OVENS and INCUBATORS

User Manual

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

Model	Description	Temperature range
TCN-30 Plus	*Natural convection oven 30L (useful volume)*	*From + 5 °C above room temperature to + 200 °C*
TCN-50 Plus	*Natural convection oven 50L (useful volume)*	*From + 5 °C above room temperature to + 300 °C*
TCN-115 Plus	*Natural convection oven 115L (usable volume)*	*From + 5 °C above room temperature to + 300 °C*
TCN-200 Plus	*Natural convection oven 200L (usable volume)*	*From + 5 °C above room temperature to + 300 °C*
TCF-50 Plus	*Forced air oven 50L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*
TCF-120 Plus	*Forced air oven 120L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*
TCF-200 Plus	*Forced air oven 200L (useful volume)*	*From + 10 °C above room temperature to + 300 °C*
TCF-400 Plus	*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 Plus	*Natural convection incubator 16L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-35 Plus	*Natural convection incubator 35L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-55 Plus	*Natural convection incubator 55L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-120 Plus	*Natural convection incubator 120L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICN-200 Plus	*Natural convection incubator 200L (useful volume)*	*From + 5 °C above room temperature to + 70 °C*
ICF-55 Plus	*Forced air incubator 55L (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*
ICF-120 Plus	*Forced air incubator 120L (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*
ICF-200 Plus	*200L forced-air incubator (useful volume)*	*From + 5 °C above room temperature to + 80 °C (plus programme for sterilisation at 130 °C)*
ICF-400 Plus	*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 medium, 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 accordance 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 xxxxxxxxxxxx

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

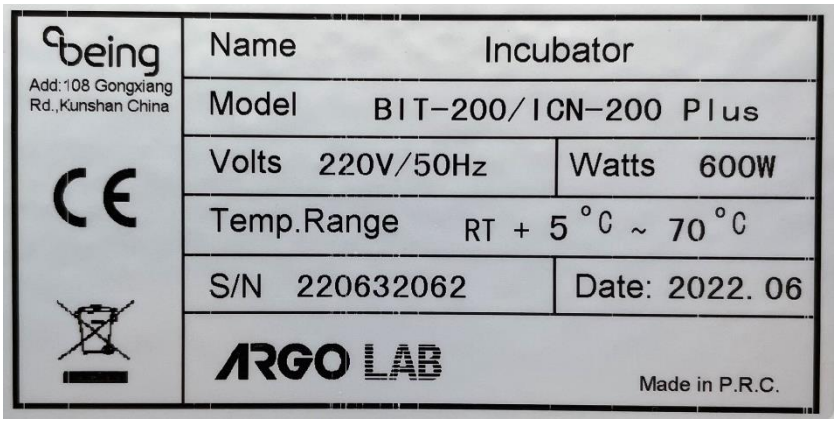
EN 61000-3-3:2013

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:

- n. 2 stainless steel grid shelves for models with a volume of less than 100 litres and n. 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.
- Clean the ArgoLab oven/incubator and shelves thoroughly (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, and 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:

