OVENS and INCUBATORS

User Manual

Super
PROJECT

*Forced air and natural convection, multifunctional **ovens** with microprocessor temperature control.*

Model	Description	Temperature range
TCN-50 Super	*Natural convection oven 50L (useful volume)*	*From + 5 °C above room temperature to + 300 °C*
TCN-115 Super	*Natural convection oven 115L (usable volume)*	*From + 5 °C above room temperature to + 300 °C*
TCN-200 Super	*Natural convection oven 200L (usable volume)*	*From + 5 °C above room temperature to + 300 °C*
TCF-50 Super	*Forced air oven 50L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*
TCF-120 Super	*Forced air oven 120L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*
TCF-200 Super	*Forced air oven 200L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*
TCF-400 Super	*Forced air oven 400L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*

*Forced air and natural convection, multifunctional **incubators** with microprocessor temperature control.*

Model	Description	Temperature range
ICN-16 Super	*Natural convection incubator 16L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-35 Super	*Natural convection incubator 35L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-55 Super	*Natural convection incubator 55L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-120 Super	*Natural convection incubator 120L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-200 Super	*Natural convection incubator 200L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICF-55 Super	*Forced air incubator 55L (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*
ICF-120 Super	*Forced air incubator 120L (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*
ICF-200 Super	*200L forced air incubator (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*
ICF-400 Super	*400L forced air incubator (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*

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1. Security Information

Definitions of warning words and symbols

The safety information in this manual is essential in order to avoid personal injury, damage to the instrument, malfunctions or incorrect results resulting from failure to follow the instructions. It is essential to read the entire manual carefully and become familiar with the instrument before using it. The manual should be kept close to the instrument so that the operator can easily consult it if necessary. Safety warnings are expressed through warning terms or symbols.

Reporting deadlines

CAUTION / WARNING / DANGER for a dangerous situation that could lead to serious injury reduced or average, serious injury or death if not avoided.

NOTICE for important product information.

NOTES useful information.

Warning symbols

DANGER
This symbol indicates an **imminently hazardous** situation which, if not avoided, may result in death or serious (irreversible) injury.

WARNING
This symbol indicates a potentially dangerous situation which, if not avoided, may result in death or serious (irreversible) injury.

ATTENTION
This symbol indicates a potentially dangerous situation which, if not avoided, may result in minor or moderate (reversible) injury.

NOTICE
This symbol draws attention to possible damage to the instrument or instrumental parts.

NOTES
This symbol identifies useful product information.

Pictograms

Within this manual there are different symbols identifying dangers, prohibitions and obligations as illustrated below.

Danger Symbols

	Danger of electric shock
	Danger of explosion
	Fire hazard
	Danger of poisoning
	Danger of overheating surfaces
	Danger of damage to health caused by toxic substances
	Risk of injury from tipping objects
	Risk of injury from lifting heavy objects
	Danger of environmental damage
	Danger of corrosion

Prohibition symbols

	Do not wet with water

Symbols of obligation

	Disconnect the instrument from the power supply by pulling the plug
	Eye protection must be used

2. General safety instructions

Installation, commissioning, cleaning, adjustment or calibration of the oven/incubator, if performed incorrectly, can lead to a risk of malfunctioning, resulting in personal injury and material damage to the instrument and samples. For this reason, all such operations should only be carried out by qualified personnel.

DANGER	
	Danger of electric shock and Danger of death ⃠ Do not get the instrument wet during installation, commissioning or maintenance. ⃠ Do not connect the instrument to the power supply if the rear panel is dented or damaged. ➢ Before opening the rear panel, remove the plug from the power supply. ➢ If the power cable or the rear panel of the instrument is damaged, stop using it immediately, unplug it from the power supply and contact your dealer for the necessary repairs. ➢ All work on the electrical components of the instrument must only be carried out by qualified personnel.
	Danger of explosion ➢ Only install the instrument where there is no risk of explosion. ⃠ Do not keep air/solvent mixtures or explosive dusts nearby. ⃠ Never introduce materials into the instrument that are explosive or flammable at the selected operating temperature. ⃠ Never introduce materials containing flammable or explosive solvents into the instrument. ⃠ Never introduce materials into the instrument which, by sublimation or pyrolysis, give rise to the formation of flammable materials at working temperature selected.
	Danger of Poisoning and Danger of Death ⃠ Never introduce materials into the instrument whose disintegration could result in the formation of poisonous gases at the selected operating temperatures.

WARNING	
	Fire hazard ⃠ The ovens/incubators must not be used if the class2 safety thermostat has failed. ➢ If the safety thermostat check fails, stop using the oven/incubator immediately, unplug it from the power supply and contact your dealer for the necessary repairs. ➢ Always place the instrument on a work surface that is resistant up to a temperature of 100 °C. ⃠ Do not put anything under the instrument (paper, plastic film, etc.). ➢ Always connect the instrument only to a fused power supply of at least 10A. Follow the recommendations of your local power supply company electrical.

ATTENTION	
	Danger of burns ➢ The air intake cover on the back of the instrument gets hot and must not be touched during operation of the oven.
	Risk of injury and Danger of breakage ➢ Always place the instrument only on surfaces that can support its weight.
	Tipping hazard and Risk of injury ⃠ Never stack more than 2 ovens/incubators on top of each other. ➢ Always secure the 2 stacked ovens with the fixing plates supplied.
   	Risk of injury, Risk of slipping or tipping the instrument and Risk of damage to the instrument ➢ The instrument must be lifted by 2 persons. ➢ The instrument must only be transported in its original packaging. ➢ The instrument must always be lifted from below with mechanical tools (e.g. forklift truck) together with the supporting pallet. ⃠ The instrument must not be lifted directly from below with mechanical tools without supporting pallets (e.g. forklift truck). ⃠ The instrument must not be lifted or dragged by pulling the door.

3. CE marking data

Argolab instruments are designed and manufactured in compliance with Directive 2006/42/EC and other relevant EU Directives applicable at the time they are placed on the market (see facsimile below).

SUZHOU BEING MEDICAL DEVICE.CO.,LTD	**DECLARATION OF CONFORMITY UE** In accordance with Annex II A - Directive 2006/42/CE Annex IV - EMC Directive and Annex VI - Directive 2011/65/UE (RoHS)	CE

No. ISETC.002420200624

Manufacturer's Name : SUZHOU BEING MEDICAL DEVICE CO., LTD

Manufacturer's Address : NO. 108 GONGXIANG RD QIANDENG TOWN, KUNSHAN CHINA

Object of Declaration: : FORCED AIR INCUBATORS

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product names:

Product description FORCED AIR INCUBATORS

Model: BI-120FL, BI-120F, BI-200FL, BI-200F, BI-400FL, BI-400F

Serial Number: from s/n xxxxxxxxxx to xxxxxxxxxxx

Product options: This declaration covers all versions of the above products

- ***The object of the declaration describe above complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:***

EMC directive: 2014/30/UE	*Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility.*
RoHS Directive 2011/65/EU	*Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.*
LVD Directive: 2014/35/UE	*Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the on the market of electrical equipment designed for use within certain voltage limits Text with EEA relevance.*
Machinery Directive : 2006/42/EC	*DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)*

- ***and conforms with the following standards:***

EN 61010-1:2010+A1:2019

EN 61326-1:2013

EN 61000-3-2:2014

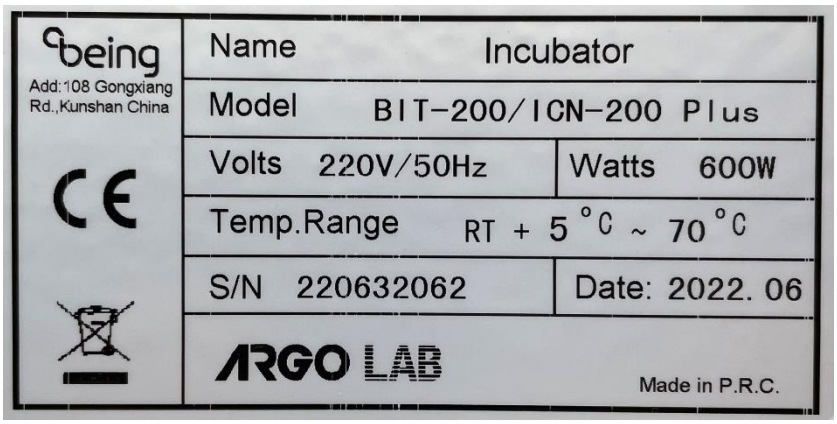
EN 61000-3-3:2013

EN 60204:2018

EN ISO 12100:2010

FAC-SIMILE

Facsimile of the CE marking plate:



4. Equipment

The instrument will be delivered complete with the following parts:

- No. 2 stainless steel grid shelves for models with a volume of less than 100 litres and no. 3 shelves for models with a volume of more than 100 litres.
- No. 4 shelf supports.
- Power cable.
- Fuses.
- Instruction manual.
- USB stick for data download.
- Test report and calibration report.

5. Transport

ATTENTION	
	Risk of injury, Risk of slipping or tipping the instrument and Risk of damage to the instrument ➢ The instrument must be lifted by 2 persons. ➢ The instrument must only be transported in its original packaging. ➢ The instrument must always be lifted from below with mechanical tools (e.g. forklift truck) together with the supporting pallet. ⃠ The instrument must not be lifted directly from below with mechanical tools (e.g. forklift truck) without the supporting pallet. ⃠ The instrument must not be lifted or dragged by pulling the door.

