

CIRCULATING BATHS

User Manual



CB 5-10/CB 5-20/CB 5-30

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1 Warranty

Thank you for purchasing this instrument. In normal use conditions, the instrument is guaranteed for a period of 24 months from the date of purchase.

The warranty is valid only if the product is original. It does not apply to any product or parts of it that have been damaged due to incorrect installation, improper connections, improper use, accident or abnormal conditions of operation. The manufacturer declines all responsibility for damage caused by failure to follow instructions, lack of maintenance and any unauthorized modification.

2 Contents of package

The instrument is delivered complete with the following parts:

1. Hose fittings (already installed on the instrument)
2. Valve for external circulation (already installed on the instrument)
3. Set of two pipes of 2 meters each with insulating material
4. Four metal clamps for pipes fastening
5. PT100 temperature probe
6. User manual

3 First use

3.1 Getting started

The circulating bath should be installed in follow conditions:

1. Dry, clean and stable work table with a flat horizontal surface
2. Respect minimum spaces around instrument 30 cm
3. Room temperature between 5 °C and 35 °C, and relative humidity maximum of 85%
4. Power supply socket with earth connection
5. Power feed between 220±10% V - 50 Hz

3.2 Tank filling

Fill the tank with a thermal fluid (demineralized water, mixtures of water and ethylene glycol, ethylene glycol in purity, etc.). **It must have the appropriate physical and chemical properties to reach the desired temperature without freezing or becoming excessively viscous.**

Liquid level must always be at the maximum capacity of the tank and **in any case in a quantity that the cooling coil is not exposed** (Picture 1).

IMPORTANT: if the tank is filled with water or its mixtures, the natural evaporation should always be considered. **It is always necessary to maintain a sufficient level of thermal fluid to cover the cooling / heating elements of the instrument** (Picture 1).

NOTE: any responsibility for damage caused by use of an improper thermal fluid is declined.



Operating level

Picture 1



ATTENTION

The circulating bath is designed to be used exclusively with non-flammable Class I fluids (DIN 12876-1).

Never use the instrument without fluid in the tank. Periodically check the tank to make sure that the level of the liquid is within acceptable levels. Fill always the tank using the same fluid already present in the tank.

Pay attention to the chemical risks associated with the fluid used.

Observe all warnings contained in the safety data sheet.

Do not use acidic fluids.

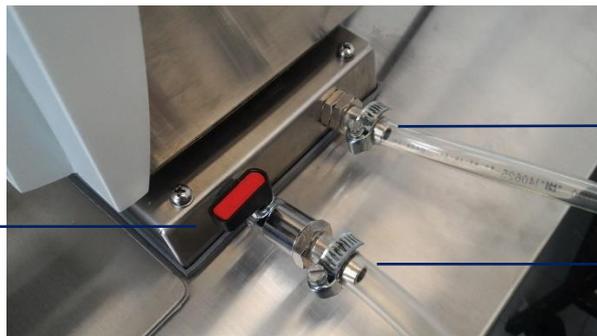
Use recommended thermal fluids.

3.3 Tube connection for external circulation

The instrument offers the possibility to thermostat an external circuit by the output and inlet fittings to the tank. The circulating bath is standard supplied with two hose barb fittings, two pipes of 2 meters each with insulating material and four fixing metal clamps.

A tap is installed on the outlet fitting from the tank, which allows to completely exclude the external circulation (Picture 2).

If desired, connect the external system to the circulating bath using the supplied pipes, taking care to fix them properly to the fittings with appropriate clamps.



