

Instruction manual

VWR® INCU-Line Premium CO₂ incubator

EU cat. no: 390-1544 VWR ILCO 180 Premium
390-1690 VWR ILCO 260 Premium



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1. Safety information

Please follow the guidelines below, and read this manual in its entirety to ensure safe operation of the unit.

1.	<u>The unit cannot be installed:</u> • outside, • in unventilated recesses, • in damp places or places which can be easily flooded, • near flammable or volatile substances (any potentially explosive areas), • near acids or in corrosive environments.
2.	<u>It is forbidden to:</u> • store inflammable or explosive substances inside the unit, • touch the inner door and glass door handles, and the inner surfaces after a sterilization process, • touch live parts of the unit, • operate the unit with wet hands, • put water vessels on the unit, • climb or put any objects on the unit, • overload the shelves (the maximum load is described in technical data).
3.	<u>You should:</u> • ensure sufficient ventilation, • place samples in such a way to provide proper air circulation in the chamber, • open the door for the shortest period of time to reduce temperature fluctuations, • always check that the doors are closed, • use only earthed mains to avoid electric shocks, • unplug the power cable holding the protective cover and not the cable itself, • disconnect the unit from the mains before undertaking any repairs or maintenance works, • protect the power cable and the plug from any damage, • disconnect the power plug before moving the unit, • disconnect the power plug if the unit will not be used for a long period of time, • disconnect the unit if it has any visual faults.

1.1. Avoiding electrical shock

The electric installation should meet the following conditions:

	The unit is powered by AC 220-240V/ 50-60Hz. It must be connected to an earthed mains socket.
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The electric installation should be secured by a circuit breaker 16 A characteristics B.

1.2. General safety instructions on installing and operating the CO₂ incubator

1.2.1. Indications for using pressure cylinders

	• During the operation of the CO₂ incubator, small amounts of CO₂ enters the room, which in high concentration can be life-threatening. The unit does not emit CO₂ when the power supply is switched off and the gas cylinder valves are closed. • The CO₂ incubator can't be operated near concentrated acids or corrosive vapours. • The workplace must be properly ventilated.
	• <u>Emergency shutdown of the CO₂ dosing</u>: close the gas cylinder valve.

The amount of dispensed CO₂ is regulated by a microprocessor controller. If the chamber door is open during CO₂ dosing, the gas will be automatically cut off.

- Together with a pressure cylinder with compressed gas, the user should be given a safety data sheet for the gas and instructions for its use.
- The ventilation performance in the room must ensure level of gas concentrations in the room below the limit values. High concentration of CO₂ (>4 Vol.-%)- risk of death by suffocation.
- During gas intake from the gas cylinder, check the pressure level regularly.

1.2.2. Characteristics of carbon dioxide

Carbon dioxide (CO₂) is colorless and odorless gas, therefore it is practically imperceptible. CO₂ is heavier than air and soluble in water.

Warning signs on the bottle containing CO₂:



Non-flammable and non-toxic gases



Pressurised gas

Product ID: Carbon dioxide (100%)

Chemical formula: CO₂

Application of the substance: General industrial applications

1.2.3. Location requirements

To prevent the accumulation of gas above the permissible concentrations in the room, natural or mechanical ventilation should be provided. In addition, a natural or mechanical installation must be provided to prevent the oxygen concentration from falling below 19.5%.

Observe the occupational exposure limit OEL for CO₂ set by national authorities (formerly maximum permitted workplace concentration). Check compliance when operating all chambers located in the room.



It is recommended to use a control and measurement equipment for measuring CO₂ concentration in rooms with a CO₂ incubator.

1.2.4. Hazards when working with CO₂



Carbon dioxide in elevated concentration causes shortness of breath, circulation problems and ultimately death. Avoid breathing gas.



The bottle contains compressed gas may cause cryogenic burns or injury (extremely cold liquid and/or high pressure gas).

1.2.5. Personal protection / first aid

In the event of gas leak:

Leave the room immediately, warn other people and ventilate the room if possible.

Respiratory protection:

In an atmosphere where there is a lack of oxygen (excess of carbon dioxide), use a self-contained breathing apparatus or a face mask with a positive pressure air supply. Respirators with air filters will not provide protection.

Inhalation problems:

Move the victim to fresh air. CO₂ gas is heavier than the air and accumulates e.g. at the floor. If breathing has stopped or is difficult, give aided respiration. Oxygen administration may be indicated. In the event of cardiac arrest, a trained person should immediately begin cardiopulmonary resuscitation.

In life-threatening emergencies:

- 1) protect yourself with a breathing apparatus,
- 2) remove the victim from the contaminated area,
- 3) call a doctor,
- 4) start CPR.

1.2.6. User's responsibility

The user is obliged to:

- 1) be familiar and comply with applicable health and safety rules, regulations for handling CO₂ and to train operators properly,
- 2) secure the unit against access by unauthorized persons,
- 3) keep the unit in perfect condition,
- 4) follow the maintenance schedule,
- 5) ensure that operators use appropriate personal protective equipment,
- 6) share the user manual and CO₂ safety data sheet with operators working with the unit.

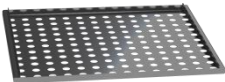
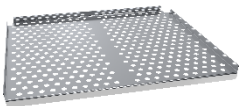
2. Package contents

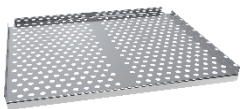
INCU-Line CO₂ incubators are delivered with the following equipment:

Description	Quantity
CO ₂ incubator	1
rack for shelves	1
water pan	1
stainless steel perforated shelf	3
key to the lock	2
quality control certificate at 37°C	1
ethernet cable	1
power cable with EU plug	1
3m pressure hose with pre-assembled hose nozzle for a quick connector and a hose clamp to connect the gas hose to the pressure reducer	1
silicone plug to close the access port	4

Multilingual instruction manual and Premium Control Software can be downloaded from the unit's internal memory on the USB stick.

Additional shelves, a stacking adaptor, a base on castors, a CO₂ gas filter can be ordered separately.

ILCO 180	Image	Quantity	Cat. No.
Additional perforated stainless steel shelf (max shelf load 10 kg)		1	390-1545
Additional reinforced perforated stainless steel shelf (max. shelf load 30 kg)		1	390-1640
Stacking adaptor		1	390-1546
Base on castors		1	390-1547
Support frame on castors (height: 800 mm)		1	390-1660
Replacement CO ₂ gas filter		1	390-1593

ILCO 260	Image	Quantity	Cat. No.
Additional perforated stainless steel shelf (max. shelf load 30 kg)		1	390-1691
Stacking adaptor		1	390-1697
Base on castors		1	390-1692
Replacement CO ₂ gas filter		1	390-1593

The INCU-Line ILCO 180 and ILCO 260 are stackable. Two units can be stacked on top of each other with the **stacking adaptor**, saving valuable space in the laboratory.

The stacking adaptor prevents heat transmission, shocks and vibrations transferring from one chamber to another.

The **base on castors** allows the incubator to be easily moved from one location to another. It is also recommended to avoid dirt from the floor potentially contaminating the chamber.

The **CO₂ gas filter** is a replacement item (see [15.1. Replacing the CO₂ gas filter](#)).

3. Installation

The chamber components of the unit are made of stainless steel, therefore slight discoloration may occur. It is a result of the technologies used in the production of metal sheet in accordance with the requirements of EN 10088-2 standard and it is not a defect of the unit.

The place of location of the unit should meet the following conditions:

- Ambient temperature between +20°C...+30°C
- Ambient relative humidity < 60%
- Low dust environment
- Appropriately ventilated according to its size
- Placed on a hard and stable surface
- Placed at least 100 mm away from the wall
- Height of the room must be at least 300 mm greater than the height of the unit
- Keep away from direct sunlight
- Kept away from any heat sources
- Not designed to be built-in e.g. within wall recesses
- Placed near a mains socket 220-240V 50-60Hz.

When after storage in a cold location you transfer the chamber to its warmer installation site, condensation may form. Before start up, wait at least one hour until the chamber has attained ambient temperature and it is completely dry.

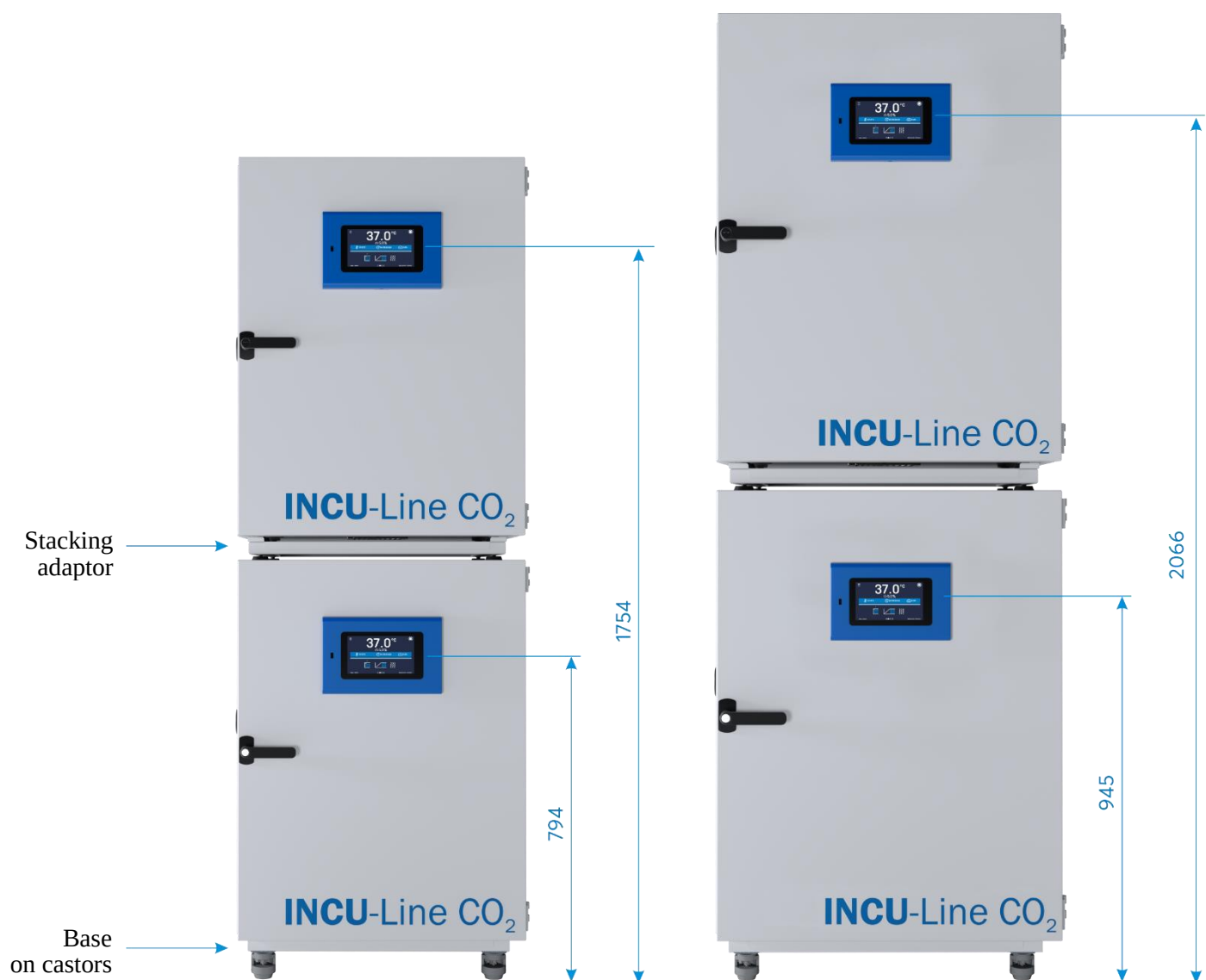
Non-compliance with the above recommendations may result in damage to the unit or impair technical parameters.

3.1. Setting up the chamber

Set up the chamber with a spirit level (not included). The unit has been equipped with levelling feet. Please use them to level the unit after it has been placed in its final location (if needed).

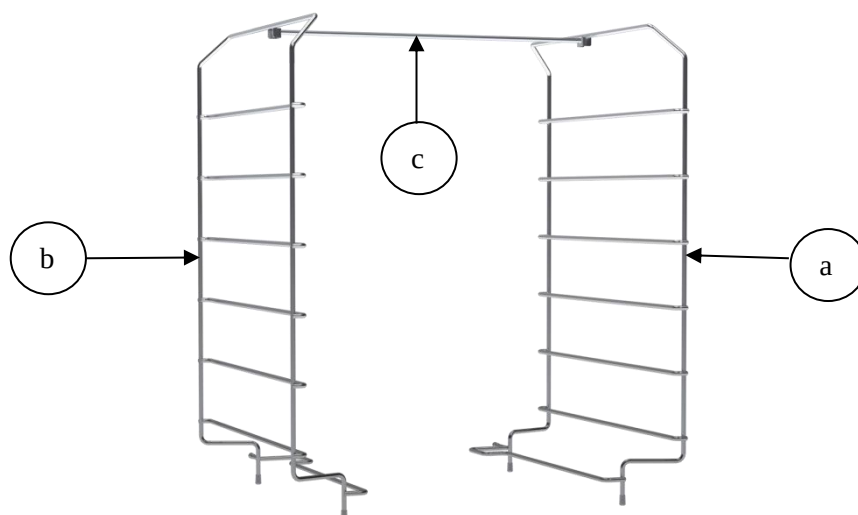


The INCU-Line ILCO 180 and ILCO 260 are stackable. You can stack two units with the stacking adaptor and save place in the laboratory.



3.2. Shelf / water pan installation

The unit is equipped with a rack for shelves.



Perform the following steps to assemble the rack for shelves, water pan and adjust shelf height:

- 1) Install the part (a) of the rack as close as possible the right wall of the chamber.
- 2) Install the part (b) of the rack as close as possible the left wall of the chamber.
- 3) Connect the part (a) with the connecting rod (c). Note: the pin of the rod must be directed towards the door.
- 4) Connect the part (b) with the connecting rod (c). Note: to lock the connecting rod rotate the pin downwards.
- 5) Install the water pan on the bottom and position it equally between the rack.
- 6) Slide a shelf onto the required frame level. The shelf rack is now correctly installed!



Perform the above steps in reverse order to clean the chamber.

3.3. Water pan

Please make sure that the water pan is placed on the chamber's bottom (equally between the rack). Below the water pan there is the cold spot of the chamber to avoid water condensation.

Fill the water pan only **with deionized (demineralized) water** up to the filling level marked by the pressed inner edge (volume: 1,5 liter).



It is recommended to clean and refill the pan 2-3 times a week. For emptying and cleaning remove the water pan. Operate the chamber only with deionized (demineralized) water. Conductivity from $1\mu\text{S}/\text{cm}$ up to a maximum of $20\mu\text{S}/\text{cm}$. (Water which is in equilibrium with the CO_2 in the air and has a conductivity $< 1\mu\text{S}/\text{cm}$ (ultrapure water) may cause acid corrosion due to its low pH).

Any corrosive damage that may arise following the use of water of deviating quality or by additives is excluded from the liability agreement.

If required, you can add microbiologically inhibiting substances such as copper chips, copper sulfate or EDTA in a concentration of 1 to 5 mmol/l.

Empty the water pan before moving the unit. In case of the contents spilling, immediately dry the chamber carefully and completely.