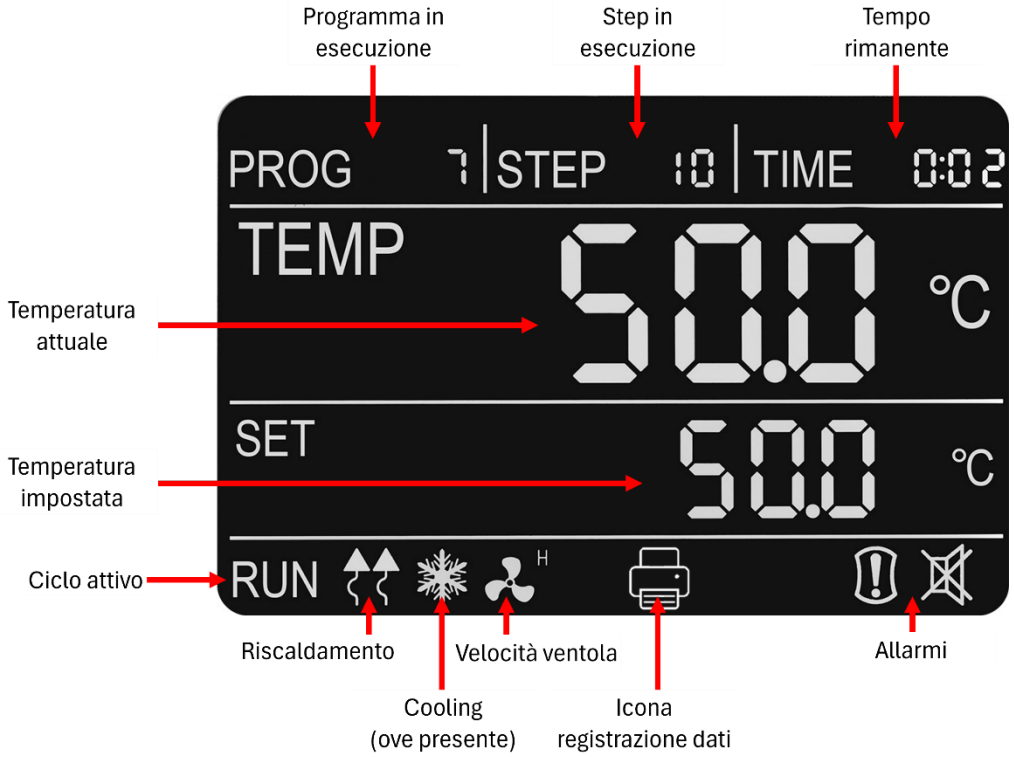
- Stable work surface with a flat, heat-resistant, dry and clean surface.
- Minimum spacing of at least 30 cm around the instrument.
- Ambient temperature between 10 °C and 40 °C, with relative humidity not exceeding 85%.
- Grounded power socket.
- Power supply 220/240 V - 50 Hz.

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



COMMAND	DESCRIPTION
	The **SET/PROG** key is used to set operating parameters and to enter/exit programmes. In combination with the **SHIFT** key, it allows access to menus with passwords (see paragraph 12).
	The **SHIFT** key allows you to quickly change the digit (decimal, unit, ten, etc.) of the parameter being edited.
	The adjustment keys allow you to increase or decrease the parameter value.
	The **START/STOP** button starts or stops a cycle or programme.

9. Technical Specifications

Natural convection ovens	TCN-30 Plus	TCN-50 Plus	TCN-115 Plus	TCN-200 Plus
Useful volume	30 litres	50 litres	115 litres	200 litres
Max. temperature/ Resolution	+200/0,1°C	+300/0,1°C	+300/0,1°C	+300/0,1°C
Temperature homogeneity at 150°C	± 3,5°C	± 3,5°C	± 3,5°C	± 4,0 °C
Temperature variation at 150°C	± 0,5°C	± 0,5°C	± 0,5°C	± 0,7°C
Heating time at 150°C	14 min.	16 min.	18 min.	20 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 / 700 W	230 V / 1000 W	230 V / 1900 W	230 V / 2100 W
Number of shelves (standard/max)	2/3	2/5	3/6	3/9
Minimum distance between shelves	50 mm	50 mm	50 mm	50 mm
Maximum shelf load	10 Kg	15 Kg	20 Kg	20 Kg
External dimensions (W x D x H) mm	460 x 600 x 685	690 x 540 x 635	815 x 670 x 750	940 x 730 x 905
Internal dimensions (W x D x H) mm	320 x 285 x 320	400 x 330 x 420	520 x 450 x 495	650 x 495 x 640

Forced air ovens	TCF-50 Plus	TCF-120 Plus	TCF-200 Plus	TCF-400 Plus
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

