

Hygoclave 40 Hygoclave 40 Plus



EN

Installation and operating instructions

988250035

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SYBOLS

HAZARD
Paragraphs marked with this symbol contain instructions that you must follow carefully to avoid damaging the device, injuring the operator and possibly the patient.

WARNING
These instructions warn that you must take particular care to avoid situations that could damage the device.

PROHIBITION
This icon highlights what you must not do, to avoid damaging the device.

TIPS
With this icon, you are given information to allow you to use the device more effectively.

WARNING
General warning symbol.

WARNING
Risk or hazard symbol. Consult the manual.

WARNING
Hot parts of the device.

Refer to the technical manual

WARNING
At the end of its working life, the device must be collected separately from other waste, in accordance with the differential waste collection regulations. Disposing of the product unlawfully is subject to the penalties defined by law.

WARNING
The device, when on, must always have the tray holder and tray on the lower shelf.


PACKAGING

We recommend keeping the packaging for handling the device in the future. In the event of disposal, separate the various parts in accordance with the differential collection regulations.

SIMBOLOGIE IMBALLO

 HIGH

 DO NOT WET

 DO NOT USE HOOKS

 STORAGE TEMPERATURE
TRANSPORT CONDITION

P
500 hPa ÷ 1060 hPa ATMOSPHERIC PRESSURE

 FRAGILE

 DO NOT ROLL

 MAX SUPPORTED
WEIGHT

RH
10% ÷ 90% RELATIVE HUMIDITY

 RECYCLABLE CARDBOARD

1 Safety standards

Follow all the instructions given in this manual.

The autoclave must be used by personnel specifically trained in the sterilisation process, within medical clinics, chiropody studios and beauty salons, under the responsibility of the director of health and the sterilisation process supervisor.

Only personnel who have been properly trained on the contents of this instruction manual may use the autoclave. The medical facility in which the autoclave is installed is responsible for the training on the product operation and maintenance. It must keep training records and check that personnel have effectively understood the training. The list of organisations that are authorised to carry out maintenance and repairs is available in the SUPPORT/LIST OF SUPPORT CENTRES section on the www.duerrdental.com website. The user is responsible for requesting servicing from authorised centres only. There are no procedures that the operator can perform to check that the product is working correctly.

1.1 Intended users

- medical staff (dentists, chiropodists)
- dental hygienists
- employees in beauty salons

USER PROFESSIONAL QUALIFICATIONS

Degree in medicine

Dental hygienist

MINIMUM SKILLS

Those required by the professional qualification

Course on use based on this manual for unqualified users

LANGUAGE COMPREHENSION

Those acquired for the professional qualification

EXPERIENCE

That required to carry out the profession

POSSIBLE USER HANDICAPS

Full use of an upper limb is required

Eyesight compatible with the profession

1.2 Intended use

It is a small steam autoclave for sterilising tools, rotary instruments, reusable medical devices and porous materials (e.g. fabrics) using saturated steam at a temperature of 121°C or 134°C.

1.3 General safety warnings

The product must be used for its intended use in accordance with the provisions of this manual.

Any use that does not comply with the instructions in the instruction manual could compromise the safety level of the device.

Never modify the equipment without written authorisation from DÜRR DENTAL SE.

The user is responsible for installation, training users, maintenance and any legal requirements related to the device, including the periodic checks described in this manual.

DÜRR DENTAL shall not be liable for harm to things and/or people caused by failure to use the product correctly as described in this manual. Failure to comply with the provisions of this manual will void any liability of the manufacturer and the product warranty.

The device discharges air from a small hole at its bottom rear. Do not obstruct this vent (**17 fig. 2**).

Do not place the autoclave on an unstable table or surface.



Electrical hazard warnings

The device must be connected to the electrical mains. The electrical system must comply with the IEC 364-1 standard and the "National regulations for installation of electrical systems in premises intended for medical purposes".

Check that the mains supply matches the power supply voltage indicated on the plate on the autoclave rear panel. If in double, consult your dealer.

The plug on the autoclave has an earth connection. Make sure that you use an earthed socket and position the device where it is not difficult to disconnect the plug.

If you use an extension cable, make sure that the cable type is adequate for the equipment consumption.

Do not attempt to carry out maintenance on the autoclave when it is connected to the power. Disconnect the power cable from the mains before working on the machine. Maintenance and repair work must be carried out by personnel who have attained the training certificate issued by DÜRR DENTAL SE.

Do not carry out maintenance work other than that described in this manual. Any work not indicated in this manual could compromise equipment safety. Contact DÜRR DENTAL technical service for any work that is not specified.



Equipment explosion hazard warnings

Do not use any acids or corrosive substances to clean any parts of the autoclave. Specifically, do not use hydrochloric acid or any detergent that contains chlorine. Using these substances may compromise the mechanical integrity of the equipment and create an explosion hazard.

The pressure chamber is protected by a safety valve: annually check that it is working correctly.

Do not carry out maintenance work other than that described in this manual. Any work not indicated in this manual could compromise equipment safety. Contact DÜRR DENTAL technical service for any work that is not specified.



Contamination hazard warnings

The autoclave must be installed in a suitable hygienically controlled environment.

Clean the chamber before using the device for the first time. The autoclave works with distilled or demineralised water (see the technical specifications on page 74). The device would not work properly with any other substance. Consult DÜRR DENTAL technical service if an unsuitable liquid is put inside.

Do not use toxic substances during the sterilisation process. Do not touch the contents of the discharge tank.

Do not put substances or products that contain heavy metals (lead, mercury, bromine, hexavalent chromium) into the chamber. If released, these products could contaminate the autoclave plumbing circuit and render it unusable.

NEVER REUSE WATER

Do not carry out maintenance work other than that described in the manual.

Only put heat-resistant products that do not release hazardous substances into the sterilisation chamber. Always consult the manufacturer's technical specifications to ensure that the products can be sterilised.

All items must be decontaminated and thoroughly cleaned and dried before being sterilised.

We recommend using chemical indicators to confirm the sterilisation process.



Fire or overheating hazard warnings

Only put products that are resistant to steam sterilisation inside, in accordance with the manufacturer's provisions. Do not place the device on a flammable surface.

The device is not suitable for use in oxygen-rich or potentially explosive atmospheres.

Do not block the air vents on the equipment casing during installation or operation.

Comply with the minimum distance requirements in detail if the autoclave is recessed.



Operation failure hazard warning

If an error message appears while a sterilisation cycle is running, it will be necessary to repeat the cycle. Accidentally dropping the device may deform it and compromise proper operation. If this happens, have a full check done by technical support.

If there are instruments that are joined together, they must be divided or located in the most ventilated and spacious place possible.

Lab coats or other reusable fabrics must be washed and dried after use and before sterilisation to remove any organic material and increase the "life" of the fabric by restoring its natural water content (i.e. humidity level). Comply with the load limits defined in this manual for each type of sterilisation load.



Crushing of body parts hazard warnings

The equipment has motorised door closure. Only hold the door by the handle, or push it from the outside. Be careful of your finger/hand position while closing the door. Do not leave fingers or other body parts between the door and the machine while it is closing.



Burn hazard warnings

To prevent possible burns, extract the trays with the dedicated pincers provided. Before cleaning any surface, make sure that it has cooled down.



Infect hazard warnings

The autoclave performs a sterilisation process. However, the user must guarantee the effectiveness of the sterilisation process by following the guidelines as well as the data provided by the autoclave. Therefore, strictly follow the protocols defined in this manual to ensure that the process continues to be effective.



Note

The device, when on, must always have the tray holder and tray on the lower shelf.

1.4 Operating and transport environmental conditions

In its packaging, the equipment can withstand the following environmental conditions for no more than 15 weeks:

Ambient temperature from -20°C to +70°C
Relative humidity from 10% to 90%
Atmospheric pressure from 500 to 1060 mBar.

The appliance must be used in the following environmental conditions:

- internal use
- altitude up to 3000 m
- temperature from 5°C to 40°C
- max relative humidity 85%
- max mains voltage variation $\pm 10\%$
- installation category (overvoltage category) II
- pollution degree rating 2
- ambient lighting 500 lx

1.5 Environmental disposal instructions

Pursuant to directives 2012/19 EC and 2011/65 EC on waste electrical and electronic equipment and the restriction of the use of certain hazardous substances in electrical and electronic equipment, waste cannot be disposed of as urban waste, but must be collected separately.

When purchasing new equipment of an equivalent type on a one-for-one basis, the equipment that has reached the end of its life must be returned to the dealer for disposal. Regarding reuse, recycling or the other forms of waste recovery mentioned above, the manufacturer must carry out the steps defined by the individual national legislation.

Adequate separate collection for future use of the equipment assigned for recycling, treatment and environmentally friendly disposal helps to prevent possible negative effects on the environment and on human health, and promotes recycling and/or reuse of the materials that make up the equipment.

The crossed-out bin symbol (see symbols on page 38) on the device or on its packaging indicates that the product must be disposed of separately from other waste at the end of its life.

2 Equipment description

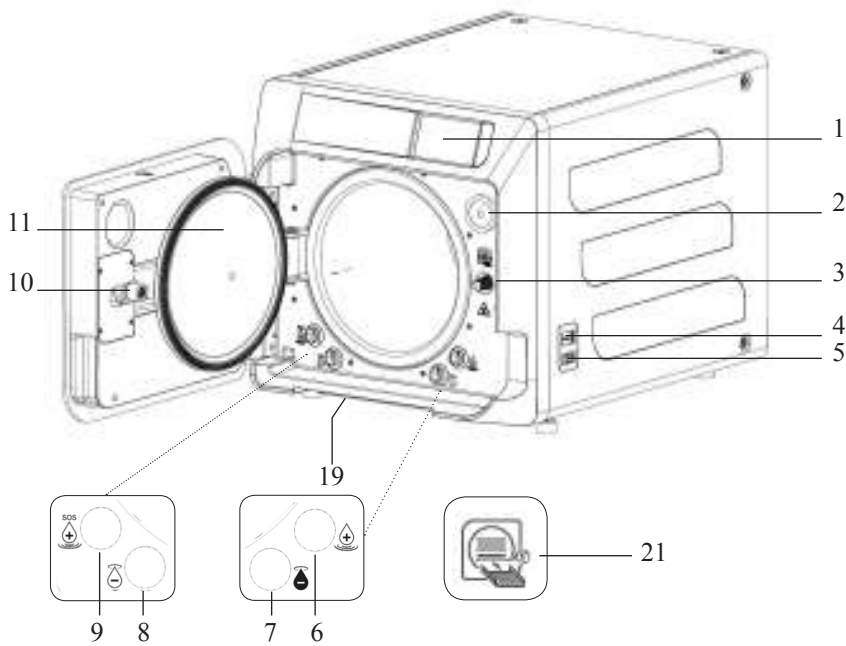


Fig. 1

1. Touch screen display
2. Bio-x filter
3. Motorised closure screw
4. USB port
5. Main switch
6. Feed tank filling connection
7. Discharge tank draining connection
8. Feed tank draining connection
9. Manual feed tank emergency filling connection
10. Nut screw for motorised closure
11. Door cover
19. Dust filter
21. Tray holder symbol

Fig. 2 – Rear view

12. Power supply
13. RS-232 port for external printer
14. LAN port
15. Discharge tank drain connection for main drain system
16. Discharge tank vent
17. Feed tank vent
18. Solenoid valve for filling the feed tank from the mains water supply (Allowable pressure from 20 kPa to 250 kPa)

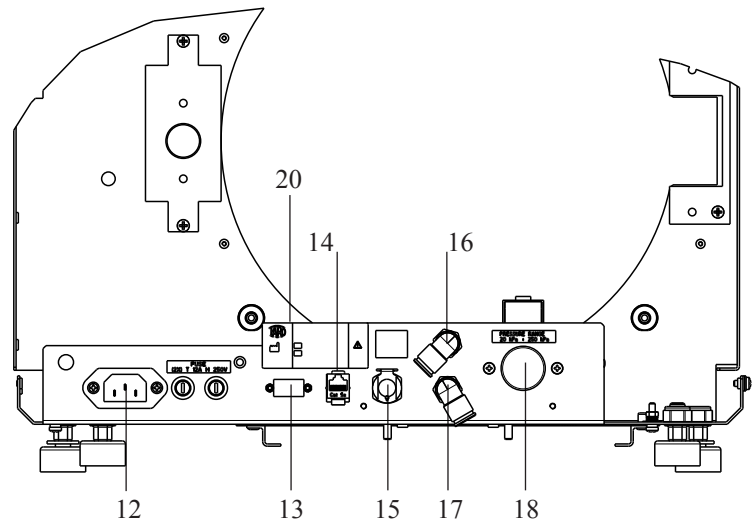
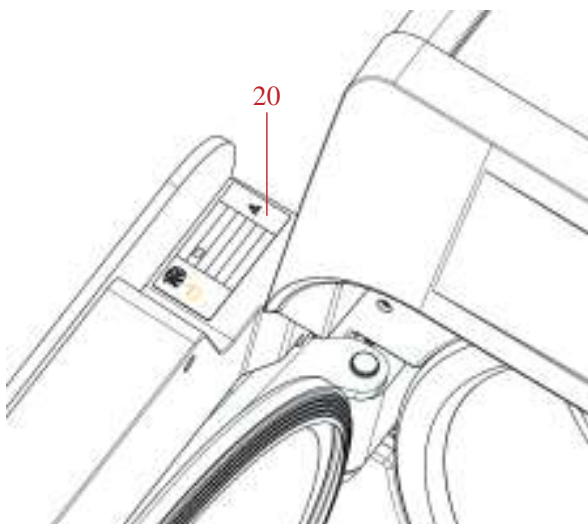


Fig. 2 and Fig. 3

20. Data plate



2.1 Variants

The following autoclave variants are available:

Versions	Hygoclave 40			Hygoclave 40 Plus		
Chamber size						
Power supply	220 V 60 Hz	230 V 50/60 Hz	240 V 50 Hz	220 V 60 Hz	230 V 50/60 Hz	240 V 50 Hz
REF Cycles B	751 030XXX	751 000XXX	751 020XXX	751 130XXX	751 100XXX	751 120XXX
REF Cycles B Switzerland	//	751 010XXX	//	//	751 110XXX	//
REF Cycles S	751 031XXX	751 001XXX	751 021XXX	751 131XXX	751 101XXX	751 121XXX
REF Cycles S Switzerland	//	751 011XXX	//	//	751 111XXX	//
REF Cycles B + S	751 032XXX	751 002XXX	751 022XXX	751 132XXX	751 102XXX	751 122XXX
REF Cycles B + S Switzerland	//	751 012XXX	//	//	751 112XXX	//

2.2 Main features

The vacuum pump ensures an optimal sterilisation process in which the steam interacts properly with the load being processed, including any cavities.