Inlet fitting

Output fitting

External circulation tap

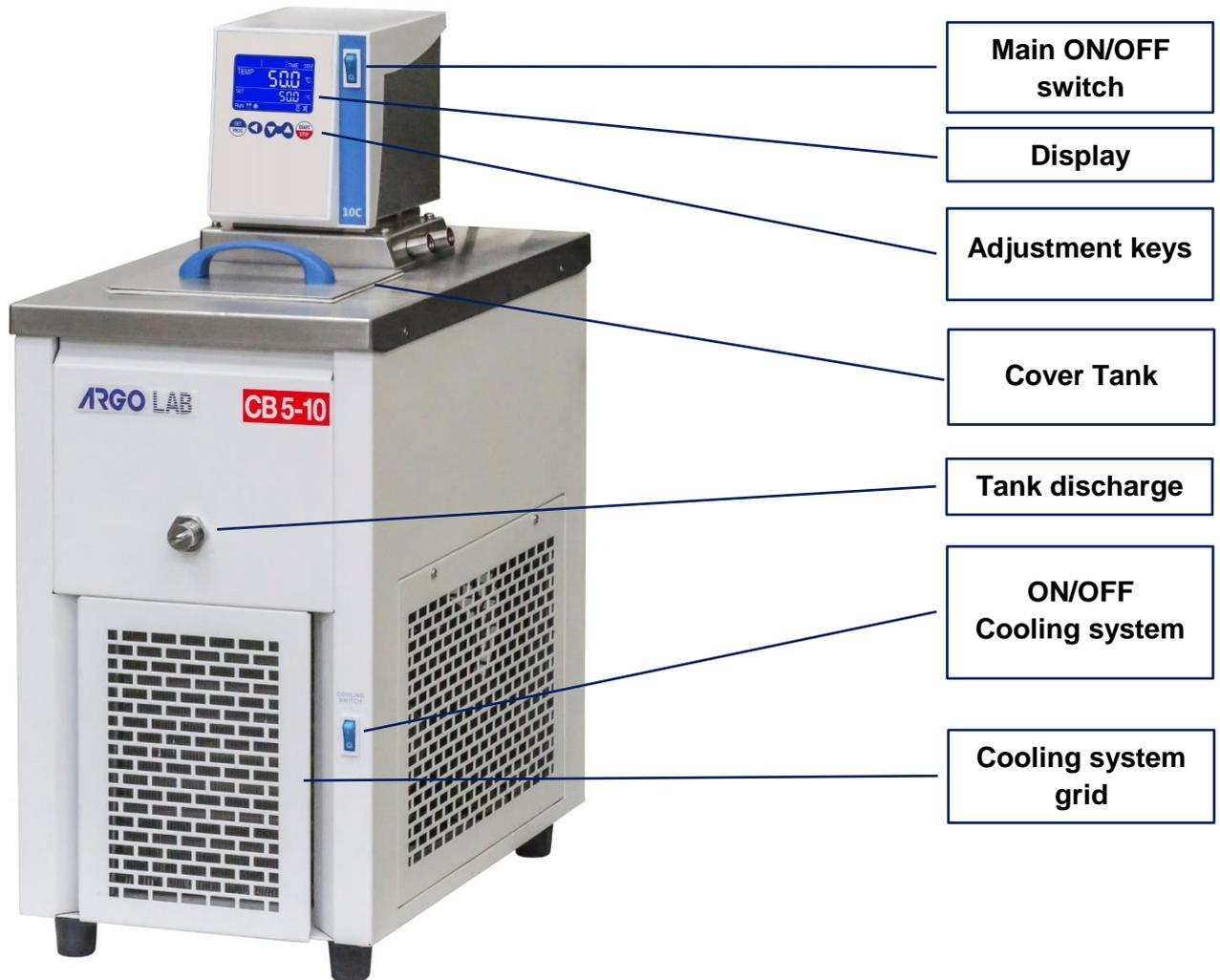
Picture 2

IMPORTANT: circulation pump in the tank is activated as soon as the instrument is powered by the main switch (Picture 3). It always pumps the fluid both inside the tank (internal recirculation) and towards the output fitting (external recirculation).

In the event that an external circuit is not connected, it is strictly necessary to keep the tap on the output fitting closed (Picture 2).

Otherwise, the thermal fluid would be pumped out of the tank.