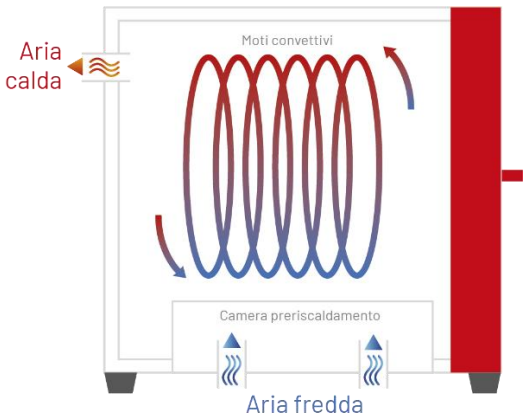
Natural convection incubators	ICN-16 Plus	ICN-35 Plus	ICN-55 Plus	ICN-120 Plus	ICN-200 Plus
Useful volume	16 litres	35 litres	55 litres	120 litres	200 litres
Max. temperature/ Resolution	+70/0,1°C	+70/0,1°C	+70/0,1°C	+70/0,1°C	+70/0,1°C
Temperature homogeneity at 37°C	± 0,4 °C	± 0,4 °C	± 0,5 °C	± 0,5 °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 Plus	ICF-120 Plus	ICF-200 Plus	ICF-400 Plus
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. Operating modes: Forced air and Natural convection

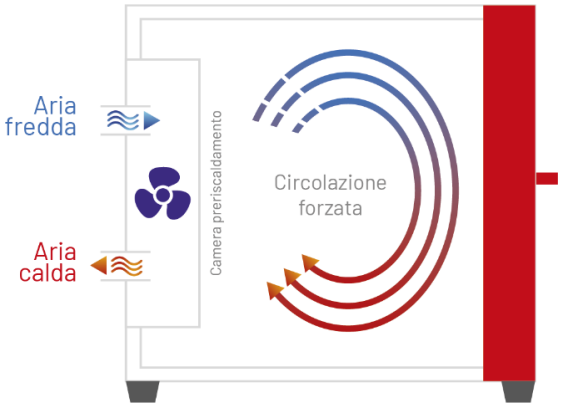
Natural convection ovens/incubators

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.**



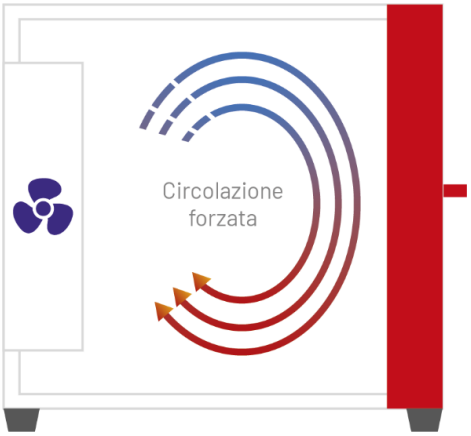
Forced air ovens

TCF series instruments operate with forced air. 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 series instruments are forced air.
This means that, in the inner chamber of the instrument, heat is distributed evenly through the fan.

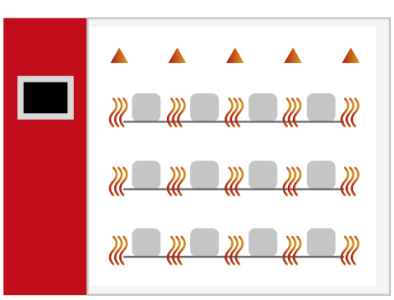


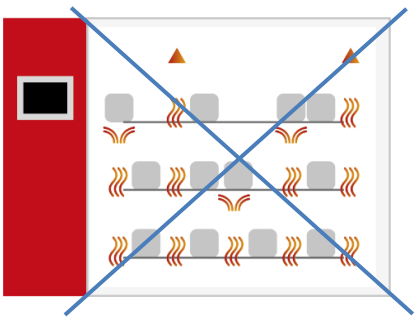
11. Introduction of samples into the oven/incubator

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. The instrument will then be ready for use.

