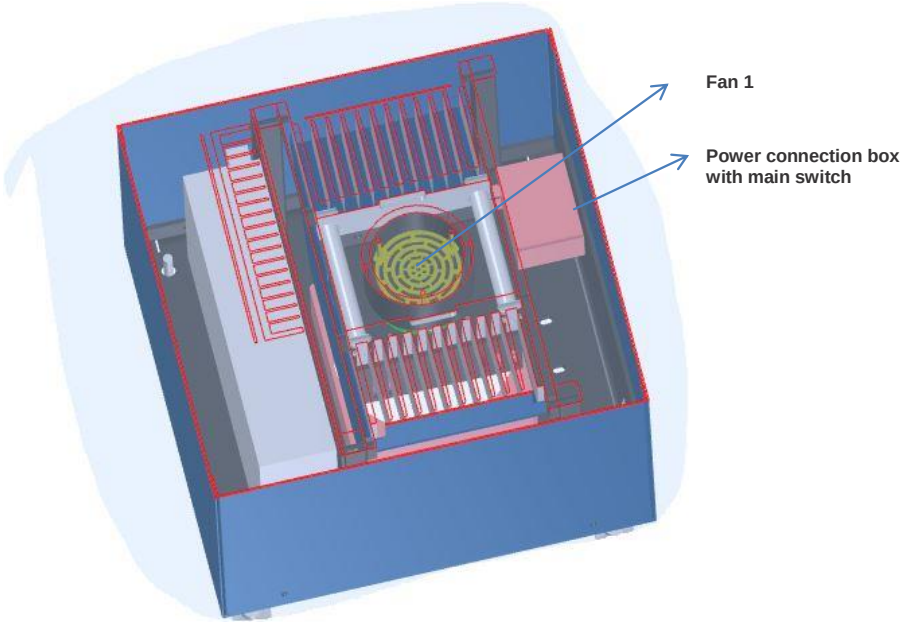
Rear of the instrument

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

Bottom of the instrument

The air inlet must not be blocked in any way.



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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 ... + 60ºC.
- 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.

3) After about 30 seconds, activation has been completed and the calibration mode is automatically displayed. Mounted heating and cooling towers, regulate micro-bath's temperature to match the adjusted nominal temperature on the controller.

4) Activate the magnetic stirrer bar using the potentiometer, turning it to the right completely (100%).

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6.4. Viewing the reference temperature and the nominal temperature

First page

In the red indicator, which is the internal PT 100 appears the following:

- **Process Value (PV):** Indicates the current temperature of the equipment.
- **Set Point (SP):** Indicates the nominal temperature that the equipment must control.

After reaching the nominal temperature, the emission of the energy generated by the micro-bath continues with start impulses in order to keep stable the level of the temperature inside.

Second Page

In the blue indicator, which is the external PT 100 appears the following:

- **Process Value (PV):** Indicates the current temperature of the equipment.
- **Set Point (SP):** Indicates the nominal temperature that the equipment must control.

After reaching the nominal temperature, the emission of the energy generated by the micro-bath continues with start impulses in order to keep stable the level of the temperature inside.

Third Page

The operation of this page is the same that the previous one but with the difference that in this screen appear the Internal and External PT 100.

6.5. Regulation of reference temperature up to the maximum

An orange bar expresses, in percentage, the heating power and a blue one the cooling.

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.

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¡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.

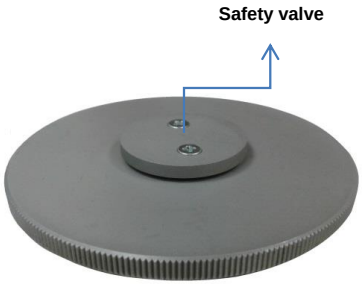
The following maximum filling heights are recommended by type:

Micro bath type	Maximum filling height
LCA 30	150 mm
LCA 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.