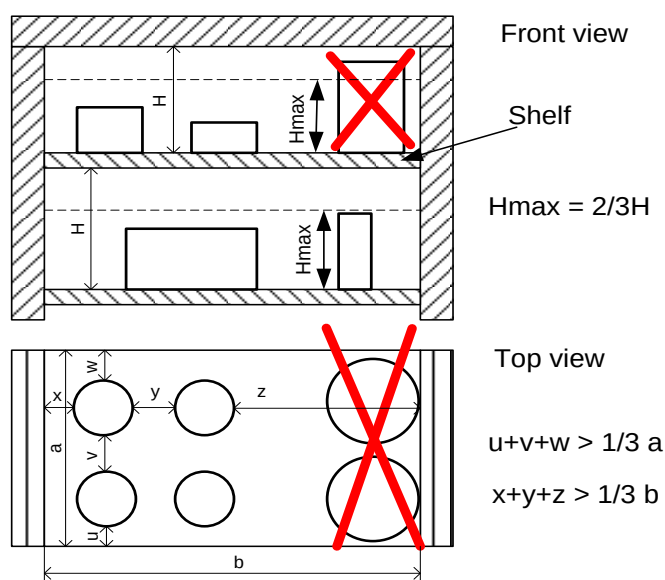
3.4. Placement of samples

To provide proper air circulation and stable conditions within the chamber, it is necessary to adhere to the following rules:

- the max height of the samples should not exceed $2/3$ of the shelf space,
- the samples should be placed so that the space between the containers does not exceed $1/3$ of the width and height of the shelf,
- samples should be placed with equal spacing between each other and the chamber walls.

The picture below is an example of the placement of samples in the chamber.

Figure 1- Samples placement in the chamber



Following the above rules will provide optimal parameters of temperature variation and fluctuation.

3.5. Closing the chamber door

The unit has been equipped with a 2-point lock. To close the door, turn the handle to the vertical position, push the door gently then turn the handle to the horizontal position. If the door has not been closed properly, an alarm will sound. Closing the door correctly reduces energy consumption and ensures the specified temperature variation and fluctuation.

3.6. Internal glass door

To open or close the internal glass door use the installed plastic handle. Always use safety gloves to protect yourself and minimise the risk of getting burnt when the temperature inside is high.



During sterilization process the inner chamber of the incubator is hot (do not touch the glass door or inner parts of the chamber).

3.7. Connection of the CO₂ gas cylinder

The manufacturer supplies the unit with a 3m pressure gas hose with pre-assembled hose nozzle for quick connector and a hose clamp. This hose is used to connect CO₂ cylinder.

To establish the gas cylinder connection to the chamber:

- 1) place the CO₂ cylinder vertically and attach it to the wall with a special clamp, rope or chain,
- 2) ensure the correct CO₂ output pressure of 1,5-2 bar (use a pressure reducer),
- 3) connect the supplied gas hose to the pressure reducer of the gas cylinder or central gas supply and secure the connection with the supplied hose clamp,
- 4) connect the pre-assembled hose nozzle of the gas hose to the quick connector on the chamber rear,



- 5) slowly unscrew the valve of the gas cylinder while checking low leakage connection.

Leak test

It's important that all gas connections will be checked for leaks after the incubator is connected to the gas cylinder. This can be done with a leak spray or with a solution of dilute soap.



The gas outlet pressure **MUST NOT** exceed the indicated value of 2,5 bar. The pressure above will result in chamber damage.



Before connecting, check the outlet pressure on the pressure reducer of the cylinder. Adjust the outlet pressure to 1,5 – 2,0 bar above the ambient pressure.

Only use the supplied hose nozzle to connect to the quick connector. Otherwise, the quick connector may leak, and/or it may become impossible to connect the original hose nozzle. In this case, please contact VWR Service.



The CO₂ gas cylinder is NOT supplied with the CO₂ incubator. The purchase, transport and connection is the responsibility of the user.

	The gas connections must be installed by qualified personnel who are trained in handling the respective gases and familiar with the required safety measures.
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- Opening the gas cylinder valves is only permitted when the cylinder has been connected to the chamber.
- Pressure level is checked by the controller regularly. When the CO₂ pressure is low, an alarm occurs on the screen (“CO₂ Pressure low Start”).

	Open the gas cylinder valve slowly to avoid pressure surges.
	Always close the valve even with apparently empty cylinders; screw on the cap when not in use. Return gas cylinders with the valve closed.

4. Intended use

INCUB-Line Premium CO₂ incubators are intended for incubation of cell cultures and similar under typical conditions of approx. 37°C. The chamber permits setting an exact CO₂ atmosphere inside and provides high humidity inside the chamber to avoid osmolarity increasing.

The appliance may only be loaded with materials and substances which cannot explode, burst or ignite (do not form any toxic or explosive vapours at the set temperature). Potentially explosive gas-air mixtures must not form, neither in the working chamber nor in the direct vicinity of the appliance. The incubator should not be used to sterilize samples. The sterilisation programme in the menu will only sterilize the inner chamber.

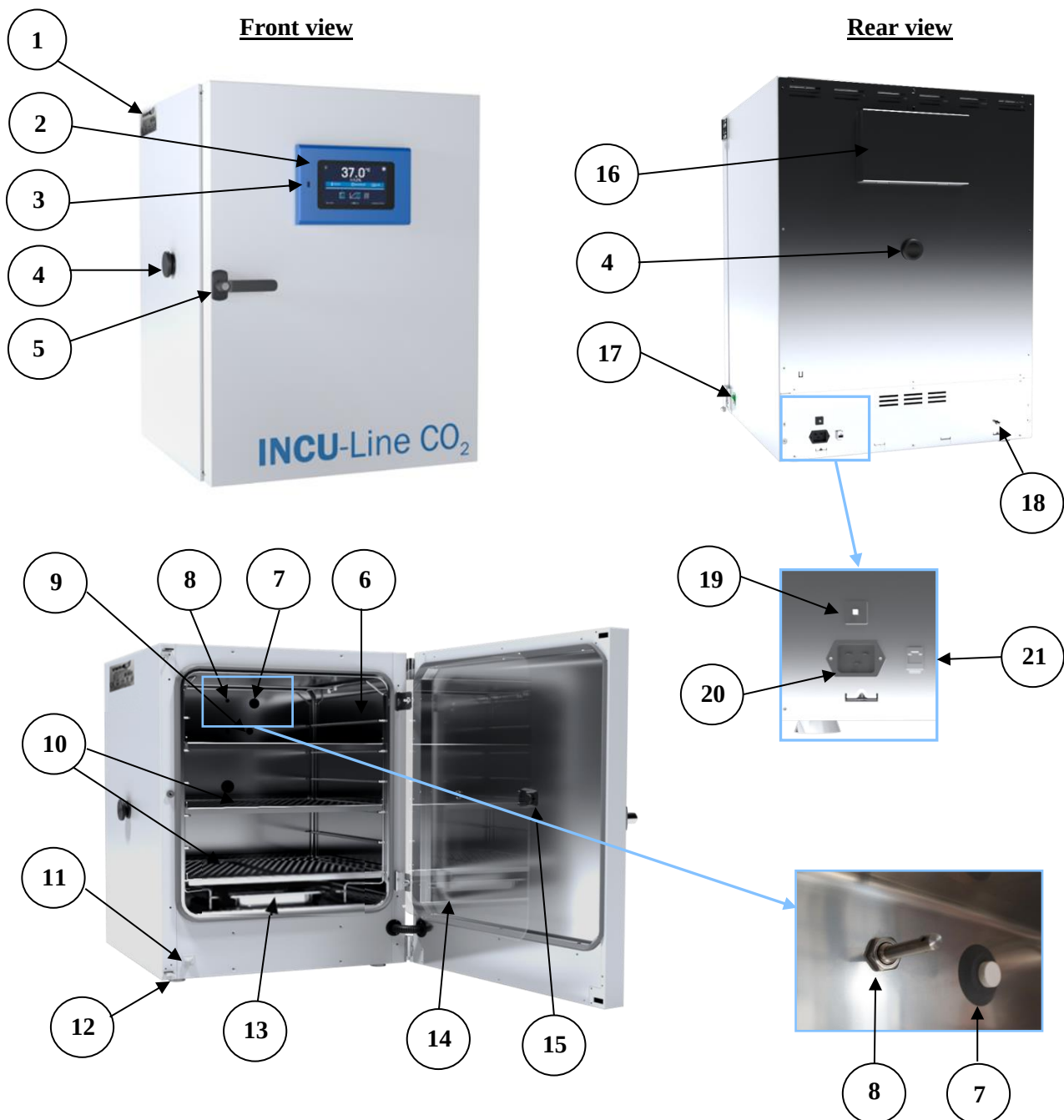
The chamber is not classified as a medical device according to Medical Device Directive 93/42/EEC. Do not use it to sterilise medical devices.

5. Symbols

The following chart is an illustrated glossary of the symbols that are used in this manual.

	CAUTION This symbol indicates a potential risk and alerts you to proceed with caution.
	CAUTION This symbol indicates important information and the recommendations to follow.
	CAUTION This symbol indicates risks associated with hot surfaces.
	This symbol means that a given field / window can be moved in the direction shown in the picture.

6. Overview

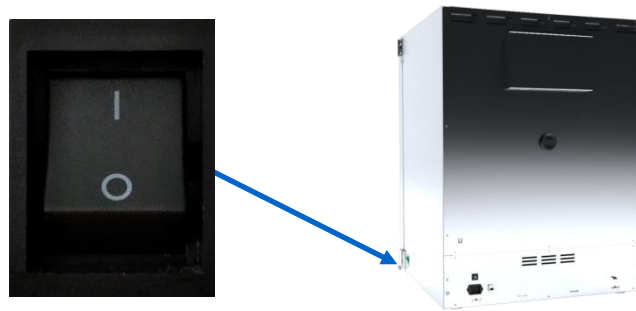


- (1) Nominal plate
- (2) 7" touch screen controller
- (3) USB port
- (4) Access port (φ30 mm)
- (5) Door handle with a key lock
- (6) Rack for shelves
- (7) CO₂ infrared sensor
- (8) CO₂ gas mixing head
- (9) Temperature sensor PT 100
- (10) Stainless steel perforated shelves
- (11) Open door sensor

- (12) Height adjustable feet
- (13) Water pan
- (14) Inner glass door
- (15) Glass door handle
- (16) Inspection cover for CO₂ sensor and filter
- (17) Main power switch
- (18) CO₂ hose connector
- (19) 10A fuse
- (20) Main power socket
- (21) LAN

7. Main Switch

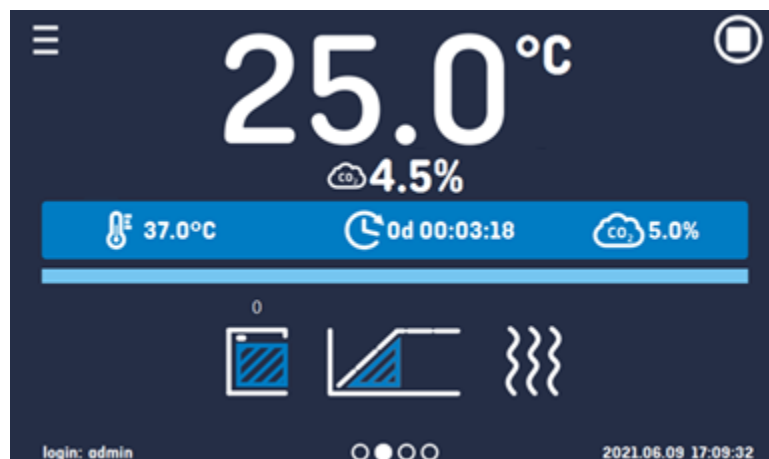
The main power switch is located at the bottom of the right wall.



8. Main screen

After switching on the unit, the Main Screen ([Figure 2](#)) appears. It contains the information about the unit status. To access to most functionalities the user should log in.

Figure 2 – Main Screen



Main Menu



Start/Stop the program



Current temperature



Current CO₂ concentration



Set temperature, to change, press the icon or value (for more information, see [10.3.1. Quick change the set temperature](#))



Elapsed or remaining time of program, to change, press the icon or value (for more information, see [10.3.2. Quick change the set time](#))



Set CO₂, to change, press the icon or value, (for more information, see [10.3.3. Quick change the set CO₂ concentration](#))



Information panel – four different windows, to scroll slide to the right or left (for more information, see [8.3. Information panel](#))



Indicates which window is displayed



Information about the user currently logged in



Current date and time

8.1. Alarm bar

The colour of the bar indicates the status of the unit:

	– blue – the unit is working properly
	– red – alarm

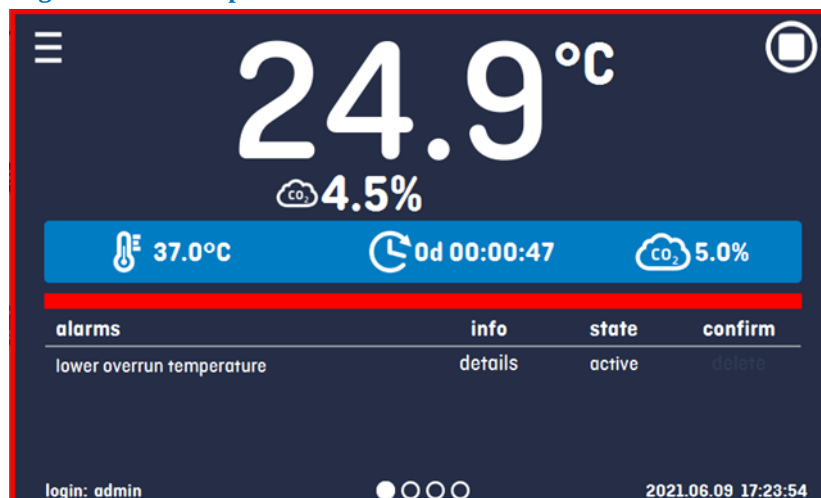
8.2. Alarms panel

In this place appears the list of alarms. With active alarm, the control bar is red. The alarm event is displayed in the list, with the status alarm active.

When an alarm event stops, the alarm remains in the list as inactive.

- “**delete**” button – confirms and removes the alarm from the list (only inactive alarms can be deleted),
- “**confirm**” button – confirms the class 3.1 alarm,
- “**details**” button – displays a preview of all instances of selected alarm ([Figure 4](#)).

Figure 3 – Alarms panel



If there are more alarms, a button  appears on the right side of the list that allows you to expand on the entire screen.

Figure 4 – Alarm details

details - over protected temperature	
date	state
2019.06.19 12:20:16	Activated
2019.06.19 12:20:16	Deactivated
2019.06.19 12:18:42	Activated
2019.06.19 12:14:45	Deactivated
2019.06.19 12:12:07	Activated

8.3. Information panel

You can view four different windows. Switching between them is done by swiping your finger left or right.