2.2.1 Sterilisation programs

- **Type B**
 - 134°C **Standard**
 - 134°C **Prion**
 - 134°C **B-Flash**
 - 121°C **Standard**
- **Special cycle**
 - Drying only
- **Type S**
 - 134°C **Universal S**
 - 121°C **Softprogramm**

2.2.2 Test programs

- **Vacuum test:** checks the ability to hold a vacuum
- **Bowie & Dick test:** checks steam penetration into porous loads
- **121 or 134°C Helix test:** checks steam penetration into hollow loads

The autoclave is available with the following storage devices:

- USB port (USB peripheral not supplied).
- RS-232 port (for DÜRR DENTAL printer, NOT supplied).

2.2.3 Water filling systems

Automatic: with the aid of a pump inside the autoclave.

Mains connection possibility of connecting a demineralisation system, to increase autonomy. It must be installed by an authorised technician.

Manual: as an alternative, the device is equipped with a manual emergency filling system at the FRONT (9 fig. 1).

2.2.4 Automatic sterilisation parameter control

During sterilisation, the pressure, temperature and time are continuously monitored by an automatic process control system.

2.2.5 Motorised closure

The autoclave has a motorised closure system to ensure a good seal. It is based on a screw and nut screw. Closure works with a pre-locking mode that activates when the door is shut. The door is only closed fully when the cycle starts.

2.2.6 Bio-X filter

This injects sterile air into the chamber during the drying and pressure balancing phases.

2.2.7 USB port

This port can be used by medical staff for data download.

2.2.8 Serial port - RS232

This port is only for connecting the DÜRR DENTAL printer. Use the dedicated serial cable supplied with the DÜRR DENTAL printer.

2.2.9 Touch screen display

This manages the autoclave fully through a menu system.

2.2.10 LAN connection

This port is only for connecting a LAN.

2.2.11 Safety devices

The steriliser is equipped with the following safety devices:

- Mains fuses

These protect the equipment from faults in the heating elements by disconnecting the electric power supply.

- Electronic circuit protection fuses

These prevent faults in the transformer primary circuit and low-voltage loads by disconnecting one or more low-voltage circuits.

- Safety valve

This prevents any overpressure in the sterilisation chamber by releasing steam to restore a safe pressure. It opens at a pressure of 350kPa ($\pm 10\%$).

- Steam generator thermal switch

This stops the steam generator from overheating by disconnecting its electrical power supply. It trips at a temperature of $220^{\circ}\text{C} \pm 7^{\circ}\text{C}$.

- Chamber thermal switch

This protects the pressure vessel heating element from overheating by disconnecting its electric power supply. It trips at a temperature of $150^{\circ}\text{C} \pm 4^{\circ}\text{C}$.

- Door lock mechanism safety microswitch

This provides feedback when the door and the door lock system are not in the correct position or when the door lock mechanism is not working correctly.

- Pressure switch

This prevents the door from being opened accidentally during the program when the machine is pressurised (even in the event of a blackout).

- Overflow system

This prevents water from flowing out onto live parts if the level sensor does not work by draining excess water to the outside.

- Built-in sterilisation process assessment system

This uses a microprocessor to continuously monitor the sterilisation process parameters. In the event of a fault, it immediately stops the program and generates alarms.

- Steriliser operation monitoring

When the machine is powered, this monitors all of its important parameters in real time. In the event of a fault, it generates alarm

messages and, if necessary, stops the cycle.

Type test carried out in accordance with the EN13060 standard
Type B cycles

	Cycles B	Cycles S
Pressure dynamic in sterilisation chamber	X	X
Air leakage	X	X
Empty chamber	X	X
Solid load - Double wrapping	X	X
Small porous load Double wrapping	X	X
Full porous load Double wrapping	X	-
Narrow lumen element	X	X
Drying, solid load Double wrapping	X	X
Drying, full porous load Double wrapping	X	-



3 Installation



THE DEVICE MUST BE INSTALLED BY QUALIFIED TECHNICIANS.

- Check that the installation spaces comply with the indications given in the dimensions. To recess the autoclave inside a cabinet, there must be enough space all around (20 mm sideways, 50 mm at the top, 30 mm at the back) it to ensure effective ventilation, and a wide opening at the rear for the power cable. Make sure that there is sufficient air flow to properly cool the heat exchanger.

- Install the steriliser on a perfectly horizontal flat surface and make sure that it is strong enough to support the weight of the device (approximately 60 kg); To prevent contact with water or other liquids that could cause short circuits and/or potential danger to the operator, do not install the steriliser too close to basins, sinks or similar places;



Do not install the steriliser in excessively damp or poorly ventilated places;



Do not install the machine in environments where there is gas, flammable vapours and/or explosives;



- Position the equipment so that the mains switch is easily accessible.

- Install the equipment so that the power cable is not bent or pinched. It must be free to move to the power socket.

- Install the equipment so that any external filling/drain hoses are not bent or pinched. They must be free to move to the drain tank.



There are two lifting points on the autoclave base. When handling the equipment briefly, it must be done by two people; the lifting points (for straps) are located on the equipment feet. For longer handling, insert the pallet provided under the equipment.

Free the autoclave from the packaging.

- Position the autoclave on the support (table or cabinet) using straps.

- Make sure that the supporting surface is not made of flammable material.

- Remove the straps and keep them for future handling.

- Use a spirit level to check that the support base is level in both directions, otherwise level the autoclave using its adjustable front feet.

- Check that the power socket used is earthed.

- Check that the mains voltage matches that on the autoclave plate.

- Insert the autoclave plug, making sure that the cable is not pinched and that it can be unplugged easily.

- The plug is the mains means of connection to the mains power, so it must be easy for the operator to access and use it.

Electrical connections

In accordance with the laws and/or regulations in force, the steriliser must be connected to an earthed power socket with adequate current capacity for the equipment consumption (see the data plate).

The socket must be properly protected by a residual current circuit breaker with the following specifications:

- Nominal current I_n 16 A

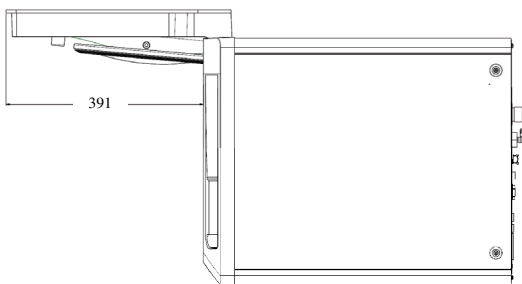
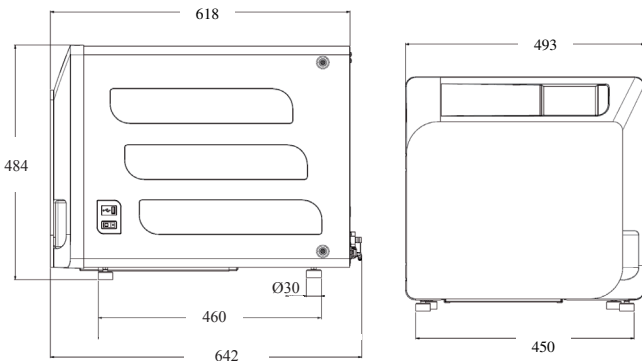
- Differential current $I_{\Delta n}$ 0.03 A

CAUTION: The manufacturer shall not be liable for damage caused by installing the steriliser with inadequate and/or unearthed electrical systems.

NOTE: Always connect the power cable directly to the power socket.

Do not use extension cables, adapters or other accessories.

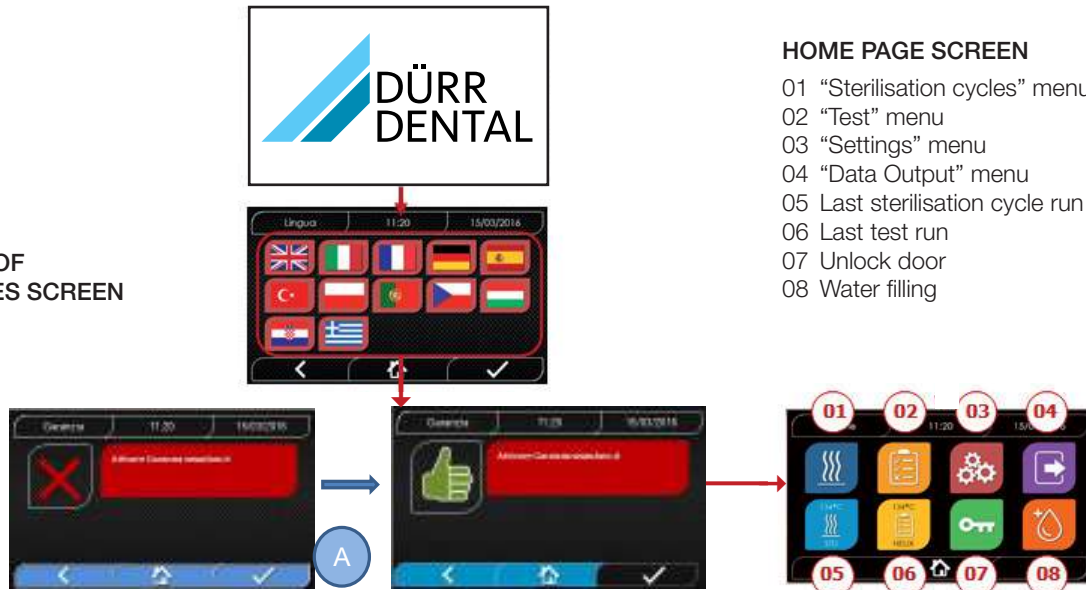
Model 18-23 sizes



3.1 FIRST POWER-UP

- Press the illuminated main switch (5 fig. 1).
- 1 - Wait for the main screen to load
- 2 - Select the desired language.
- 3 - "Warranty Activation" screen.
- 4 - Home page loading following the choices made during warranty activation.
Select the "07 open door" icon to open the door and extract the supplied accessories from the chamber.

EXAMPLE OF LANGUAGES SCREEN



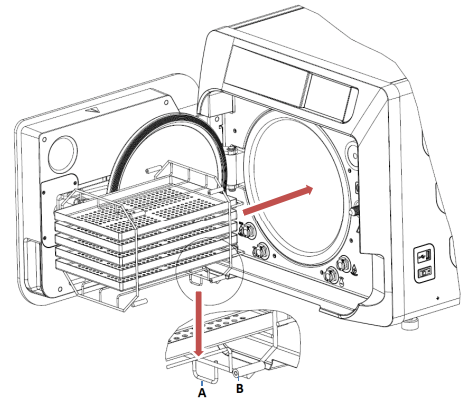
"WARRANTY ACTIVATION" SCREEN on the website www.DÜRR DENTAL.it:
The screen will appear every 24 hours for 30 days. Please register your warranty on DÜRR DENTAL's website – www.duerrdental.com – within 30 days. When you press the "A" button you will see the "Registration Confirmation" screen.

