

Translation of the original manual

english

Elmasonic Med

Ultrasonic cleaning unit



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Elma Schmidbauer GmbH

Gottlieb-Daimler-Strasse 17

78224 Singen (Germany)

www.elma-ultrasonic.com

Technical support:

Tel: + 49 (0)77 31 882 280

Email: support@elma-ultrasonic.com

Subject to technical and visual modifications.

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1 About this manual

NOTE Please read the manual before using the product. This manual forms part of the contents supplied with the unit. Keep the manual in an accessible place close to the product, and keep it with the product if it is sold on.

Meaning of the symbols used:

- This symbol denotes lists.
- ✓ This symbol denotes requirements.
- 1. Numbers with a dot denote actions.
- This symbol denotes individual actions.
- ⇨ This symbol denotes interim results.
- ➔ This symbol denotes the result of an action.
- 1 Numbers without a dot denote image labels.

1.1 User

In the manual, the term *User* refers to all persons who transport, set up, connect, operate and maintain the unit. The manual is aimed at persons with appropriate technical knowledge and experience in handling similar units.

Users must have read and understood the manual and be capable of following all notes and instructions.

All tasks that go beyond the pure operation of the unit within the scope described here must be performed by qualified and authorised specialists.

1.2 Other applicable documents

In addition to the specifications given in this manual, the following documents and directives also apply and may take precedence. This list is not exhaustive:

- Regional safety regulations and other locally applicable provisions.
- Safety data sheet and dosing instructions of the cleaning agents used.
- All serious incidents that occur in connection with the product must be reported to the manufacturer and the responsible authority of the member state in which the operator and/or the patient are resident.

1.3 Factory settings

The unit is delivered with predefined factory settings that determine the type and version of various unit functions. All information given in this manual is based on the use of a unit that is being operated with the factory settings unchanged.

Unit functions can be customised in *Setup* mode. If this has been done, the unit functions can differ from the information given in this manual. If discrepancies are found, the unit can be reset to the factory settings [▶ 29].

1.4 CE mark

This unit fulfils CE marking requirements in line with EU-directives. Details are stated in the EU declaration of conformity that can be obtained from the manufacturer.

Technical changes to the unit must be approved by the manufacturer.

2 Proper use

The unit is used exclusively to treat objects and materials submerged in cleaning fluid with ultrasound. The cleaning effect is produced by the purely physical action of the ultrasound generated by the unit. The cleaning power can be boosted by adding suitable cleaning agents [▶ 10] and by increasing the temperature and duration of the bath. The unit is also authorised for use in typical laboratory applications, such as the preparation of samples by degassing, emulsifying or dispersing fluids and solutions.

The unit is classified as a class I medical device in line with the EU Medical Device Regulation and is designed exclusively for use in commercial environments. Only original accessories manufactured for the unit are permitted to be used.

The following objects are considered to be appropriate cleaning goods as long as the object in question is approved for cleaning in an ultrasonic bath. The list is not exhaustive:

- Medical and surgical microinstruments/instruments.
- Other medical devices.
- Dental instruments and dental laboratory materials.
- Podiatry instruments.
- Instruments from the tattooing and piercing sector.
- Laboratory tools such as flasks, filters and plastic objects.
- Spectacles and objects used in timepiece and jewellery production.
- Industrial products and industrial objects.

Using the unit in any other way is considered improper use.

The operator is responsible for assessing the cleaning results.

2.1 Cleaning medical devices

The unit is used to clean and pre-clean medical devices. The following conditions must be fulfilled:

- The medical device is approved for ultrasonic cleaning and reprocessing (see information from the medical device manufacturer in line with EN ISO 17664).
- The medical device is only reused if downstream cleaning and preparation procedures ensure that it is properly cleaned, disinfected and sterilised.
- In cases of doubt, information on using and cleaning the device that is stipulated in the associated manual must be given precedence.

IMPORTANT

Pre-cleaning medical products does not replace subsequent cleaning, disinfection or sterilisation using automated standard processes, e.g. washer-disinfectors or autoclaves.

2.2 Misuse

Misuse refers to any use of the unit that deviates from proper use. Any misuse takes place at the user's own risk and incurs the following consequences:

- The warranty is invalidated if the unit is misused.
- All liability for personal injuries and damage to property is excluded.

Therefore, it is vital to prevent misuse. This particularly applies to foreseeable misuse that can, for instance, arise in the following circumstances:

- Operation by persons who are incapable of operating the unit safely due to their physical, sensory or mental abilities, due to inexperience or due to a lack of knowledge. Children, in particular, must be kept away from the unit at all times.
- Failure to observe safety and warning notifications and maintenance and repair regulations.
- Failure to observe the conditions and fluids defined in the manual during setup and operation.