Information about which window is active indicates



Figure 5 – Status - icons



Closed door, open door. The number above the icon presents open door counter, press the icon to cancel the counter. The counter is also cancelled during turning on the unit



Ramp status: Chamber is currently cooling down or heating up to reach set temperature



Set temperature is reached

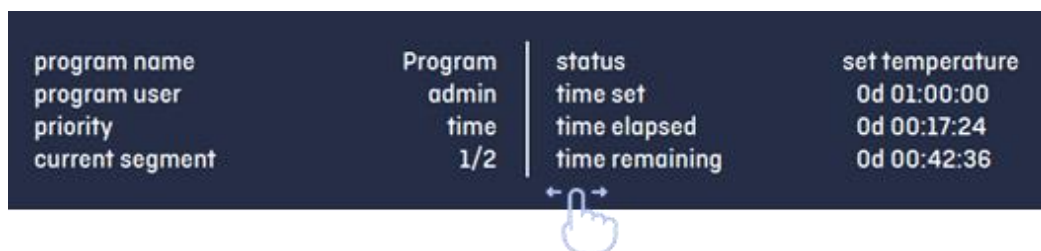


Icon is only visible when the chamber is heating

8.4. Status - description

The status of the unit is indicated by description.

Figure 6 – Status - description



program name	Program	status	set temperature
program user	admin	time set	0d 01:00:00
priority	time	time elapsed	0d 00:17:24
current segment	1/2	time remaining	0d 00:42:36

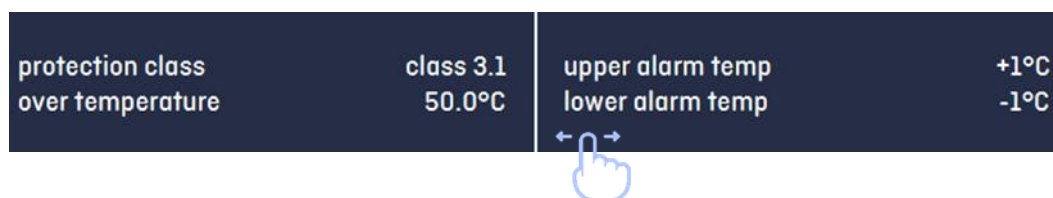
Program name	The name of program
Program user	The name of user to whom the program belongs
Priority	In regard of time or parameters, more information see 10.1.5. Priority
Current segment	Currently performing segment / total number of segments in the program
Current loop	Currently performing cycle/ total number of cycles to perform 10.1.4. Loop
Status	Status of the program: ramp, set temperature, program off
Time set	Set time of performing segment
Time elapsed	Elapsed time after reaching the segment
Time remaining	Remaining time until the end of the segment

8.5. Status – protection and alarms

In the left part there is information about the alarm class and the upper set value. It is associated with a running or completed program. The protection parameters can be set in the program parameters ([10.1.1. Program creating / edition](#)). Information about protection classes ([12. Temperature protection](#)).

In the right part there is information about the set alarms (more information on alarms set, see [\(10.11. !\[\]\(66568c3ce22862f5aa9927d764d3a113_img.jpg\) Alarms\)](#)). Separately for overrunning up and down. The value 0 means the alarm is turned off.

Figure 7 - Status – protection and alarms



protection class	class 3.1	upper alarm temp	+1°C
over temperature	50.0°C	lower alarm temp	-1°C

9. Getting started

9.1. Internal memory

It may be necessary to use the data from the external memory – a USB stick. The USB stick should be formatted the FAT 32 file system. The USB stick should be placed in USB slot located on the front the unit, near to the display. Wait a few seconds, the correct reading is indicated by the message „USB flashdrive connected” at the bottom of the screen.



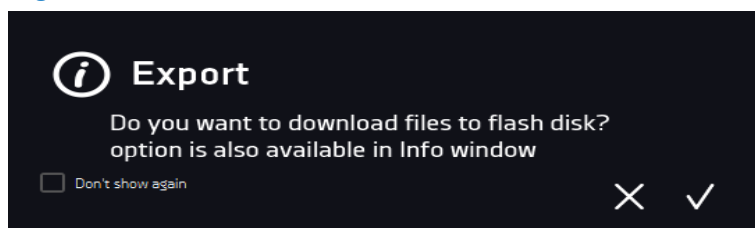
USB slot is used to connect a flash memory – a USB stick. Connecting other units (external hard drives) is not authorized by the manufacturer and may damage the USB slot.

9.2. First boot

During the first boot, the screen ([Figure 8](#)) will display proposing to save the "Download" folder (folder includes Premium Control Software and instruction manual) on a USB stick. Insert the USB stick (not included) and wait a second to detect the hardware, then press . By pressing  you quit downloading the folder, the window will appear again during the next start. You can tick „Don't show again” so that the window will not be displayed when you start.

You can always download the "Download" folder in the information panel. More information, [10.7.](#)  [Info](#).

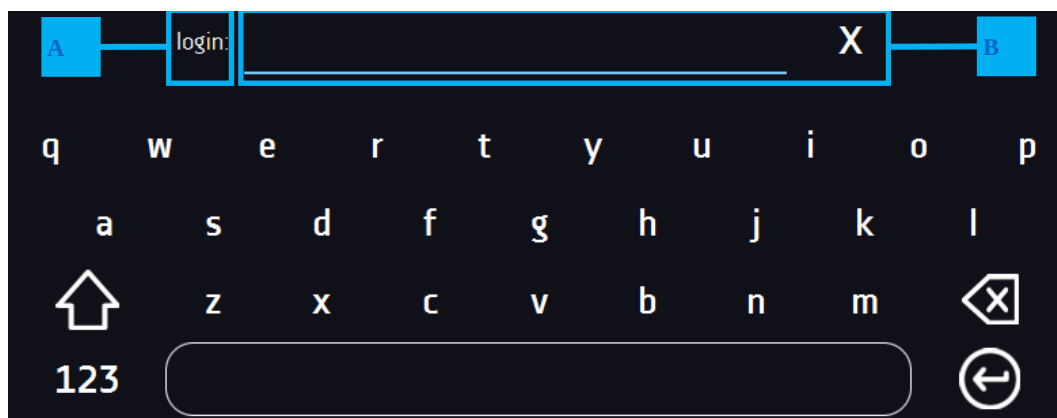
Figure 8 – Manual download



9.3. Using the keypad

When operating the unit, it is sometimes necessary to enter alphanumeric characters (e.g. when logging in to the system, entering the user's name, etc.). In such cases, the keypad ([Figure 9](#)) appears on the display screen. In addition to the standard letters, there are symbols corresponding to the computer keyboard.

Figure 9 - Alphanumeric keypad



- A** Edition of field name
- B** Edition field
- X** Deleting the entire text
-  Change to block letters (the size of letters is important when entering login and password)
- 123** Change to numbers or special characters
- ABC** Change to letters
-  Deleting the entered character
-  Confirmation of the entered text/closing the keypad

 Sometimes input characters can be displayed as asterisks *. This happens when input information is secret (e.g. when typing passwords).

9.4. User logging in

Only the logged-in user (Super Admin or Admin) can control the unit. If no user is logged-in, press  in the main screen. The login window will appear ([Figure 10](#)).

Factory default login parameters:

login: admin

leave the password field empty.

Super Administrator can create max. 4 additional users. More information, [10.8.](#)  [Users](#).

Figure 10 - Login panel



The login panel is a dark blue rectangular box. It contains two input fields: 'login:' and 'password:'. To the right of the 'password:' field is a small white eye icon with a red diagonal line through it, indicating a toggle for password visibility. To the right of the eye icon is a blue rectangular button with a white lock icon.

It is advised to set the password during the first run and make a note in a safe place in order to avoid interference of unauthorized people.

 It is necessary to write down and remember the password because it is not possible to reset it!
If the password has been lost, it is necessary to contact service.
Resetting the password is not a warranty repair!

Information about the types of user accounts ([10.8.2. Types of accounts and their limits](#)).

Logging out: press  in Main Menu.

10. Operation

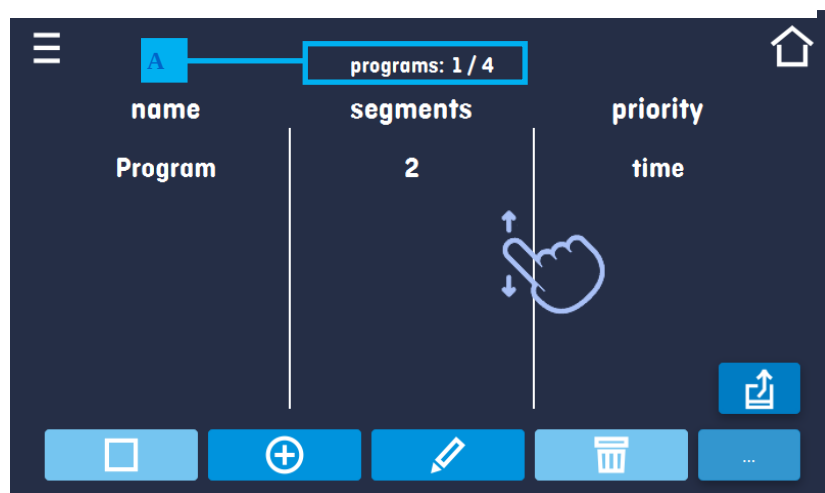
10.1. Programs

In this panel ([Figure 11](#)) you can run the selected program, add a new one, edit the program, delete it, make it available to another user and download it from the USB flash drive.

Menu push buttons:

	Run the selected program
	Stop the program
	Add a new program
	Edit the selected program
	Delete the selected program
	Download the program from the USB flash drive

Figure 11 - List of programs



Information about the number of created programs and the programs to be created is presented at the top .

10.1.1. Program creating / edition

Press the button  or , and a panel with program parameters will appear ([Figure 12](#), [Figure 13](#)). You can set the panel:

- **Name** – after pressing, the keypad will appear and you will be able to enter the name of the program
- **Segments number** – the number of segments
- **Interval** – frequency of saving to data logging
- **Protection class** – more information [10.1.6. Protection class](#)
- **Protection temperature** – temperature range for the protection class

- **Priority** – the priority of time or parameters, more information [10.1.5. Priority](#)
- **Loop** – the number of program repetitions, more information [10.1.4. Loop](#)

Figure 12 - Program parameters (1)

Figure 13 - Program parameters (2)

 ∞'. To the right of the 'protection temperature' and 'priority' settings is a hand icon with vertical arrows, indicating a scrollable list. At the bottom are two buttons: a blue button with a white bar chart icon and a light blue button with a white 'X' icon."/>


Cancels adding or editing of the program

Switching to the edition of program segments



With more parameters you can scroll the panel up and down.

10.1.2. Segments edition

Press the button , and the first program segment will appear (Figure 14, Figure 15).

In this window you can set:

- **temperature** – set temperature which the unit is to achieve in this segment, (can't be higher than over temperature protection -2°C),
- **time** – the time of maintaining the set temperature ([d hh:mm]) (days, hours and minutes) it is possible to select continuous work in the last segment ∞,
- **CO₂** – CO₂ concentration to be achieved in the segment,
- **ramp time** – the time of reaching the set temperature ([d hh:mm]) (days, hours, minutes).

The active value is highlighted in blue.

The item highlighted in red means that the value is out of range and you should enter another one, eg the temperature is above / below the operating range of the unit or the protection temperature.

Figure 14 - Program segment edition (1)

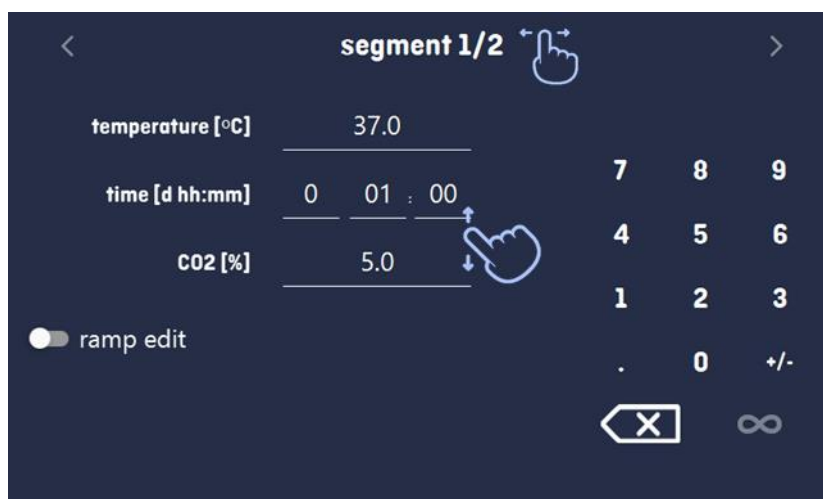
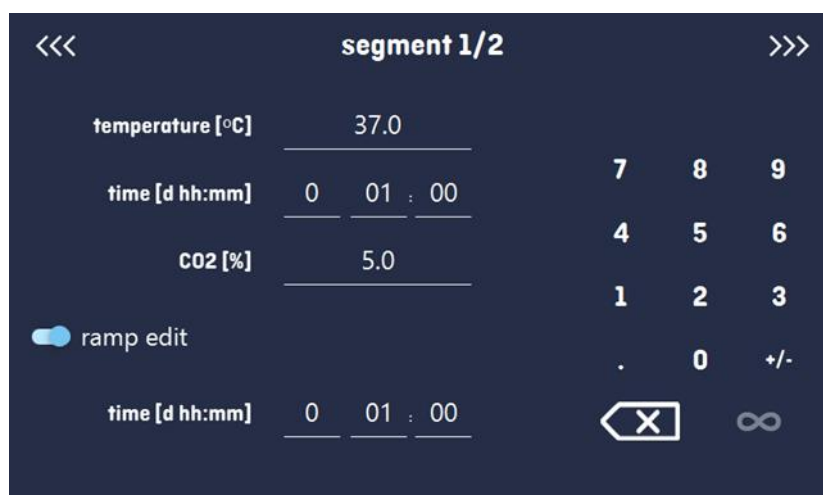


Figure 15 - Program segment edition (2)



The navigation between: segments, program parameters and summary is done by swiping up the segment with the finger or

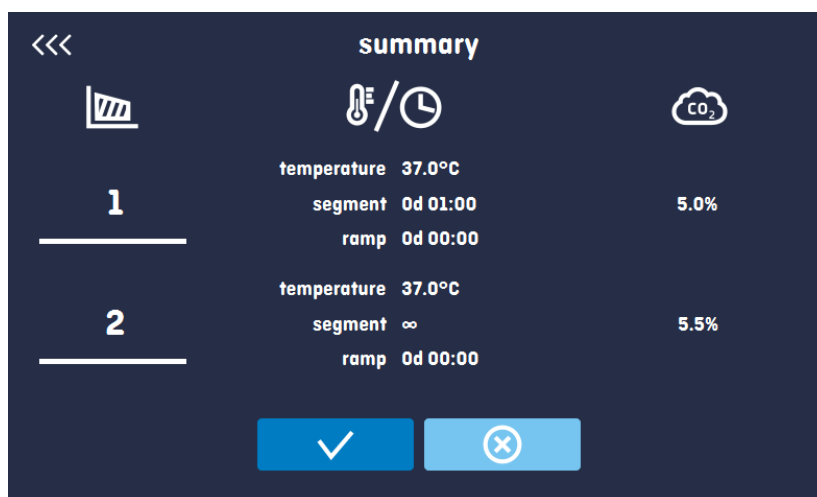
touch the icon  .

10.1.3. Summary of segments

In the summary in the figure all segments (*Figure 16*) are visible along with the entered settings:

- segment number,
- temperature, CO₂ concentration, duration time, target time of reaching temperature of a given segment.