3.4 Instrument parts

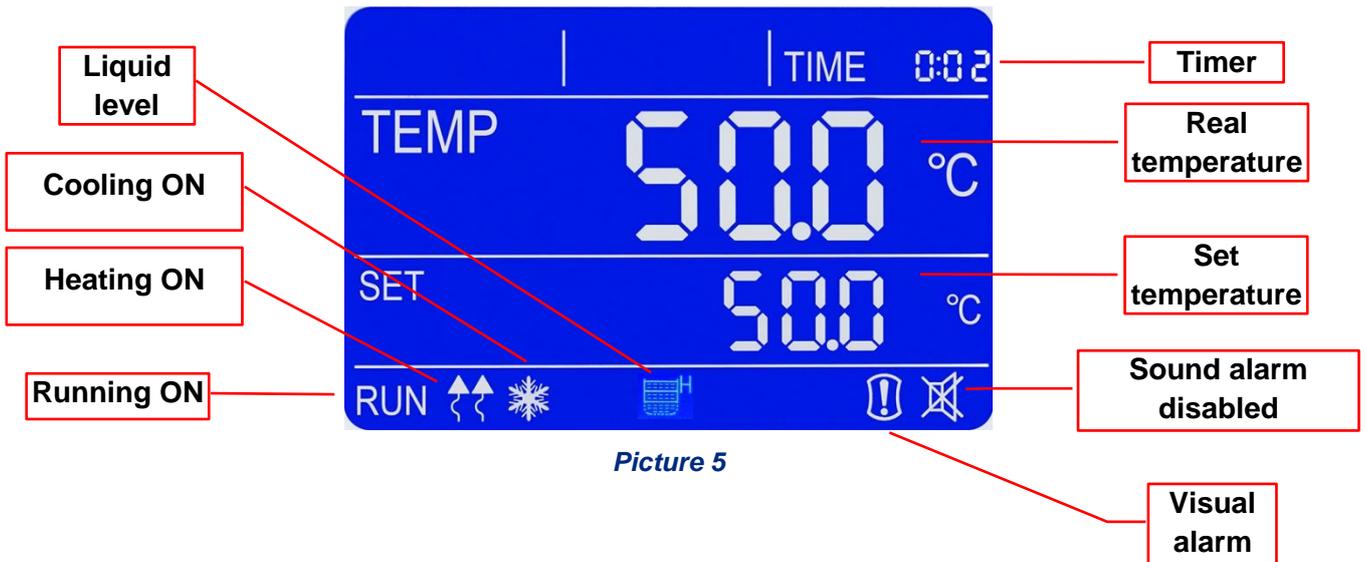


Picture 3



Picture 4

4 Display and commands



Picture 5

COMMANDS	DESCRIPTION
	The SET / PROG key permits to set the operating parameters. In combination with the SHIFT key, it allows access to the menu with a password (see paragraph 5.7).
	The SHIFT key allows to change quickly the digit (decimal, unit, tens, etc.) of the value of the parameter you are editing. In combination with the SET / PROG key, it allows access to the menu with a password (see paragraph 5.7).
	The adjustment keys allow to increase and decrease the value of the parameter being edited.
	The START / STOP button permits to start / stop an operation cycle.
	The main ON / OFF button allows the instrument to be switched on and off.
	The "Refrigeration unit" ON / OFF button permits to activate or deactivate the cooling system.

5 Operation

5.1 Switching on the instrument

Before connecting the power supply cable to a socket, it is necessary to fill the tank (see paragraph 3.2).

Turn on the instrument by pressing the button main ON / OFF. The button and the display light up. The display shows the initialization sequence and then the instrument is ready for use.

NOTE: every time you turn the instrument beeps intermittently, the icon of visual alarm  and the word "end" appear on the display, indicating that a heating cycle had been done before. Press any button to silence the audible signal and the icon  appears.

5.2 Switching on/off of the cooling system

The cooling unit can be switched on or off at any time by pressing the "Cooling switch" ON / OFF button.