- Operation using unapproved cleaning agents.
- Operation in areas with explosive atmospheres.
- Operation connected to a power supply without a fault-current circuit breaker.

Use for the following purposes is also considered misuse:

- Cleaning or hydrating contact lenses.
- Cleaning animals or plants.

3 Safety

The unit has been designed and manufactured in line with current technological standards and recognised technical safety regulations. Nevertheless, the unit can pose a hazard to the life and health of users or third parties throughout its entire service life and can cause damage to itself or other material assets.

This chapter provides information on the basic structure of warnings, possible residual risks when using the unit and on how to avoid the resulting hazards. This information must be supplemented by statutory provisions and locally applicable regulations, which can be very different depending on the place of installation and intended application.

3.1 The structure of warnings



SIGNALWORD

Type and source of the danger

Possible consequences of the danger if disregarded.

➤ Measures to prevent the danger.

Signal word	Meaning	Consequences if disregarded
DANGER	Immediate danger	Death or serious injury
WARNING	Possible dangerous situation	Death or serious injury
CAUTION	Possible dangerous situation	Slight injuries, damage to components or units
NOTICE	Useful advice or tip	No risk of personal injury, but possible damage to components or units

Table 1: Meaning of the signal words

3.2 Meaning of symbols on the unit



Warning – hot surfaces, vapours and liquids

3.3 Meaning of symbols on the nameplate



Attention



Medical unit



Unique Device Identification



Read the manual



Manufacturer

	Date of production
	Order number
	Serial number
	Temperature limit
	CE mark
	UK Conformity Assessment marking
	E.g. Swiss authorised representatives for medical device manufacturers
	Disposal information

3.4 Safety information on specific types of hazard

Electrical power

Contact with live components can lead to serious injury or death due to electrocution!

- Do not connect the unit to the power supply if the connection cables or other components are visibly damaged.
- Keep the enclosure and control elements clean and dry.
- Protect the unit against penetrating moisture.
- The mains voltage and the connected load on the nameplate must correspond to the on-site connection conditions.
- Only operate the unit in power circuits that are protected by a fault-current circuit breaker.

Risk of fire and explosion

Critical injuries, burns

- Do not fill the cleaning tank with flammable liquids.
- Only use cleaning agents that are approved for this unit.
- In case of doubt, ask the manufacturer or supplier.

Infections

Danger of possible infection due to poor cleaning results, dirty cleaning fluid and insufficient maintenance and disinfection of the unit.

- Change the cleaning fluid when it becomes visibly dirty and at least once per day.
- Clean the tank and surfaces thoroughly after draining the fluid and disinfect, if necessary.
- Check the cleaning results. The operator is responsible for monitoring the cleaning results.

Hot liquids and surfaces

Danger of burns and scalds due to contact with hot fluids or surfaces caused by high operating temperatures or continuous ultrasound operation.

- Do not touch the surfaces, accessories or objects being cleaned.
- Danger of splashes caused by high temperatures, by switching on ultrasound operation or by careless insertion of the basket or objects. If necessary, wear suitable protective equipment.
- If work must be performed on hot components, switch off the unit and allow to cool. If necessary, wear suitable protective equipment.

Cleaning agents

Volatile, corrosive or aggressive cleaning agents can cause chemical burns to the skin and respiratory tract.

- Observe the safety data sheet when using cleaning agents.
- Wear the protective equipment stipulated in the safety data sheet.
- Where necessary, provide adequate extraction for the emitted vapours and regularly check that the extraction system is working correctly.
- Observe the information stipulated in the *Cleaning agents* chapter. In case of doubt, ask the manufacturer or supplier.

Ultrasound-conductive liquids and materials

Ultrasound damages the cell membranes and bone structure.

- Do not reach into the ultrasonic bath during ultrasound operation.
- During ultrasound operation, do not touch any parts that conduct ultrasound, such as the tank, basket or any accessories used.

Ultrasound noise emissions

Working with ultrasonic cleaning units for longer periods of time can damage your hearing.

- Use the lid or wear personal ear protection when working on ultrasonic units.
- Pregnant women must not be subjected to the noise emissions for longer periods of time.
- Keep animals away from the vicinity of ultrasonic devices.

Electromagnetic radiation

- No binding statement can be made for persons with active medical implants, such as pacemakers or implanted defibrillators. A binding statement can only be made for specific workstations and in consultation with the implant manufacturer.

4 Use of cleaning agents

A cleaning agent can be added to the liquid in the tank to improve the cleaning results.

If using cleaning agents, observe and apply the instructions stated in the safety data sheet and product information.