Figure 16 - The summary of the program



Confirms and saves the changes



Cancels the entered changes to segments and goes into program parameters.



With more parameters you can scroll the panel up and down.

10.1.4. Loop

The option is available if the number of segments is equal to 2 or more.

When the program finishes the last segment, the unit starts the program again from the first segment.

You can define if a program should be carried out once (loop: 1) or multiple times (loop: 2 to 255). You can also set the program to be carried out continuously, tick the „∞” option.

10.1.5. Priority

Can be set in terms of:

Parameters:

The program without a ramp – the unit starts the countdown of the segment time when the set temperature is reached.

The program with a ramp – first, the unit counts down the time of the ramp and then proceeds to the segment countdown when the set temperature is reached. Regardless of whether the time of ramp elapsed.



It may happen that the unit couldn't reach the set temperature within the set time because the reaching time was too short. In such situation the reaching time will be exceeded and the segment's time countdown will start when the set temperature is reached.

Time:

The program without a ramp – the unit starts counting down the segment time when the program is started. Regardless of whether the temperature has been reached.

The program with a ramp – the unit first counts down the ramp time and after its expiry it proceeds to the countdown of the segment time. Regardless of whether the temperature has been reached.



It may happen that the time of reaching was too short and the unit failed to reach the set temperature within the set time. Then the countdown of the segment time will start before reaching the set temperature. Thus, the actual time of unit stay in the set temperature will be shortened.

10.1.6. Protection class

The unit is equipped with cartridge protection – over temperature protection **class 3.1**, which is realized on the basis of the temperature value measured by an independent temperature sensor, the so-called security sensor.

The main aim of the cartridge protection is to protect against uncontrolled rise in temperature. At the moment of activation, the relay disconnects the heating power supply.

Temperature protection **class 3.1** – when the temperature drops below the set protection value, the power turns on automatically and after rising the temperature above the set protection value, the power turns off automatically.

Figure 17 - Confirmation of protection alarm class 3.1

alarms	info	state	confirm
over protected temperature	details	active	confirm

The temperature set in the segment cannot be higher than the upper protection temperature less 2°C, e.g. the upper protection temperature: 39°C the maximum temperature set in the segment that can be given is 37°C.

More information see [12. Temperature protection](#).

10.2. Starting the program

You can start the program in two ways:

The first way

- Press the icon  „programs” in main menu ([Figure 18](#)).
- Then select the program you want to activate and press „Start” button  ([Figure 19](#)).

Figure 18 – Main menu

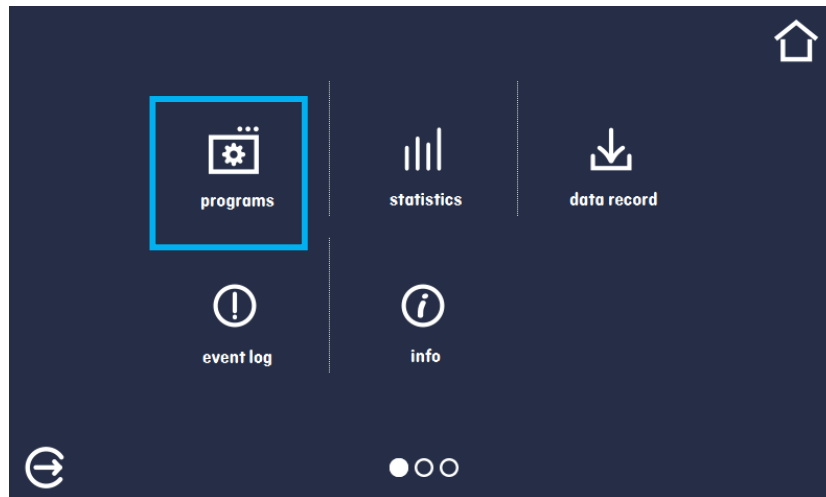
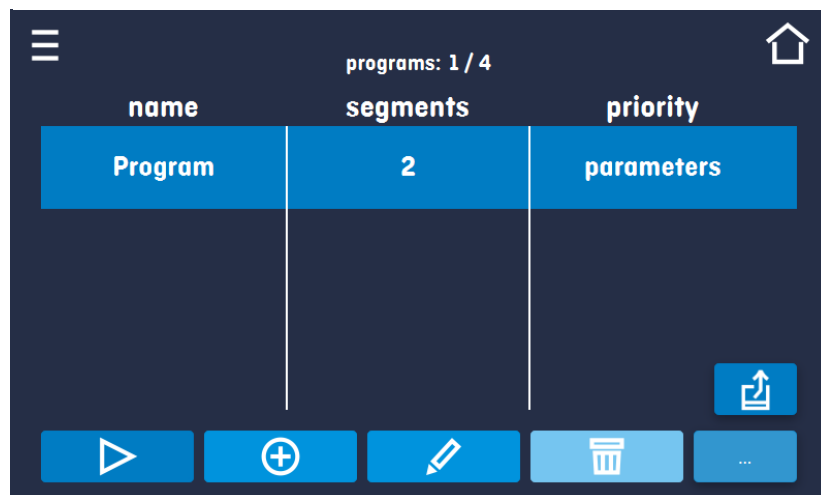


Figure 19 – List of programs



The second way

- In the main panel (Figure 20) press the icon in the upper right corner .
- Select the program you want to activate (Figure 21), you have got two additional options:



Immediate start of the program



Scheduled program start according to the set date and time

Figure 20 – Main screen

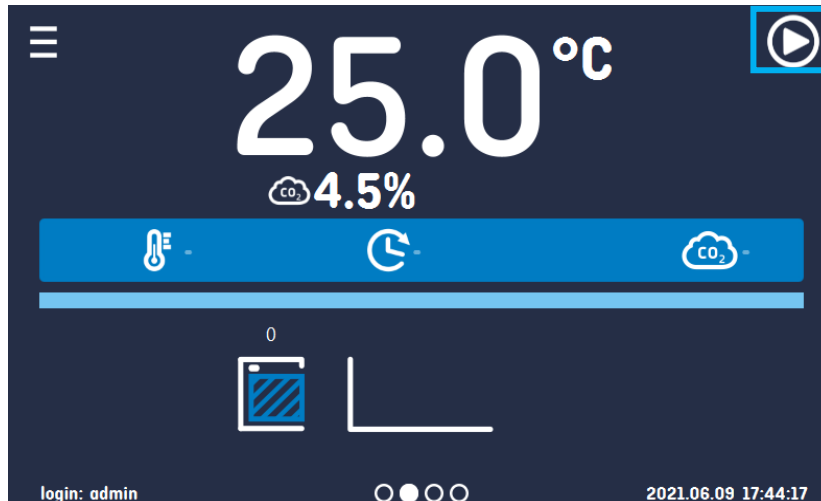


Figure 21 - Starting the program



10.3. Quick change of parameters



You cannot make a quick change (time / temperature / CO₂) in a running program belonging to another user.
Information about the program owner can be found on the bottom panel (Figure 6).

10.3.1. Quick change the set temperature

In order to quickly change the value of the set temperature of the program, press the icon  in main screen (Figure 2). The value of the temperature should be selected by scrolling the list up or down (Figure 22). Confirm the change by pressing



Temperature cannot be higher than protection temperature (over temperature) -2°C.

Figure 22 - Quick change of temperature



10.3.2. Quick change the set time

In order to quickly change the duration time of the program, press the icon  in main screen (Figure 2).

Select the number of days, hours and minutes by scrolling the list up or down (Figure 23). Confirm the change by pressing . To set the continuous work press .

To change the way of displaying the time, press:



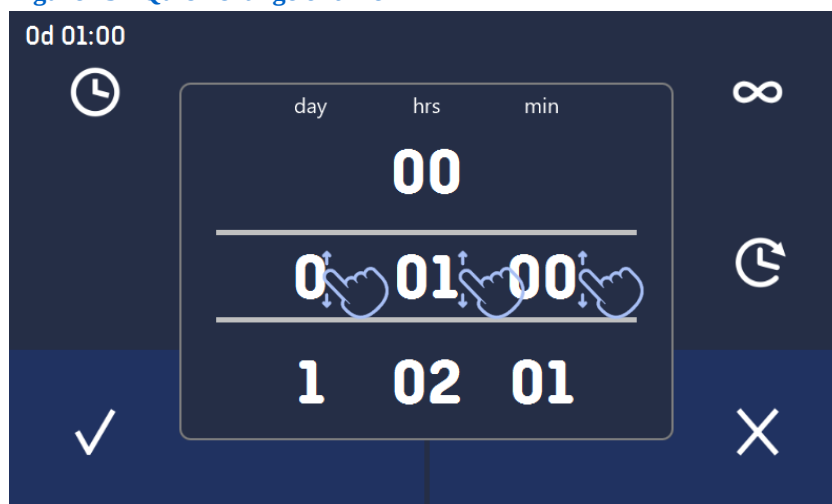
- to display the elapsed time



- to display the remaining time

To change only the way of displaying, you do not have to confirm it by .

Figure 23 - Quick change of time



10.3.3. Quick change the set CO₂ concentration

In order to quickly change the set CO₂ concentration, press the  icon in the main screen.

Select the required CO₂ concentration by scrolling the list up or down (Figure 24). Confirm the change by pressing .

Figure 24 – Quick change of CO₂ concentration



10.4. Statistics

This panel displays statistics about the currently running program or program that has ended. Statistics are calculated separately for each segment and separately for each cycle. Data logging starts for calculation after 30 seconds from reaching the set temperature in the segment. The next data is registered every 1 minute.

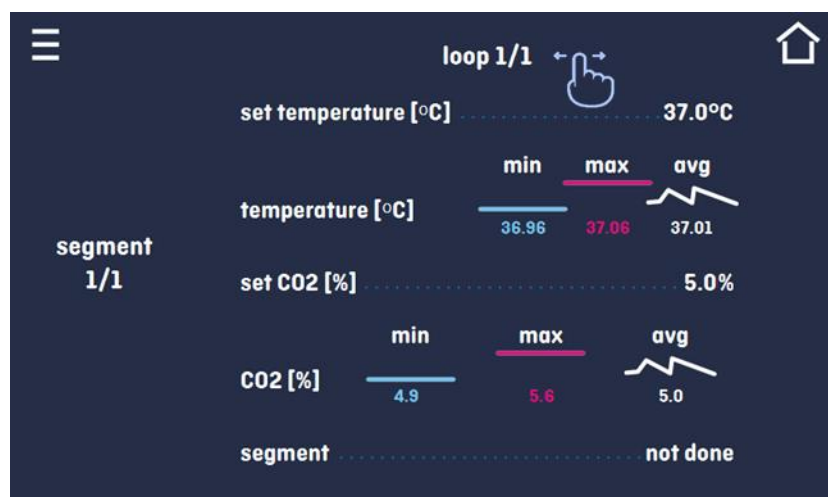
The following information is available:

- **Set temperature [°C]** – set temperature in the segment,
- **Minimum temperature [°C]** – the lowest recorded temperature,
- **Maximum temperature [°C]** – the highest recorded temperature,
- **Average temperature [°C]** – average temperature,
- **Minimum CO₂ [%]** – the lowest recorded CO₂ concentration,
- **Maximum CO₂ [%]** – the highest recorded CO₂ concentration,
- **Average CO₂ [%]** – average CO₂,
- **Segment** – status of the segment:
 - in progress – currently performed segment (data is constantly updated),
 - finished – the segment is made,
 - interrupted – the segment was interrupted by the user before the set time expired.
- **Segment 1/2** – the number of the currently overlying segment / number of the currently performed or completed segment. Navigating between the segments is done by swiping up your finger up or down.
- **Cycle 1/1** – the number of currently overlying cycle / the number of currently performing or completed segment. Navigating between the cycles is done by swiping up your finger up or down.



You cannot overview the segment / cycle data that has not yet started.

Figure 25 - Statistic



10.5. Data record

Register window (Figure 27) contains the following information:

- Time and date of the registered data [date],
- Temperature value in °C measured by the main sensor inside the chamber [temp.],
- CO₂ concentration value [CO₂],
- Status of the unit.

For each user 10 000 data will be stored for maximum of 12 months. If all the memory cells are full, the oldest ones are overwritten.

Data is displayed in the chronological order from the oldest to the latest record. It is possible to segregate data according to the selected column. To do so, click the column heading.

Data are only registered when the program is running. The frequency of registration depends on the program parameters settings.



The time of opening the Data Register depends on the number of saved data. The larger number of stored cells increases the opening time of the window. Then, a progress window will appear (Figure 26), indicating what date range has been displayed. By clicking on  you can stop loading and overview only some part of the data. By pressing the progress bar, you can minimize it (it will appear at the top of the screen) and overview the previously loaded data.

Figure 26 – Process bar

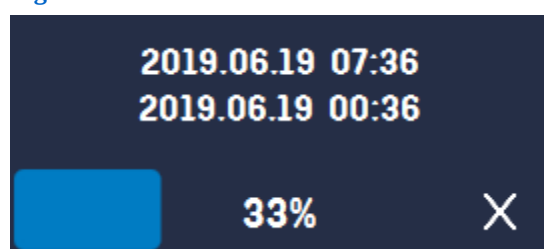
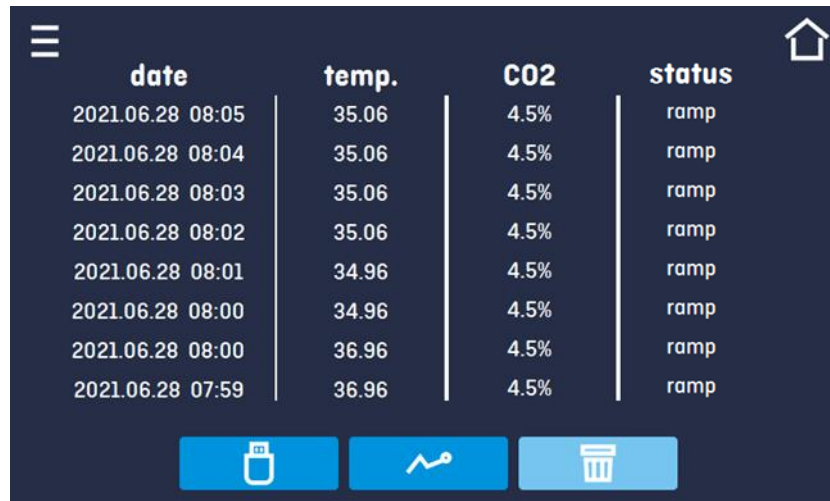


Figure 27 - Data Register



date	temp.	CO2	status
2021.06.28 08:05	35.06	4.5%	ramp
2021.06.28 08:04	35.06	4.5%	ramp
2021.06.28 08:03	35.06	4.5%	ramp
2021.06.28 08:02	35.06	4.5%	ramp
2021.06.28 08:01	34.96	4.5%	ramp
2021.06.28 08:00	34.96	4.5%	ramp
2021.06.28 08:00	36.96	4.5%	ramp
2021.06.28 07:59	36.96	4.5%	ramp

Buttons at the bottom: USB stick icon, Line graph icon, Trash can icon.