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7. Handling the micro bath

Angular sensors, sensors with larger diameters or with special designs can be calibrated in a micro-bath. That's why bathrooms are the most appropriate tool. The liquid circulates with the help of a magnetic stirrer, ensuring a very good temperature distribution in the bath. The liquids used are selected based on the desired calibration temperature.

The micro-bath is heated or cooled until the desired calibration temperature is reached. When the temperature is stable, the temperature probes to be calibrated are compared with the reference thermometer

7.1 Operating in calibration mode in each operation mode

Operation mode of operation

- The equipment must be turned off
- Place the magnetic stirrer bar 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 bar 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 25ºC / 77ºF)
- 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 Starting Screen

We connect the equipment to the power supply and turn on the alternating current switch. We wait the equipment to be started completely (30s).

Before beginning, any modification not expressed in this manual, Leyro Instruments is not responsible for the malfunction of the same. The equipment stores all the modified data from its first start and in case the equipment needs to return to the factory due to malfunction by these, it will be excluded from guarantee

For any modification expressed in this manual, we must press done to save the changes

When the equipment has been fully started, it will start to control by default with the Internal PT100 and the PT100 Ext key will be deactivated, shown in gray, with which, the internal control will be activated and the external control will be deactivated.
If it is necessary to control with External PT100, press the PT100 Ext key, which will be activated and represented by green color, with which the internal control will be deactivated and external control will be activated.

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The equipment starts on the first page, which represents the PID control by Internal PT 100.
If PID control is required by External PT100, press the arrow on the right, which allows us to go to the second page.
If you need to visualize both PID controls both Internal and External, press the arrow on the right again and we will go to the third page.

7.3 Modification of the set point

To modify the set point (SP), we must select the number indicated in the value of the set point and change it to the necessary one. To return to the main screen press enter, to send the team the new set point or cancel or return arrow, to discard.

The set point (SP) can only be modified in the PID control of the Internal PT100, regardless if the equipment is controlled by internal or external probe.

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7.4 Record data / Logging

To record the necessary data, press the Logging key, since by default the device is not in recording mode, represented in gray. Pressing will activate the recording mode, represented in green

When the mentioned process needs to be stopped, the Logging key will be deactivated, and return to a gray state.

To save the data can be stored on the computer or in a USB device. By default the equipment will storage hem in it and can be saved in it or exported to a USB device. At the same time data's can be Import from a USB device and store it on the computer.

7.5 Failures

If we press the arrow that appears at the top of the screen, we will access the menu of:

In case the equipment has the option of external probe, an error will appear if it is not connected to the equipment, it is indicated by a red bar flashing at the top. When the probe is connected, the error will disappear.

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7.6 Menu

Pressing the menu key will access all the equipment options.

My menu

- PT 100 Int Set Point: Is the value that must be modified to the necessary one.
- Display units: By pressing the key, we can change degrees Celsius to degrees Fahrenheit.

These options can be modified according to needs, by pressing settings and my menu again.

Profiles

It serves to visualize the profiles that the equipment has. All the functions are detailed in point 8

Settings

- **My menu:** From this option you can modify “my menu” (the menu which appears outside the configuration).
- **Control PID loops:** You can see the configuration of the PID.
- **Profile Settings:** The profile settings can’t be modified, because the equipment doesn’t have the timer option to turn on and off.
- **Inputs:** In this screen you can select internal or external PT 100 and within them you can modify the accuracy of the screen, which allows you to present the data with one, two or three decimals.
- **Outputs:** You can visualize the cold and hot outputs of the internal and external control.
- **Machine controls:**
  - **Variables:** You can visualize the variables; these variables are not used because the equipment hasn’t got the option.
  - **Linearization:** This section has the function of calibrating the probes in 8 points, both internal and external probes. It is explained with more details at the point 9.
- **Keys:** You can visualize the keys which appear in the main screen.
- **Network:** It is used to configure the Ethernet mode data which will be modified as necessary.