Transport of an already used oven/incubator

- Switch off the Argolab oven/incubator using the main switch.
- Disconnect the power cable from the socket.
- Remove the shelves.
- Thoroughly clean the Argolab oven/incubator and shelves (see Chapter 13 on p. 18).
- Dry the inside of the Argolab oven/incubator and the shelves.
- Wrap the shelves in bubble wrap.
- Place the shelves in their original packaging and then place them inside the Argolab oven/incubator.
- Pack the entire Argolab oven/incubator in its original packaging.
- Ensure that the Argolab oven/incubator does not come into contact with water during transport.
- Maintain the permissible ambient temperature during transport (-10 °C to 60 °C).

6. Conservation

- Store the Argolab oven/incubator only in closed, dry rooms.
- The permissible storage temperature is 10 °C to 60 °C, while the maximum permissible storage humidity is 85% RH in the absence of condensation.

7. First Installation

Preliminary Operations

The instrument must be installed under the following conditions:

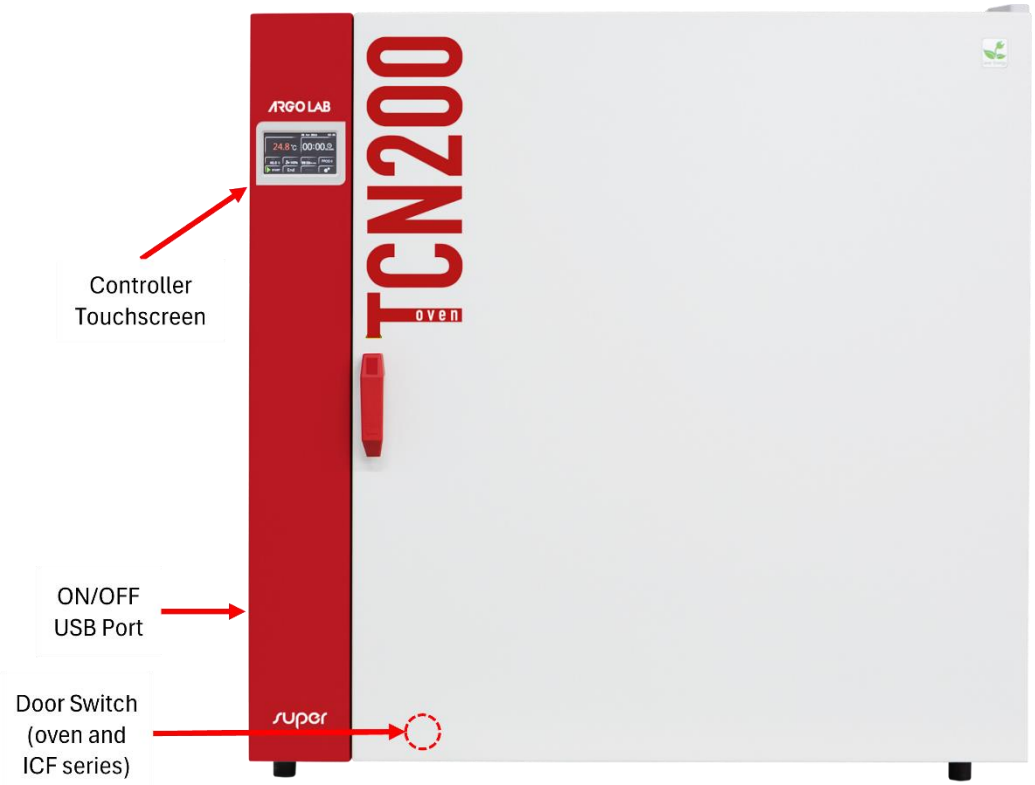
- Stable work surface with a flat, heat-resistant, dry and clean surface.
- **Minimum spacing of at least 30 cm around the instrument.**
- Ambient temperature between 10 °C and 40 °C, with relative humidity not exceeding 85%.
- Grounded power socket.
- Power supply 220/240 V - 50 Hz.

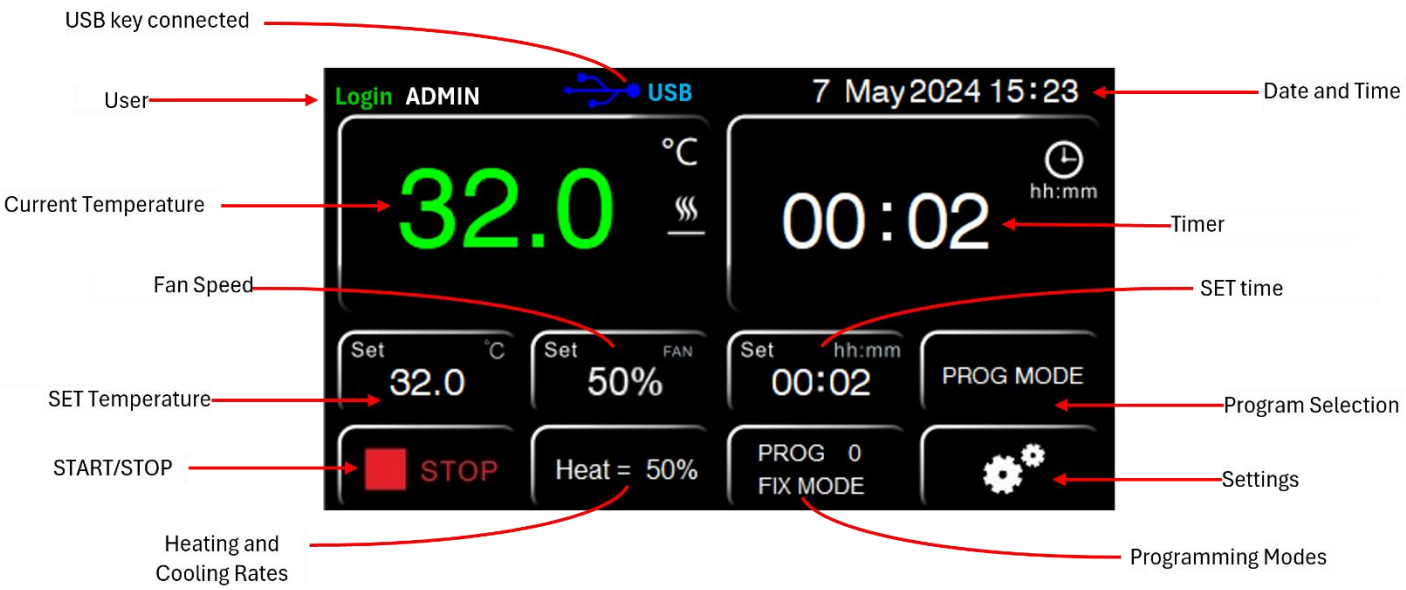
NOTICE	
	Risk of overheating - Damage to the appliance ∅ DO NOT install appliances in unventilated places. Make sure there is sufficient ventilation to disperse heat.

ATTENTION	
	Danger of overturning the upper appliance - Appliance damage ➢ When stacking two devices, place rubber pads under the four feet of the upper unit.

DANGER	
	Risk of explosion and danger to life. ∅ DO NOT operate the device in potentially explosive areas. ∅ DO NOT use explosive dust or air-soluble mixtures in the environment.

8. Instrument parts





9. Technical Specifications

Natural convection ovens	TCN-50 Super	TCN-115 Super	TCN-200 Super
Useful volume	50 litres	115 litres	200 litres
Max. temperature/ Resolution	+300/0,1°C	+300/0,1°C	+300/0,1°C
Temperature homogeneity at 150°C	± 3,5°C	± 3,5°C	± 4,0 °C
Temperature variation at 150°C	± 0,5°C	± 0,5°C	± 0,7°C
Heating time at 150°C	16 min.	18 min.	20 min.
Timer	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞
Security class	3.1	3.1	3.1
Power supply/power	230 V / 1000 W	230 V / 1900 W	230 V / 2100 W
Number of shelves (standard/max)	2/5	3/6	3/9
Minimum distance between shelves	50 mm	50 mm	50 mm
Maximum shelf load	15 Kg	20 Kg	20 Kg
External dimensions (W x D x H) mm	690 x 540 x 635	815 x 670 x 750	940 x 730 x 905
Internal dimensions (W x D x H) mm	400 x 330 x 420	520 x 450 x 495	650 x 495 x 640

Forced air ovens	TCF-50 Super	TCF-120 Super	TCF-200 Super	TCF-400 Super
Useful volume	50 litres	120 litres	200 litres	400 litres
Max. temperature/ Resolution	+300/0,1°C	+300/0,1°C	+300/0,1°C	+300/0,1°C
Temperature homogeneity at 150°C	± 2 %	± 2 %	± 2 %	± 2 %
Temperature variation at 150°C	± 0,3°C	± 0,3°C	± 0,4°C	± 0,5°C
Heating time at 150°C	20 min.	24 min.	30 min.	50 min.
Timer	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞
Security class	3.1	3.1	3.1	3.1
Power supply/power	230 V / 980 W	230 V / 1900 W	230 V / 2400 W	230 V / 3200 W
Number of shelves (standard/max)	2/5	3/7	3/9	3/10
Minimum distance between shelves	50 mm	50 mm	50 mm	50 mm
Maximum shelf load	15 Kg	20 Kg	20 Kg	20 Kg
External dimensions (W x D x H) mm	690 x 640 x 635	910 x 760 x 750	945 x 825 x 870	1285 x 820 x 1060
Internal dimensions (W x D x H) mm	400 x 310 x 415	520 x 435 x 530	645 x 495 x 650	1000 x 500 x 800