Check that the accessories include:

- Documentation (instruction manual)
- The tray support
- 3 trays (Basic version)
- 1 tray extraction pincer
- 1 filling hose
- 1 drain hose
- 1 funnel

WARNING

- Insert the tray holder as shown in the figure
- The tray holder must be inserted into the chamber with foot "A" facing down and positioned at the bottom of the chamber. The position of foot "A" must be respected both when using 3 trays and 5 trays
- The tray holder must always have rubber protection "B" mounted on the eight supports



If the autoclave is not filled with water from external tanks, **DO NOT CONNECT** it directly to the water mains, but connect it to a demineralizer or water treatment system that will ensure the required water specifications (see 7.1). The water treatment system must prevent water backflow to the mains.

Validate the installation in accordance with the following table:

- Vacuum test
- Autoclave automatic test
- Autoclave instrumentation calibration check
- Overtemperature trip test
- Thermometric test for small loads (*)
- Drying test for small loads (*)
- Steam penetration test for porous loads (*)
- Thermometric test for solid loads (*)
- Drying test for solid loads (*)
- Steam penetration test for solid loads (*)
- Thermometric test for a load chosen by the user
- Microbiological test for a load chosen by the user

(*) To be carried out with cycles of 121°C and 134°C

4 Operating instructions

Operate the autoclave as follows:

- Press the main switch (**5 fig. 1**).
- Wait for the main screen to load

USING THE MENUS


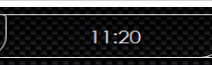






















The main menu contains the following:




















































- 01 Sterilisation programs
- 02 Test programs
- 03 Settings
- 04 Data output
- 05 Last cycle run
- 06 Last test run
- 07 Open door
- 08 Water filling
















4.1 SYMBOLS

The icons in the Basic version are the same as those in the Premium version, but the graphics are in black and white, and some functions are disabled (see the menu architecture).

Description	Icon	What it does/what it means
Screen name		Indication icon only. Cannot be selected. Shows the name of the selected screen.
Time		Indication icon only. Cannot be selected. Shows the name of the selected screen.
Date		Indication icon only. Cannot be selected. Shows the name of the selected screen.
Back		Returns to the previous screen.
Home		Returns to the home screen.
Confirm		Confirms certain kinds of actions.
Cycles		Goes to the cycles screen where you can select the desired cycle.
Test		Goes to the tests screen where you can select the desired test.
Settings		Goes to the machine settings screen.
Data output		Goes to the data output screen.
Open door		Opens the door.
Water filling		Goes to the water filling screen.
134°C standard cycle		Goes to the 134°C standard cycle screen, which displays all of the cycle specifications.
121°C standard cycle		Goes to the 121°C standard cycle screen, which displays all of the cycle specifications.
134°C Prion cycle		Goes to the 134°C Prion cycle screen, which displays all of the cycle specifications.
134°C B Flash cycle		Goes to the 134°C B Flash cycle screen, which displays all of the cycle specifications.
Drying cycle		Goes to the drying cycle screen. This is considered a special cycle to be used when an additional drying cycle is needed.
Programmed start		Programs the cycle start time. The set time is displayed beside the corresponding icon.
Increment drying		Increments the drying time. The value entered will update the drying time in the cycle.
Next		Increases the value in the relative field by one or goes to the next option.
Previous		Decreases the value in the relative field by one or goes to the previous option.
Vacuum Test		Goes to the Vacuum Test screen, which displays all of the cycle specifications.
134°C Helix Test		Goes to the 134°C Helix Test screen, which displays all of the cycle specifications.
134°C Bowie & Dick Test		Goes to the 134°C Bowie & Dick Test screen, which displays all of the cycle specifications.

Description	Icon	What it does/what it means
121°C Helix Test		Goes to the 121°C Helix Test screen, which displays all of the cycle specifications.
Programmed start		Programs the test start time.
Next		Increases the value in the relative field by one unit or goes to the next option.
Prevoius		Decreases the value in the relative field by one unit or goes to the previous option.
User settings		Goes to the user setting screen. You can choose from: add user, delete user, edit/change user. This section can only be accessed by the administrator user "Admin", who will be asked to enter a PIN.
Date/time settings		Goes to the data/time settings screen. Sets the time (hours, minutes) and date (dd/mm/yyyy).
Language settings		Goes to the language settings screen. Selecting a different language automatically returns to the setting screen with all the fields updated in the selected language.
Mesurement unit settings		Goes to the measurement unit settings screen. Changes the pressure measurement unit.
Connectivity settings		Goes to the connectivity settings screen.
Water parameter settings		Goes to the water parameter settings screen. Changes the water filling type (manual at the front or water mains at the rear). Displays the water quality. There are three levels: green, yellow and red, with the cursor on the corresponding level.
Printer settings		Goes to the pinter settings screen. Sets manual or automatic printing.
Service		Goes to the service action, after entering a PIN. The service section has dedicated graphics to show users where they are.
Next		Increases the value of the relevant field by one unit or move to the next option.
Prevoius		Decreases the value of the relevant field by one unit or move to the previous option.
ENGLISH		Sets the language for all menus to ENGLISH.
ITALIAN		Sets the language for all menus to ITALIAN.
FRENCH		Sets the language for all menus to FRENCH.
GERMAN		Sets the language for all menus to GERMAN.
SPANISH		Sets the language for all menus to SPANISH.
TURKISH		Sets the language for all menus to TURKISH.
POLISH		Sets the language for all menus to POLISH.
PORTUGUESE		Sets the language for all menus to PORTUGUESE.
CZECH		Sets the language for all menus to CZECH.
HUNGARIAN		Sets the language for all menus to HUNGARIAN.

Description	Icon	What it does/what it means
Croatian		Sets the language for all menus to CROATIAN.
Greek		Sets the language for all menus to GREEK.
Ethernet settings		Goes to the Ethernet settings screen, where you can set the network parameters (IP address, subnet mask, gateway).
Add users		Goes to the user data entry screen (name, surname, PIN).
Edit users		After you have selected which user to edit, it goes to the user edit scan (name, surname, PIN).
Delete users		After you have selected which user to delete, it asks for confirmation.
Admin user		Goes to the Admin data (name, surname, PIN).
Generic user		From the edit section, it goes to the user data (name, surname, PIN). From the deleted section, it determines which user is to be deleted.
Alphanumeric keypad		Allows you to enter letters, numbers and symbols . Eg. To select the letter C, press the corresponding key 4 times (2, A, B, C).
Usb		Goes to the screen whre you can load cycles onto a USB pen drive. After inserting the USB drive, you can select the cycles that you want to transfer.
Print		Goes to the screen whre you can print reports, labels and barcodes. The icon will be disabled if the printer is not connected.
Info		Goes to the screen with the machine manufacturing information: SN, PN, installation date, configuration, FW, no. of cycles, website.
Barcode		Selects barcode printing. Once selected, a menu appears from which you can choose the number of labels to print. Printing starts when you confirm.
Report		Selects and activates cycle report printing.
Label		Selects label printing. Once selected, a menu appears from which you can choose the number of labels to print. Printing starts when you confirm.
Increase		Increases the value in the relative field by ten.
Decrease		Decreases the value in the relative field by ten.
STOP water filling		Stops the muanual water filling pump.
START water filling		Starts the muanual water filling pump. The button is disabled when filling from the water mains.
Previous		Goes to the previous option in the scrolling menu.
Next		Goes to the next option in the scrolling menu.
Next		Increases the value in the relative field by one or goes to the next option.
Previous		Dencreases the value in the relative field by one or goes to the previous option.
Programmed start icon		Indication icon only. Cannot be selected. Shows the start time of the selected cycle.
Pressure indicator		Indication icon only. Cannot be selected. Shows the pressure in the selected cycle.
Maximum instrument load indicator		Indication icon only. Cannot be selected. Shows the maximum instrument load for the selected cycle.

Description	Icon	What it does/what it means
Remaining time indicator		Indication icon only. Cannot be selected. Shows the remaining drying time in the cycle (to be checked) .
Temperature indicator		Indication icon only. Cannot be selected. Shows the temperature in the selected cycle.
Maximum textile load indicator		Indication icon only. Cannot be selected. Shows the maximum textile load for the selected cycle.
Door lock indicator		Indication icon only. Cannot be selected. Shows that the door is closed and locked.
Cycle count indicator		Indication icon only. Cannot be selected. Shows the cycle counter.
Stop cycle/test		Stops a cycle/test at any time. Press the icon for at least 3 seconds to activate it. After 3 seconds, the cycle/test will stop and the machine is put in a safe state.
Cycle completed confirmation		Indication icon only. Cannot be selected. Appears when the cycle has ended correctly.
Cycle error		Indication icon only. Cannot be selected. Appears when the cycle has been stopped by an error or manually by the operator.
Cycle progress bar		The cycle progress bar advances according to the following phases: <ol style="list-style-type: none"> 1. Preheating phase 2. Vacuum phase 1 3. Pressure ramp-up phase 1 4. Vacuum phase 2 5. Pressure ramp-up phase 2 6. Vacuum phase 3 7. Pre-sterilisation phase 8. Balancing phase 9. Sterilisation phase 10. Discharge phase 11. Drying phase 12. Pressure balancing
Sterilisation complete		Indication icon only. Cannot be selected. Appears when the sterilisation phase is complete (not the cycle). Allows the user to stop the cycle to remove the instruments, skipping the drying phase.
Feed tank maximum level		Appears when the water in the feed tank reaches the maximum level. Water filling stops automatically.
Feed tank intermediate level		Appears when the water in the feed tank is between the minimum and maximum levels.
Feed tank minimum level		Appears when the water in the feed tank is close to the minimum level.
Water quality		Indication icon only. Cannot be selected. Shows the water quality bar.
Water quality bar		The cursor position indicates the water quality. Green: quality OK Yellow: critical quality area → message generated Red: quality not OK → message generated and machine stops.

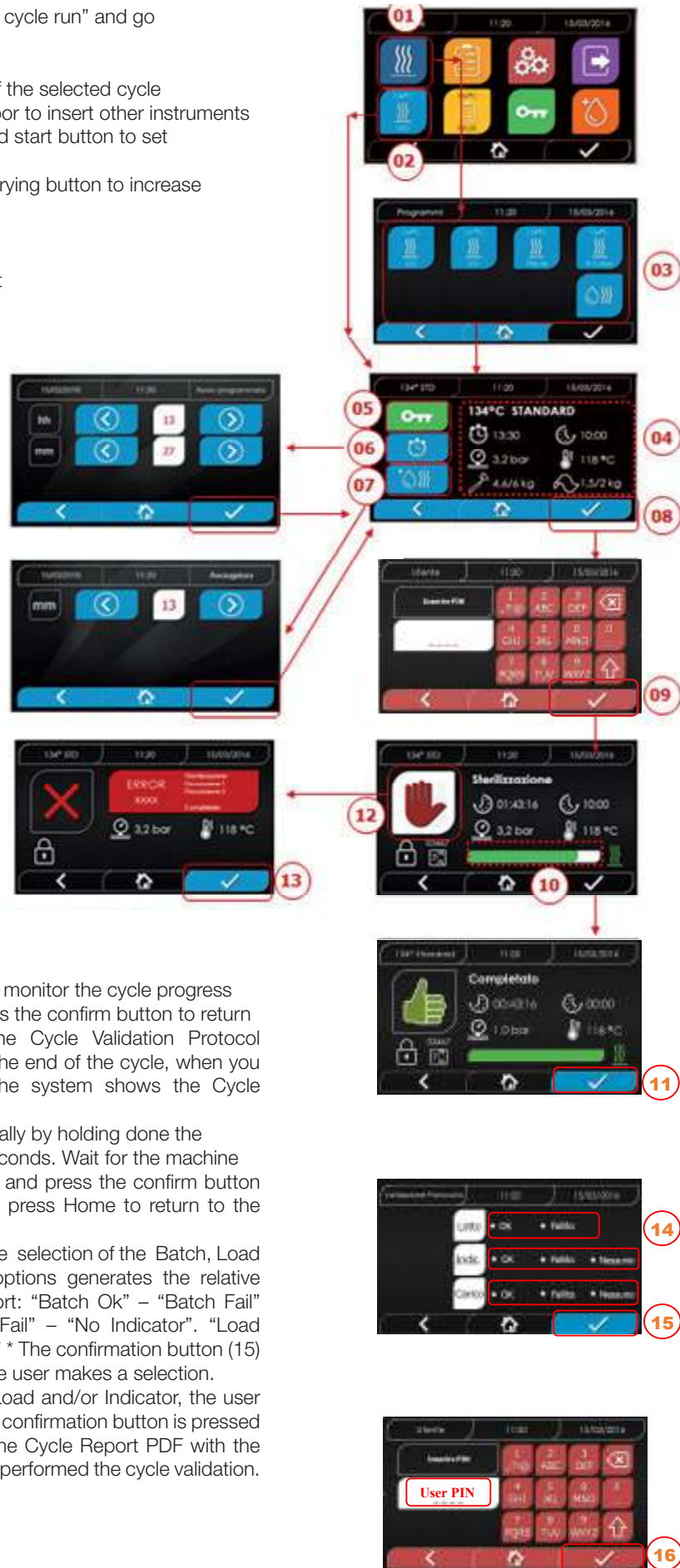
4.2 Menu architecture

- Home
 - Sterilisation programs
 - Last sterilisation program run*
 - Test programs
 - Last test program run*
- Settings
 - User management*
 - Date and time
 - Printer
 - Language
 - Measurement unit*
 - Water parameters*
 - Connectivity*
 - Service
- Data output
 - Usb
 - Printer
 - Info
- Open door
- Water filling

* In the Premium version only

4.3 Selecting sterilisation programs

- 01 Select the “Sterilisation cycles” menu
- 02 Alternatively, directly select “Last cycle run” and go to step 04
- 03 Select the desired cycle
- 04 Screen with all the parameters of the selected cycle
- 05 (Optional) You can open them door to insert other instruments
- 06 (Optional) Select the programmed start button to set the start time
- 07 (Optional) Select the increment drying button to increase the cycle drying time
- 08 Start the cycle
- 09 (If active) enter the user PIN.
- On confirming, the cycle will start



- 10 You can use the green bar to monitor the cycle progress
- 11 When the cycle finishes, press the confirm button to return to the Home screen. If the Cycle Validation Protocol Management is enabled, at the end of the cycle, when you confirm the selection by, the system shows the Cycle Validation Protocol screen.
- 12/13 You can stop the cycle manually by holding done the “Stop cycle” buttonh for 3 seconds. Wait for the machine to be put in a safe condition and press the confirm button (13) for 2 seconds and then press Home to return to the home screen.
- 14/15 Cycle Validation Protocol: The selection of the Batch, Load and/or Indicator validation options generates the relative information in the cycle report: “Batch Ok” – “Batch Fail” “Indicator OK” - “Indicator Fail” – “No Indicator”. “Load OK” - “Load Fail” - “No Load” * The confirmation button (15) will be “Operational” when the user makes a selection.
- 16 For the validation of Batch, Load and/or Indicator, the user must enter his PIN. When the confirmation button is pressed (16), the system generates the Cycle Report PDF with the identification of the User who performed the cycle validation.