Data recording onto the USB stick. .csv files are available - semicolon separated by opening e.g. with a spreadsheet, .plx - opening with the Premium Control application

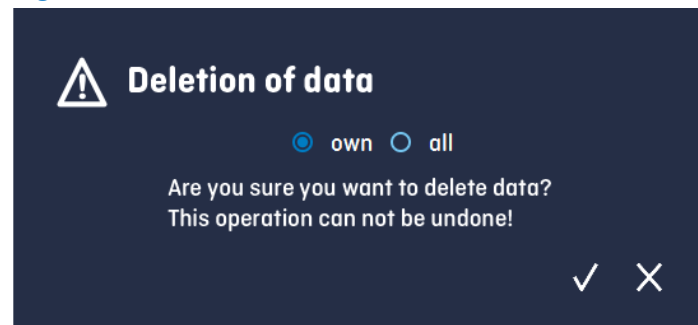


Diagram display, see [10.5.1. Graph](#)



Deleting data. Users with Super Admin rights can delete all data also those registered by other users ([Figure 28](#))

Figure 28 – Deletion of data



10.5.1. Graph

It is possible to generate a graph from the available samples in the data register. Choose the graph to enlarge by double click ([Figure 29](#)).



Displays the entire graph / back to the list of graphs



Back to Data Register

Figure 29 – Graph selection

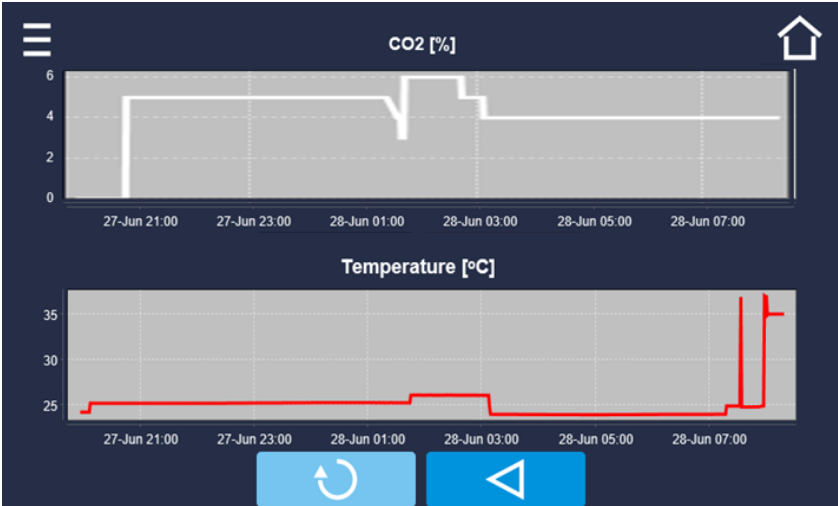


Figure 30 - Temperature graph

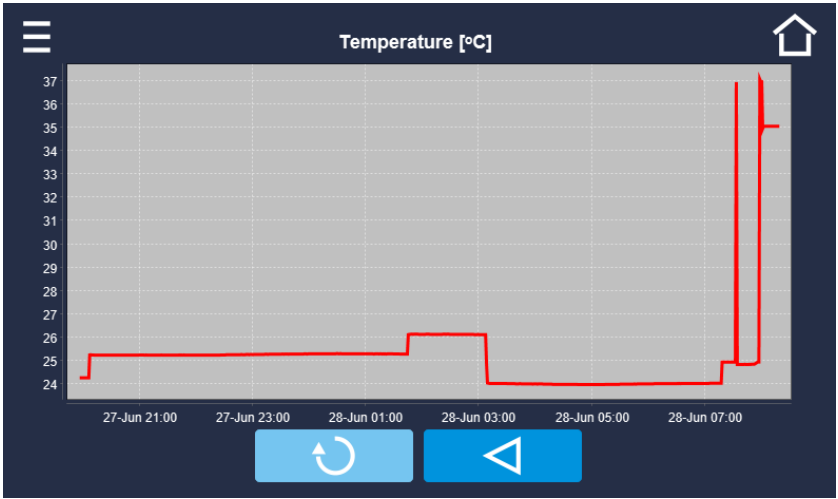
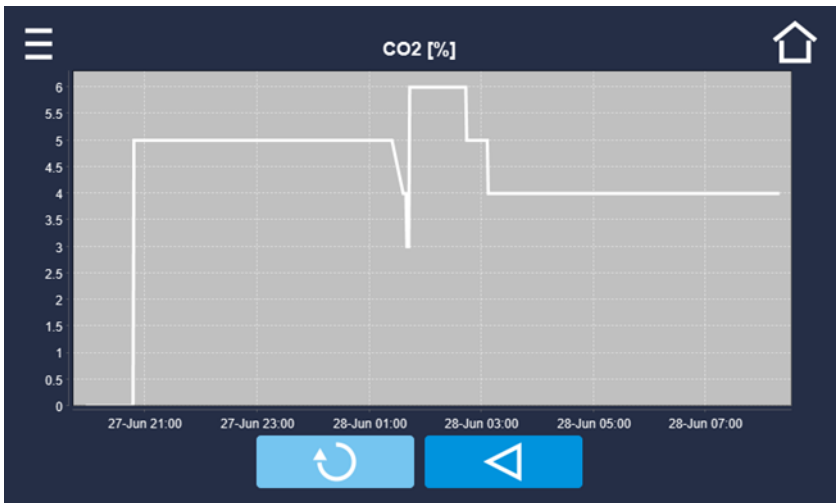


Figure 31 – CO2 graph

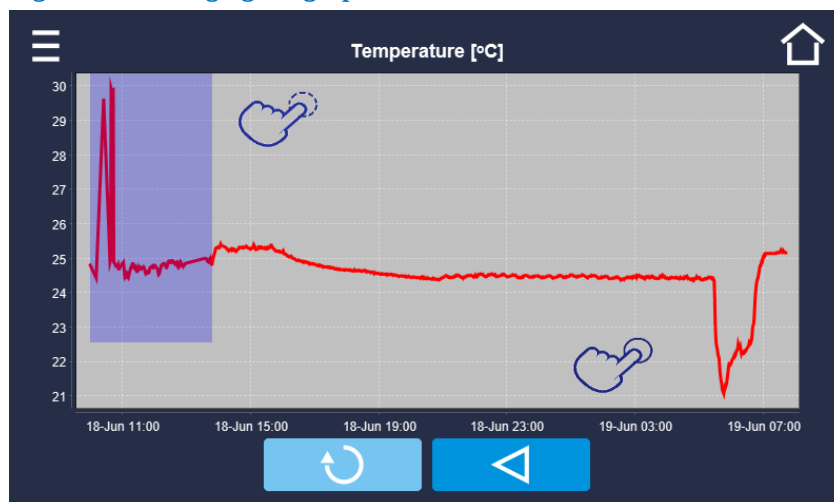




The time of opening the graph depends on the number of saved data. The larger number of stored cells increases the opening time of the window.

It is possible to enlarge a fragment of the graph. Press anywhere and swipe both right and down at the same time (Figure 32). By swiping to the left you can back to the normal size of the graph.

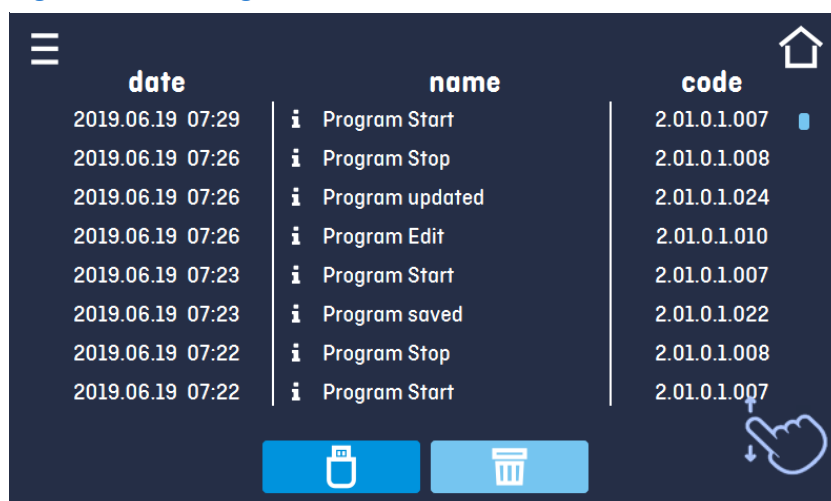
Figure 32 - Enlarging the graph



10.6. Event log

The window displays information about registered events, alarms and errors. Data is only available for Super Admin users.

Figure 33 – Event log



date	name	code
2019.06.19 07:29	i Program Start	2.01.0.1.007
2019.06.19 07:26	i Program Stop	2.01.0.1.008
2019.06.19 07:26	i Program updated	2.01.0.1.024
2019.06.19 07:26	i Program Edit	2.01.0.1.010
2019.06.19 07:23	i Program Start	2.01.0.1.007
2019.06.19 07:23	i Program saved	2.01.0.1.022
2019.06.19 07:22	i Program Stop	2.01.0.1.008
2019.06.19 07:22	i Program Start	2.01.0.1.007



Saving the data onto USB stick. .csv files are available - semicolon separated by opening e.g. with a spreadsheet, .plx - opening with the Premium Control application



Deleting data

Possible events:

- **Date/time change** – data/time were changed
- **Device On** – the incubator is switched on (on the main switch)
- **Device Off** – the incubator is switched off (on the main switch)
- **Door closed** – the door is closed
- **Door opened** – the door is opened
- **Open door alarm start** – open door alarm has been activated
- **Open door alarm stop** – open door alarm has been deactivated
- **Over Protection Start** – over-temperature protection has been activated
- **Over Protection Stop** – over-temperature protection has been finished
- **Program Edit** – changing the program parameters
- **Program End** – program is finished
- **Program Restarted** – program has been restarted after power failure
- **Program Start** – starting the program
- **Program Stop** – stopping the program
- **Lower temp. alarm Start** – lower temperature alarm has been activated
- **Lower temp. alarm End** – lower temperature alarm has been finished
- **Upper temp. alarm Start** – upper temperature alarm has been activated
- **Upper temp. alarm End** – upper temperature alarm has been finished
- **Deleted Measurement** – user measurements have been deleted
- **Deleted All Measurement** – all measurements have been deleted
- **User added** – new user has been added
- **User updated** – user has been changed
- **User deleted** – user has been deleted
- **Program saved** – new program has been saved
- **Program deleted** – program has been deleted
- **Program updated** – program has been updated
- **Lower CO₂ alarm Start** – lower CO₂ concentration alarm has been activated
- **Lower CO₂ alarm End** – lower CO₂ concentration alarm has been finished
- **Upper CO₂ alarm Start** – upper CO₂ concentration alarm has been activated
- **Upper CO₂ alarm End** – upper CO₂ concentration alarm has been finished
- **CO₂ Pressure low Start** – low CO₂ pressure alarm has been activated
- **CO₂ Pressure low Stop** – low CO₂ pressure alarm has been finished
- **Sterilization program start** – sterilization program has been started
- **Sterilization program failed** – error or sterilization program has been stopped / interrupted (incomplete sterilization)
- **Sterilization program successful** – successful sterilization at 180°C for 2 hours has been finished
- **Sterilization program completed** – sterilization program has been finished (37°C in the chamber)
- **Start program cancelled, door is open** – sterilization start has been cancelled, the door is open

10.7. Info

The panel contains the following information:

- software versions,
- name of the unit,
- manufacturer's address,
- manufacturer's website.

Figure 34 - Info window

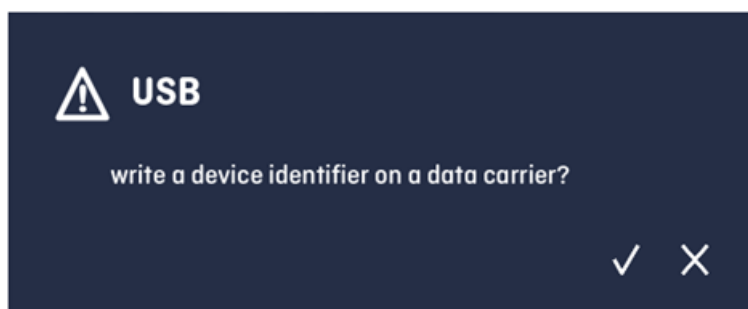


Press icon  to save the “Download” folder (Premium Control Software and instruction manual) on the USB memory stick.

 - write the service data on the USB stick – contact the service for more information.

If an external storage is connected to the unit, then during the entry to the Info panel, the suggestion to save the unit configuration file on the USB stick appears ([Figure 35](#)). The file is used to create an offline program in the Premium Control application.

Figure 35 - Saving the configuration file



10.8. Users

In this panel ([Figure 36](#)) the Super Administrator can add a new user, edit an existing one or delete it. Max. 5 different users can be created and max. 40 programs can be freely distributed among these 5 users.



Add a new user

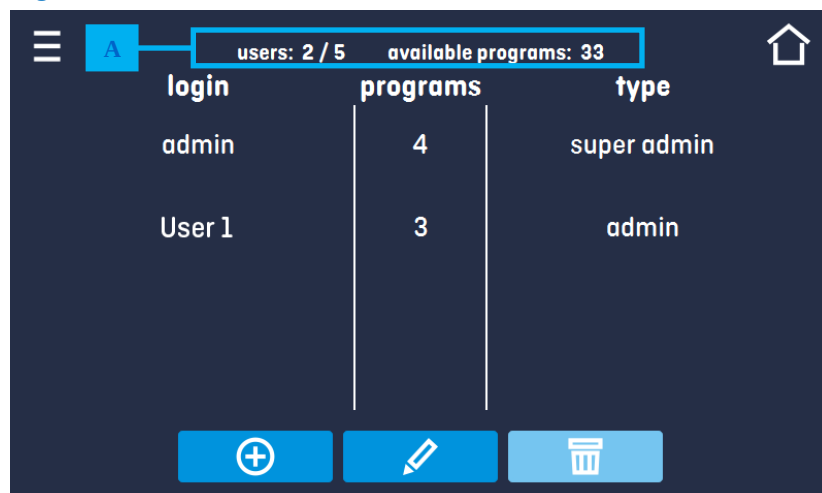


Edit the selected user



Delete the selected user, along with the user, his programs and data register will be also deleted

Figure 36 - List of users



At the top **A** there is information about:

- **User:** the number of created users/ the total number of users to create,
- **Available programs:** the total number of available programs to be assigned to users.

10.8.1. User creating / edition

Press  or , and the panel with user data will appear (Figure 37). Only the Super Administrator can create and edit users.

Should be given:

- **login** – a user name,
- **password** – account password
- **password confirmation** – enter the password again to confirm it
- **type** – type of account: Super Admin and Admin (users have only access to type account Admin. More information in chapter [10.8.2. Types of accounts and their limits](#))
- **programs limit** – the number of programs that user can create/ the number of available programs.

Figure 37 - User edition

login: User 1

password: •

password confirmation: •

type: admin

programs limit: - 3/36 +



Confirms and saves the user



Cancels the entered data and returns to the list of users.



The unit can have up to 5 users (incl. Super Administrator). Super Administrator can distribute up to 40 programs among users.