NOTE: At first power-on, **the instrument will be in stand-by mode**, indicated by the text "**TIME end**" in the top right corner, and will be set to the default program "PROG 0".

QR code programming tutorial

By framing the QR code below with your mobile phone camera, you will see a quick tutorial showing how to set up programmes on ArgoLab Plus version ovens/incubators:

Programming

Each ArgoLab oven/incubator can manage up to 8 programmes, each consisting of 10 working steps in which temperature, timer and ventilation speed (where applicable) can be set. In addition to the standard programmes, there is '**PROG 0**', which allows you to set a simple single-step cycle with the same parameters.

MULTI-STEP: **PROG 9** was introduced, a programme that allows all 8 stored programmes to be executed sequentially, for a maximum total of 64 consecutive steps.

Basic single-step temperature programme - Using and modifying 'Prog 0'

1. To change **PROG 0** press and hold the **SET/PROG** button for a few seconds. **PROG**' and the number **0** will flash simultaneously, then only the number 0.
2. Press the **SET/PROG** button again to enter the edit mode, where you can set the temperature, timer and fan speed (where applicable).
3. **To switch between parameters (temperature, timer, fan speed), briefly press the SET/PROG button.**

NOTE - continuous cycle: In **PROG 0**, by setting the timer to "00:00", the ArgoLab heater/incubator will work continuously at the set temperature until the operator manually switches off the heating cycle by pressing the **START/STOP** button.

Modifying a programme

To change a programme, press and hold the **SET/PROG** button for a few seconds: '**PROG**' and the programme number will flash simultaneously, then only the programme number. Release the **SET/PROG** button once the programme number starts flashing by itself.
Use the **adjustment keys** to select the programme to be edited and confirm with a short press of the **SET/PROG** key. The instrument will then enter edit mode and the temperature value of the first step will flash together with "**PROG**", indicating that programming is in progress.

STEP 1
Set the temperature of the first step using the SET/PROG and **SHIFT keys**. Confirm with **SET/PROG** to switch to timer. Set time and confirm. If the instrument is forced air, set the **fan speed** (H=High, M=Medium, L=Low), otherwise go to step 2.

STEP 2
Repeat the same procedure to set temperature, timer and, if necessary, fan speed. Proceed in this way for each subsequent step.

NOTE: If you do not use all 10 available steps, you must set the next to last step with the time "00:00" to indicate the end of the programme.

Example: If the last step to be used is the fifth, set the sixth step with the timer to '00:00' to stop the instrument at the end of the fifth step.

Selection of programmes

When the instrument is switched on and in standby (heating cycle off), briefly press the **SET/PROG** button. **PROG**' and the programme number will start flashing simultaneously. Use the adjustment keys to select the desired programme. Confirm by briefly pressing the **SET/PROG** button. The selected programme will be ready to start.

NOTE: This operation only allows you to select the programme to be executed. To edit a programme, you must follow the procedure described in the chapter on editing programmes.

Starting/Stop a programme

Once the programmes have been set, call up the desired one and **long press the START/STOP button for 4-5 seconds to start it**. The word '**end**' in the top right-hand corner will disappear and '**RUN**' will be displayed in the bottom left-hand corner. The display will show the programme number, the current step, the timer, the set temperature, the measured temperature and the ventilation speed (if present).

At the **end of the program**, the instrument will emit an intermittent acoustic signal, which can be silenced by pressing any button. The text "**end**" will appear in the top right corner of the display. The acoustic signal will continue until silenced by the operator, even if the heating cycle is complete. During this time, the samples inside will remain exposed to the residual chamber temperature.

NOTE: It is possible to interrupt a running program at any time by pressing and holding the **START/STOP** button for 4-5 seconds.

13. Access to submenus with password

To access password-protected functions and parameters, press and hold down **SET/PROG** and **SHIFT** simultaneously for a few seconds. To avoid accidentally entering operating parameter settings, it is recommended to first press **SHIFT** and, while holding it down, also **SET/PROG** for a few seconds.