4.3.1 Sterilisation program types

When the machine is cold, the preheating time is approximately 10 minutes. Selecting the “Programs” submenu accesses the list of sterilisation cycles that the autoclave can run:

B CYCLES

- **134°C Standard Cycle:** 4 min. of sterilisation plus the drying phase
- **134°C Prion Cycle:** 18 min. of sterilisation plus the drying phase
- **134°C B-Flash Cycle:** 3,5 min. of sterilisation plus the drying phase
- **121°C Standard Cycle:** 16 min. of sterilisation plus the drying phase

S CYCLES

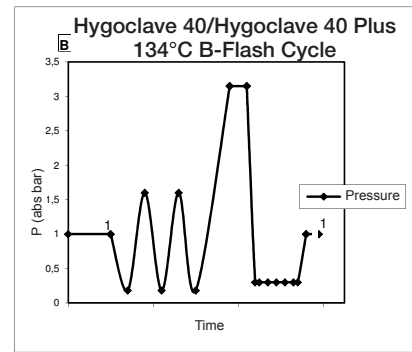
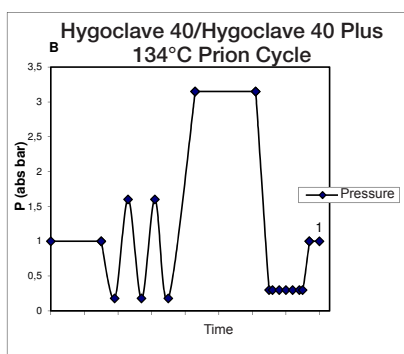
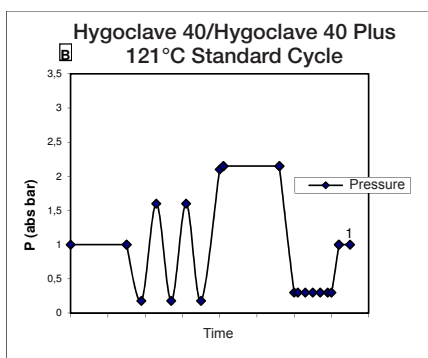
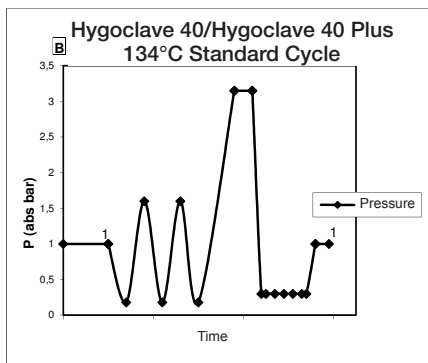
- **134°C Universal Cycle:** 3,5 min. of sterilisation plus the drying phase
- **121°C Softprogramm Cycle:** 15,5 min. of sterilisation plus the drying phase

SPECIAL CYCLES

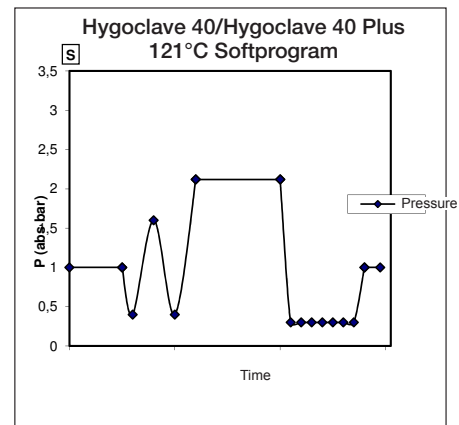
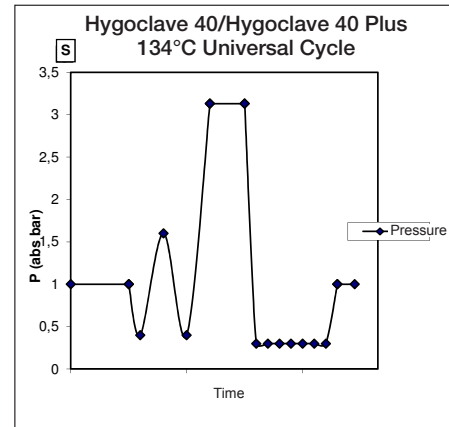
- **Drying cycles:** drying phase only

NOTE: For each available sterilisation cycles, the manufacturer must perform the Works Tests in accordance with EN 13060 (par. 7.3). Any available cycles for which the manufacturer has not performed the Works Tests must undergo Installation Tests in accordance with EN 13060 par. 7.4.

4.3.2 Diagrammi Cicli di Tipo B



4.3.3 Cycle Diagram type S



4.4 Sterilisation program specifications

		Sterilisation cycles type B				Sterilisation cycles typ S	
Cycle name		134 STD	121 STD	134 Prion	134 B- Flash	134 Universal S	121 Softprogr.
Cycle type		B				S	
Sterilisation temperature		134°C	121°C	134°C	134°C	134°C	121°C
Sterilisation pressure		316 kPa	214kPa	316 kPa	316 kPa	316 kPa	214kPa
Sterilisation phase duration		4 min	16 min	18 min	3,5 min	3,5 min	15,5 min
Minimum drying phase duration		16 min	16 min	16 min	6 min	16 min	16 min
Average total cycle duration	18 litres	43 min	54 min	57 min	32 min	36 min	47 min
	23 litres	47 min	57 min	59 min	32 min	37 min	48 min
Average H ₂ O consumption	18 litres	415 ml	455 ml	510 ml	300 ml	260 ml	295 ml
	23 litres	455 ml	500 ml	540 ml	315 ml	275 ml	300 ml
Average energy consumption	18 litres	515 Wh	547 Wh	598 Wh	390 Wh	375 Wh	410 Wh
	23 litres	646 Wh	654 Wh	706 Wh	425 Wh	450 Wh	480 Wh

4.5 Putting the material to be sterilised in the chamber

Package the load very carefully, making sure that the medical devices are compatible with the chosen packaging.

The chosen packaging material must be:

- Compatible with the sterilisation process.
- Compatible with the labelling system.

Only use medical packaging that is compliant with: EN 868-5 and ISO 11607-1 qualified for 134°C cycles.

To check that the thermodynamic sterilisation cycle has completed successfully, always put a class 5 chemical indicator in together with the load in accordance with ISO 11140-1. Choose the indicator according to the selected cycle (121°C or 134°C)

Place the clean material on the trays and distribute them evenly.



The chamber can contain a maximum of:

	B Cycles					S Cycles	
	Standard Cycles			134 B- Flash Cycles		Packed solid material	Porous load
	Unpacked solid material	Packed solid material	Porous load	Packed solid material	Porous load		
HC 40	5,5 kg	3,5 kg	1,5 kg	0,5 kg	0,2 kg	2,5 kg	0,3 kg
HC 40 Plus	6,5 kg	4 kg	2 kg	0,7 kg	0,3 kg	3,0 kg	0,4 kg



Objects in bags must be placed on the trays with the transparent part of the package facing down.

4.5.1 Preparing the material

First of all, remember that when handling and moving contaminated material, it is good practice to take the following precautions:

- Wear suitably thick rubber gloves and a face mask;
- Wash your already-gloved hands with a germicidal detergent;
- Always use a tray to transport instruments.
- Never transport them directly in your hand;
- To avoid the risk of contracting hazardous infections, protect your hands from contact with any sharp or pointed parts;
- Immediately separate any items that must not be sterilised or that cannot support the process;
- When you have finished handling the unsterile material, wash your still-gloved hands thoroughly. All materials and/or instruments to be sterilised must be perfectly clean and free of any kind of residue (organic/inorganic deposits, paper fragments, cotton/gauze pads, limescale, etc.).

NOTE

In addition to causing problems during the sterilisation process, failure to clean and remove residues can damage the instruments and/or the steriliser.



NOTE

In addition to causing problems during the sterilisation process, failure to clean and remove residues can damage the instruments and/or the steriliser.

Proceed as described to clean effectively:

1. Rinse the instruments under a jet of running water immediately after use;
2. Separate metal instruments by material type (carbon steel, stainless steel, brass, aluminium, chromium, etc.) to prevent electrolytic oxidation;
3. Wash with an ultrasonic cleaner containing a mixture of water and germicidal solution, carefully following the manufacturers' recommendations. Alternatively, use a thermal disinfectant.
4. For better results, use a detergent specifically for ultrasonic cleaning, with a neutral pH.



NOTE

Solutions that contain phenol or quaternary ammonium based compounds can corrode the instruments and the metal parts of the ultrasonic equipment.

5. After washing, rinse the instruments thoroughly and check that the residues have been completely removed. Repeat the washing cycle or wash by hand if necessary.



NOTE

To prevent the formation of limescale stains, rinse with deionised or distilled water if possible. Always dry the instruments if you use hard tap water.

For handpieces (turbines, counterangles, etc.), in addition to the above, use special equipment that will clean them properly inside (which may also include lubrication).



NOTE

When the sterilisation program has finished, remember to lubricate the handpiece internal mechanisms with special oil. These precautions will ensure that the lifetime of the instrument is not reduced.

CAUTION

Refer to the instrument/material manufacturer's instructions and make sure that it is compatible before treating it in the autoclave. Strictly follow the usage methods for detergents and disinfectants and the operating instructions for automatic washing and/or lubrication equipment.

For textiles, (or porous materials in general), such as lab coats, napkins, caps and similar, wash them thoroughly and dry them before treating them in the autoclave.



NOTE

Do not use strong detergents that contain chlorine and/or phosphates. Do not bleach with chlorine-based products. These components could damage the tray supports, the trays and any metal instruments in the sterilisation chamber.

4.6 Filling and draining water





Volume of water used for a sterilisation cycle/load with the highest consumption: 700ml

Minimum water tank filling level: 1.1 litres

4.6.1 Filling the feed tank

- Only use water that complies with the technical specifications on page 68.
- The display shows MSG001 (empty load tank), fill the feed tank in one of the following two ways:

Automatic filling from the front

- Insert the part of the hose with the quick coupling into the water filling fitting (6 fig. 1) and put the other end into the water container.
- Select the "water filling" menu 
- Press the icon "PLAY WATER FILLING"  to start the water filling pump.
- Filling stops automatically when the water reaches the maximum level in the feed tank .
- Press the icon "STOP"  to voluntarily stop filling.

REAR AUTOMATIC FILLING

In case of connection to the demineralization system (18 fig. 2) the filling of the charging tank is automatic at the beginning and end of the sterilization cycle. During the water loading the machine cannot perform sterilization cycles and tests.