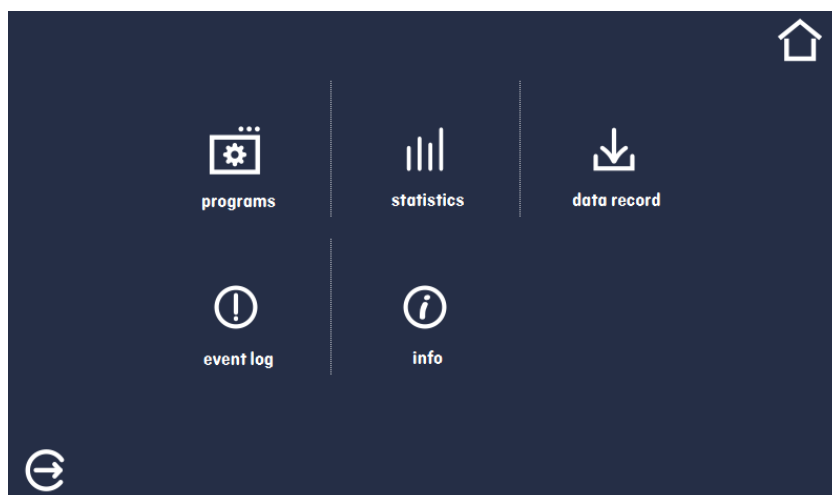
10.8.2. Types of accounts and their limits

There are two different account types available. Each has its own qualities and limits described below.

Admin account

It has access to **program management menu**, where users can create or edit programs (**programs**), check their statistics (**statistics and data register**) and information about the system (**info**).

Figure 38 - Main menu – Admin



Super Admin account

Super Admin account has not limits. It has access to the program menu management and to the settings menu.

Figure 39 - Main menu – Super Admin (1)

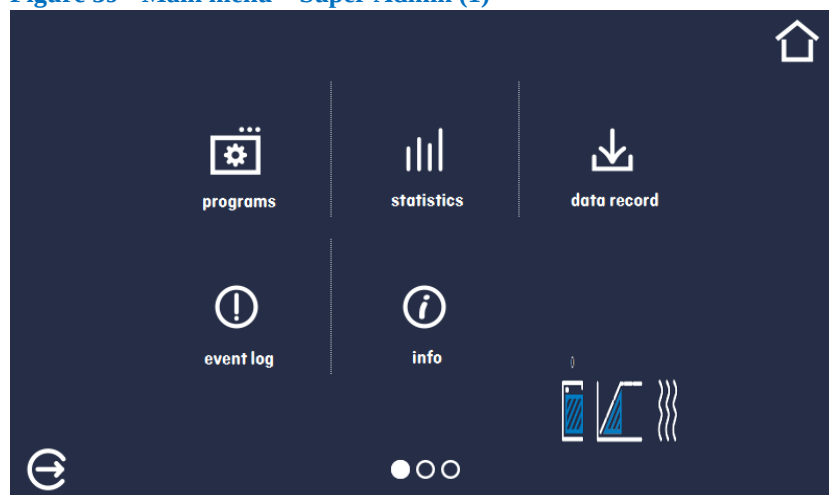


Figure 40 - Main menu – Super Admin (2)

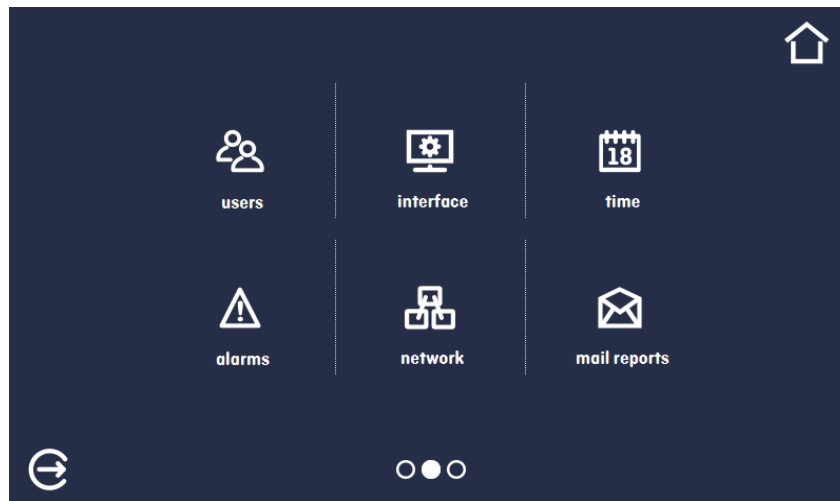
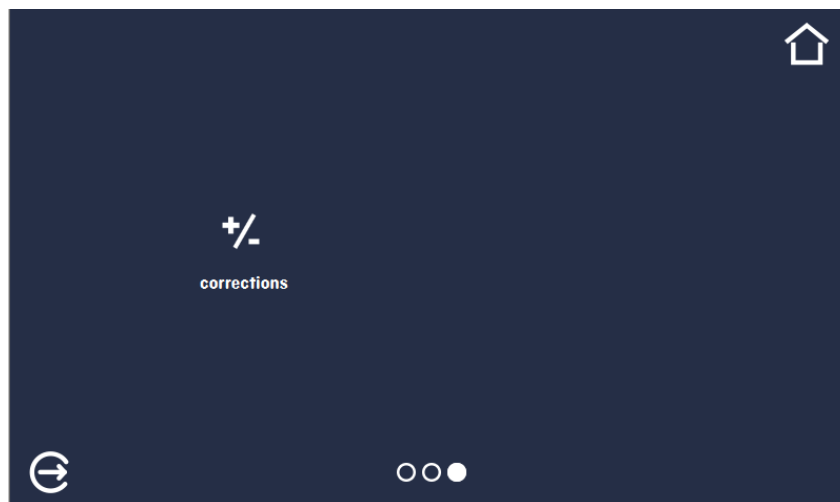


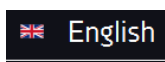
Figure 41 - Main menu – Super Admin (3)



Information about which window is active indicates  .

10.9. Interface

In this panel (Figure 42) you can:



View available language of the controller



Set the time after which the screen will be dimmed



Turn on/off the sound, alarm sounds will be still emitted



Set the time after which the user will be automatically logged-out



Confirms and saves changes



Cancels the entered changes

10.10. Time

In this panel (*Figure 43*) you can:

- change date / system time,
- change time zone.

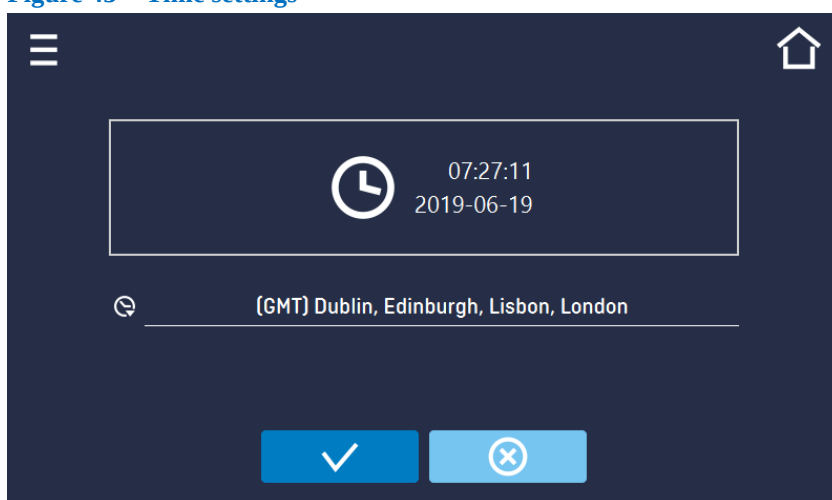
When you change the system date or time, the unit will be restarted. Date and time cannot be changed while the program is running.

If you change the date and time to an earlier than the current one, a message will appear on the display:

Changing the date/time will interfere with the records in the database. Delete the data from data record and event log first, then change the date/time.

You must first delete the data from the “data record” and from “event log” and then change the date/time.

Figure 43 - Time settings



Confirms and saves changes



Cancels the entered changes



The same time zones are required for correct operation of computer and unit's programs.

10.11. Alarms

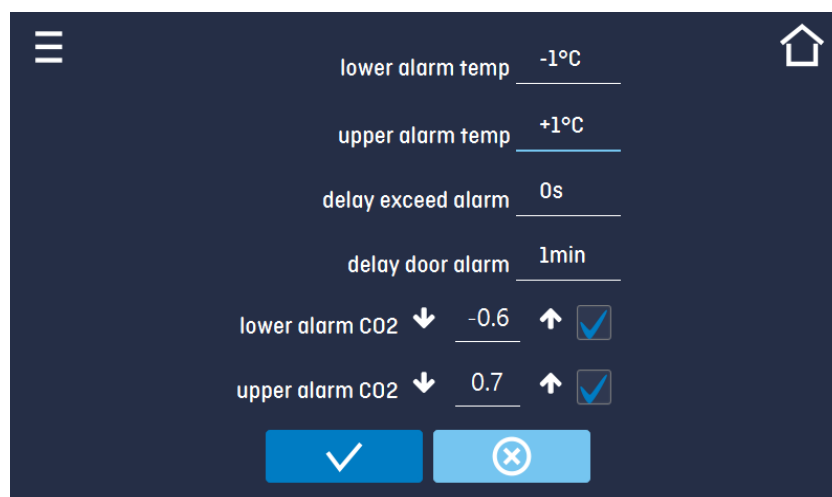
You can set parameters related to alarms.

- **lower alarm temp** – an alarm will be generated if the temperature drops below the value given in this field
- **upper alarm temp** – an alarm will be generated if the temperature rises above the value given in this field
- **lower alarm CO₂** – an alarm will be generated if the CO₂ concentration drops below the value given in this field
- **upper alarm CO₂** – an alarm will be generated if the CO₂ concentration rises over the value given in this field

The lower and upper alarm can only be generated after reaching the set temperature.

- **delay exceed alarm** – an alarm will be activated with a delay (1 min, 2 min, 5 min, 15 min) after exceeding the permitted temperature/CO₂ concentration
- **delay door alarm** – a door alarm will be activated when the door is opened for the time selected by the user (5 s, 30 s, 1 min, 5 min, 10 min)

Figure 44 – Alarm settings



Confirms and saves changes



Cancels the entered changes



In the field "lower alarm temp" you can set a value of -1°C to - 5°C and in the field "upper alarm temp" you can set a value of +1°C to +5°C.

10.12. Network

In this panel ([Figure 45](#)) you can change the settings for the network. Switch between the type of LAN / WiFi network, press

the icon  or .



Only one type of network can be active.
After changing the network type, it may be necessary to restart the unit.

LAN settings (Figure 45)

- **IP** – the incubator's IP address
- **Mask** – an Ethernet network mask to which the incubator is connected
- **Gate** – Server's IP address or router's that manages the Ethernet network
- **DNS** – IP address of the domain name system
- **MAC** – the address of the network card, read-only
- **DHCP** – you can select if the server that allocates IP addresses is running on the local network. You can then skip setting IP, Masks, Gates

Icon  indicates the connection status.

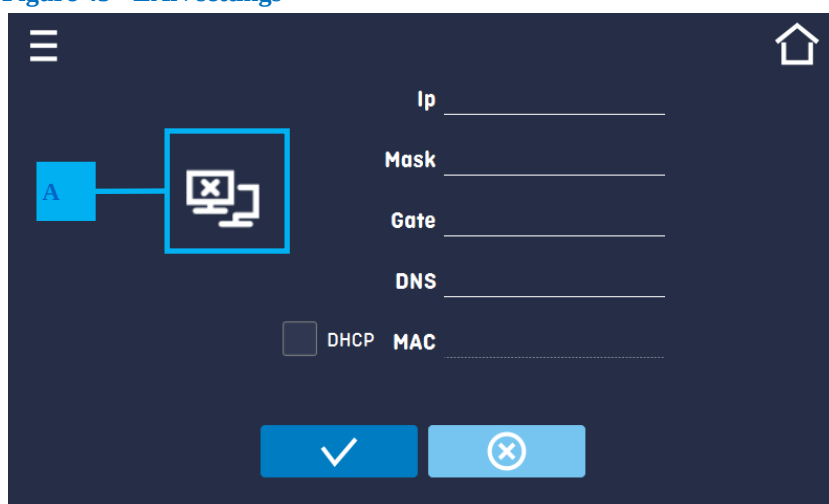


Incubator connected



Incubator disconnected

Figure 45 - LAN settings



Confirms and saves changes



Cancels the entered changes

WiFi settings (Figure 46)

-  – press to refresh network list
- **SSID** – press to select network from the drop down list
- **PSK** – network password
- **IP, Mask, Gate, DNS** – automatically completed when the network connection is correct
- **MAC** – the address of the network card, read-only

Figure 46 – WiFi settings



Confirms and saves changes



Cancels the entered changes

10.13. Mail reports

In this window, you can set the parameters needed to activate notifications via e-mail. The panel is divided into three windows:



Selection of event types for which notifications should be sent:

- **Activate** – activate or deactivate e-mail notifications
- **Door alerts** – alarms caused by the half-open door
- **Critical alerts** – critical alerts (e.g. sensors damage)
- **Temperature alerts** – alarms caused by too high or too low temperature
- **CO2 alerts** - alarms caused by too high or too low CO₂ concentration
- **Programs** – events connected with programs (e.g. adding, edition, delete of a program)
- **Users** – events connected with users edition settings (adding, edition, delete of a user).

Figure 47 - E-mail events



Confirms and saves changes



Cancels the entered changes



If you do not enable the "activate" option at the top of the panel, emails will not be sent!



Sender and recipients (*Figure 48*)

- **Sender** – sender's e-mail address
- **Recipients** – recipient's e-mail addresses (up to 3)

Figure 48 - E-mail – sender and recipients



Confirms and saves changes



Cancels the entered changes



Configuration of the sender e-mail account (*Figure 49*).

In this window you can add the details of your e-mail account.

- Server ID SMTP
- Server password SMTP
- Server Host SMTP
- Server Port SMTP

You can also select the way of encryption **TLS** or **SSL**.

The above information can be obtained from the email account provider.

Figure 49 – E-mail - configuration of the sender e-mail account

-  Connecting test
-  Confirms and saves changes
-  Cancels the entered changes

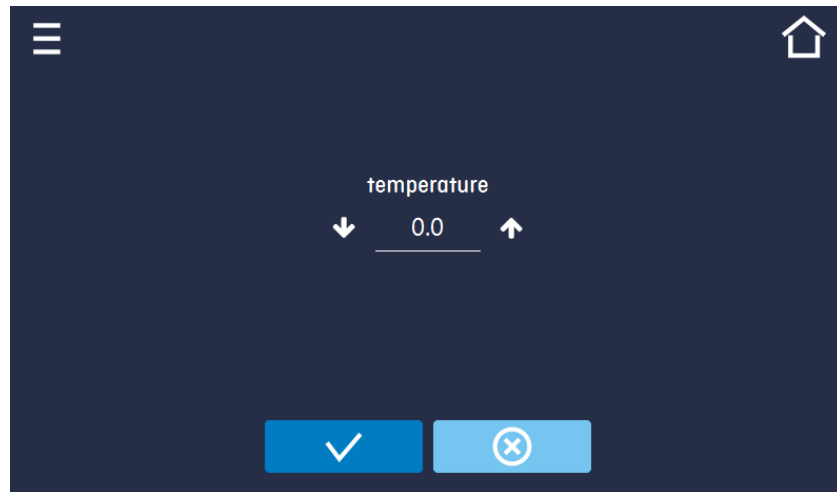
 Before testing the connection, make sure that the unit is connected to a computer network and has a properly configured network connection.