Also observe the following information:

4.1 Permissible cleaning agents

- Only use aqueous cleaning agents for ultrasonic cleaning.
- Only use cleaning agents that are suitable for ultrasonic cleaning.

Elma provides a wide range of aqueous cleaning agents developed in-house that are optimised for ultrasonic cleaning.

A list of Elma cleaning agents can be found here:

<https://www.elma-ultrasonic.com/en/products/cleaning-chemistry>

4.2 Cleaning agents

Use of aggressive, corrosive cleaning agents:

Aggressive, corrosive cleaning agents can cause severe chemical burns if they come into contact with eyes or skin. Insufficient ventilation can result in severe chemical burns to the respiratory tract.

- Before using any cleaning agents, read the safety data sheet and product information and observe and apply the instructions.
- Where necessary, install an effective extractor system for the emitted vapours (e.g. at higher temperatures) and regularly check that the extractor system is working correctly.
- Never reach into the tank when filled with cleaning agent.
- Wear suitable protective equipment in line with the safety data sheet.

Danger of fire or explosion when using combustible cleaning agents

Ultrasound and heat increase the evaporation of liquids and form extremely fine mists that readily ignite on contact with sources of ignition. This can result in severe burns or death.

- Do not use cleaning agents that are labelled with the pictograms GHS01 (explosive), GHS02 (flammable) or GHS03 (oxidising) in line with the CLP regulation (EC no. 1272/2008). Do not use cleaning agents that have a flashpoint.
- If necessary, clarify the cleaning agents that can be used by consulting the manufacturer or supplier.



Table 2: GHS pictograms for explosive, flammable or oxidising substances

Damage to stainless-steel tank caused by unsuitable cleaning agents

Unsuitable cleaning agents can cause pitting and therefore damage the stainless-steel tank within a short time.

- Consult the unit and cleaning agent manufacturers to clarify whether the cleaning agent is suitable.
- Do not use any cleaning agents in the acidic pH range at the same time as halides, such as fluoride, chloride, bromide or iodide.
- Only use cleaning agents that are suitable for ultrasound applications.

5 Technical data

5.1 Elmasonic Med 30–100

Elmasonic Med	Unit	30	60	100
Mechanical data				
Max. external dimensions W/D/H (unit with cover)	mm	305/170/230	370/210/275	380/300/280
Max. opening dimensions W/D (inside of tank above stacking collar)	mm	235/135	295/235	295/235
Interior dimensions W/D (tank below fill level marking)	mm	220/120	275/125	280/220
Fill level (tank base to fill level marking)	mm	65	115	115
Working height (basket base to fill level marking)	mm	40	85	80
Interior dimensions of basket W/D/H (original accessories)	mm	195/105/50	255/115/75	255/200/70
Max. basket loading (original accessories)	kg	1	5	6
Total volume	L	2.7	5.9	9.5
Recommended tank operating capacity	L	1.6	4.3	6.8
Weight (unit with cover)	kg	3.6	5.2	6.2
Performance data				
Total power consumption	W	320	550	550
Ultrasonic power effective $\pm 10\%$	W	120	150	150
Ultrasonic peak performance max.	W	480	600	600
Heating power	W	200	400	400

5.2 Elmasonic Med 120–200

Elmasonic Med	Unit	120	180	200
Mechanical data				
Max. external dimensions W/D/H (unit with cover)	mm	380/300/330	405/360/330	600/385/280
Max. opening dimensions W/D (inside of tank above stacking collar)	mm	295/235	325/295	505/300
Interior dimensions W/D (tank below fill level marking)	mm	300/215	300/270	505/300
Fill level (tank base to fill level marking)	mm	165	165	85/120
Working height (basket base to fill level marking)	mm	130	130	60/95
Interior dimensions of basket W/D/H (original accessories)	mm	250/190/110	280/250/115	490/255/95
Max. basket loading (original accessories)	kg	7	8	4.0
Total volume	L	12.9	17.8	22.7
Recommended tank operating capacity	L	10.0	14.2	13/18
Weight (unit with cover)	kg	7.7	10.2	12.2
Performance data				
Total power consumption	W	1,000	1,000	1,100
Ultrasonic power effective $\pm 10\%$	W	200	200	300
Ultrasonic peak performance max.	W	800	800	1,200
Heating power	W	800	800	800