- 01 Select the "Water filling" menu
- 02 Select "Start" to start filling
- 03 Select "Stop" to stop filling
- 04 The cursor position indicates the water quality

N.B. Filling will stop automatically when the maximum level has been reached, and you will return to the Home screen

Emergency manual filling

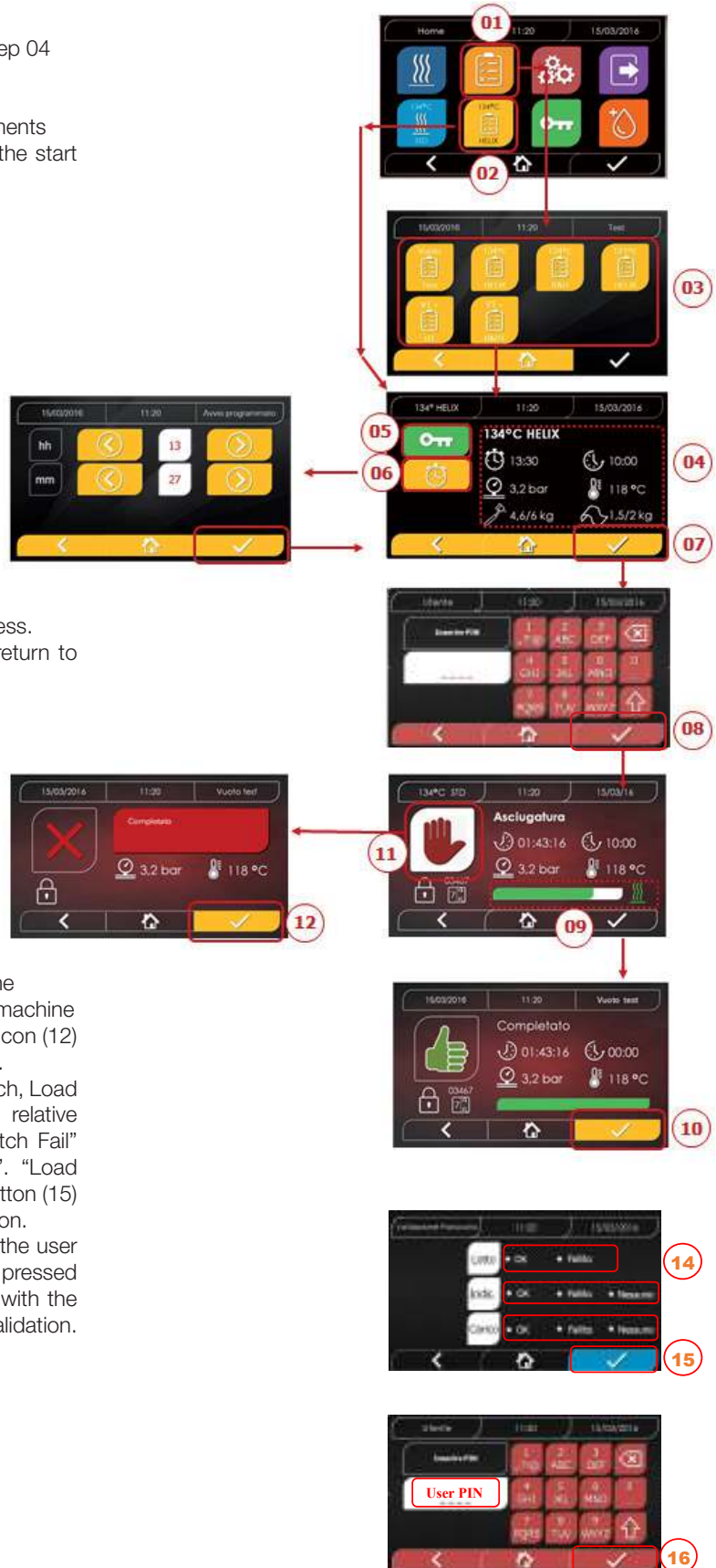
- Insert the part of the hose with the quick coupling into the hole (9 fig. 1)
- Insert the funnel into the other end of the hose and pour in a maximum of 2 litres of distilled water.
- **In case of connection to demineralization system (18 fig. 2) the loading tank is filled automatically.**

4.6.2 Draining the discharge tank

- Insert the end of the hose without the quick coupling into a container to collect the drained water.
- Insert the quick coupling into the hole (7 fig. 1) and position the container under the autoclave to drain the tank.
- **Drain the water in compliance with the waste disposal regulations in force.**
- **Possibility to use the drain tank outlet, placed at the back (15 fig. 2).**

4.7 Test programs

- 01 Select the "Test cycles" menu
- 02 Alternatively, directly select "Last test run" and go to step 04
- 03 Select the desired cycle
- 04 Screen with all the parameters of the selected cycle
- 05 (Optional) you can open the door to insert other instruments
- 06 (Optional) Select the programmed start button to set the start time
- 07 Start the test cycle
- 08 (If anabled) enter the user PIN.
- On confirming, the test cycle will start.



- 09 You can use the green bar to monitor the cycle progress.
- 10 When the cycle finishes, press the confirm icon to return to the Home screen.

- 11-12 You can stop the cycle manually by holding done the "STOP CYCLE" button for 3 seconds. Wait for the machine to be put in a safe condition and press the confirm icon (12) and then press Home to return to the home screen.
- 14/15 Cycle Validation Protocol: The selection of the Batch, Load and/or Indicator validation options generates the relative information in the cycle report: "Batch Ok" – "Batch Fail" "Indicator OK" - "Indicator Fail" – "No Indicator". "Load OK" - "Load Fail" - "No Load" * The confirmation button (15) will be "Operational" when the user makes a selection.
- 16 For the validation of Batch, Load and/or Indicator, the user must enter his PIN. When the confirmation button is pressed (16), the system generates the Cycle Report PDF with the identification of the User who performed the cycle validation.

4.7.1 Test program types

Selecting the "test" sub-menu accesses the list of test cycles that autoclave can run:

- Vacuum Test
- 134°C Helix Test
- 121°C Helix Test
- 134°C Bowie&Dick Test

4.7.2 Vacuum test (leakage test)

To run this function, the chamber must be cold and have no instruments in it.

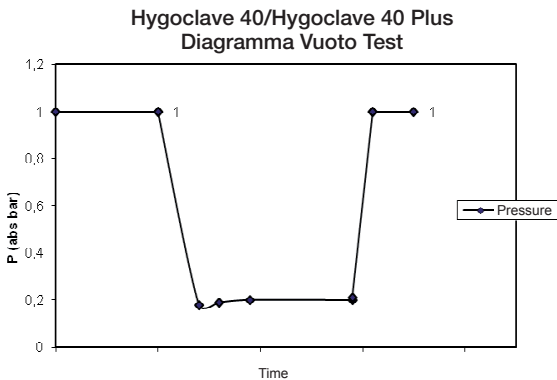
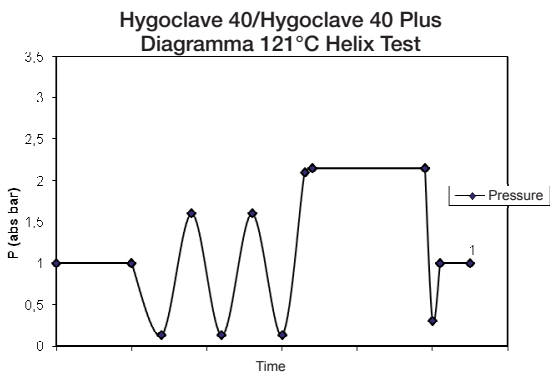
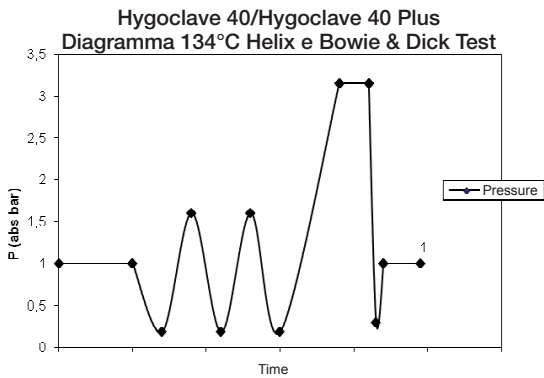
4.7.3 Bowie & dick test

To run this test, the chamber must have no instruments in it. The Bowie & Dick "package" used for the porous load test must be positioned on the lower tray.

4.7.4 Helix test

To run this test, the chamber must have no instruments in it. The instrument used to test narrow hollow loads must be positioned on the lower tray.

4.7.5 Test diagrams



4.8 Settings

4.8.1 User settings



01 Select "Settings"

02 Select "User"

03 Enter the administrator pin (factory setting "2222") and confirm
With the Administrator PIN (2222), it is possible to set the users and to manage their PIN and the Cycle Validation Protocol.

04 Click on the arrows to enable or disable the USERS function.
When the function is enabled, a user PIN will be requested every time a cycle/test is started.

If PIN User Management is enabled, upon confirmation you will go to the new Cycle Validation Protocol Management screen. If PIN User Management is disabled, upon confirmation of the selection, the confirmation button (4) will become "Non-Operational".

05 When the "Users" function is enabled, you can ADD other users

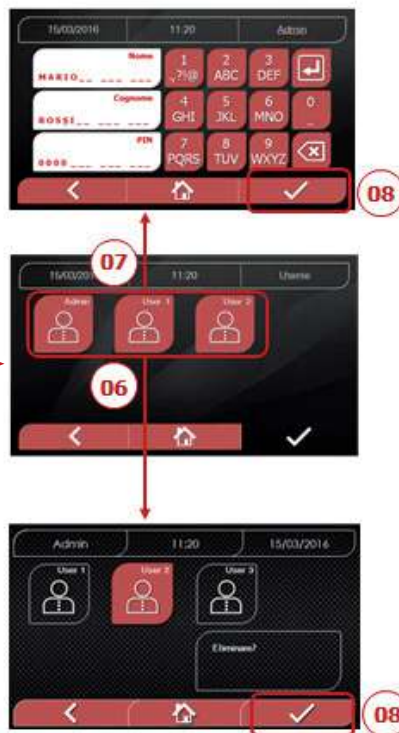
06 When the "Users" function is enabled, you can DELETE previously created users

07 When the "Users" function is enabled, you can EDIT previously created users

08 Confirm to save

09 By enabling the Protocol Management PIN, the Cycle Validation Protocol is activated at the end of the cycle.

The Confirmation button (9) will be "Operational" when the user changes the Disable/Enable state.



4.8.2 Date and time settings



01 Select "Settings"

02 Select "date and time"

03 Click on the arrows to increase or decrease the relative field (day, month, year)

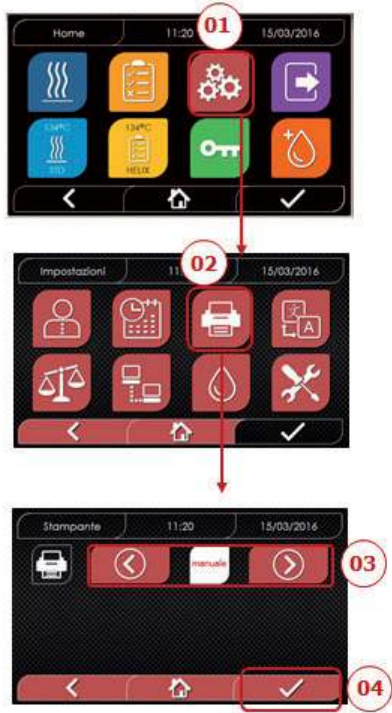
04 Confirm to go to the "time" screen

05 Click on the arrows to increase or decrease the relative field (hours, minutes, 12/24)

06 Confirm to save



4.8.3 Printer settings



- 01 Select "Settings"
- 02 Select "Printer"
- 03 Click on the arrows to change from automatic to manual print mode and vice versa
- 04 Confirm to save

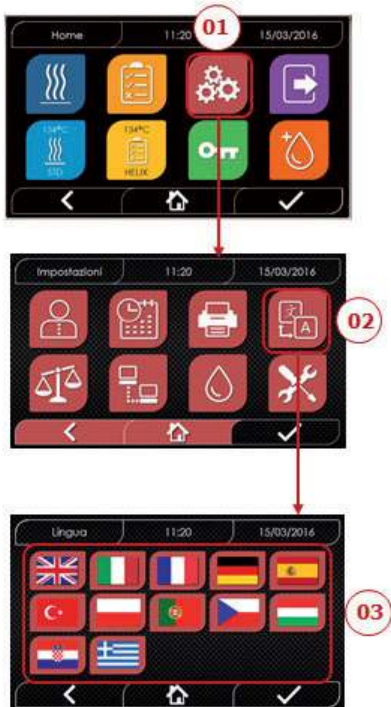
4.8.5 Measurement unit settings



- 01 Select "Settings"
- 02 Select "Measurement unit"
- 03 Click on the arrows to change from "bar" to "kPa" to "mbar"
- 04 Click on the arrows to change from "absolute" to "relative"
- 05 Confirm to save