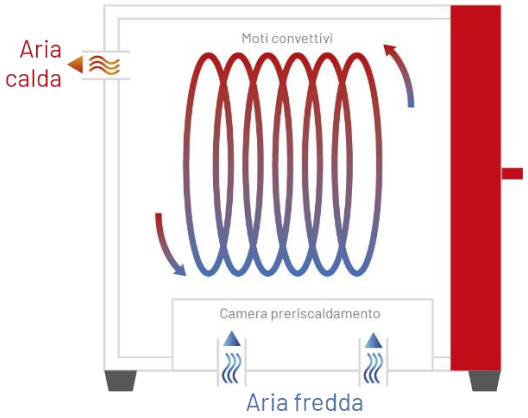
Natural convection incubators	ICN-16 Super	ICN-35 Super	ICN-55 Super	ICN-120 Super	ICN-200 Super
Useful volume	16 litres	35 litres	55 litres	120 litres	200 litres
Max. temperature/ Resolution	+70/0,1°C	+70/0,1°C	+70/0,1°C	+70/0,1°C	+70/0,1°C
Temperature homogeneity at 37°C	± 0,4 °C	± 0,4 °C	± 0,5 °C	± 0,5 °C	± 0,5 °C
Temperature variation at 37°C	± 0,3°C	± 0,3°C	± 0,3°C	± 0,3°C	± 0,3°C
Warm-up time at 37°C	18 min.	22 min.	25 min.	30 min.	35 min.
Timer	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞
Security class	2	2	2	2	2
Feeding/ power	230 V / 85 W	230 V / 125 W	230 V / 250 W	230 V / 350 W	230 V / 600 W
Number of shelves (standard/max)	2/3	2/5	2/5	3/7	3/9
Minimum distance between shelves	25 mm	30 mm	50 mm	50 mm	50 mm
Maximum shelf load	5 Kg	7.5 Kg	10 Kg	10 Kg	10 Kg
External dimensions (W x D x H) mm	530 x 450 x 370	620 x 510 x 440	660 x 600 x 500	780 x 700 x 610	875 x 760 x 755
Internal dimensions (W x D x H) mm	270 x 255 x 230	360 x 230 x 300	400 x 385 x 360	520 x 500 x 460	610 x 575 x 600

Forced air incubators	ICF-55 Super	ICF-120 Super	ICF-200 Super	ICF-400 Super
Useful volume	57 litres	120 litres	200 litres	400 litres
Max. temperature/ Resolution	+80/0,1°C	+80/0,1°C	+80/0,1°C	+80/0,1°C
Temperature homogeneity at 37°C	± 0,3 °C	± 0,4 °C	± 0,4 °C	± 0,5 °C
Temperature variation at 37°C	± 0,1°C	± 0,1°C	± 0,2°C	± 0,3°C
Heating time at 37°C	30 min.	40 min.	45 min.	55 min.
Timer	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞	99:59 hh:min and ∞
Security class	3.1	3.1	3.1	3.1
Power supply/power	230 V / 350 W	230 V / 600 W	230 V / 700 W	230 V / 1500 W
Number of shelves (standard/max)	2/5	3/7	3/9	3/10
Minimum distance between shelves	50 mm	50 mm	50 mm	50 mm
Maximum shelf load	20 Kg	20 Kg	20 Kg	20 Kg
External dimensions (W x D x H) mm	690 x 620 x 650	810 x 760 x 750	945 x 825 x 870	1285 x 820 x 1060
Internal dimensions (W x D x H) mm	400 x 350 x 415	520 x 435 x 530	645 x 495 x 650	1000 x 500 x 800

10. Operation Modes

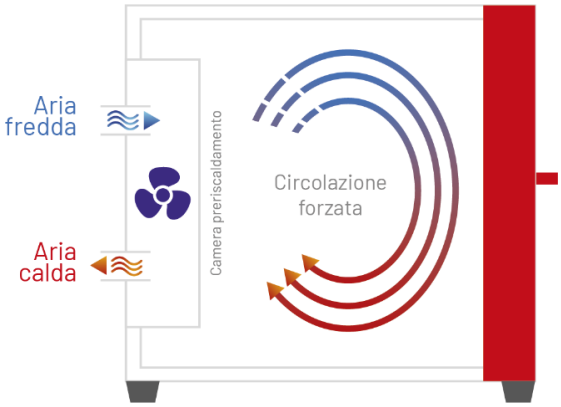
Natural Convection Ovens / Incubators - TCN / ICN

TCN and **ICN** series instruments operate with natural convection. This means that, inside the chamber, heat spreads through the natural convection motions created by heat exchange between cold and hot air. In ArgoLab instruments with natural convection, there are manual valves for proper air recirculation.
IMPORTANT: ArgoLab instruments are supplied with the valves open; it is recommended not to close them in order not to impair performance. Depending on the model, the lower valves may or may not be present.
WARNING: In ovens, the heating element is located at the bottom of the instrument. **Contact between the bottom and any sample or material is prohibited to avoid risk of overheating and damage.**



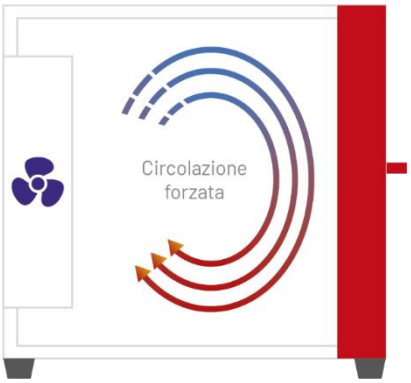
Forced Air Ovens - TCF

TCF series instruments operate with forced ventilation. This means that, in the inner chamber, heat is distributed evenly thanks to a dedicated fan. In the ArgoLab forced-air heaters (**TCF** series), there is an adjustable manual valve for the entry of cold air, aimed at the correct exchange of air inside the chamber.
NOTE: ArgoLab ovens are supplied with the valve open; it is recommended not to close it completely in order not to impair the performance of the instrument.
NOTE: In the **TCF 400** model there are 2 valves for discharging hot air (located at the top) and 2 valves for inlet of cold air (located at the bottom). Each exhaust valve is connected to a fan.



Forced Air incubators - ICF

ICF series instruments are forced-ventilated.
This means that, in the inner chamber of the instrument, heat is distributed evenly through the fan.

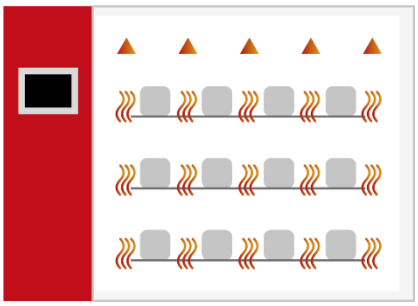


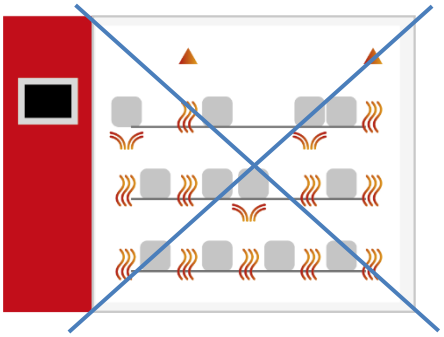
11. Introduction of samples into the oven/incubator

DANGER	
	Danger of explosion and Danger of death ⃠ Never introduce materials into the instrument that are explosive or flammable at the selected operating temperature. ⃠ Never introduce materials containing flammable or explosive solvents into the instrument. ⃠ Never introduce materials into the instrument which by sublimation or pyrolysis result in the formation of flammable materials at the selected operating temperature.
	Danger of Poisoning and Danger of Death ⃠ Never introduce materials into the instrument whose combustion could result in the formation of poisonous gases. ⃠ Never introduce materials into the instrument that can react with moisture and form explosive gases.

Uploading Samples

To ensure optimal air circulation within the ArgoLab oven/incubator chamber, it is recommended to leave empty spaces between the samples. For proper convection, it is important not to place samples in contact with the walls of the chamber. **Under no circumstances should any samples be placed on the bottom of the internal chamber of the instrument and in front of the fan.** This could impair operation and cause the samples or the instrument to overheat.





12. Operation

Switching on the instrument

Connect the power cable to a grounded power outlet. Switch the instrument on using the **ON/OFF** button. The button and the display will light up, and the display will show the initialisation sequence.

IMPORTANT:
Once switched on, the display will perform the initialisation sequence.

At the end of start-up, the instrument will enter **logout mode**: **user authentication will be required for any type of operation**.
This will happen every time the power is switched on and off.

The tool supports **3 access levels** with different authorisations:

1. **User**
2. **Manager**
3. **Admi**n

Before you can configure and use the tool, you will need to **enter the** correct **user credentials** (see *section 'Multi-User Management - Login/Logout'*).

There are 6 user users and 2 ***manager*** users.
(see *section 'Multi-User Management - Change User / Password'* for more details).

The factory passwords for **User** and **Manager** are shown in the table below, while the password for the **Admin** user is reserved for technical service.