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- **Global:** In this option you can change:
  - The name of the equipment.
  - Temperature units.
  - CA line frequency (Consult with Leyro Instruments before changing it).
  - Date.
  - Time zone.
  - Hour.
  - Language.

- **Upgrade**: This section is used to update the equipment. If you need an update, it can only be effective by the manufacturer.

- **Display:** It is used to adjust the brightness of the screen, 0, is the minimum and 100 is the maximum brightness.

Data logging

- **Start:** With this option we will start the data registration which if it has been started, we will have to press stop to stop the registration.

- **Annotation:** This option allows us to save a message that we can need in the equipment.

- **Registered data points:** represents the points which have been selected in the data point selection function.

- **Selection of data points:** in this function we establish the data points.

- **Configuration:** in this option we can modify the file name, register in the device or USB device, modify the interval of the points to be registered, the maximum size of the recorded file and stop or overwrite when the memory is full.
  We can also observe the state of the record, whether it is recording or not and, on the other hand, the available memory in MB or in hours.

- **Transfer of data record files:** With this function we can Access the file transfer mode Ethernet, which can be modified according to the needs of the client.

Trending

This function allows us to make graphs of the analog inputs and outputs. To start making graphics we must press actions (in any of the four trends, since it allows four graphics, but not simultaneous).

When you press this key you will Access to the configuration of the graph, which allow us to do:

- **View:** see the instantaneous graph.
- **View / Edit details:** modify the name of the graph, the presentation in grid, the automatic scaling and the maximum time represented by the graph (Time Spam).
- **Edit pens:** in this option the necessary variables are added in the graph, by clicking add or edit and edit font and, to change the color, press edit and edit color.
- **Delete all:** this option will be used if it is necessary to reset the graph.

File transfer

To export the saved data, for example, from trend 2, we must connect a USB device, press file transfer, select the necessary USB device, press export and transfer the files.

Login

In this option you can log in to access the advanced functions of the equipment. If it is necessary to disconnect the session, presses disconnect. By default the equipment is switched on with the session disconnected.

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Service

This option allows calibrating the 0 Ohm in the internal and external PT100**.** Before doing it consult previously with Leyro Instruments.

Personalize

- **Home screen customization:** you can choose between top, center or bottom, within them you can choose up to four pages and within the latter up to four blocks.

- **Personalization of menu:** with this option the desired color of the navigation menu will be chosen.

Help

- **About it:** in this option we will observe the internal characteristics of the equipment.
- **Plug-in modules:** represents the number of cards that the equipment has.
- **Installed functions:** represents the installed software.
- **Enable:** this function allows us to take screenshots. Screenshots can only be made if a USB device is connected. You can only capture the trend graphs by clicking on the graph the upper right key (key with 3 points vertically) and press the camera icon.

8. Profiles

In the main screen there is a direct access to the programming of the profiles, called profile actions. Once clicked we will have different options:

- **Run last:** This option will execute the last selected profile.

- **Run profile:** Press this key and select the necessary profile by pressing actions and within this menu you can choose:

  - **Run profile:** Used to start a profile.

    When a profile is executed you can press profile actions again and:

    - Pause: to pause the profile.
      - Resume: This option is used to restart the profile, but only will be active when pause is pressed.
    - Finish: to finalize the profile.

  - **Custom Run:** Allows you to select the step from which you need to start the profile.

  - **View/edit steps:** In this option you can modify the steps used by the profile.

    The variables named with number 2 can only be modified in the equipment with the external probe option.

    First:

    - Modify the step that is added by default, by pressing **Soak** and changing it to **Instant Change**.

    - Once this is done, modify the value of **Instant Change** in the **Target Set Point Loop 1** and **Target Set Point Loop 2** to necessary. The value should be the same in the two.

    - The Guaranteed Soak Enable 1 and Guaranteed Soak Enable 2 must be disabled.