4.8.4 Language settings

EXAMPLE OF LANGUAGES SCREEN



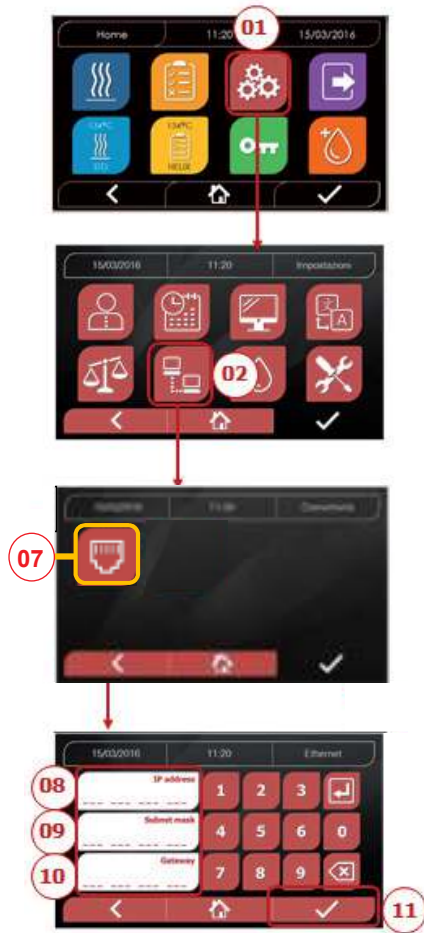
- 01 Select "Settings"
- 02 Select "Language"
- 03 Click on the desired language

4.8.6 Water settings



- 01 Select "Settings"
- 02 Select "Water settings"
- 03 Click on the arrows to change from front filling (manual) to rear filling (from the demineralization system)
- 04 Confirm to save

4.8.7 Connections



ETHERNET

- 01 Select "Settings"
- 02 Select "Connectivity"
- 07 Select "ETHERNET"
- 08/09/10 Click on the relative fields and enter the data
- 11 Confirm to save

4.8.8 Hygoclave 40 / Hygoclave 40 Plus - Ethernet Connection

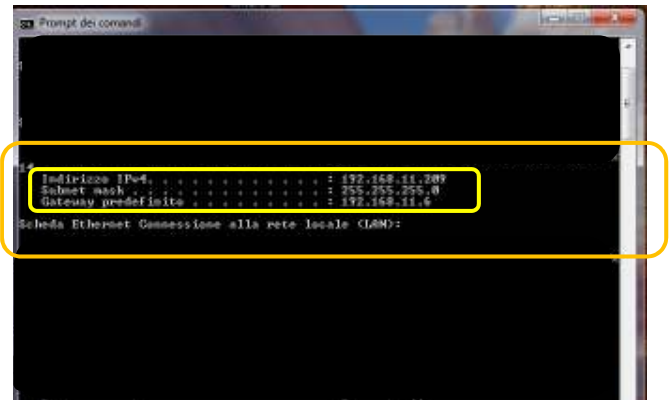
The Hygoclave 40/Hygoclave 40 Plus series sterilizers can be connected to a local Ethernet network by means of a specific cable connected to the special connector (14 - fig. 2) located in the rear of the autoclave. Through a PC or other device connected to the network (smartphone, tablet, etc.) with the use of a Web Browser (Internet browsing program like Internet Explorer, Firefox, Chrome, etc.) and by knowing the TCP-IP number assigned to the sterilizer, you will be able to monitor the machine to know its operating status and download the reports of the cycles performed.

ETHERNET NETWORK CONNECTION CONFIGURATION

The sterilizer Web Server only works with a network with active DHCP and static IP.

The number chosen as the machine address must be compatible with the range assigned by the DHCP server of the local network and its Subnet Mask.

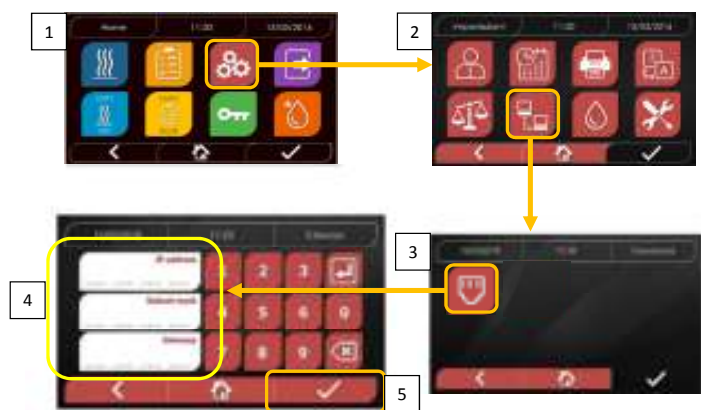
To find out the local network numbering range on Windows systems, you can use the IPCONFIG command from a "Command Prompt" window (accessible from "All Programs – Accessories"):



For a correct configuration you must assign to the IP address of the machine: - a number belonging to the local network defined by the first 3 values of the IP address: in the example above it is "169.254.190.xxx"; - as the last number a value not assigned to the local network: e.g. "169.254.190.158".

Therefore the complete IP address of the sterilizer could be of the type: **169.254.190.158**

Once you know the IP address and Subnet Mask to be assigned to the machine you must enter these values in the setting screen of the autoclave Ethernet parameters using the keyboard and save the data:

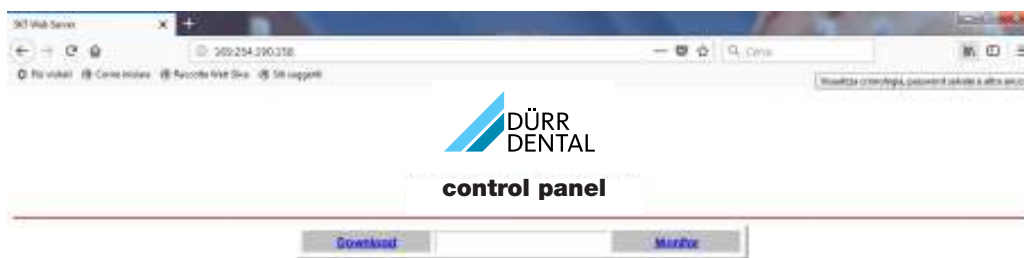


Note: The Gateway address is not important for local network communications.

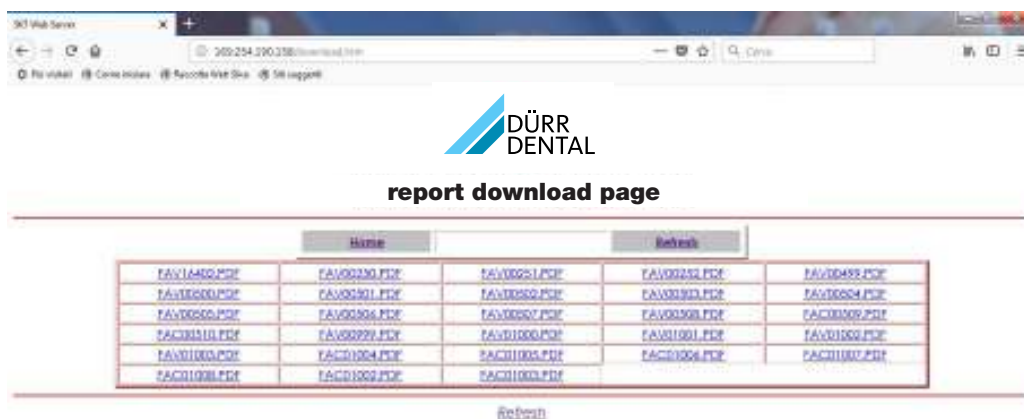
Once the Ethernet configuration data has been entered and saved, the autoclave must be switched off and on again so that the data can be used by the Web Server of the machine.

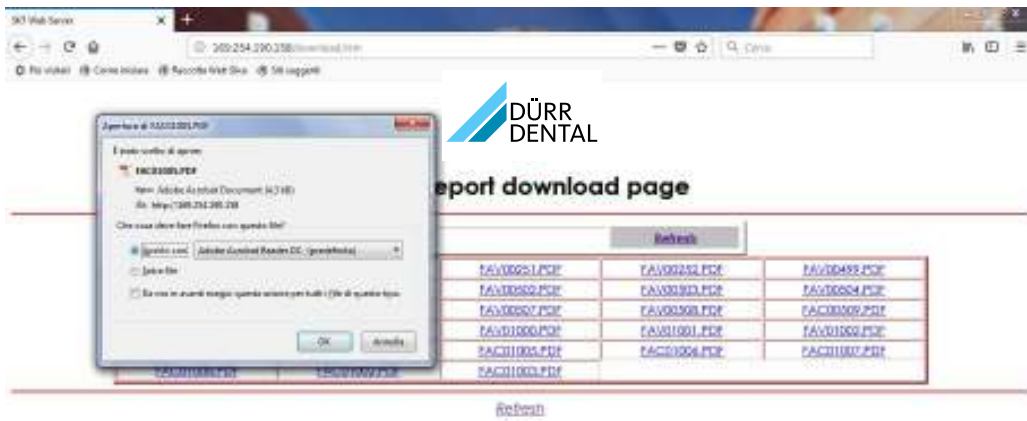
At this point, with the sterilizer turned on on the Home screen, from a PC connected to the local network, or directly connected to the machine via Ethernet cable, you must open the Web Browser (Internet browsing program like Internet Explorer, Firefox, Chrome, etc.) and in the address field you must enter the IP address previously entered in the sterilizer (in our e.g. **169.254.190.158**). You will then have access to a "Hygoclave 40 / Hygoclave 40 Plus Panel control" Web page dedicated to downloading reports of cycles that the machine has performed (**Download**) or to monitor its operation (**Monitor**):

Hygoclave 40 / Hygoclave 40 Plus control panel

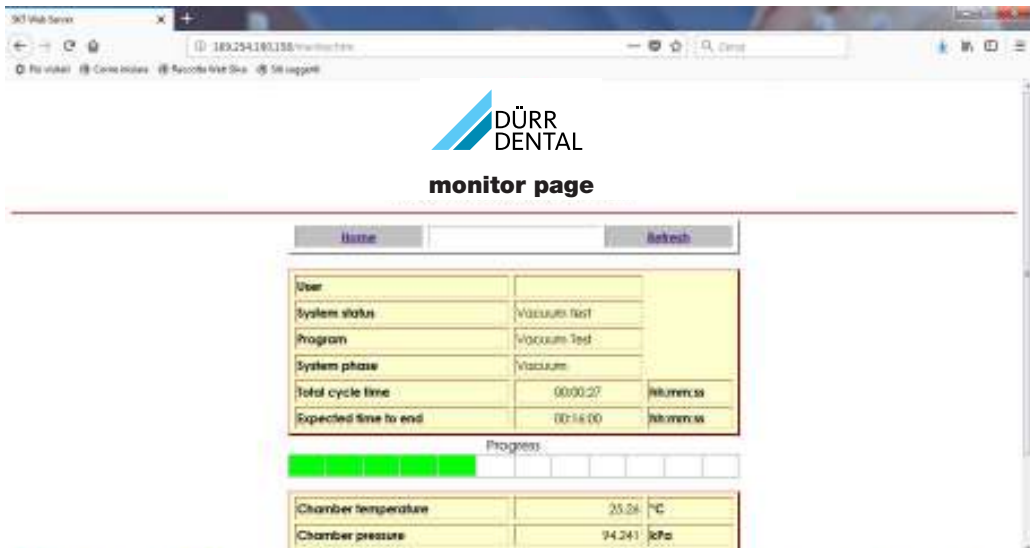


Hygoclave 40 / Hygoclave 40 Plus report download page





Hygoclave 40 / Hygoclave 40 Plus monitor page



4.9 Data output

USB

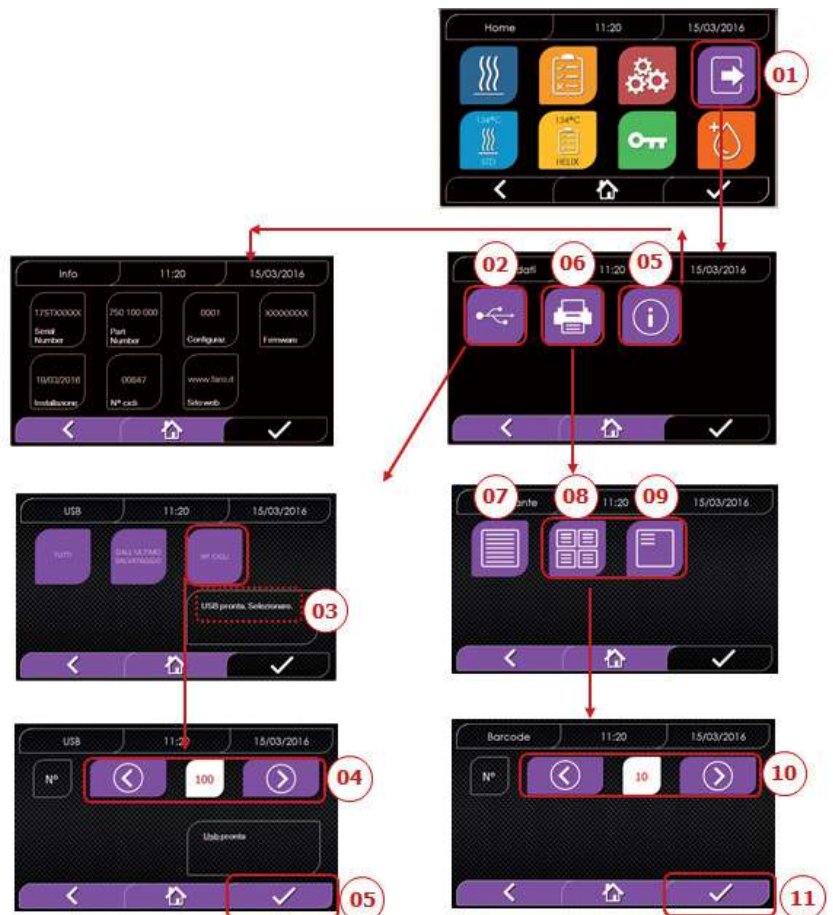
- 01 Select the "Data output" menu
- 02 Select the USB symbol
- 03 Insert the USB pen drive and wait for it to be recognised
- 04 Select the number of cycles to transfer
- 05 Confirm and wait for the transfer to complete

STAMPA

- 01 Select the "Data output" menu
- 06 Select the PRINTER symbol
- 07/08/09 Select the printout type (report, labels, barcodes)
- 10 Select the number of labels/barcodes to print
- 11 Confirm printout

INFO

- 01 Select the "Data output" menu
- 05 Select the INFO symbol



EN

5 ROUTINE MAINTENANCE

5.1 General table

Operation	Frequency			
	Daily 5 cycles	Monthly 50 cycles	Quarterly 500 cycles	Annually 1000 cycles
Clean the door seal	•			
Clean the chamber edge (area where the seal touches)	•			
Clean the door cover		•		
Clean the chamber and accessories		•		
Clean the front panel		•		
Clean the side walls and top panel		•		
Clean the chamber filter		•		
Clean the dust filter (if provided)		•		
Clean the screw and nut screw		•		
Lubricate the screw and nut screw		•		
Clean the feed tank			•	
Replace the bacterial filter			•	
Replace the door seal				•



Before cleaning any surface, make sure that it has cooled down.