User	Password
User1	1
User2	2
User3	3
User4	4

User	Password
User5	5
User6	6
Manager1	11
Manager2	12

Once the appropriate credentials have been entered, the tool will be ready for configuration and use (see *section 'Multi-User Management - Login/Logout'*).

To change passwords or to change users *see section 'Multi-User Management - Change User / Password'.*

Multi-user management - Login / Logout

When switched on, the instrument starts in **Logout mode**.
To access the operational functions and use the tool, it is necessary to **log in** with one of the users listed in the previous paragraph.

To log in:

1. Select the main menu icon located in the top left corner of the screen, next to the "logout" text(- - -), or tap on the two upper boxes dedicated to temperature and time.

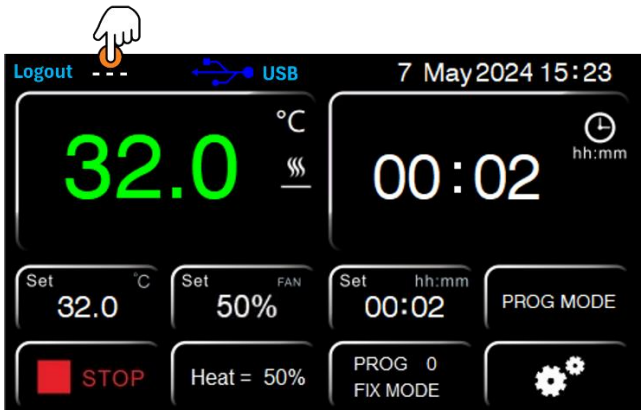
2. Select the desired user level from User or Manager.

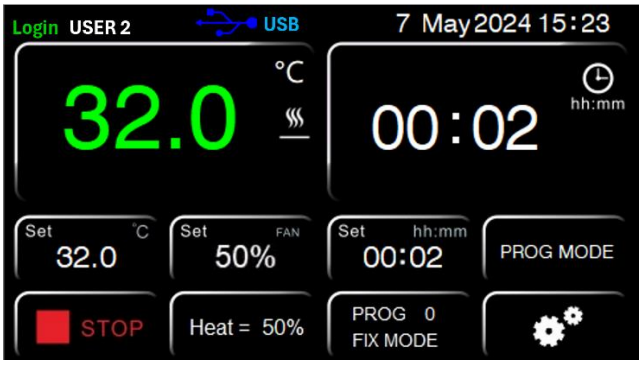
3. After selecting the level, choose the corresponding operator. The available operators are:
   a. User1, ..., User6
   b. Manager1 or Manager2.

4. Enter the password (see table above)

Once the selection is complete, the tool will be ready for use and the word **Login** will appear in the top left-hand corner.

Please refer to the screenshots below for a detailed view of the steps.





Multi-user management - User / Password change

The system allows the currently logged-in user to change his or her password securely and independently. This function is designed to guarantee privacy and secure access to the system.

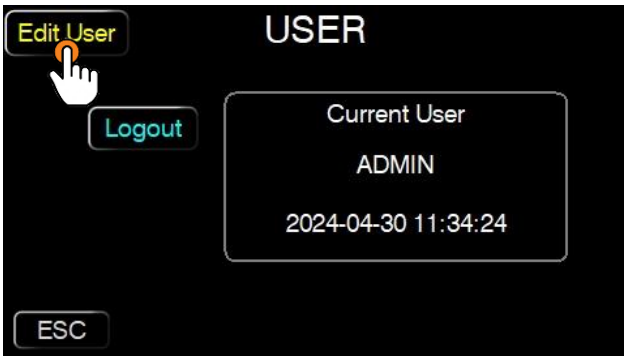
TECHNICAL NOTE: The supplier cannot be held liable if the user changes all passwords and subsequently does not remember them.
Care should therefore be taken when managing passwords.

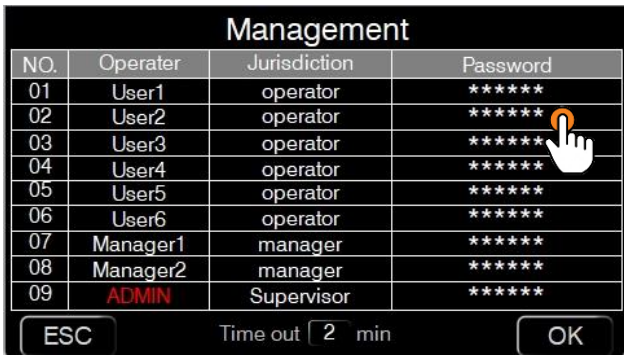
To **change your password,** follow the steps below:

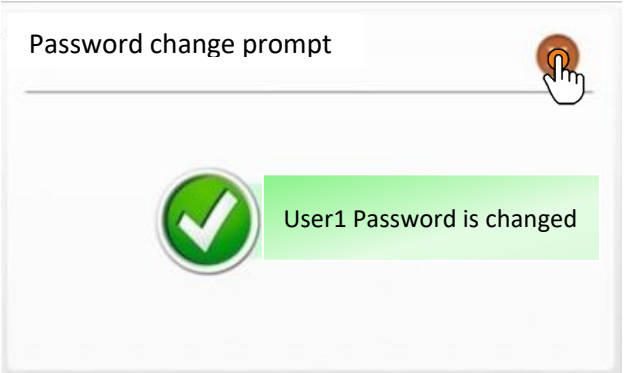
1. Click on the username displayed in the top left-hand corner.
2. Select Edit User.
3. Click on the password for the currently logged-in user.
4. You will now be prompted to enter the password of the logged-in user.
5. Enter your current password and, in the next line, enter your new password.
6. Press OK to confirm the change.
7. Once completed, exit the configuration by clicking on the red icon in the top right-hand corner.

To **change users**, you must first log out of your current account and then log in with the new user's credentials.
Follow the steps below to complete the procedure:

1. Click on the username displayed in the upper left-hand corner of the screen.
2. Select the Logout option.
3. Once the operation has been completed, it will be possible to access the system using the new user's credentials.





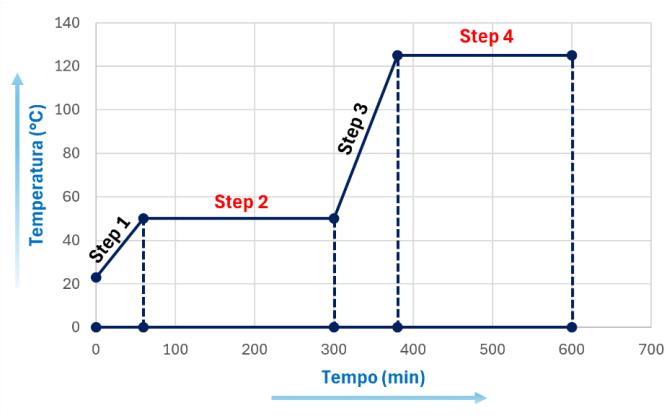


Instrument operating modes (programmes)

The instrument can operate in **3** distinct modes (**basic**, **programme**, **multi-step**):

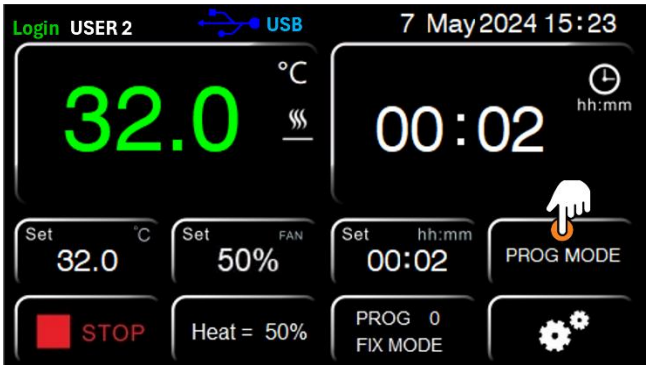
- **Basic** (**PROG 0**) - **the simplest**, single-step **programme**.
  In this mode, you set a SET temperature, an operating time (with 00:00 to indicate an indefinite time) and the fan speed (if present).
  The instrument will reach and maintain the temperature for the set time.

- **Programme** (**PROG 1...8**) - 8 storable programmes, each consisting of up to 8 steps.
  The programmes (PROG 1, ... , PROG 8) support the **TEMPERATURE RAMPS** function:
  a. The **odd numbered** steps (first, third, etc.) are used to set the heating ramp, i.e. how long you want to reach the set temperature.
  b. The **even-numbered** steps (second, fourth, etc.) are used to set the holding time at the desired temperature.
  For each step, it will be necessary to set the temperature, time and fan speed (if any).



- **Multi-step** programme (PROG 9) - this programme allows all the stored programmes to be executed sequentially, for a maximum total of 64 consecutive steps.
  Like its predecessors, the multi-step programme (PROG 9) handles temperature ramps, concatenating steps from the first in PROG 1 up to the limit required by the user.

In all modes, the temperature, timer and fan speed (if present) can be set for each working step.To select the type of programme, click on '**PROG MODE**'.



IMPORTANT: In the event of an unforeseen power failure or shutdown via the ON/OFF button, the system will again request user authentication when resuming operation.