    - At the same time, the waiting time must be left in 0 hours 0 minutes 0 seconds.

    - Then, press **Done**.

    - If you have modified the value, but want to change it, press **Actions** and **Edit Step Parameters**.

    - If you want to delete a step, click on **Actions** and **Delete Step**.

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Second:

- Press **Add Step** or press **Actions** and **Insert**. You must add another step called **Wait For**.
- For it, press **Instant Change** and press **Wait For**.
- Once this is done, modify the value of **Wait For Process 1 Condition** and **Wait For Process 2 Condition**.
- This step executes an undefined timer, which will end when the set point has been reached.
- **ATTENTION:** It should be selected, in **Wait for Process 1 Condition** and **Wait for Process 2 Condition**, **Above** when the temperature are heating and **Below** when the temperature are cooling.
- Then, press **Done**.
- If you have modified the value, but want to change it, press **Actions** and **Edit Step Parameters**.
- If you want to delete a step, click on **Actions** and **Delete Step**.

Third:

- Press **Add Step** or press **Actions** and **Insert**. You must add another step called **Soak**.
- For it, press **Wait For** and press **Soak**.
- Once the set point has been reached, the equipment will be at that point for the time specified (advisable to modify the value to **0 hours**, **20 minutes** and **0 seconds**).
- Then, press **Done**.
- If you have modified the value, but want to change it, press **Actions** and **Edit Step Parameters**.
- If you want to delete a step, click on **Actions** and **Delete Step**.

These steps must be repeated for the necessary calibration points, maintaining the order of the set point, wait and constant value.

In case of not wanting this profile, press cancel new profile and in actions of that same profile press delete profile.

Example: Lower the temperature from 25,000ºC to 20,000ºC.

If the temperature is 25,000ºC and we need to lower it to 20,000ºC, the **Instant Change** should be at **20,000ºC** in the **Target Set Point Loop 1** and **Target Set Point Loop 2**

The **Profile** is started.

Once the **Instant Change** is started, the equipment will go to the next step, which will be **Wait For**, which should be configured in **Below** in **Wait For Process 1 Condition** and **Wait For Process 2 Condition**, since the temperature is going down.

Once the temperature has been reached and the equipment drops below 20,000ºC, it will go to the last step, which will be **Soak**, which will be configured in **20 minutes**.

When that time passes, the profile will be finished.

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- **View/edit details:**
  - Name: You can choose the necessary name.
  - Password: A password can be entered, so that it is only activated when that password is entered.
  - Data logging: If activated, once the profile is started, registration is activated and if it is deactivated, registration will not start when the profile is started and it will have to be started manually if necessary

- **Export file:** In this option you can export the desired profile. To export it, an USB device must be connected.

- **Delete profile:** This function serves, as its own name indicate, to eliminate the unnecessary profile.

- **Create profile:** Use to create a profile
  - Name: You can choose the necessary name.
  - Password: A password can be entered, so that it is only activated when that password is entered.
  - Data logging: If activated, once the profile is started, registration is activated and if it is deactivated, registration will not start when the profile is started and it will have to be started manually if necessary.

- **Go to profiles:** Allows you to view all created profiles.

- **Clear state profile:** This option allows you to delete the finished or stopped profile in the screen, which m, in the screen shows, when a profile is initiated, the start profile, ,the remaining steps and the estimated time and when the profile is finished or stopped manually, the name of the profile appears on the screen. This function is use to erase that indication only when it is finished or stopped.

- **Cancel** Use to exit from the menu.

Observations: The equipment has a manufacturer profile called calibration.

9. PT 100

Change from PT100 Int to PT100 Ext.

To change from internal to external probe it is necessary that the external probe is connected and press the PT 100 Ext key, which will turn green, since by default the equipment works with the internal probe and with the key in grey

Note: If the equipment is started without the external probe connected, an error will appear, which will fire and remain hidden, but the error will always appears, and it will be indicated by red flashes in the upper line. The error will disappear when the external probe is connected and it is not necessary to turn off the equipment

To calibrate both, the internal and external probe, press the menu key, configuration, machine controls and linearization.