After this operation, "**Lk**" (lock) will appear in the upper right-hand corner of the display instead of the word **TIME**, with the digits "**0000**" (password) next to it. Below are the passwords and access sequences for the various parameters and functions.

PASSWORD	FUNCTION/PARAMETER	DESCRIPTION
0000	Pn	Number of the programme to which the dy and Cy functions are to be applied
	Cy	Number of repetitions of the selected programme
	dy	Delayed start of selected programme
0003	tm	Temperature limit for sample protection
	Po	Restart mode after power failure
	AL	Temperature limit for over-temperature alarm
	Pb	Temperature offset at one point
	PK	Temperature offset over the entire ramp
	PA	Temperature offset on room temperature sensor

Number of the programme to which the Delay and Cycle functions apply

In ArgoLab ovens/incubators, it is necessary to define to which programme (1 to 7) to apply the start delay (**Delay**) and repeat (**Cycle**) functions.
To do so, access the first submenu using the password '**0000**', change the **Pn** (programme number) parameter using the **adjustment keys**, and confirm your selection by briefly pressing the **SET/PROG** key.

Repetition of selected programme - Cycle

The instrument allows you to repeat the selected programme from 1 to several times. After selecting the programme via the Pn parameter, the number of repetitions (Cy) can be set using the adjustment and SHIFT keys. The value of Cy (1, 2, 3, etc.) will be confirmed by briefly pressing the SET/PROG key.
NOTE: It is also possible to set the continuous repetition of a programme by putting it into a continuous 'loop' by setting the parameter Cy=0.

Delayed start function - Delay

After selecting the programme via parameter **Pn**, you can set a delay (in hours and minutes) for the start of the operating cycle. Use the **adjustment keys** to set the desired delay (hh:mm). Use the **SHIFT** key to move quickly between digits. Confirm with **SET/PROG**, after which the display will return to the standby screen. By pressing **START/STOP** for a long time (4-5 seconds), the instrument will start the programme but will not start heating immediately. The word '**end**' and the delay time will flash alternately until the actual start of the programme, at which time the regular timer will appear on the display.

Temperature limit for sample protection - (AL)

The instrument allows you to limit the maximum working temperature to protect your samples from incorrect temperature settings. Follow the instructions in paragraph 13 and enter the password **0003** via the **adjustment keys**. Use **SHIFT** to move quickly between digits and confirm with **SET/PROG**. The parameter **tm** (maximum temperature) will appear on the display with the maximum value for the instrument.

Set the desired maximum temperature, beyond which the instrument must not go, using the **adjustment keys**. Confirm the value with **SET/PROG**.

NOTE: It is necessary to consider the initial temperature peak that the oven/incubator may have during thermostatting.

Application example: If the set temperature is 100 °C and the tm limit is set at 70 °C, the instrument will attempt to reach 100 °C, but when 70 °C is reached, the alarm is triggered, and the heating element is switched off until the temperature falls below the set limit.

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	When the power supply returns, the instrument does not automatically resume the cycle heating, but must be restarted manually.
1	When the power supply returns, the instrument automatically resumes the operation from the beginning of the interrupted heating cycle.
2	When the power supply returns, the instrument automatically resumes the operation from the precise point in the heating cycle where it was interrupted.

Follow the instructions in paragraph 13 and set the password **0003** using the **adjustment keys**. Use **SHIFT** to move between digits and confirm with **SET/PROG**. The display will show the parameter tm (maximum temperature) in the top right-hand corner. Press **SET/PROG** again to move to the next parameter **Po** (Power). Set the desired value (0, 1, 2) using the **adjustment keys** and confirm with **SET/PROG**.