10.14. Corrections

In this window ([Figure 50](#)) you can set correct temperature value indicated on the display by adding the correction value. The set correction value is taken in the whole temperature range operation of the unit. For example, if the average temperature displayed by the unit indicates 37°C and the average temperature measured by independent, external sensor indicates 37,5°C, the correction should be set on +0,5°C. The average temperature should be calculated from chosen period of time e.g. 30min. The correction range: -5°C to +5°C.

	The unit has been calibrated by the manufacturer in accordance with applicable norms. The temperature shown on the display corresponds with a great accuracy to the temperature in the geometrical centre of the chamber. For the correct operation of the unit it is not necessary to use user's calibration.
	The user is performing temperature correction on his own responsibility and he must be aware of consequences of changing of manufacturer's settings. If the equipment was calibrated, calibration certificate loses its validity.

Figure 50 – Correction made by the user



Confirms and saves changes



Cancels the entered changes

10.15. Hot-air sterilization program

	Before starting hot-air sterilization: - the entire interior must be clean and dry. No residue of e.g. samples, plastic or water can remain inside the chamber, - empty the water pan (the rack, shelves, water pan and CO₂ sensor can stay inside the chamber, the blue plastic caps at the rack system are heat resistant and don't need to be removed), - close the inner glass door and the outer chamber door.
	During hot-air sterilization do not touch the internal components and glass door, as there is a risk of burns. Use protective gloves to avoid burns from hot components.
	First sterilization processes may cause an odour. It is not a quality defect. It is recommended to ventilate the room well during sterilization.

The CO₂ incubator is equipped with an automatically controlled hot-air sterilization program. The program (Figure 51) is in the Main Screen (Figure 2) under the  button (upper right corner).

The start of the program can be immediate or delayed.



Immediate start of the program



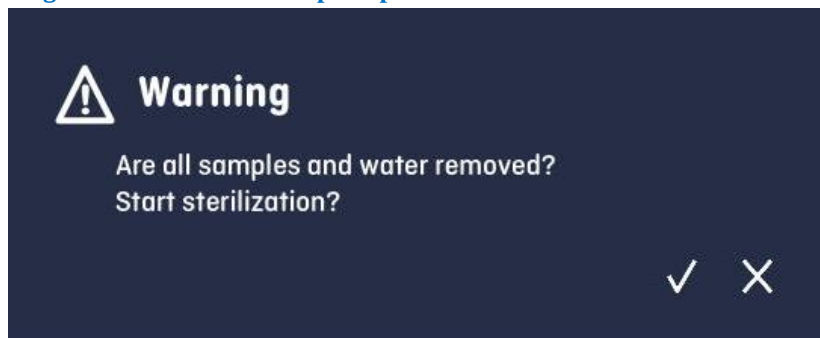
Scheduled program start according to the set date and time

Figure 51 – Sterilization program



Before running the program a confirmation prompt is displayed. Make sure that the water pan was emptied and all samples were removed from the chamber. Confirm the message. The program starts immediately or when the program delay time is over.

Figure 52 – Confirmation prompt



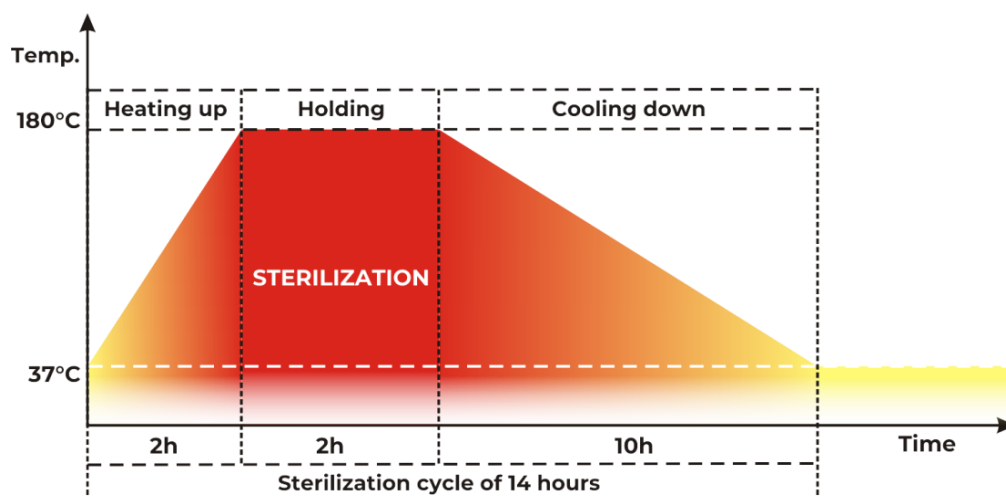
The program will take approx.14 hours and consists of the following steps:

- 1) **Heating up phase:** the inner chamber is heated up as fast as possible to the sterilization setpoint temperature
- 2) **Holding phase:** setpoint temperature is kept for 2 hours

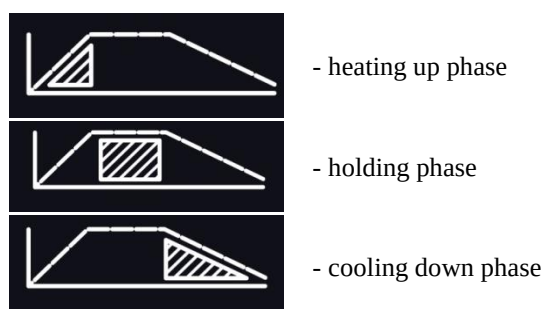
The sterilization setpoint temperature is set to 180°C. The duration of the heating up and holding phase is in total 4 hours. This ensures that the effective sterilization temperature is maintained on all internal surfaces for 2 hours.

- 3) **Cooling down phase:** it takes around 10 hours until 37°C is reached.

Figure 53 - Setpoint profile during the sterilization cycle



The phase of the cycle is indicated at the bottom of the screen by icons shown below.

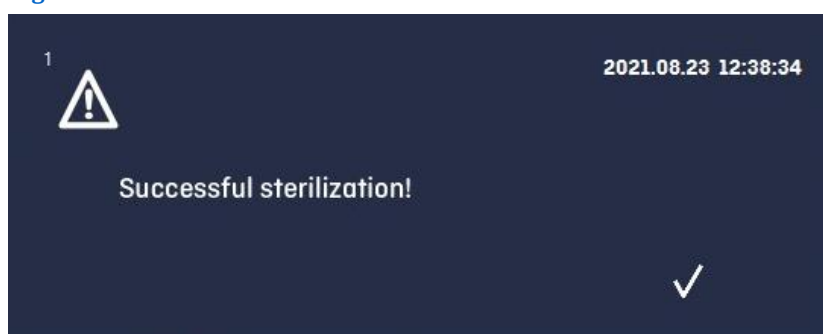


Temperature and time of the sterilization process cannot be changed.

The CO₂ sensor can be hot-air sterilized inside the chamber.

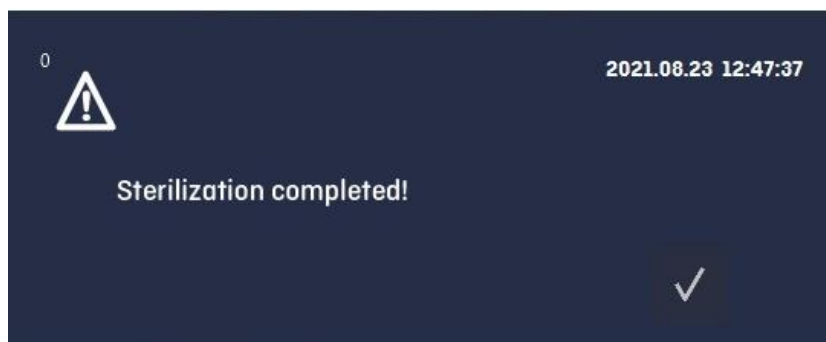
After holding the temperature inside the chamber for 2 hours at 180°C the sterilization process automatically finishes. The information of successfully performed process pops up on the controller display (*Figure 54*).

Figure 54 – Successful sterilization



The total cycle of sterilization finishes when the temperature inside the chamber cools down to 37°C. Then, the information of completed sterilization occurs (*Figure 55*). Confirm the message with the  icon.

Figure 55 - Sterilization completed



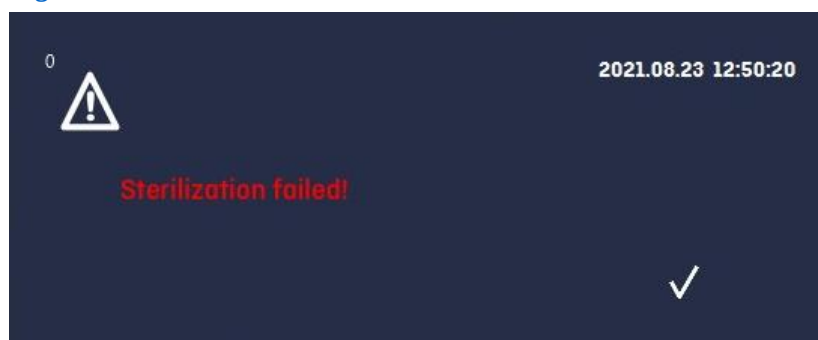
If during the heating up and holding phase:

- the program is stopped by pressing the  button,
- the external door is opened,
- the unit is turned off with the main power switch or in case of power failure,
- the unit's error occurs,

the sterilization is prematurely terminated. The information of incompletely performed sterilization pops up on the display ([Figure 56](#)) and the event is registered in the Event log ("Sterilization failed").

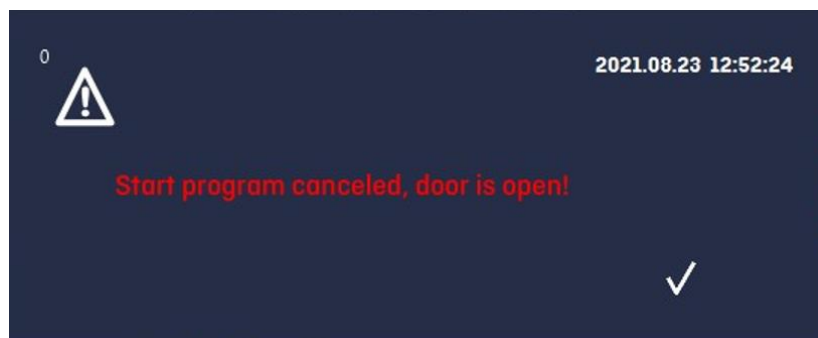
If the sterilization cycle was terminated prematurely, the germs inside the chamber might not be killed totally. It is recommended to repeat the sterilization.

Figure 56 - Sterilization failed



If the door is open when the sterilization program is starting, the program won't start. The information of cancelled sterilization pops up on the controller display ([Figure 57](#)). Close the door and run the sterilization program again.

Figure 57 – Sterilization start cancelled



	Do not touch the glass door and the inner surfaces for approx.10 hours after the prematurely terminated sterilization cycle.
	CO ₂ control is deactivated during the sterilization process and will only be activated when the temperature has cooled down to a value below 55° C.

The chamber during the sterilization process can have negative impacts on the other chamber. Therefore it is recommended to use the original stacking adaptor.

11. Components of the CO₂ incubator

11.1. Door lock

All INCU-Line units are equipped with a door lock located in the door handle. Two keys are attached on the backside of the unit.



11.2. Access ports

11.2.1. External access ports

Two Ø30 mm access ports located on the left wall and on the rear can be used to insert external sensors, which have been secured with silicone plugs. The plugs should cover the access ports while the unit is operating. If multiple cables have been inserted through the access port and if it is not possible to use the plug, secure the access port with adhesive tape. If you leave the access port open, it may affect temperature variation and fluctuation within the chamber.



11.2.2. Access port in glass door

This additional access port with cross cut silicone membrane allows to measure the CO₂ concentration inside the chamber by using special gas sampling tubes (e.g. Dräger) without opening the inner glass door.



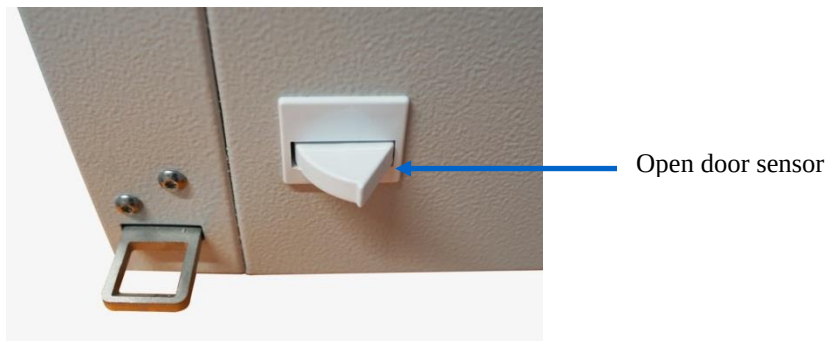
11.3. Open door alarm

All incubators have been equipped with an open door sensor. If you open the door, icon:



appears on the display.

If you leave the door open for more than the selected delay door alarm time, an alarm will sound and the control bar will be red. The alarm event “door open” is displayed in the list, with the status alarm active.



11.4. USB port

To transfer data from the unit's memory to the USB memory stick, connect the memory stick to the USB slot on the unit's front. Go to Setup → Data record, press the button



Select file type *.csv, *.plx.

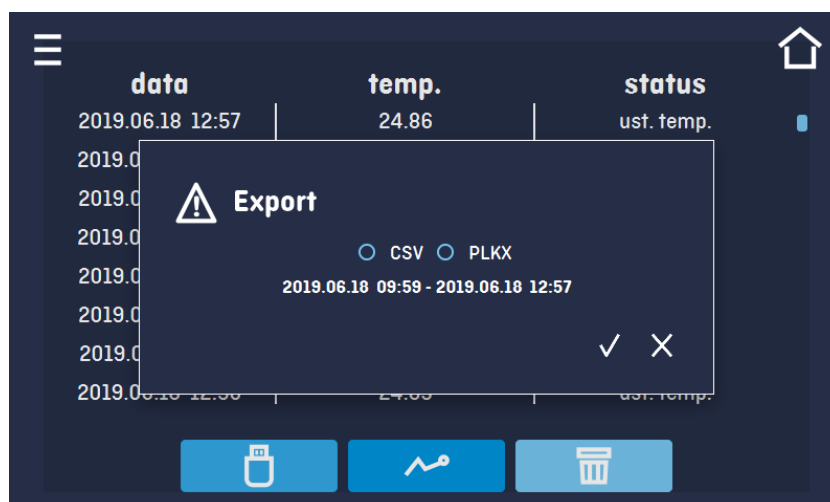
Press:



Data is copied.

Data saved as *.csv file can be opened in the Notepad. Data saved as *.plx file can be opened only by Premium Control. This program allows you f. ex. to view the data in the table or as a graph. It also allows you to make a report of selected data range.