Calibrate

To calibrate the internal probe, linearization 1 is chosen and linearization 2 is chosen for the external probe.

The function must be interpolated and the units must be in source.

To adjust both the internal and external probe by comparison with a standard, the same set point must be set both in the equipment and in the linearization in the entry point 1. When the equipment has reached the temperature, it is observed that it marks the probe to be calibrated and which marks the pattern and if the probe to be calibrated is out of adjustment, the value that should mark at the exit point 1 will be introduced.

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This process can be repeated with a maximum of 8 calibration points, which are from 2 to 9, since 1 and 10 are to establish the end of linearization and **always** establish in:

	LCA 30	**LCA 50**
Input Point 1	- 40,000ºC	20,000ºC
Output Point 1	- 40,000ºC	20,000ºC
Input Point 10	170,000ºC	270,000ºC
Output Point 10	170,000ºC	270,000ºC

The equipment is calibrated by fabric

10. Cooling the Micro 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.

11. Maintenance, Cleaning and Re calibration

11.1. 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.

11.2. 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.

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11.2.1. 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. C lean the perforation of the micro bath with pressurized air and with a dry cloth the perforation and the cap.

11.2.2. 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

11.2.3. 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

11.2.4. 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.

11.3. Re calibration

ISO /17025 Certificates

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.

12. 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.

12.1. Additional options

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

13. PASSWORD

The access code to the equipment to configure the different options is: **leyro30**

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14. Failures

Failure	Causes	Solutions
Error	Internal PT 100 stops or it is defective	Send the instrument to the manufacturer or to the repair service for repair work.
Error	External PT 100 is not connected or it is not properly connected. If you ensure a good contact in the connection, then is an internal problem of the equipment.	Send the instrument to the manufacturer or to the repair service for repair work
The heat sink fan	The fan is defective or blocked. It is possible that the temperature switch has switched and therefore cut off the power supply for the heater cartridges.	Send the instrument to the manufacturer or to the repair service for repair work
Stirrer	The stirrer is blocked. It is possible that the engine has stopped working.	Send the instrument to the manufacturer or to the repair service for repair work
USB and Ethernet	It is possible that the external connection is not correct. If you ensure a good contact it is an internal problem of the equipment	Send the instrument to the manufacturer or to the repair service for repair work
The final temperature is not reached	The semiconductor relay is defective or the heating or cooling tower has shorted or has aged	Send the instrument to the manufacturer or to the repair service for repair work
There is no indication	The regulator is defective.	Send the instrument to the manufacturer or to the repair service for repair work
There is no function	The network connection has not been made correctly or the fuse is defective	Check network 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.

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15. 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.

15.1. 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 and remove the plug.
3. Remove residues of calibration fluid from the micro-bath. See the chapter "Cleaning the micro-bath"

15.2. 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

15.3. 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.

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TEST REPORT ACCORDING TO DIN EN 10204/3.1

Date:	**02/08/2017**
Certificate Nº:	**XXXXXXXXX**
Calibration object:	**LCB 30**
Temperature range:	**-35 … 165 ºC / -31 … 329 ºF**
Measurement inaccuracy:	**+/- 0,3 K**
Serial Number:	**XXXXXXX**
Ambient temperature:	**20ºC +/- 3ºC / 68ºF ± 5.4 ºF**

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**
[ºC]	[ºC]	[ºC]
- 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

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Declaración de Conformidad UE
EU Declaration of Conformity

Documento Nº.:
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: **LCA 30, LCA 50**
Type Designation: ***LCA 30, LCA 50***

Descripción: **Microbaños de Calibración**
Description: ***Micro Calibration Baths***

Homologaciones y certificados, serie LCA, 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, LCA 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

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