5.1.1 Cleaning the sterilisation chamber and internal components

Use a soft cloth soaked in water to avoid damaging the protective surface treatment of the chamber. Rinse thoroughly with water and then dry. If necessary, moisten the cloth with white vinegar to remove any limescale.

However, we recommend cleaning the chamber only when strictly necessary. If there are limescale deposits, immediately check what is causing them. White patches forming at the bottom of the chamber means that the water used is of poor quality or does not comply with the required specifications.

5.1.2 Cleaning the door cover

Use a soft cloth soaked in water to avoid damaging the protective treatment of the door cover. Rinse thoroughly with water and then dry. **DO NOT USE** metallic or particularly abrasive cloths for cleaning. Using them could damage the external surface of the door cover.

5.1.3 Cleaning the external front panel

Use a soft cloth soaked in alcohol, taking care not to let it penetrate into the autoclave internal parts. Never use detergents based on trilene, benzene or turpentine or solvents of any kind. **DO NOT USE** metallic or particularly abrasive cloths for cleaning.

5.1.4 Cleaning the door seal

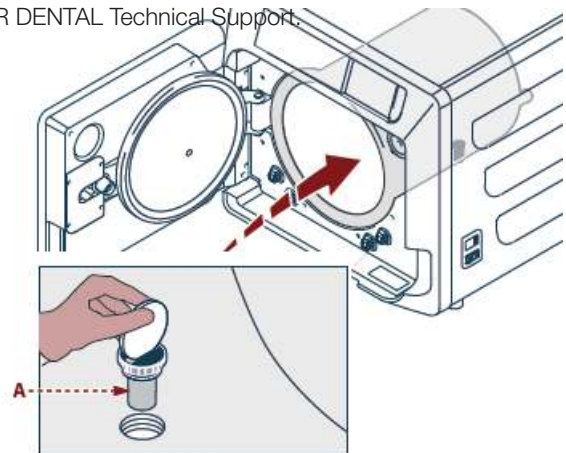
Clean the seal with a soft cloth moistened with water or white vinegar, to remove any limescale. Rinse thoroughly if you used vinegar. This procedure serves to remove impurities that can cause pressure loss in the sterilisation chamber and possibly break the seal.

5.1.5 Cleaning the filter in the chamber

- Remove the tray holder with the trays from the chamber
- Rinse the filter thoroughly with water.
- Reposition the filter on the bottom of the chamber and screw it back in place.

If the cleaning operation does not produce satisfactory results, call

DÜRR DENTAL Technical Support.



5.1.6 Replacing the Bacterial or Bio X filter

Open the autoclave door

- Unscrew the filter (**2 Fig. 1**) by turning it anticlockwise.
- Screw the new filter in clockwise, making sure that it is tightened properly.

5.1.7 Replacing the door seal

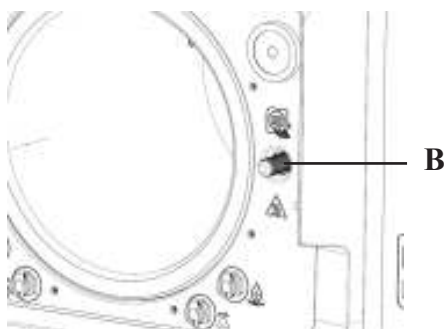
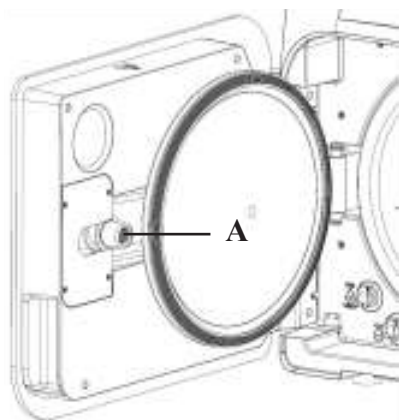
This must be carried out by qualified technicians.

5.1.8 Cleaning the dust filter (if provided)


Remove the dust filter from the bottom of the autoclave (**19 fig. 1**), rinse it thoroughly with water and dry it before refitting it.

5.1.9 Lubricating and cleaning the screw and nut screw

Every 250 cycles, clean and lubricate with silicone grease the inside of the threaded bushing "A" located on the door .



Clean screw "B" on the front panel using a soft cloth.

 Never use hydrochloric acid or detergents containing chlorine to clean any part of the autoclave.

5.1.10 Clean the feed tank

This must be carried out by qualified technicians.

5.3 Periodic process effectiveness and safety checks


Operation	Frequency			
	Before first use	Daily	Annually	Every two years
Vacuum Test EN 17665		•		
Bowie & Dick Test 17665		•		
Helix Test EN 17665		•		
Protective earthing continuity				•
Insulation test				•
Casing leakage current				•
Initial validation EN 17665	•			
Periodic validationa EN 17665			•	
Safety valve check			•	

Before proceeding with the operations indicated above, always switch off the main switch (5 Fig. 1) and make sure that the chamber is cold.

 Never use hydrochloric acid or detergents containing chlorine to clean any part of the autoclave.

5.2 Annual maintenance

After every 1000 cycles, or one year after installation, a reminder message appears to perform maintenance.

 Annual maintenance can only be carried out by a DÜRR DENTAL qualified technician from the DÜRR DENTAL Technical Support Service network.

The maintenance consists of replacing, cleaning and checking some parts, as indicated in the relative table.

The work consists of the following:

Replace:

- door seal
- bacterial or Bio X filter
- chamber filter
- water filter
- vacuum pump membrane kit (if necessary)

Check:

- Safety valve check
- Leakage current check
- Hose checks: hose performance does not change until they physically break, in which case they do not work. Only replace them with DÜRR DENTAL spare parts.

When finished, the qualified technician will issue a certificate stating that the annual autoclave maintenance was carried out. Comply with the intervals specified or indicated in this manual and in the additional sheets. Only use ORIGINAL SPARE PARTS. Failure to comply will void the equipment warranty.

6 Troubleshooting guide

6.1 Error Codes

Code	Message	Description	Reset procedure
ER 001	Door closing timeout	The door closing time is too long	B
ER 002	Door switch	Door switch error condition	B
ER 003	Door unlocking timeout	The door unlocking time is too long	B
ER 004	Door opening timeout	The door opening time is too long	B
ER 006	Very poor water quality	The water conductivity is higher than 30uS/cm	B
ER 007	Floating feed tank in unexpected condition	Floating feed tank in unexpected condition	B
ER 100	Vacuum timeout during preheating	The vacuum preheating phase time is too long	A
ER 101	Pressure rise timeout during preheating	The vacuum preheating phase time is too long	A
ER 110	Vacuum pressure timeout	The time to reach the vacuum pressure is too long	A
ER 120	Discharge pressure timeout	The time to reach the thermodynamic discharge pressure is too long	A
ER 121	Pressure difference	The pressure increase is lower than the set parameter	A
ER 130	Discharge time	The pressure discharge time is too long	A
ER 140	Sterilisation pressure timeout	The time to reach the sterilisation pressure is too long	A
ER 141	Pressure difference	The pressure increase is lower than the set parameter	A
ER 150	T chamber high	The chamber temperature is over the top limit for sterilisation	A
ER 151	T chamber low	The chamber temperature is below the bottom limit for sterilisation	A
ER 152	T theoretical high	The theoretical temperature is over the top limit for sterilisation	A
ER 153	T theoretical low	The theoretical temperature is below the bottom limit for sterilisation	A
ER 154	Temperature difference	The difference between the chamber and theoretical temperature is over the allowed limit	A
ER 160	Final discharge	The final discharge time is too long	A
ER 170	AV block	The measured pressure is below the set parameter for the drying phase	A
ER 180	Balancing timeout	The pressure balancing time is too long	A
ER 200	Vacuum test timeout	The time to reach the vacuum pressure is too long in the vacuum test	A
ER 201	Vacuum test: first phase	Failure to comply with the parameters in the first phase of the vacuum test	A
ER 202	Vacuum test: second phase	Failure to comply with the parameters in the 2nd phase of the vacuum test	A
ER 203	Vacuum test: temperature	Failure to comply with the temperature limits during the vacuum test	A
ER 204	Vacuum test: balancing	Pressure balancing failed in the vacuum test	A
ER 310	Vacuum pressure threshold reached timeout	The time to reach the test vacuum pressure threshold has been exceeded	A
ER 340	Test pressure rise timeout	The time to reach the test vacuum pressure threshold has been exceeded	A
ER 341	Pressure delta	Pressure delta	A
ER 342	Safety valve open	The safety valve has opened during test execution	A
ER 355	Test execution timeout	The test execution time has been exceeded	A
ER 360	Final discharge timeout	The time to discharge the pressure has been exceeded	A
ER 370	AV lock during drying	Pressure measurement less than the parameter established in the drying phase during the test	A
ER 380	Pressure balancing timeout	The pressure balancing time has been exceeded during test execution	A

6.2 Alarm Codes

Code	Message	Description	Reset procedure
AL 001	Reset pressed	The reset button was pressed	A/B
AL 002	Blackout	A blackout has occurred	A/B
AL 003	Water filling time	The time to fill the feed tank is too long	A
AL 100	Chamber probe fault	The chamber probe reading circuit is faulty	A
AL 101	Generator probe fault	The generator probe reading circuit is faulty	A
AL 102	Bundle probe fault	The pipe bundle probe reading circuit is faulty	A
AL 103	Pressure transducer	The pressure transducer is faulty	A
AL 104	Door microswitch	The door microswitch has opened unexpectedly	A
AL 105	Safety microswitch	The safety microswitch has opened unexpectedly	A
AL 200	Chamber safety cut-off	The chamber has exceeded the safety temperature	A
AL 201	Generator safety cut-off	The generator has exceeded the safety temperature	A
AL 202	Bundle safety cut-off	The pipe bundle has exceeded the safety temperature	A
AL 203	Safety valve fault	The pressure has exceeded the maximum trip threshold of the safety valve	A
AL 300	Hardware error Reboot the system	There is no synchronisation for managing AC loads and checking the mains frequency	A
AL 301	Valve drive voltage	There is no valve drive voltage due to a PTC trip	A
AL 302	Mains frequency error	The mains frequency is < 45 Hz or > 65 Hz	A
AL 303	Watchdog trip	Program execution has crashed	A
AL 304	Communication error with Main Board Reboot system	There is a communication fault between the main board and the CPU board	A
AL 305	Hardware error	Hardware fault on the main board	A
AL 306	Hardware error	Hardware fault on the main board	A
AL 307	Hardware error	Hardware fault on the main board	A
AL 308	Hardware error	Hardware fault on the main board	A
AL 309	Hardware error	Hardware fault on the main board	A
AL 310	Hardware error	Hardware fault on the main board	A
AL 311	Hardware error	The cycle has incorrectly been closed – Software error	A
AL 401	Generator temperature low	Generator failure	A
AL 402	Band temperature low	Band failure	A

6.3 Messages

Code	Phase	Message
Msg001	Standby or cycle start	Feed tank empty
Msg002	Standby or cycle start	Feed tank full
Msg003	Pin entry	Incorrect Pin
Msg004	Water loading	Poor water quality
Msg005	Cycle start	Door open
Msg008	Vacuum Test start	Chamber temperature over limit
Msg009	Machine switch-on	Serial number inconsistency between CPU and MB
Msg010	Machine switch-on	Lubricate the automated system of the door
Msg011	Machine switch-on	Replace the Bio-X filter
Msg012	Machine switch-on	Conduct maintenance
Msg013	Incorrect date	System date incorrect - Check
Msg014	Do vacuum test	Do vacuum test
Msg016	PIN too short	PIN too short
Msg017	Duplicate PIN	PIN already exists
Msg018	MB FW revision incompatible with CPU FW	Firmware version incompatible – contact Technical Support

6.4 Reset procedures

Reset procedure "A"

If the cycle is "running", reset the error by selecting the confirm icon on the safety screen and then select the Home icon to return to the initial screen.