Temperature limit for overtemperature alarm - (tm)

The instrument allows setting specific temperature limits that trigger an alarm in case of **overtemperature** or **undertemperature**. Although these values are adjustable, **the parameter is factory-preset and calibrated based on the type of instrument. It is recommended not to alter these settings**, as normal temperature fluctuations, especially in natural convection models, may cause false alarms if the limit is set too close to the working temperature.

To modify the **AL parameter**, refer to the instructions in section 13. After entering the default password 0003 and confirming with the **SET/PROG** key, you can access the parameter. Use the adjustment keys to set the desired alarm limit value and confirm again with **SET/PROG**.

The AL parameter defines both the upper limit for the **overtemperature** alarm and the lower limit for the **undertemperature** alarm. The instrument will signal an anomaly if the measured temperature exceeds the upper limit or falls below the lower limit.
For example, with a set temperature of 37.0°C and an AL value of 3.0°C, the instrument will trigger an alarm if the temperature exceeds 40.0°C (37.0°C + 3.0°C) or falls below 34.0°C (37.0°C - 3.0°C). To silence the alarm, press any key.

14. Data download via USB key

The instrument offers the possibility of recording up to 2.000 data, which can be easily downloaded via a USB key. To do so, simply plug the USB key into the USB port located on the left side of the instrument, next to the power button. Once inserted, the data transfer will take place automatically, allowing for later archiving and analysis of the parameters recorded during instrument operation.

Setting the data acquisition interval

By default, the instrument records data every **60 minutes**. The internal memory can store up to 2160 data points; therefore, for extended recordings, it is recommended to keep a USB drive inserted. On the USB drive, a .txt file will be created for each day of recording, and these files will be organized into monthly folders.

To modify the data acquisition interval, follow the instructions at the beginning of section 13 and enter the password 0188. Press the **SET/PROG** key to confirm the password and use the **SET/PROG** key again to navigate through the configuration parameters (described in the table below). Each parameter is configurable.

PARAMETER(S)	DESCRIPTION
Pt	The Pt value represents, in minutes, the data acquisition interval. The factory setting for Pt is 60, which corresponds to an acquisition interval of 60 minutes. Any value other than 0 will cause the output icon to appear for data logging.
Yr - mH - dA - Hr - mi	Parameters for date and time configuration (year, month, day, hour, minute).
on	Setting the value to 1 saves the previous changes.

NOTE: The instrument's internal memory can hold up to 2.000 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 at 60 minutes, the memory can hold:

2.000 data × 60 minutes = 120,000 minutes, equivalent to 2.000 hours or approximately 83 days.

NOTE: If a USB stick is connected to the instrument, recordings are also saved directly on it, in addition to the internal memory. The 2.000 data limit for the internal memory remains unchanged, but the USB stick acts as an additional external memory. This allows for continuous recording well more than 2.000 data, providing extended storage capacity.

IMPORTANT: To start recording on a USB drive, a work cycle must be initiated.

15. Door switch

The door switch, present on all heaters, and forced-air 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.

16. Temperature Offset - Calibration

The instrument allows the user to set offset values, i.e. calibrations, on a 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 you detect discrepancies between the instrument readings and those of a certified digital thermometer. Follow the instructions in section 12 and enter the password 0003. Use **SHIFT** to move between digits and confirm with **SET/PROG**. Scroll to the desired offset parameters and adjust as required.

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 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 (consider 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

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 device. This electromechanical safety device, classified as **Class 3.1** in accordance with technical standard DIN 12880, is installed inside the left side panel of the instrument.
This user-adjustable device 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**.

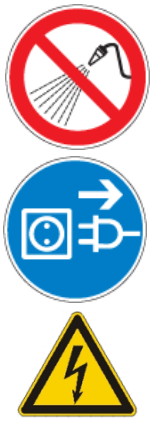
Although the operating limit of the instrument is set at 80.0°C, it is possible to run a sterilisation cycle at 130.0°C for short periods.
To activate this function, follow the steps below using the basic programme PROG 0:

- 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. In the absence of this, it is important to provide **sturdy and suitable 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.