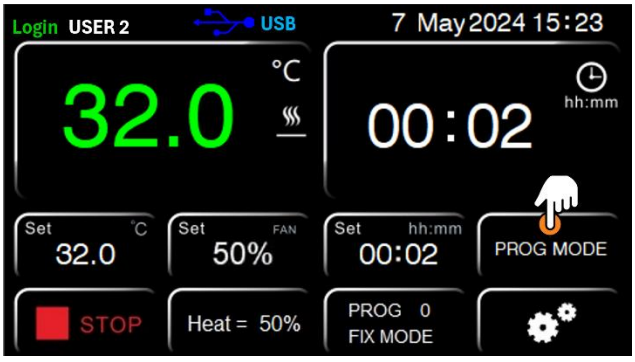
Basic Mode - PROG 0

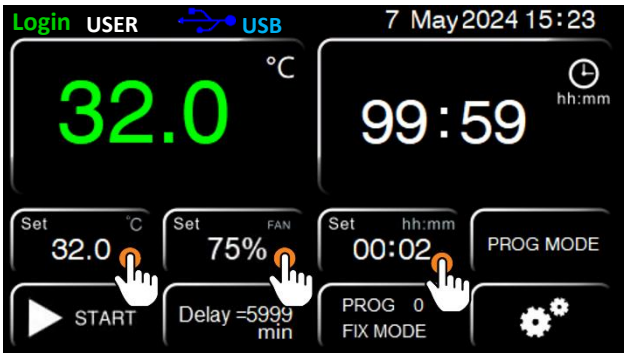
PROG 0 is the simplest and most intuitive programme to use, designed for single-step operations. In this mode, the user can set a desired temperature (**SET**), an operating time and, if the instrument is equipped with forced air, the fan speed.

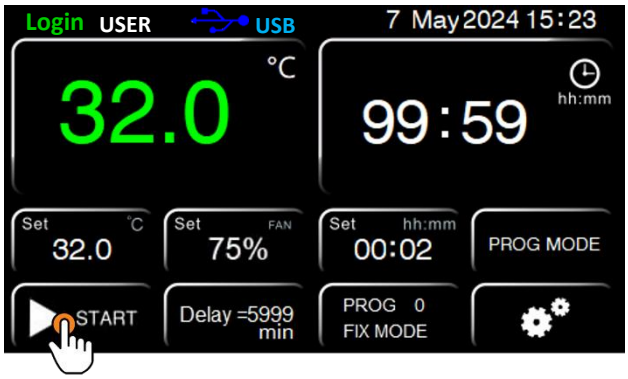
To change the **temperature**, **time** and **fan** speed (if present), select the corresponding fields in the main menu, marked '**Set**'. Once a field (temperature, time or fan) has been selected, it will be possible to modify it using the instrument controls. Once the desired values have been set, press **OK** to confirm the changes.
NOTE: If the time is set to **00:00**, the operating cycle will be continuous, with no time limit, until manually interrupted.

Once started, the instrument will reach the set temperature and maintain it for the specified duration, facilitating simple and straightforward operations without the need to configure multiple steps.

To call up this programme, simply press **PROG MODE**, select **0** under **CHOOSE PROGRAM**, and confirm with **ENTER**.
At this point, the programme will be ready for execution.
Press **START** to start. Press **STOP** to interrupt the work cycle.







Programme Mode - PROG 1, ..., PROG 8

These programmes offer the possibility of storing up to eight different operating sequences, each consisting of a maximum of eight steps.

RAMPS FUNCTION
The **odd numbered** steps (1, 3, 5, etc.) are used to set the **heating ramp**, i.e. to define the time required for the instrument to reach the desired temperature.
In these steps, the user will set how slowly or quickly the instrument should heat up to the preset temperature value. (example at the bottom of the page)

The **even-numbered** steps (2, 4, 6, etc.), on the other hand, serve to **maintain the temperature** reached for a certain period.
In these steps, the duration of temperature maintenance is set for continuous and stable operation. (example at the bottom of the page)

NOTE: A heating **ramp that is too short** (e.g. 10 minutes to go from room temperature to 150°C), if it cannot be completed in the allotted time, will still be completed within the capabilities of the instrument. However, this may trigger the **low temperature** alarm. For details, see '*Parameter AL*' in '*Settings and Parameters*'.

NOTE: the average heating time to reach 150°C from room temperature is approximately 30 minutes.

For each step, both odd and even, it will be necessary to **define the following parameters**:
- Desired **temperature**
- Warm-up or holding **time**
- **Fan** speed, if any

To select and recall one of the storable programmes PROG **1** to **PROG 8**, from the main menu select "**PROG MODE**" and select the desired programme (number between **1** and **8**) under **CHOOSE PROGRAM**. Confirm with **ENTER**.
This will display the table for the selected programme (example on the following page).
Press **OK** to confirm your choice and return to the initial menu.
This will call up the chosen programme, ready to be executed.

To set and change the previously selected programme and thus change temperatures, times and fan speed (if any), click on **PROG** in the main menu and fill in the table (example on the following page).

To launch the programme, from the main menu press **START**.

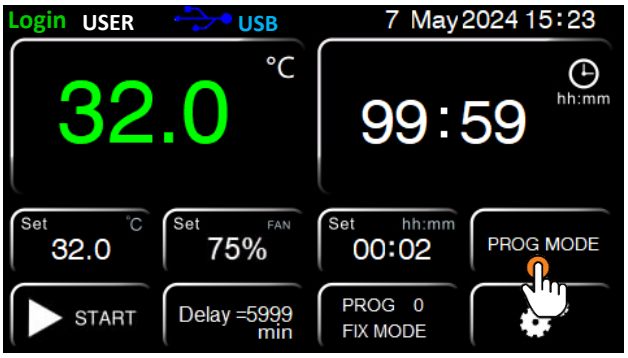
PROGRAMME INTERRUPTION: If you want to interrupt the programme at the n-th step, enter **0** in the time value at the (n+1)-th step. (example below)

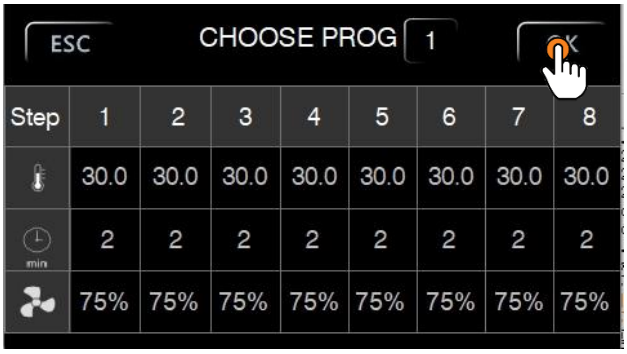
Example: *if I want to work with 4 temperature steps where I want to reach a temperature of 100.0°C in 2 hours, maintain it for 10 hours and then in turn reach a temperature of 175.0°C in 2 hours and maintain it for 7 hours, I will have to set the programme as follows*

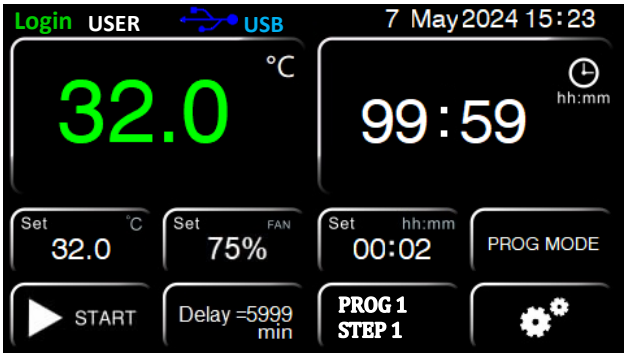
Step	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Temperature [°C]	100.0°C	100.0°C	175.0°C	175.0°C	#	#	#	#
Time [min]	120 min	600 min	120 min	420 min	**0**	#	#	#
Fan Speed	High	High	Medium	Medium	#	#	#	#

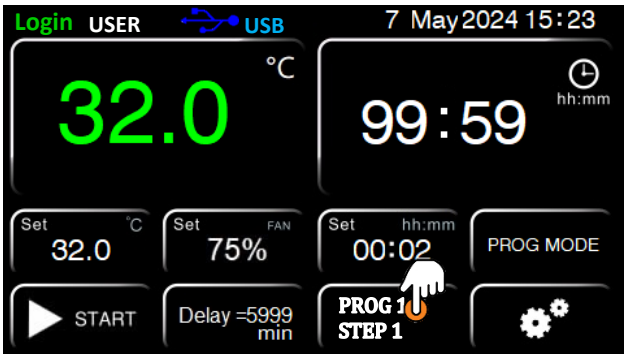
The value '#' in the programme table is irrelevant for the execution of the above programme. Only the value 0 entered in the time at the next programming step will interrupt the programme.

Example: Selection and configuration of programme No. 1 (PROG 1).