NOTE: When the set temperature is quite higher than ambient temperature ($> 40^{\circ}\text{C}$), it is possible to exclude the refrigeration unit, but for a better control of the temperature, it is advisable to leave the refrigeration unit turned on also for "high" temperatures. The instrument will correctly modulate heating and cooling to keep the temperature constant.

IMPORTANT: refrigeration unit is an ON/OFF type, that is when it is turned on, it always cools, regardless of the presence or absence of an active operating cycle. As a consequence, if the refrigeration unit is switched on but no operating cycle is activated, ice may quickly forms inside the tank.

It is therefore suggested to activate the cooling unit only after starting an operating cycle (see paragraph 5.4).

5.3 Setting of parameters

5.3.1 Working temperature

When the instrument is switched on, pressing one time the SET/PROG  button, the set temperature value starts to blink.

Set the desired temperature value (in Celsius degrees) pressing  keys.

It's possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button.

5.3.2 Working time

After confirming the temperature, the last value of the set time (timer) starts flashing.

Set the desired value (hh:mm) by pressing  keys. It's possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button.

NOTE: the value “00:00” indicates the operating mode "continuous", that means once you start the operating cycle by the START / STOP  button, it continues maintaining the set temperature until it is stopped manually (START/STOP ).

If you set a value of time, such as 1 hour, the instrument will reach the set temperature and will maintain it for an hour.

5.4 Start/stop cycle

Once the operating parameters have been set, press the START / STOP button  with long pressure (4-5 seconds), the cycle starts for the time defined in hh: mm or continuously (00:00).

The word “end” at the top right corner of display disappears, the message RUN appears in the bottom left corner and display shows contemporary: timer, temperature measured inside the tank and set temperature (see).

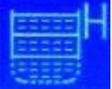
At any time you can always manually stop the cycle by pressing the START / STOP  button with long pressure (4-5 seconds).

Once the set time has elapsed or after the manual stop, the instrument beeps intermittently, the icon of visual alarm  and the word "end" appear on the display. Pressing any button it's possible to silence the audible signal and the icon  appears.

NOTE: the acoustic signal will not end until it is stopped by the operator, but the heating cycle is terminated so for the samples inside the instrument will remain exposed to the internal temperature the chamber.

5.5 Liquid level control

The instrument is equipped with a system for detecting the level of liquid inside the tank, which indicates the quantity of fluid through an icon on the display:

	Sufficient liquid level
	Insufficient liquid level: tank must be refilled

IMPORTANT: when the instrument detects an insufficient level of liquid, it stops heating immediately, but the recirculation pump and the refrigeration unit continue to operate.

As a consequence, if the tank is not refilled, they may be damaged.

5.6 External circuit temperature control

The instrument is standard equipped with external temperature probe and its connection (Picture 4).

To control the temperature in the external circuit it is sufficient to connect the probe and the instrument automatically recognizes it.

IMPORTANT: the controller of the instrument manages the heating/cooling based on the detected temperature. If the external probe is not used, it is absolutely necessary disconnect it from the connection port, to avoid heating/cooling the liquid unnecessarily.

5.7 Functions with password access

5.7.1 Access to menu with password

Simultaneously pressing the SET / PROG  and SHIFT  for few seconds, you can access some functions and parameters that are password protected.

To access these submenus and avoid mistakenly entering in the operating parameters setting, it is recommended to firstly press the SHIFT  key, keep it pressed, and then press the SET / PROG  for few seconds.

After have made this keys combination, on the right top part of display instead of word TIME, “Lk” (lock) appears close to “0000” (password).

Below the passwords and access sequence to the various parameters/functions.

<i>PASSWORD</i>	<i>FUNCTION/ PARAMETER</i>	<i>DESCRIPTION</i>
0000	dy	Delay of heating cycle start
0003	tm	Safety temperature limiter for samples protection
	Po	Restart mode after absence of power supply
	AL	Temperature range for over temperature alarm
	Pb	Temperature offset on single point
	PK	Temperature offset on the entire ramp
	PA	Temperature offset of the room temperature probe

5.7.2 Delay of cycle start

It's possible to set a delay (hour and minutes) of cycle start.