5.3 Elmasonic Med 300–900

Elmasonic Med	Unit	300	500	900
Mechanical data				
Max. external dimensions W/D/H (with cover)	mm	575/360/330	770/425/505	870/595/505
Max. external dimensions W/D/H (with sound-protection cover open)	mm	-	770/510/975	870/640/1,145
Max. external dimensions W/D/H (with sound-protection cover closed)	mm	-	770/510/505	870/640/505
Interior dimensions W/D (tank below fill level marking)	mm	475/270	500/330	600/500
Fill level (tank base to fill level marking)	mm	165	230	195
Working height (basket base to fill level marking)	mm	135	210	180
Interior dimensions of basket W/D/H (original accessories)	mm	455/250/110	460/300/195	545/460/190
Max. basket loading (original accessories)	mm	10.0	25	36
Total volume	L	27.5	49.7	89
Recommended tank operating capacity	L	22.0	40.3	63.7
Weight (unit with cover)	kg	12.2	30.4	43.4
Weight (unit with sound-protection cover)	kg	-	34.7	49.3
Weight (filled unit with cover)	kg	34.2	70.1	106.7
Weight (filled unit with sound-protection cover)	kg	-	74.7	112.5
Performance data				
Total power consumption	W	1,500	2,140	2,960
Ultrasonic power effective $\pm 10\%$	W	300	540	960
Ultrasonic peak performance max.	W	1,200	2,160	3,840
Heating power	W	1,200	1,600	2,000

5.4 Elmasonic Med 30–900

Elmasonic Med	Unit	30	60–300	500–900
Mechanical data				
Drain connection thread	Inches	–	3/8	3/4
Nominal hose nozzle diameter	Inches	–	DN10	DN20
Material (tank, enclosure)	–	Stainless steel		
Electrical data				
Mains voltage $\pm 10\%$	V~	220–240		
Mains frequency	Hz	50/60		
Ultrasonic frequency -2.5 kHz/+5.5 kHz	kHz	37		
Max. target temperature 25–80 °C	°C	80		
Degree of protection	–	IP20		
Protection class	–	I		
Ambient conditions				
Temperature (transport)	°C	-15 to +60		
Temperature (operation, storage)	°C	+5 to +40		
Air pressure (transport, storage)	hPa	500–1,010		
Permissible relative humidity (transport, storage)	% r. h.	10–80, non-condensing		
Permissible relative humidity (operation)	% r. h.	80; non-condensing under fluctuating temperatures		
Max. perm. altitude (operation)	m above sea level	+2,000		
Overvoltage category	–	II		
Degree of contamination	–	2		
Sound pressure level LpAU*	dB	<80		

*Measured sound pressure level with cover at a distance of 1 m.

6 Product contents

IMPORTANT	<p>Check deliveries for damage to the packaging. Document any damage immediately (e.g. photo) and report it to the manufacturer or dealer.</p> <p>Check that all parts of the delivery are complete and undamaged.</p> <p>Never put a damaged unit into operation.</p> <p>Dispose of packaging materials that are no longer required in an environmentally friendly manner.</p>
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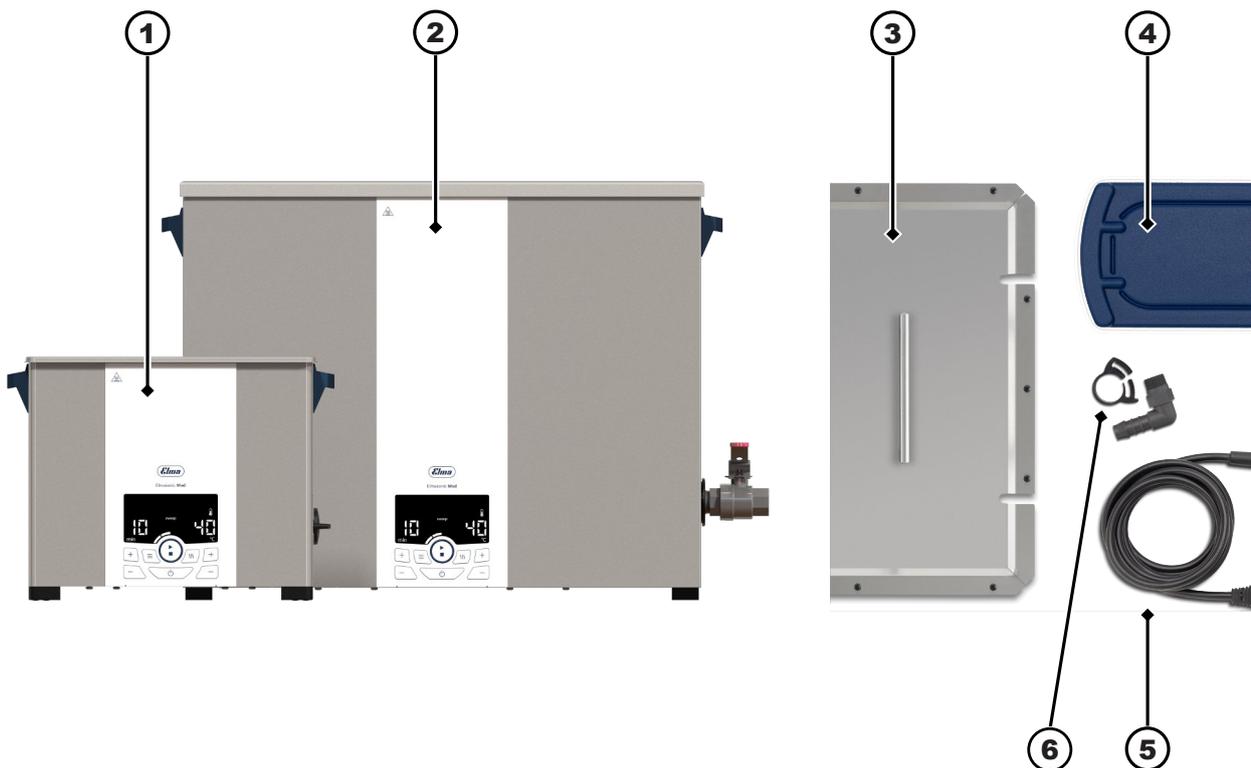