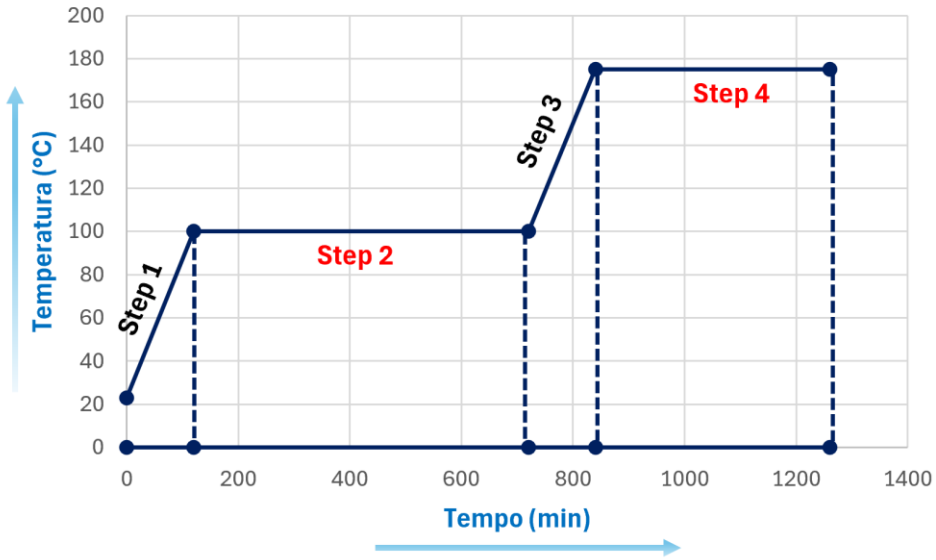




In the last step enter, step by step, the settings required by the user such as temperature, time, fan speed (optional, where present).

IMPORTANT: Pay attention to the warm-up time of the odd-numbered steps (1,3,5,...) as described in the previous paragraph.

Example: graphical display of program no.1 (PROG 1)



Step	1	2	3	4	5	6	7	8
Temperature [°C]	100.0°C	100.0°C	175.0°C	175.0°C	#	#	#	#
Time [min]	120 min	600 min	120 min	420 min	**0**	#	#	#
Fan Speed	High	High	Medium	Medium	#	#	#	#

Here is the reference table with the average heat-up rate, expressed in °C/min, for each oven.
During odd-numbered steps, consider this value **to adjust the minimum heating time needed to reach the desired set point**:

Instrument	Heat-up rate [°C/min]
TCN 30	8,2 °C/min
TCN 50	3,6 °C/min
TCN 115	4,0 °C/min
TCN 200	3,0 °C/min
TCF 50	
TCF 120	3,8 °C/min
TCF 200	3,2 °C/min
TCF 400	1,4 °C/min

Example:
if I want to set a heating ramp on a TCN 50 oven to go from Ambient Temperature (~25.0°C) to 100.0°C, I first need to calculate the temperature difference (ΔT):

$$\Delta T = (100.0 - 25.0)°C = 75.0°C$$

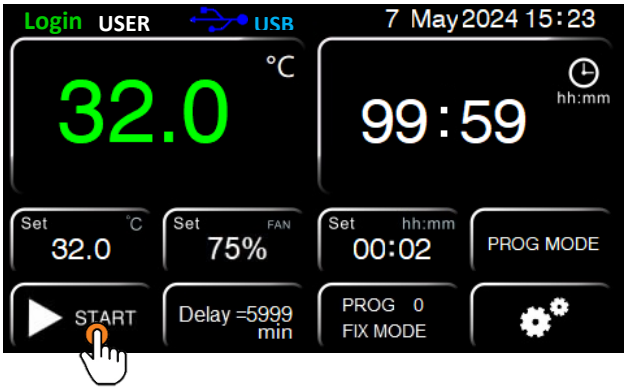
Then, divide the obtained value by the average heat-up rate (Heat-up rate TCN 50):

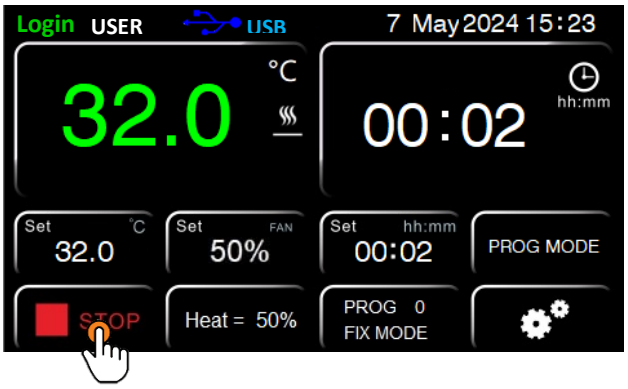
$$Heating\ Time = \frac{\Delta T}{\text{"Heat} - \text{up rate"}} = \frac{75.0°C}{3{,}6°C/min} = 21\ minutes$$

The resulting time (21 minutes) represents the minimum time required to reach the set temperature (100.0°C) from the initial temperature (25.0°C). Below this interval, the device will not be able to execute a faster heating ramp. Therefore, you should set a time equal to or greater than this value (21 minutes).

Start/Stop a programme and Set parameters

To start or stop a programme, press the **START** button for start and **STOP** for stop.



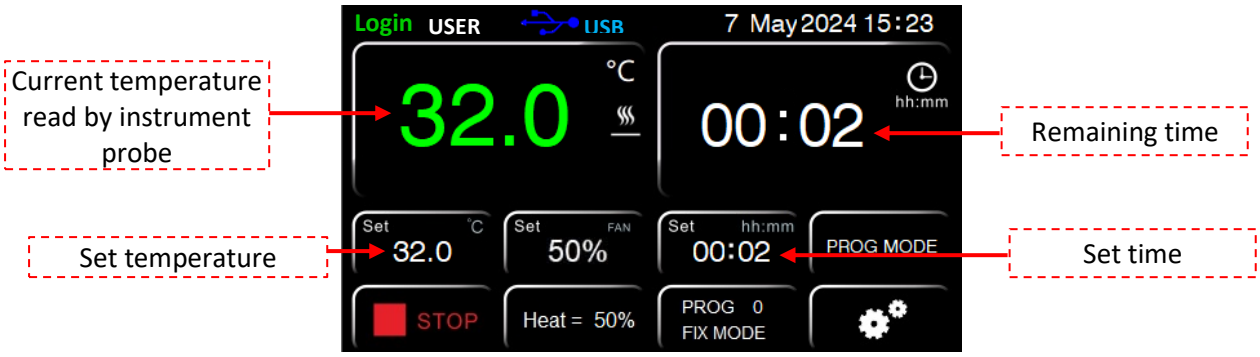


The temperature and duration of the operating cycle (Set) will be displayed on the main menu screen.

For the **Basic Programme** (**PROG 0**), the set time countdown will start as soon as the instrument reaches the set temperature (Set Point):

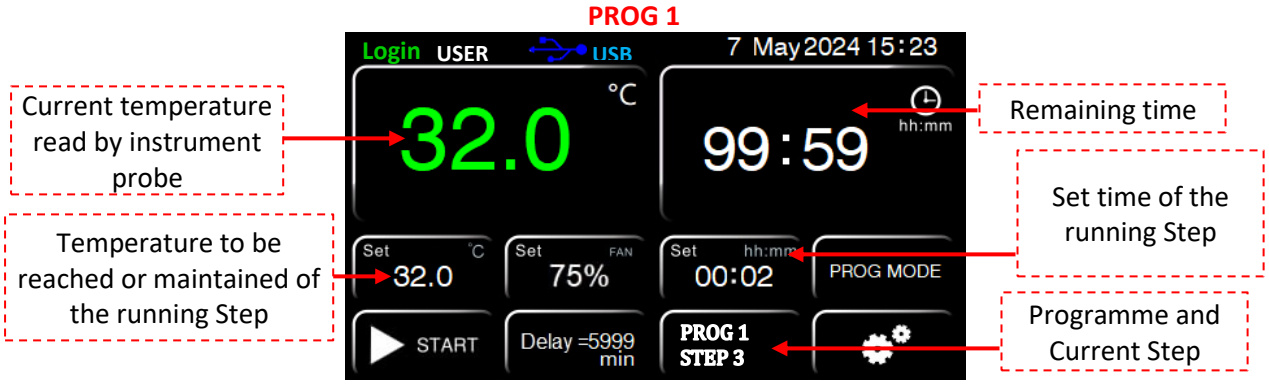
1. The temperature read by the instrument probe and the time remaining will be displayed in the upper panels (for a cycle of indefinite duration, **00:00** will be displayed)
2. The set temperature and time (Set) will be shown on the display in the boxes labelled Set.

PROG 0



For **Programmes 1 to 8**, the display will show the times and temperatures for the current step. As for Programme 0, these parameters will be shown in the appropriate spaces in the display.

PROG 1



NOTE: During the odd numbered steps, dedicated to temperature ramping, the temperature displayed in the Set area will gradually increase until the instrument completes the warm-up ramp.

13. Settings Menu

In the main menu, the **Settings** icon is located at the bottom left.
From here, you access three levels of settings, divided by user type: **User**, **Service** and **Admin**.

1. **User User**: has exclusive access to User level settings.
2. **User Manager**: can access both User and Service settings.
3. **Admin user**: has full access to all settings, including User, Service and Admin levels.

1. User Settings submenu

The User submenu includes the following options:

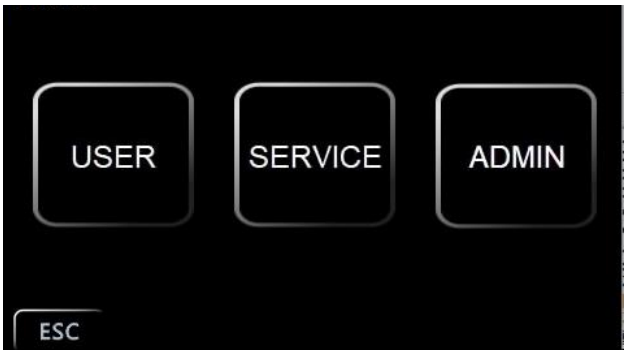
- **Data Log**: display of all values recorded by the instrument, with the possibility of customising the recording interval.
- Graph: real-time graph with recorded value history.
- Alarm Log: Log of activated alarms.
- **Operation** Log: log of operations performed on the unit.