Please follow the instructions reported at paragraph 5.7.1 and confirm the “0000” password pressing shortly one time SET/PROG .

On the top right part of display the parameter “dy” (delay) appears close to value 00:00.

Set the desired delay value (hh:mm) pressing  keys. It's possible a quick movement between the digits using the SHIFT  button. Confirm the set value with another press of SET/PROG  button.

The display comes back to the standby screen (see Picture 5).

Pressing the START/STOP  button with long pressure (4-5 seconds) the instrument starts the work cycle but it doesn't immediately heat: the word “end” and the set delay time alternately blink on the top right part of display, counting the wait time until the real starting of heating.

Once the delayed time is passed the instrument starts to heat and the regular timer appears on display.

5.7.3 Safety temperature limiter for samples protection

The instrument has the possibility to limit the maximum work temperature for the samples protection from an erroneous setting of the working temperature.

Please follow the instructions reported at paragraph 5.7.1 and using the  keys set the “0003” password. It's possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button.

On the top right part of display the parameter “tm” (temperature max) and the maximum expected value for the kind of instrument (different for oven and incubator) appear.

Set the maximum temperature value you want the instrument doesn't exceed during work cycle by the  keys. It's possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button.

Example

If the set temperature for the work cycle is 50 °C and the safety temperature is fixed at 30°C, the instrument tries to achieve the set temperature (50°C), even if it's major than the safety temperature set in this menu (tm).

When the 30 degrees are achieved the instrument goes in alarm emitting an audible intermittent alarm (silence it pressing any keys) and the heating element doesn't receive power supply until to the temperature will go below the safety temperature (tm).

NOTE: the instrument tries in any moment to achieve the set work temperature; as a consequence, until it is bigger than the safety temperature (tm), it goes in over temperature alarm as described in the previous paragraph.

5.7.4 Restart mode after absence of power supply

It's possible to set the restart mode of the instrument after a power supply absence:

Po VALUE	DESCRIPTION
0	On return of the power supply, the instrument does not automatically resume the heating cycle, but you must manually restart.
1	On return of the power supply, the instrument automatically resumes operation from the beginning of the heating cycle interrupted
2	On return of the power supply, the instrument automatically resumes operation at the very point of the heating cycle in which it was interrupted

Please follow the instructions reported at paragraph 5.7.1 and using the  keys set the “0003” password. It's possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button.

On the top right part of display the parameter “tm” (temperature max), pass to the next parameter “Po” (Power) pressing shortly SET/PROG .

Confirm pressing shortly another time SET/PROG . Set the desired value (0, 1, 2) pressing the  keys. Confirm pressing shortly SET/PROG .

5.7.5 Temperature range for over temperature alarm

The instrument has the opportunity to set the range of temperature over which it goes in over temperature alarm.

NOTE: even if this value is adjustable by the operator, it's already set by factory and perfectly calibrated in function of instrument type, natural/forced air oven or incubator.

We recommend to do not change this value unless absolutely necessary, because temperature fluctuations more or less than the set one, especially in models with natural convection, are normal and thus reducing dramatically the value of AL, it would risk do go frequently and unnecessarily alarmed the instrument.

Please follow the instructions reported at paragraph 5.7.1 and using the  keys set the “0003” password. It’s possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button

On the top right part of display the parameter “tm” (temperature max), pass to the next parameters pressing shortly SET/PROG  more times.

Find the parameter AL (alarm), set the minimum temperature value above which you want the instrument goes in alarm pressing the  keys. It’s possible a quick movement between the digits using the SHIFT  button. Confirm the set value with another press of SET/PROG  button.

5.7.6 Temperature offset on single point, on entire ramp, on room temperature sensor

The instrument has the opportunity to set the offset value on a single temperature point, on the entire temperature ramp and on the room temperature sensor.

NOTE: even if these values are adjustable by the operator, they are already set by factory and perfectly calibrated with certified and referable Accredia measurement instruments.