Illustration 1: Included items (schematic diagram)

1	Ultrasonic unit Elma Med 30–300
2	Ultrasonic unit with sound-protection cover Elma Med 500/900
3	Cover Elma Med 500/900
4	Cover and drip tray Elma Med 30–300
5	Network cable (IEC connector)
6	Hose connector for drain (not available for Elma Med 30)
7	Manual (not shown)

7 Unit description



Illustration 2: Operating side/rear side

- | | |
|--|---|
| 1 Warning of hot surfaces | 7 Rotary switch, open/close drain |
| 2 Display, splash-proof | 8 Feet, non-slip |
| 3 Handle | 9 Membrane keyboard, wipeable |
| 4 Mains connection | 10 Blower on the unit base (not shown) (not available for Elmasonic Med 30–100) |
| 5 Nameplate, not shown | 11 Ball valve, open/close drain (Elmasonic Med 500/900) |
| 6 Drain (not available for Elmasonic Med 30/500/900) | |



Illustration 3: Drain of Elmasonic Med 500/900

8 Controls

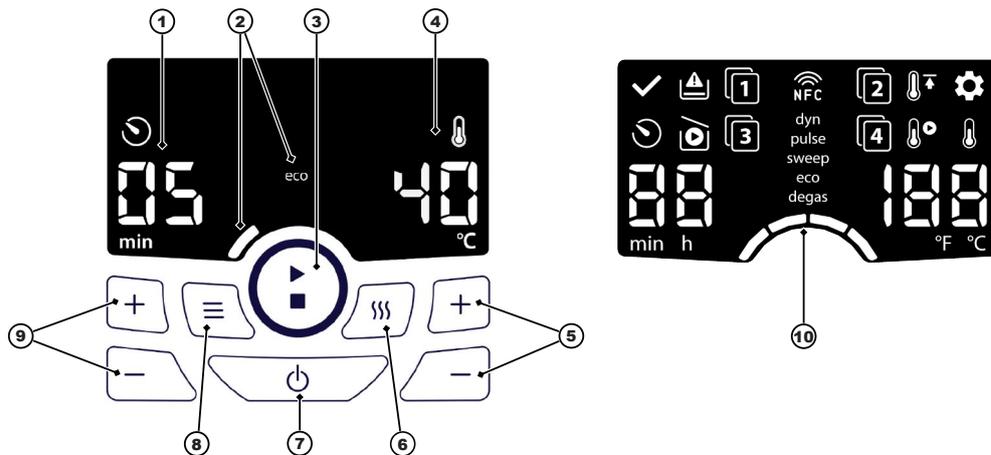


Illustration 4: Controls

- 1 **Cleaning duration display** value/unit/symbol
- 2 **Current ultrasound mode display** name/bar segment
- 3 **Start/stop button** for ultrasonic cleaning (short press)/ultrasonic cleaning with auto-degas (long press)
- 4 **Temperature display** value/unit/symbol
- 5 **Plus/Minus buttons** set temperature/program memory/parameter values (short press); quick cycle (long press)
- 6 **Heating button** on/off (short press)/temperature-controlled start (long press)
- 7 **On/off button** for switching the unit on/off
- 8 **Mode button** set ultrasound modes (short press)/switch modes (long press)/save programs (press > 4 seconds)
- 9 **Plus/minus buttons** set cleaning duration/program memory/parameters
- 10 **Display** showing all LED indicators for LED test LED test [▶ 34]