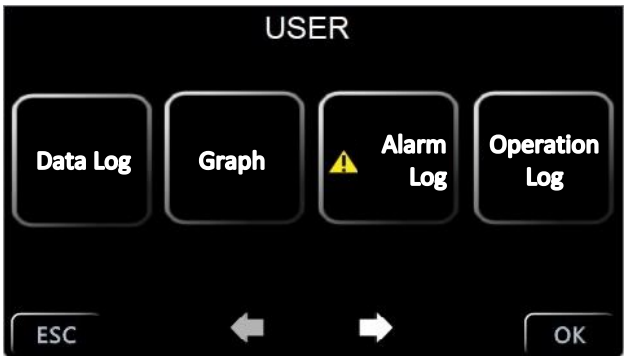
Click on the arrow pointing to the right to access the settings of:

- **Date and Time**.
- Sampling **Rate** (customisable sampling interval).

Further clicking on the arrow, you will find the parameters related to:

- Delay (**dy**, switch-on delay).
- **Cycle** (**Cy**, number of programme repetitions).





2. Service Settings submenu

To access the Service submenu, you must be logged in as Manager or Admin.
Access requires the entry of a **password**, which by default is 3.
This submenu contains the instrument's calibration parameters, which are presented in the table below describing their nomenclature and name.

PARAMETER	DESCRIPTION
tm	Temperature limit for sample protection
Po	Restart mode after power failure
AL	Temperature alarm threshold
Pb	Temperature offset at one point
PK	Temperature offset over the entire ramp
PA	Temperature offset on room temperature sensor

3. Admin Settings submenu

The Admin submenu allows access to factory parameters, reserved exclusively for service personnel for advanced maintenance or structural changes to instrument settings.

User Settings submenu

The **User** submenu includes the following applications:

1. **DATA LOG**: allows the display of all values recorded by the instrument, including the date and time of each recording, the set temperature (Set Point) and the temperature actually measured by the internal datalogger. Data can be exported to a **USB** stick (supplied) for further analysis or archiving.

2. **GRAPH**: shows a real-time graph representing the temperature trend against time. The graph shows both the set curve, i.e. the set temperature, and the temperature actually recorded by the system, allowing an immediate visual comparison.

3. ALARM LOG: provides a detailed history of all alarms triggered by the instrument, with the possibility of exporting the log to a **USB** stick (supplied).

4. **OPERATION** LOG: records all operations performed on the instrument, similar to the alarm log. This log can also be downloaded to a **USB** stick (supplied) for a thorough review of the activities performed on the unit.

Sampling Rate
The **Sampling** Rate allows you to set the recording frequency between one measurement and the next with a sensitivity of 1 minute. It is editable.

Delay function
The **Delay** function, configurable via parameter **dy**, allows a delay to be set when the operating cycle is turned on, with a sensitivity of 1 minute.
During the delay, the remaining time will be shown on the display. To activate the delay and start the programmed cycle, the START button must be pressed. Note that to repeat the delay the next time the instrument is switched on, it will be necessary to reset it manually each time.

Repetition of selected programme (cycle)
The **Cycle** function, configurable via the **Cy** parameter, allows the selected programme to be repeated cyclically for a predefined number of times.
Cy=0 repeats the cycle infinitely.

Service Settings submenu

Access to the **Service** submenu is restricted to users with **Manager** or **Admin** privileges.
To log in, enter the default **password, equal to 3**, and press **ENTER**.
Within the Service submenu, it is possible to manage the instrument's calibration parameters, which allow adjustment and verification of operational accuracy in accordance with specified standards.

Admin Settings submenu

The **Admin** submenu allows access to factory configuration parameters, intended only for qualified technical personnel for specialised maintenance or advanced adjustment of instrument settings.

14. Instrument Parameters

Temperature limit for sample protection (tm)

The instrument has a maximum operating temperature limitation function, designed to protect samples from any errors in temperature setting. This function allows you to define a **maximum temperature threshold** beyond which the instrument cannot exceed.

To activate this protection, set the desired temperature limit in degrees Celsius/ Fahrenheit depending on the set unit of measurement. Once this threshold is reached, the instrument will cut the power to the heating element and activate an alarm, preventing further temperature increases.

NOTE: It is important to consider that a momentary temperature peak may occur during the initial heating phase. It is therefore advisable to set the limit taking this possible overspike into account.

Application example: If the set point temperature is set at 100.0 °C and the upper limit (tm) is set at 75.0 °C, the instrument will attempt to reach 100.0 °C, but when 75.0 °C is reached, the alarm is activated and the heating element is disabled until the temperature falls below the set limit.

This function is particularly useful in shared environments, where several users might accidentally set temperatures that are not suitable for the samples inside the instrument.

Restart mode after power failure (Po)

The mode in which the instrument resumes operation after a power failure can be set:

Po VALUE	DESCRIPTION
0	After the power supply is restored, the instrument does not automatically restart the heating cycle, requiring a manual restart to resume operation.
1	After the power supply is restored, the instrument automatically resumes operation, starting from the beginning of the previously interrupted heating cycle.
2	After the power supply is restored, the instrument automatically resumes operation exactly from the point in the heating cycle where it was interrupted.

Temperature limit for over- and under-temperature alarm (AL)

It is possible to set a **differential** temperature (AL) value above/below which the instrument will trigger an **over-** or **under-temperature** alarm. This value applies both above and below the set temperature (set point).

Example: If the set temperature is 125.0°C and AL = 5.0°C, the instrument will go into alarm (audible and visual) if the temperature exceeds 130.0°C (125.0°C + 5.0°C) or falls below 120.0°C (125.0°C - 5.0°C).

NOTE: Although modifiable, this value is factory preset and calibrated according to the type of instrument (natural/forced convection heater or incubator).
It is not recommended to change it, as temperature fluctuations are normal, especially in natural convection models, and a too low AL value could cause false alarms.
AL applies to all set temperatures and during temperature ramps in programmes 1 to 8.

Temperature Offset - Calibration (Pb and PK)

The instrument allows the user to set offset values, i.e. calibrations, on one temperature point, on the entire temperature ramp and on the ambient temperature ramp.

TECHNICAL NOTE: These values are already factory-calibrated with Accredia-referenced instruments. It is recommended not to change them unless there are discrepancies between the instrument readings and those of a certified digital thermometer.

PARAMETER	DESCRIPTION
Pb	By modifying this parameter, it is possible to correct the reading of the PT100 temperature sensor inside the instrument to only one temperature point. The correction will therefore be referable to only one specific point.
PK	By modifying this parameter, it is possible to correct the reading of the instrument's internal PT100 temperature sensor over the entire temperature ramp, i.e. to vary the inclination of the reading ramp of the sensor itself.
PA	By modifying this parameter, it is possible to correct the reading of the PT100 room temperature sensor installed on the instrument (refrigerated versions only) to a single temperature point. The correction will therefore be referable to only one specific point.

NOTE: For quick correction of temperature readings on Argolab ovens/incubators, it is recommended to only change the Pb offset.

To correct the Pb offset, follow the instructions:

1. Calculate the temperature difference between the temperature measured by the external thermometer and the temperature read on the instrument.
   NOTE: It is recommended to take average values at regular time intervals (e.g. 10 measurements, one every 2 minutes).

2. Algebraically add the value of the difference just calculated to the value of the current parameter Pb of the instrument (take into account the sign)

3. Wait at least one hour and proceed with a calibration check.

4. Repeat the operation if the result is not sufficient.

Example:
Temperature measured by outside probe = 35.5°C
Oven/incubator temperature = 37.0°C
Temperature difference = (35.5 - 37.0) °C = - 1.5 °C
Instrument parameter Pb value = 2.3
Calibration = -1.5 + 2.3 = 0.8

15. Data download via USB key

The instrument offers the possibility of recording up to 200.000 data, which can be easily downloaded via a USB key.

Setting the data acquisition interval

By default, the instrument records data every minute. The internal memory can store up to **200.000 data**. A **.txt** file will be created on the USB stick for each day of logging, which will be stored in monthly folders.

To download data onto a USB stick, follow these steps:

1. Select **Settings**, then **User** and then **Data Log**.
2. Click on '**Download**' at the bottom left.
3. Enter the **time interval of** the data you want to download (From...To...).
4. Press **OK** to confirm and start downloading.
5. When the download is complete, exit the window by clicking on the red icon in the top right-hand corner, as shown in the figure.

Make sure the USB stick is properly inserted before starting the download process.

Data download to USB key

To change the data acquisition interval, please refer to the **User submenu** and follow the instructions provided.

NOTE: The instrument's internal memory can hold up to 200.000 records. When this limit is reached, the instrument will begin to overwrite existing data, progressively deleting the oldest ones to make room for the new ones.
The recording frequency affects the overall duration of the storage capacity.
For example, with a recording frequency set to 60 minutes, the memory may contain:

200.000 data × 60 minutes equals 200.000 hours, or approximately 8,000 days or 22.8 years.

NOTE: If a USB stick is connected to the instrument, recordings are also saved directly on it, in addition to the internal memory. The memory limit of 200.000 data still remains, but the USB stick acts as an additional external memory. This allows for continuous recording well in excess of 200.000 data, providing extended storage capacity.