Reset procedure "B"

Reset the error by selecting the confirm icon on the safety screen.

N.B. In the event of faults that compromise sterilisation/test cycle execution, the cycle selection icons on the Home screen will be disabled.

6.5 Troubleshooting

Code	Possible cause	Possible solution
ER 001	There is a malfunction in the motorised door closing/opening system.	Reset the machine. Repeat the door closing procedure. If the problem persists, contact technical support.
ER 002	There is a malfunction in the motorised door closing/opening system.	
ER 003	There is a malfunction in the motorised door closing/opening system.	
ER 004	There is a malfunction in the motorised door closing/opening system.	
ER 006	The water quality is very poor.	Reset the machine. Very poor water quality: empty the feed tank and refill it with better quality water. If the problem persists, contact technical support.
ER 007	Floating feed tank in unexpected condition.	Reset the machine. Check the condition of the floating feed tank. If the problem persists, contact Technical Support.
ER 100	There is a leak in the machine plumbing circuit or a malfunction in the vacuum pump.	Reset the machine. Check that the door seal is clean and positioned correctly, then repeat the selected program. If the problem persists, contact technical support.
ER 101	There is a leak in the machine plumbing circuit.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that there is water in the feed tank; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 110	There is a leak in the machine plumbing circuit or a malfunction in the vacuum pump.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that the filter in the chamber is clean and positioned correctly. Then repeat the selected program. If the problem persists, contact technical support.
ER 120	There is a leak in the machine plumbing circuit or a malfunction in the water injection pump.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that there is water in the feed tank; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 121	There is a leak in the machine plumbing circuit or a malfunction in the water injection pump.	
ER 130	There is a malfunction in the machine discharge system.	Reset the machine. Check the amount of load in the chamber and repeat the selected program. If the problem persists, contact technical support.
ER 140	There is a leak in the machine plumbing circuit or a malfunction in the water injection pump.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that there is water in the feed tank; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 141	There is a leak in the machine plumbing circuit or a malfunction in the water injection pump.	
ER 150	There is a leak in the machine discharge system or a chamber loading error.	Reset the machine. Check: a) the tray support position and the tray position in the chamber; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 151	There is a malfunction in the sterilisation condition holding system or a chamber loading error.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that there is water in the feed tank; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.

Code	Possible cause	Possible solution
ER 152	There is a malfunction in the sterilisation condition holding/control system.	Reset the machine. Check: a) that there is water in the feed tank; b) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 153	There is a malfunction in the sterilisation condition holding/control system.	
ER 154	There is a malfunction in the sterilisation condition holding/control system.	Reset the machine. Check: a) the tray support position and the tray positions in the chamber; b) that there is water in the feed tank; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 160	There is a malfunction in the machine discharge system.	Reset the machine. Check the amount of load in the chamber and then repeat the selected program. If the problem persists, contact technical support.
ER 170	There is a malfunction in the machine drying system.	Reset the machine. Check the amount of load in the chamber and the Bio-X filter condition, then repeat the selected program. If the problem persists, contact technical support.
ER 180	There is a malfunction in the pressure balancing system.	
ER 200	There is a leak in the machine plumbing circuit or a malfunction in the vacuum pump.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that the filter in the chamber is clean and positioned correctly. Then repeat the selected program. If the problem persists, contact technical support.
ER 201	There is a leak in the machine plumbing circuit.	Reset the machine. Check that the door seal is clean and positioned correctly, then repeat the selected program. If the problem persists, contact technical support.
ER 202	There is a leak in the machine plumbing circuit.	
ER 203	A Vacuum Test is running in chamber conditions other than ambient temperature.	Reset the machine. Repeat the Vacuum Test, making sure that the chamber is at ambient temperature. If the problem persists, contact technical support.
ER 204	There is a malfunction in the pressure balancing system.	Reset the machine. Repeat the selected program. If the problem persists, contact technical support.
ER 310	Leak in the hydraulic circuit of the machine or malfunctioning of the vacuum pump.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that the filter in the chamber is clean and positioned correctly. Then repeat the selected program. If the problem persists, contact technical support.
ER 340	Leak in the hydraulic circuit of the machine or malfunctioning of the water injection pump.	Reset the machine. Check: a) that the door seal is clean and positioned correctly; b) that there is water in the feed tank; c) the amount of load in the chamber. Then repeat the selected program. If the problem persists, contact technical support.
ER 341	Leak in the hydraulic circuit of the machine or malfunctioning of the water injection pump.	
ER 342	The safety valve has opened during test execution.	Replace the safety valve.
ER 355	The test execution time has been exceeded.	Check the condition of the safety valve and replace it if necessary.
ER 360	Malfunction in the machine discharge system.	Reset the machine. Check the amount of load in the chamber and then repeat the selected program. If the problem persists, contact technical support.
ER 370	Malfunction in the machine drying system.	Reset the machine. Check the amount of load in the chamber and the Bio-X filter condition. Then repeat the selected program. If the problem persists, contact technical support.
ER 380	Malfunction in the machine pressure balancing system.	
AL 001	The reset button was pressed.	Reset the machine.
AL 002	A blackout has occurred.	Reset the machine. Check: a) that the power cable is connected correctly; b) that there is mains power in the system. Then repeat the selected program. If the problem persists, contact technical support.
AL 003	There is a malfunction in the feed tank water filling system.	Reset the machine. Check that the water filling hose is positioned and connected correctly, then repeat the selected procedure. If the problem persists, contact technical support. If water comes out of the overflow fitting at the rear, contact technical support.
AL 100	There is a malfunction in the chamber probe reading circuit.	Reset the machine.
AL 101	There is a malfunction in the generator probe reading circuit.	Repeat the selected program. If the problem persists, contact technical support.
AL 102	There is a malfunction in the pipe bundle probe reading circuit.	

Code	Possible cause	Possible solution
AL 103	There is a malfunction in the pressure transducer reading circuit.	Reset the machine. Repeat the selected program. If the problem persists, contact technical support.
AL 104	There is a malfunction in the door closing/opening control system.	
AL 105	There is a malfunction in the door closing/opening control system.	
AL 200	There is a malfunction in the temperature control system.	
AL 201	There is a malfunction in the temperature control system.	
AL 202	There is a malfunction in the temperature control system.	
AL 203	There is a malfunction in the pressure control system.	Reset the machine. Contact technical support.
AL 300	There is a malfunction in the electronic system.	Reset the machine. Repeat the selected program. If the problem persists, contact technical support.
AL 301	There is a malfunction in the electronic system.	
AL 302	There is a malfunction in the electronic system.	
AL 303	There is a malfunction in the electronic system.	
AL 304	There is a malfunction in the electronic system.	
AL 305	There is a malfunction in the electronic system.	
AL 306	There is a malfunction in the electronic system.	
AL 307	There is a malfunction in the electronic system.	
AL 308	There is a malfunction in the electronic system.	
AL 309	There is a malfunction in the electronic system.	
AL 310	There is a malfunction in the electronic system.	
AL 311	There is a malfunction in the electronic system.	
AL 401	Generator malfunction.	
AL 402	Band malfunction.	

6.6 Message solutions

Code	phase	Message	Possible solution
Msg001	Standby or cycle start	Feed tank empty	Fill the feed tank
Msg002	Standby or cycle start	Feed tank full	Empty the discharge tank
Msg003	Pin entry	Incorrect Pin	Enter the correct Pin
Msg004	Water loading	Poor water quality	Change the water in the feed tank with better quality water
Msg005	Cycle start	Door open	Close the door
Msg008	Vacuum Test start	Chamber temperature over limit	Repeat Vacuum Test when the chamber temperature returns below the allowed limit (45°C)
Msg009	Machine switch-on	Serial number inconsistency between CPU and MB	Contact The Dürr Dental Technical Service
Msg010	Machine switch-on	Lubricate the automated system of the door	Lubricate the autoamted system according to the instructions in par. 5.1.9 of the user manual
Msg011	Machine switch-on	Replace Bio-X filter	Replace the Bio-X filter with original spare part Dürr Dental
Msg012	Machine switch-on	Conduct maintenance	Contact Dürr Dental Technical Service for routine maintenance
Msg013	Machine switch-on	Incorrect date	Set clock/calendar of the machine again. If the problem persists, contact the Dürr Dental Technical Service
Msg014	Machine switch-on or cycle start	Do vacuum test	Do vacuum test
Msg016	Pin entry	Pin too short	Entry 4-digit PIN
Msg017	Pin entry	Duplicate PIN	Entry correct PIN
Msg018	Machine switch-on	MB FW revision incompatible with CPU FW	Contact the Dürr Dental Technical Service

7 Technical specifications

	Hygoclave 40			Hygoclave 40 Plus		
	220 V	230 V	240 V	220 V	230 V	240 V
Power supply voltage	220 V	230 V	240 V	220 V	230 V	240 V
Mains frequency	60 HZ	50/60 HZ	50 HZ	60 HZ	50/60 HZ	50 HZ
Power	1880 W	2050 W	2230 W	2010 W	2200 W	2400 W
Maximum current consumption	8,5 A	8,9 A	9,3 A	9,1 A	9,6 A	10,0 A
Fuse (6.3x32)	T12 A H 250v			T12 A H 250v		
Noise level	<60dB (A)					
Electric shock protection class	Class I					
Operating temperature	From 5°C to 40°C					
Chamber volume	approx. 17 litres			approx. 22 litres		
Usable chamber volume	approx. 11 litres			approx. 14 litres		
Feed tank volume	5,2 litres					
Weight per unit area of empty machine	202 kN/m ²			216 kN/m ²		
Weight per unit area at full load	237 kN/m ²			251 kN/m ²		
Empty machine weight	57 kg			61 kg		
Fully loaded machine weight	67 kg			71 kg		
Safety valve calibration pressure	2,5 bar			2,5 bar		

7.1 Water specifications (distilled or demineralized)

Conductivity at 20°C	0÷15 green µS/cm	15÷30 yellow µS/cm	> 30 red µS/cm
Chlorides	<2.0 mg/l		
pH at 20°C	5.0 - 7.0		

8 Spare parts codes

6048100022 : Tray handle
 6048100023 : 18 L tray
 6048100024 : 23 L tray
 6048100019 : Bio-X-Filter
 6048100018 : Door seal

9 Product reference table

Manufacturer Code	DÜRR Code	Product name
75100035	604810001	Hygoclave 40 Type B 230V 50/60Hz
751030035	6048100003	Hygoclave 40 Type B 220V 60Hz
751020035	6048100004	Hygoclave 40 Type B 240V 50Hz
751010035	6048100005	Hygoclave 40 Type B 230V 50/60Hz CH
751031035	6048100006	Hygoclave 40 Type S 220V 60Hz
751001035	6048100007	Hygoclave 40 Type S 230V 50/60Hz
751021035	6048100008	Hygoclave 40 Type S 240V 50Hz
751011035	6048100009	Hygoclave 40 Type S 230V 50/60Hz CH
751032035	6048100010	Hygoclave 40 Type B+S 220V 60Hz
751002035	6048100025	Hygoclave 40 Type B+S 230V 50/60Hz
751022035	6048100026	Hygoclave 40 Type B+S 240V 50Hz
751012035	6048100027	Hygoclave 40 B+S 230V 50/60Hz CH
75110035	604810002	Hygoclave 40 Plus Type B 230V 50/60Hz
751130035	6048100028	Hygoclave 40 Plus Type B 220V 60Hz
751120035	6048100029	Hygoclave 40 Plus Type B 240V 50Hz
751110035	6048100030	Hygoclave 40 Plus B 230V 50/60Hz CH
751131035	6048100031	Hygoclave 40 Plus Type S 220V 60Hz
751101035	6048100032	Hygoclave 40 Plus Type S 230V 50/60Hz
751121035	6048100033	Hygoclave 40 Plus Type S 240V 50Hz
751111035	6048100034	Hygoclave 40 Plus S 230V 50/60Hz CH
751132035	6048100035	Hygoclave 40 Plus Type B+S 220V 60Hz
751102035	6048100036	Hygoclave 40 Plus B+S 230V 50/60Hz
751122035	6048100037	Hygoclave 40 Plus Type B+S 240V 50Hz
751112035	6048100038	Hygoclave 40 Plus B+S 230V 50/60Hz CH



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