We recommend that you do not change these values unless absolutely necessary, for example if after a check with digital certified thermometer you find a discrepancies between the reading of the instrument and the external thermometer.

Please follow the instructions reported at paragraph 5.7.1 and using the  keys set the “0003” password. It’s possible a quick movement between the digits using the SHIFT  button.

Confirm the set value with another press of SET/PROG  button

On the top right part of display the parameter “tm” (temperature max), pass to the next parameters pressing shortly SET/PROG  more times.

<i>PARAMETER</i>	<i>DESCRIPTION</i>
Pb	Changing this parameter you can correct the reading of PT100 sensor inside the instrument on one point temperature. The correction will therefore be attributable to one specific point.
PK	Changing this parameter you can correct the reading PT100 sensor inside the instrument over the entire temperature ramp, that is going to change the inclination of the ramp reading of the sensor.
PA	Changing this parameter you can correct the reading of environmental PT100 sensor installed on the instrument (only refrigerated versions) on only one temperature point. The correction will therefore be attributable to one specific point.

6 Tank emptying

 ATTENTION	When it is desired to empty the tank it is essential that the heating element is no longer powered and has first been cooled.
	Before proceeding with the fluid removal operations, wait until it has cooled down sufficiently.

To empty the tank unscrew the cap of the discharge pipe on the frontal part of the instrument (Picture 3).

If necessary, remove the residual liquid with a cloth or absorbent paper, but make sure that the fibers of the latter do not end up inside the drain nozzle located on the bottom of the tank.

7 Clean and maintenance

Proper maintenance and cleaning of the instrument guarantee its good conditions.

The inner tank of the instrument is made of stainless steel, so it can be cleaned with any detergent provided it is not aggressive and / or corrosive.

You should clean the inside and outside surfaces with a standard all-purpose cleaner sprayed on a soft cloth.

Before proceeding with any cleaning or decontamination, the user must ensure that the method used does not damage the instrument.

 ATTENTION	If using absorbent paper, take extreme care so that no traces remain in the tank.
	Possible blocks of paper could seriously damage the recirculation pump and / or block the discharge nozzle.

IMPORTANT:

If the instrument must be returned for service, it is necessary to provide for proper cleaning and possible decontamination by pathogens of the same.

It is also recommended to put the instrument in its original packaging to send it in for repairs and if it is missed it is necessary to provide to pack it properly in order to the transport.

Any damage caused from the incorrect shipping will not be covered by warranty.

 ATTENTION	Before emptying the tank or any other maintenance activity, make sure that the instrument is disconnected from power supply socket.
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7.1 Check of the refrigeration units compartment, heat sinks and cooling fans

For the checking of the refrigeration units compartment and its components it is necessary to stop the working cycle and switch off the machine by the ON/OFF button on the side control panel and disconnect the power cord from the power socket.

Then wait the necessary time so that the heat sinks and refrigeration units cool down (at least 30 minutes) before inspection.

The grilled panel placed at the bottom on the front of the instrument (Picture 3) is anchored to the instrument by magnets. To remove it, simply pull the upper part out first (Picture 6) and then the lower part (Picture 7).



Picture 6



Picture 7

Make sure that compartment and various components are clean, particularly verify that the surface of the heat sinks is well cleaned and does not have folded metal fins.

If it is necessary proceed with cleaning taking particularly care to don't fold the metal fins.

It is advisable to use a normal vacuum cleaner, however be careful to keep the suction nozzle at a sufficient distance. For other parts use a soft cloth and a not aggressive or corrosive detergent not in purity but always diluted with water.

Reposition the frontal wired panel in its seat.

8 Disposal of electronic equipment



The electrical and electronic equipment marked with this symbol may not be disposed of in landfills.

In accordance with EU Directive 2012/19/EU, the European users of electrical and electronic equipment have the opportunity to give back to the distributor or manufacturer upon purchase of a new one.

The illegal disposal of electrical and electronic equipment is punished with an administrative fine.