Downloading alarm and operation logs to USB key

In addition to temperature data, it is also possible to download **alarm** and **operation** logs. To do this, you follow the same procedure as described above for downloading data to a USB stick. This allows complete monitoring of the instrument's activities, providing secure and detailed control for verification, diagnostics and preventive maintenance purposes.

16. Door switch

The **door switch**, present on all forced-air heaters and incubators, automatically disconnects the heating element and fan (if present) when the door is opened.
This function facilitates the loading and unloading of samples, preventing excessive overheating of the internal chamber in the event of prolonged opening of the door, while maintaining the operational safety of the instrument.

17. Temperature safety device

Every ArgoLab instrument, whether oven or incubator, is equipped with an electronic over-temperature limiter conforming to Protection Class 2 according to DIN 12880.

ArgoLab ovens of the TCN and TCF series, as well as forced-air incubators of the ICF series, are equipped with an additional adjustable electromechanical protection.
This electromechanical safety device, classified as **Class 3.1** according to DIN 12880, is installed inside the left side panel of the instrument.
The device, which can be manually adjusted by the user, has the function of mechanically disconnecting the heating element when the temperature exceeds the temperature set on the device's controller.

18. Sterilisation at 130.0°C for ICF Forced Incubators

The ICF series **forced incubators** offer the possibility of setting a **sterilisation cycle at 130.0°C for a maximum duration of 10 minutes**.

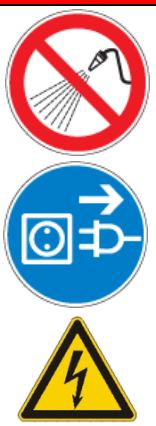
Although the operating limit of the instrument is set at 80.0°C, it is possible to run a sterilisation cycle at 130.0°C for short periods.
To activate this function, follow the steps below using the basic programme PROG 0:

- Set the temperature set point at 130.0°C.
- Define the working time for a **maximum duration of 10 minutes**.

WARNING: Exceeding the 10-minute time limit may cause irreparable damage to the mechanical components of the instrument and its spare parts. The manufacturer accepts no liability for any damage resulting from use not in accordance with the operating specifications described.

19. Cleaning and Maintenance

Before carrying out any cleaning operations, switch off and disconnect the instrument from the power supply. Proper maintenance and cleaning of the instrument ensures its good condition. The internal chamber of the instrument is made of stainless steel (INOX), allowing the use of various neutral detergents. Avoid aggressive or corrosive substances. Apply the cleaning agent with a soft cloth, rinse with distilled water and dry completely. For maintenance of specific components, refer to the manual or contact technical support.

DANGER	
	**Danger of electric shock and Danger of death** ∅ DO NOT spray water or detergents on interior and exterior surfaces. ∅ Turn off the main switch and disconnect the mains plug before cleaning. ➢ Dry the device completely before switching it on again.

It is recommended to clean internal and external surfaces with a normal all-purpose cleaner sprayed on a soft, dampened cloth, so that it is not concentrated. Before proceeding with cleaning or any decontamination, the user must ensure that the method adopted does not damage the instrument.

WARNING	
	Danger of corrosion - Damage to equipment ∅ DO NOT use cleaning agents containing halogen acids. ∅ DO NOT use neutral detergent on other surfaces (e.g. on the galvanised parts of the hinges or on the rear wall of the outer structure).
	Eye contact - Eye damage caused by chemical burns ∅ DO NOT discharge into the sewage system. ➢ Wear protective goggles.

20. Troubleshooting

This section provides solutions to common issues that may occur when using ArgoLab ovens and incubators. If the issue persists after performing the suggested checks, contact your distributor for technical assistance.

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1. The device does not power on (the display does not illuminate)

If the device does not power on and the display remains off, the issue may be related to a power supply failure or a blown fuse.

Possible Causes and Solutions:

- Ensure that the **power cable is correctly connected** to both the power outlet and the rear power socket of the device.
- Verify that the **power outlet is supplying voltage** by testing it with another electrical device.
- Inspect the **fuse located in the rear compartment**. If the fuse is blown, replace it with the spare fuse provided with the instrument.
- If the issue persists, contact the **distributor**.

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2. The device does not heat up

If the device does not reach the set temperature, possible causes include incorrect cycle activation or safety parameters preventing heating.

Possible Causes and Solutions:

1. **Verify the set temperature:** Ensure that it is at least **5°C higher** than the ambient temperature. If not, increase the setpoint.
2. **Check that the heating cycle has been started:**
    - **Plus Version:** Ensure that the display shows the **"RUN"** indication in the lower-left corner. If not, press and hold the **Start/Stop** button for **4 seconds** to initiate the cycle.
    - **Super Version:** Press the **Start** icon in the lower-left corner. If the cycle is active, the **Stop icon (red square)** will be visible.
3. **Verify the sample protection parameter (Tm):**
    - **Plus Version:** Press and hold **SET + SHIFT** for 4 seconds, enter the password **0003**, and check the **Tm** parameter. If this value is lower than the set temperature, increase it by at least **3°C** above the setpoint.
    - **Super Version:** Enter the **Service** menu, enter the password **3**, and check the **TM** parameter. If it is too low, adjust it accordingly.

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3. The fan is not operating (forced ventilation models only)

If the fan does not activate, the issue may be due to the heating cycle status or the door being open.

Possible Causes and Solutions:

- **Ensure that the heating cycle is active** (refer to the previous section).
- **Check that the door is fully closed:** In forced ventilation models, opening the door **automatically deactivates the fan** as a safety feature.
- If the fan does not start even when the cycle is running and the door is closed, **contact the distributor**.

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4. The display shows 4 squares [□□□□] instead of the temperature (Plus Version only)

This issue indicates that the temperature sensor is not being detected by the device.

Solution:

- Contact the **distributor** immediately for technical support.

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5. The temperature fluctuates excessively

If the temperature does not stabilize and fluctuates significantly, the most common causes are **overloading, improper sample distribution, or incorrect installation location**.

Possible Causes and Solutions:

1. **Check sample arrangement:** Samples must be placed **evenly**, leaving sufficient space for proper air circulation. Do not overload the shelves or position samples directly against the chamber walls.
2. **Verify the installation location:** The device must be installed at least **30 cm away** from walls, windows, heat sources, or ventilation systems.
3. **Perform an empty test cycle:**
    - **Remove all samples** from the chamber.
    - Set the device to **37°C for incubators** or **100°C for ovens**.
    - Allow the unit to operate for **2 hours** with the door closed, monitoring the temperature during the final hour.
4. If the issue persists, contact the **distributor**.

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6. Overtemperature or undertemperature alarm

If the display indicates a temperature error exceeding or below the set limit, the **AL parameter** may be incorrectly configured.

Possible Causes and Solutions:

- **Plus Version:** Enter the service menu via **SET + SHIFT**, enter the password **0003**, and check the **AL** parameter. If it is too low, increase it.
- **Super Version:** Enter the **Service** menu, enter the password **3**, and adjust the **AL** parameter.
- Ensure that the device is not exposed to **sudden temperature changes** or air currents that could affect temperature regulation.

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7. The device does not resume operation after a power failure

If the device does not automatically restart after a power outage, the **power recovery mode** may be set to manual restart.

Possible Causes and Solutions:

- **Plus Version:** Enter the service menu via **SET + SHIFT**, enter the password **0003**, and verify the **Po** parameter:
    - **Po=0**: Manual restart required.
    - **Po=1**: The device resumes from the beginning of the interrupted cycle.
    - **Po=2**: The device resumes operation from the exact point where it was interrupted.
- **Super Version:** Enter the **Service** menu, enter the password **3**, and verify the **Po** parameter.

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8. The display is unresponsive to commands

If the display does not respond or the control buttons are unresponsive, the issue may be due to a temporary system freeze.

Solution:

- Turn off the device and disconnect it from the power supply for **30 seconds**.
- Reconnect the power and restart the device.

If the issue persists, contact the **distributor**.

21. Shipping in Technical Assistance

Should the instrument be sent for **service**, it must be properly cleaned and possibly decontaminated from pathogens.
For shipping, it is recommended to use the instrument's original packaging. Without this, it is important to provide adequate packaging to ensure protection during transport.
We recommend removing the shelves and their supports.
Please note that any damage caused by incorrect shipment will not be covered by the warranty. For detailed instructions on cleaning and decontamination, please refer to the "Maintenance and Cleaning" section of the manual or contact technical support directly.

22. Warranty

Under conditions of use in accordance with the specifications, this instrument is covered by warranty for a period of 24 months from the date of purchase.
The guarantee is only valid for the product in its original configuration.
It does not apply to products or components that have been damaged as a result of: installation not in accordance with specifications, improper electrical or mechanical connections, inappropriate use or use not in accordance with the operating manual, accidents or fortuitous events, operating conditions outside the specified parameters.
The manufacturer accepts no liability for damage resulting from use not in accordance with the instructions in the operating manual, failure to carry out prescribed maintenance procedures, unauthorised modifications and alterations made to the product.
Please consult the user manual for detailed instructions on the correct use and maintenance of the instrument.

23. Disposal of electronic equipment

This equipment is classified as an electronic device and is subject to specific regulations for the disposal of such devices. When disposing of this equipment, please strictly adhere to the legal requirements for electronic waste in your jurisdiction. It is recommended that you consult the relevant local authorities or the supplier of the equipment for details of disposal procedures in accordance with current environmental regulations.