8.1 Ultrasound mode display

The display shows the currently set ultrasound mode by displaying the mode name and a certain number of bar segments. You can choose from the following ultrasound modes:

 degas (0 segments)	auto-degas (degas flashing)	Used to degas cleaning fluid and for specialist laboratory applications. Used to degas the cleaning fluid before ultrasonic cleaning. The set ultrasound mode starts automatically once degassing has been completed (duration approx. 10 min.).
 eco (1 segment)	eco (1 segment)	Used for gentle cleaning and quieter operation. The sweep ultrasound mode is a lower-intensity cycle.
 sweep (2 segments)	sweep (2 segments)	This mode performs most cleaning tasks with an evenly distributed sound field (standard ultrasound mode).

	pulse (3 segments)	Removes stubborn dirt using pulsed sound field distribution.
	dynamic (4 segments)	Combines the ultrasound modes <i>sweep</i> and <i>pulse</i> to improve the overall cleaning power.

8.2 Operating status symbols

The following symbols are shown on the display as soon as the unit enters the respective operating status:

	End of cleaning	Ultrasonic cleaning has been completed and is finished.
	Remaining time	Ultrasonic cleaning is running; the remaining cleaning duration is shown below the symbol.
	Dry operation	(Not available for Elmasonic Med 500/900). The tank is empty, or the filling level is too low. Dry-run detection is available during active heating.
	Setup	<i>Setup</i> mode is activated; the unit parameters [▶ 29] can be changed.
	Heating	The ultrasonic bath is currently being heated.
	Temperature-controlled start	Ultrasonic cleaning will start automatically as soon as the set cleaning temperature has been reached.
	Temperature limit	A temperature limit is defined as a maximum permissible cleaning temperature. A higher temperature cannot be set. The symbol flashes when the temperature limit is reached or exceeded.
	Programme	The displayed cleaning programme is selected (programme number 1–4). A total of four cleaning programmes can be stored.

8.3 Operating modes

Operating mode	Brief description	Display
<i>Switched off</i>	The unit is being supplied with power and is switched off.	Off
<i>Standby</i>	The unit is switched on. The display is dimmed after a longer period of inactivity. The automatic safety shut-off is activated after 8 hours of inactivity.	On

Operating mode	Brief description	Display
<i>Setup</i>	The unit is switched off. The Setup menu is activated to change the unit functions.	<ul style="list-style-type: none"> • Setup symbol • Number of the selected unit function (parameter) • Current setting (parameter value)
<i>Normal mode</i>	The unit is ready to use. Ultrasonic cleaning can be conducted using adjustable operating parameters.	<ul style="list-style-type: none"> • Set operating parameters During Normal mode: <ul style="list-style-type: none"> • Current operating status
<i>Programme mode</i>	The unit is ready to use. Four stored programmes can be selected for ultrasonic cleaning. The programmes can be specified and saved.	<ul style="list-style-type: none"> • Available programmes • Operating parameters of the selected programme No programmes have been saved: <ul style="list-style-type: none"> • Programme number 1 and "--" for duration and temperature During programme operation: <ul style="list-style-type: none"> • Current operating status

9 Set up and connect the unit



CAUTION

Heavy loads (applies to unit sizes Elmasonic Med 500/900)!

Serious injuries to the spine or back muscles.

- Comply with the health and safety requirements on lifting heavy loads.

9.1 Notes on installation site

The unit is designed to be set up in commercially used premises such as laboratories, medical practices, etc.

- The installation site must be well ventilated.
- The permissible ambient conditions are met.
- The unit must be installed on a sturdy, horizontal, non-slip, moisture-resistant work surface with the following characteristics:
 - The surface must be non-flammable.
 - There must be sufficient clearance above the unit to allow the cover and the objects being cleaned to be removed.
 - There must be an area available next to the unit for setting down the basket and inserts.

- Electrical connection conditions:
 - Splash-proof earthed socket near the unit (cable length approx. 1.5 m).
 - The power connection must be protected by a fault-current circuit breaker (RCD).
 - Ensure that the power supply required to operate the unit is available.
 - Wastewater connection requirements:
 - **Units without drains:** select an installation site located close to a sink that can be used to empty the unit.
 - **Units with drains:** properly connect the unit drain to the on-site wastewater disposal system. If necessary, properly route the drain into a sink located nearby.
- ⚠ CAUTION! Use heat-resistant material.**

9.2 Set up the unit

- ✓ Unpack the unit completely.
 - ✓ Keep the cover and accessories e.g., basket, inserts, etc., on hand.
 - Place the unit on the selected surface.
IMPORTANT The controls, such as the display, buttons and, if applicable, discharge tap must be clearly visible and easily accessible.
- ➔ The unit has been set up.