Figure 58 – Saved data export

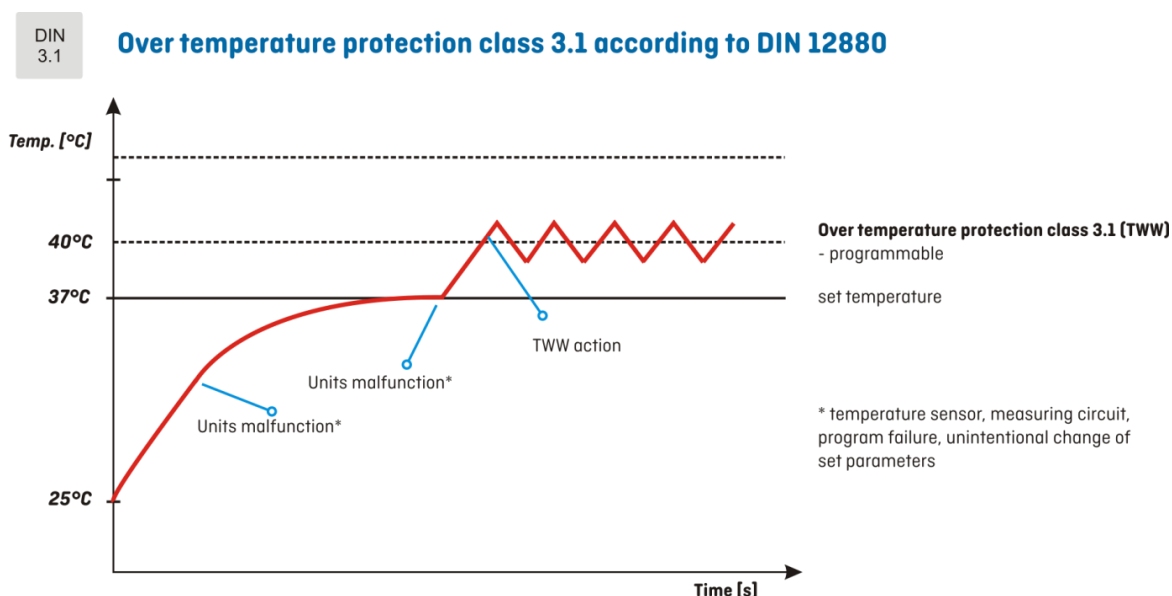


11.5. LAN port

Each unit can be connected to the Ethernet network or directly to the computer with a LAN cable. Premium Control software enables to create programs and send them to the unit remotely, read data (saved data and event log), create graphs and make reports. With this feature, equipment can be controlled and monitored remotely. It is also possible to connect several units at the same time and control them from one computer.

12. Temperature protection

Temperature protection is included as standard. If damage occurs to the temperature controller or the user changes the temperature settings outside the limit, temperature protection will activate. Protection class 3.1 is a standard. The figure below shows how this works.



Protection Class 3.1 according to DIN 12880 norm is called a protecting sample function. The user can set the temperature protection (upper limit) by himself and when the set temperature falls outside of this range, the power heater is switched off. When the temperature returns to within normal parameters, the equipment continues to work normally.

13. Remote control of the unit

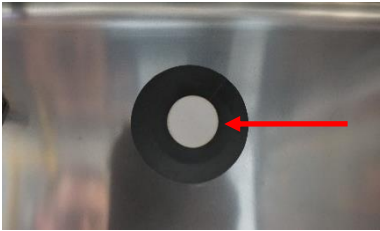
Every Premium unit can be connected to the Ethernet network and controlled remotely using the Premium Control software. The features of the program have been described in a separate instruction manual.

14. Troubleshooting

Before you contact VWR Service Department ([21. Technical service](#)):

1.	Make sure that the operation complies with the instruction manual of the CO ₂ incubator.
2.	Restart the incubator to make sure that the unit is not functioning properly. If it still does not work, disconnect the unit again from the mains and repeat the operation after one hour.

Review the information in the table below to troubleshoot operating problems.

Problem	Cause	Solution
The unit is not working	Check the voltage in the socket.	Measure the voltage in the socket. Plug the unit into a different socket, preferably from a different electrical circuit. Call an electrician with qualifications to inspect the electrical wiring.
	Check if the unit is plugged in.	Plug in the unit.
	Check the status of a circuit-breaker on the back of the unit.	Press the circuit breaker on the back of the unit.
	Check if the power cable is broken.	Change the cable.
The unit is not heating up	Check if the door of the unit is closed properly.	Clean the gasket.
	Does the installation site meet the installation conditions?	Adapt to the installation requirements (according to 3. Installation).
CO ₂ measurement malfunction	Check if water is not condensed in the measuring tip of CO ₂ sensor.	Remove the white filter from the measuring tip of CO ₂ sensor (in the chamber) and let the tip to dry or run the program without water pan e.g. 50°C till the sensor is dry. 
CO ₂ concentration is not rising	Check if the gas cylinder is not empty.	Replace the CO ₂ cylinder.
	Check if the gas hose is not curved too much.	Straighten out the gas hose.
	Check if the CO ₂ gas filter is not clogged.	Replace the filter (according to 15.1. Replacing the CO₂ gas filter).
	Check if the CO ₂ gas filter was replaced according to schedule.	
	Check the CO ₂ pressure on the pressure regulator (approx. 1,5-2 bar).	Adjust the pressure regulator for proper CO ₂ pressure (approx. 1,5-2 bar).

15. Service of the unit

15.1. Replacing the CO₂ gas filter

The incoming gas passes through a sterile inlet filter when the device is in operation. This aseptic filter (particle size 0,2 µm) has a filtration efficiency of 99,99%. The gas cylinder and the supply hose can be a source of dirt. The filter prevents this dirt from accumulating in the gas inlet valve and in the hoses leading into the chamber.

VWR recommends to change the CO₂ gas filter once per year when using gas with a technical grade of 99,5%. The changing intervals should be shorter when gas with less pureness is used.

A safe CO₂ gas filter replacement should be performed according the following procedure:

1. Turn off the unit and remove the cover on the chamber rear.
2. Remove the gas filter on both sides from the gas hoses and then install a new filter.
3. Check gas connections for leaks (e.g. with leak spray or diluted soap solution). Run an exemplary program, adjusting 5% CO₂ concentration. When no gas bubbles are observed after few valve openings, that can be heard (max. 1 minute of the program), the hoses are connected properly. Stop the program.
4. Reinstall the cover on the chamber rear.



16. Accessories and spare parts

Description	Quantity	Cat. No.
Replacement CO ₂ gas filter	1	390-1593

17. Cleaning and maintenance of the unit



Disconnect the unit from the electrical supply before you start cleaning!

Maintenance (cleaning of the housing and the chamber) should be carried out at least once a week (depending on the environmental conditions in the workplace).

To clean products made of stainless steel (INOX) it is recommended using cleaning solution dedicated particularly to stainless steel material. It preserves the steel surface from permanent stains and retains aesthetic appearance of the product.

INOX products are made of stainless steel, when used in standard laboratory conditions they do not rust. However, it is possible that stains (which may look like rust) form on the steel surface (e.g. due to the kind of samples that are incubated in the chamber). In such case, it is recommended using cleaning solution (to clean the stains) which is dedicated to this particular application, e.g. Pelox.



Pay attention to the recommendations given in the safety data sheet of the cleaning solution.

17.1. Exterior cleaning

1.	The housing and door should be cleaned with caution, using a soft cloth dampened with water.
2.	Only mild cleaning products should be used to clean the incubator.
3.	Electrical parts should not be in contact with water or detergent.
4.	Clean the touch screen using a soft cloth.
5.	USB port can be cleaned with a vacuum cleaner to prevent accumulation of dirt inside the socket.

17.2. Interior cleaning

1.	The chamber need to be emptied before cleaning.
2.	Open the door of the incubator and wait until the interior is cooled down (if needed), take out the shelves, rack, water pan and start cleaning the incubator.
3.	Only water or mild detergent should be used.
4.	During cleaning pay attention not to damage the temperature and CO ₂ sensors in the chamber.
5.	Having finished cleaning, you should allow the chamber to dry completely.
6.	To assure septic environment in the chamber it is recommended to clean the inner gasket with a 70% isopropylene.

17.3. Disinfection of the CO₂ sensor

The disinfection of the sensor can only be performed when the CO₂ incubator is turned off. VWR recommends to wipe the sensor head with a lint-free cloth soaked with disinfectant. The disinfectant must be an non-corrosive , acid and chlorine-free alcohol based surface disinfectant or 96% pure alcohol.

To sterilize the entire chamber use the hot air sterilization routine.



NOTICE : Do not spray the sensor with any cleaning detergents or disinfectants which are not recommended by VWR !



NOTICE: An unsuitable disinfection procedure can damage the CO₂ sensor.



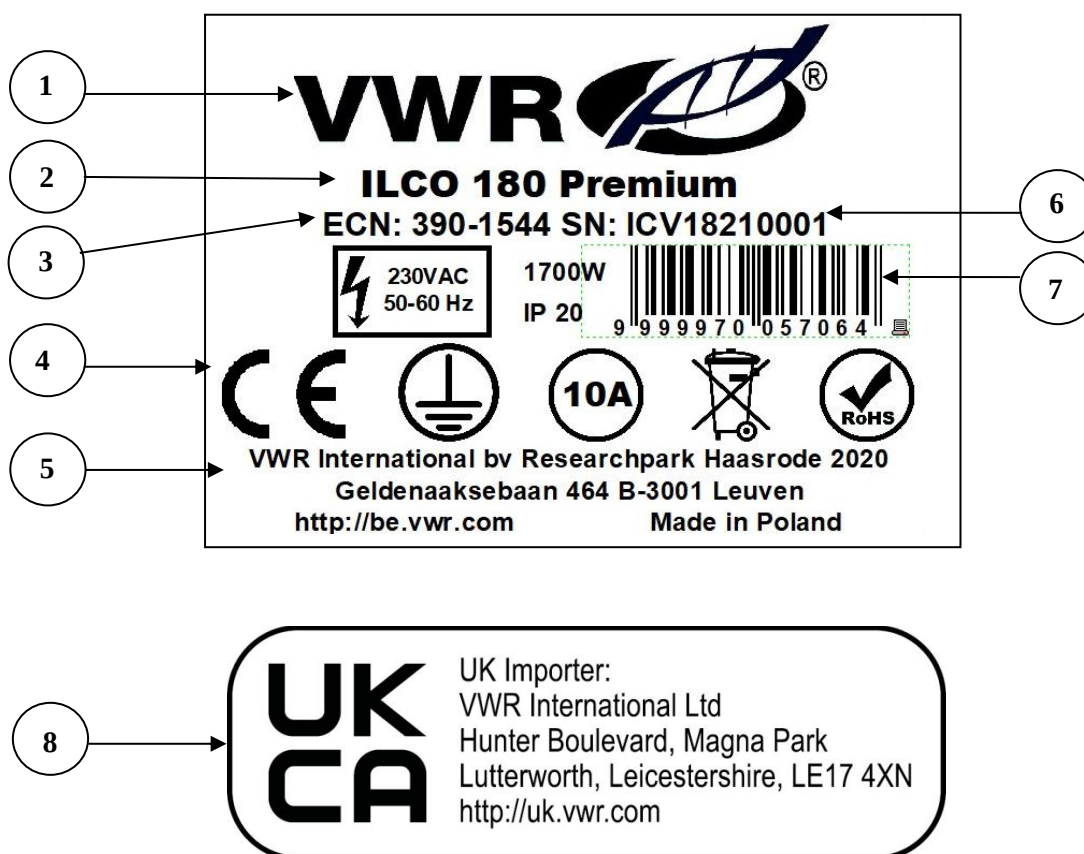
NOTICE: It's forbidden to spray the disinfectant directly on the CO₂ sensor.

18. Advice on how to safely store the unit

1.	Close the CO ₂ pressure cylinder valve and disconnect the CO ₂ gas hose.
2.	Remove load from the chamber.
3.	Clean the chamber and empty the water pan.
4.	Before disconnecting the unit from the mains, the chamber must be dried (e.g. by door opening, chamber ventilating or chamber heating without the water pan). Turning the unit off without drying will cause water condensation in CO ₂ sensor and its malfunction.
5.	Disconnect the incubator from the mains.
6.	Leave the inner/ outer doors and access port open to allow adequate ventilation.
7.	Store in temperature between 10°C and 50°C and relative humidity maximum of 70%.

19. Product identification label

The product identification label is located on the left upper corner of the unit. An example of the product label is shown on the figure below.

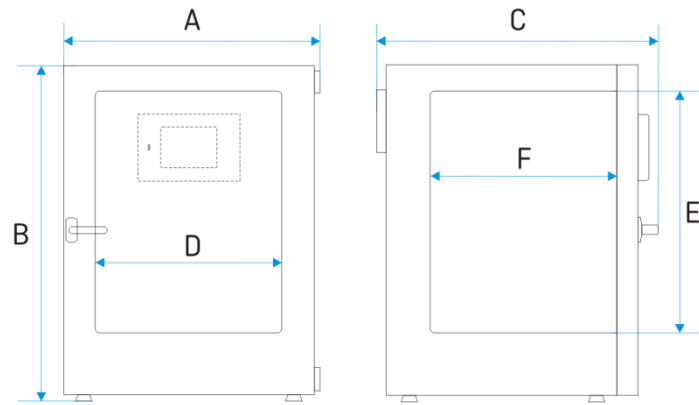


(1) Logo (2) Type of the unit (3) Catalogue number (4) CE mark	(5) Name and address of the manufacturer (6) Serial number (7) Bar code (8) UKCA mark and UK importer
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20. Technical data

		ILCO 180 PREMIUM 	ILCO 260 PREMIUM 
Air convection		natural (fan-less)	
Chamber capacity [l]		182	262
Working capacity ¹⁾ [l]		135	205
Door type		double (external solid, internal glass)	
Temperature range [°C]		+5°C above ambient temperature...+50	
Temperature resolution [°C]		every 0,1	
Humidity range [% rH]		90-95	
CO ₂ range [Vol.-% CO ₂]		0-20	
CO ₂ resolution [Vol.-% CO ₂]		every 0,1	
CO ₂ measurement		IR	
Controller		microprocessor with a large 7" full colour touch screen	
Interior		stainless steel to DIN 1.4301	
Housing		powder coated sheet	
Overall dims ²⁾ [mm]	A width	700	740
	B height	920	1070
	C depth	780	840
Internal dims [mm]	D width	560	600
	E height	650	800
	F depth	500	550
Max shelf workload [kg]		10	30
Max unit workload [kg]		30	50
Nominal power [W]		1700	1700
Weight [kg]		96	118
Temperature fluctuation ³⁾ at 37°C [°C]		< ± 0,1	< ± 0,1
Temperature variation ⁴⁾ at 37°C [°C]		< ± 0,3	± 0,4
Recovery time after 30 seconds door opening at 37°C [min]		6	5
CO ₂ recovery time after 30 seconds door opening at 5 Vol.-% CO ₂ [min]		10	10
Energy consumption at 37°C [Wh/h]		66	97
Power supply		230V 50-60Hz	230V 50-60Hz
Sound level [db(A)]		42	44
Shelves (std./max.)		3/6	3/8
Warranty		24 months	

- ¹⁾ doesn't include rack for shelves' space
²⁾ depth doesn't include 50 mm of power cable
³⁾ fluctuation measured in centre of the chamber
⁴⁾ in space, variation (K) calculated for chamber as: $K = \pm \frac{\bar{T}_{max} - \bar{T}_{min}}{2}$



21. Technical service

Visit the VWR website at www.vwr.com for:

- Complete technical service contact information
- Access to the VWR Online Catalogue, and information about accessories and related products
- Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com.

22. Warranty

VWR warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

23. Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorisation, unless any refusal is due to a defect of the product.

24. Equipment disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

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