9.3 Connect the unit

Connect the drain

- ✓ Obtain the required connection materials, e.g. suitable heat-resistant hose and hose clips (the hose is not included).
 1. Unscrew the yellow plug from the drain.
 2. Screw the included hose nozzle into the drain.
 3. Push the hose onto the hose nozzle and secure it using the hose clip.
 4. Connect the hose to the wastewater disposal system. If necessary, properly route the hose into a sink.
 5. Check the drain for leaks. To do so, fill the tank with cold water up to around 1/3 of the fill level. Then, open the discharge tap to test all joints for leaks.
 6. Seal any leaks found.
- ➔ The drain is connected.

Connecting the network cable

- ✓ Ensure that the required power connection is available.
 1. Plug the power cord into the IEC connector on the unit.
 2. Route the power cord in such a way that it does not pose a tripping hazard, cannot be damaged and is not exposed to moisture. The power cord must not touch the unit housing, as the housing becomes hot during operation.
 3. Connect the plug. The plug must be easily accessible so that it can be disconnected in emergencies.
- ➔ The power supply has been connected.

10 Insert objects to be cleaned

- ✓ Ensure that all optional original accessories e.g., baskets or inserts for holding the objects being cleaned, are available.

IMPORTANT Do not place objects on the bottom of the tank. The tank and the objects can be damaged through ultrasonic operation.

1. Position the basket or insert next to the unit. The cover can be used as a mat.
2. Place the objects inside the basket or insert without overfilling it. Arrange the objects being cleaned in such a way that fluid will be able to circulate around them without obstructions.

IMPORTANT Only clean objects that are suitable for ultrasonic operation, the set temperature and, where applicable, the cleaning agent in use. In case of doubt, contact the manufacturer or dealer.

3. Hook the filled basket or insert inside the tank.

➔ The objects being cleaned have now been inserted.

11 Fill the tank

The cleaning fluids intended for use in ultrasonic cleaning are water, softened water or distilled water. Cleaning power can be improved by adding suitable cleaning agents.

- ✓ The unit and the tank are clean and, if necessary, disinfected.
- ✓ The filled basket or insert is hooked into the tank.

IMPORTANT When filling the tank without a basket or insert in place, please note that inserting the basket or insert will cause the filling level in the tank to rise. To prevent the tank from overflowing, do not fill the tank up to the fill level marking. If necessary, top up the tank after inserting the objects.

1. Add the cleaning fluid to the tank up to the fill level marking using, for example, a measuring jug. The fill level marking is the stacking collar (1) in unit sizes 30–300 and the embossed mark (3) in unit sizes 200, 500 and 900. The unit size 200 has an additional embossed mark (2), suitable for a lower basket loading. The unit may thus be operated with less fluid.

⚠ CAUTION! An overfilled tank can cause the cleaning fluid to boil over at high temperatures.

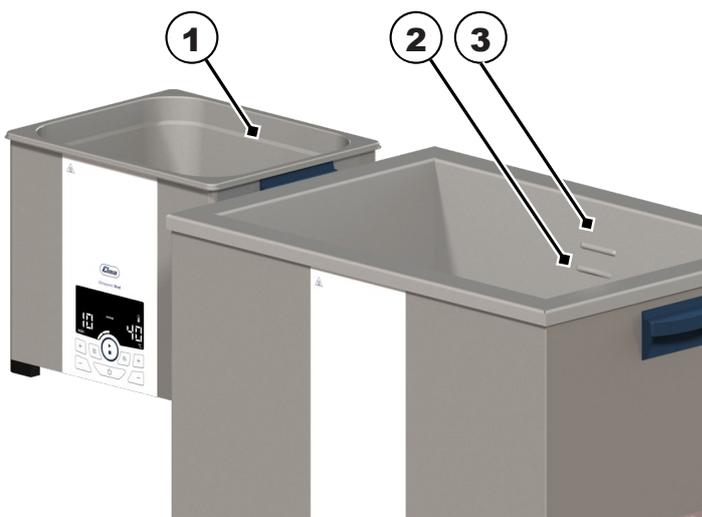


Illustration 5: Elma Med 30–900 fill level marking

2. **IMPORTANT** The objects being cleaned must be completely submerged in the fluid to achieve good cleaning results. If necessary, reduce the number of objects being cleaned.

➔ The tank is filled.

12 Operating the unit

WARNING

Damage caused by noise emissions

Hearing damage!



- When working with the unit in ultrasound mode, cover it with the lid or wear hearing protection.
- Pregnant women must not spend long periods of time near an ultrasonic unit in operation.
- Keep animals away from the ultrasonic unit.

CAUTION

Hot liquid, vapours and unit parts!

Burns or scalds.



- Do not reach into the tank.
- When working at high cleaning temperatures (> 50 °C), only touch baskets, covers and inserts wearing suitable protective gloves or allow them to cool before touching them.

CAUTION

Dry running!

Damage to the tank and unit.



- Always fill the tank with fluid up to the fill level marking before operating the unit.
- Never operate the unit without cleaning fluid.
- Regularly monitor the filling level.

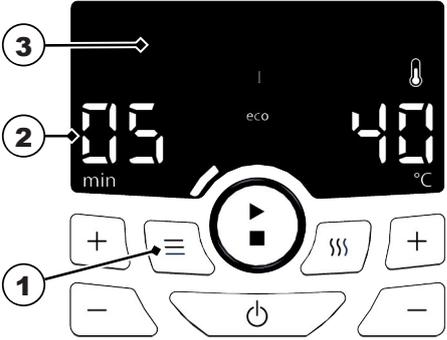
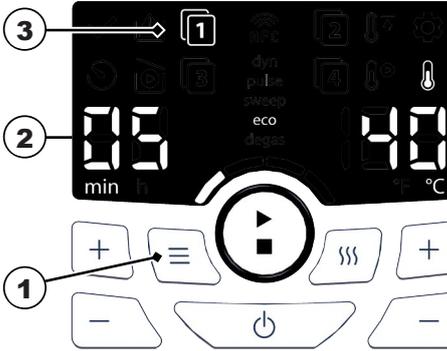
12.1 Switch on the unit

- ✓ The unit is ready to use.
- ✓ The unit is filled and the objects to be cleaned have been inserted.
- ✓ The unit is covered with the cover.



Press the **On/Off** button to switch on the unit. The display shows the last-used settings, e.g. duration, ultrasound mode, current temperature and, if applicable, the stored programme number.

Two modes can be selected for starting ultrasound operation:

Display in Normal mode	Display in Programme mode
	
<ol style="list-style-type: none"> 1. Set the duration, ultrasound mode and temperature. 2. Switch the heating on/off. 3. Set the unit to start with auto-degas. 4. Or, set the unit to start with temperature control. 5. Save programmes. 	<p>Select or start a saved programme.</p>

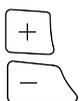
Press the **Mode** button (1) for 2 seconds to switch between Programme mode and Normal mode.

The display (2) shows the current settings.

The display (3) shows the set programme number (programmes 1–4 in Programme mode).

12.2 Set the cleaning duration

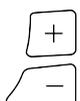
From 1 minute to 6 hours.



Press one of the **Plus/Minus** buttons below the time display to set the duration. Press the button repeatedly until the required duration is shown on the display. Hold the button down to increase/decrease the duration more quickly.

12.3 Set the target temperature

From 25–80 °C/77–176 °F.



Press one of the **Plus/minus** buttons below the temperature display to set the required target temperature. Press the button repeatedly until the required temperature flashes on the display. Hold the button down to increase/decrease the duration more quickly.

IMPORTANT If a temperature limit between 40–60 °C/104–140 °F has been set, see the Change parameters section for information on changing the temperature limit.

Longer periods of ultrasound operation heat the cleaning fluid in addition to the heating function. This can lead to the fluid being hotter than the set target temperature.

12.4 Set the ultrasound mode

Degas, eco, sweep, pulse or dyn (dynamic)



Press the **Mode** button to set the ultrasound mode. Press the button repeatedly until the required ultrasound mode is shown on the display.

12.5 Set auto-degas

Use this function to degas a fresh batch of cleaning fluid.

- ✓ One of the ultrasound modes, eco, sweep, pulse or dyn, has been set.
- ✓ The unit is not currently in ultrasound operation.

Hold down the **Start/Stop** button until the ultrasound mode **degas** flashes on the display.

Press the **Start/Stop** button again to start the **auto-degas** function.



Alternatively, save auto-degas as a programme. See the section Save programmes for more information.

Degas flashes slowly on the display (degassing takes approx. 10 min.). Once auto-degas has been completed, the set ultrasonic cleaning mode will start and be shown on the display.

12.6 Set Temperature-controlled start

Use this function to start ultrasound operation automatically once the target temperature has been reached.

IMPORTANT When cleaning sensitive objects, please note that the ultrasound is switched on briefly multiple times during the heating phase.

- ✓ The required target temperature has been set.
- ✓ Ensure that the required target temperature is higher than the current actual temperature. If not, allow the fluid to cool.
- ✓ The unit is not currently in ultrasound operation.



Hold down the **Heating** button until the **Temperature-controlled start** symbol flashes on the display.



Press the **Start/Stop** button to start the unit using the temperature-controlled start function.

See the section Save programmes for information on saving the Temperature-controlled start function as a programme.

The display shows the Temperature-controlled start and Heating symbols. The display shows the set target temperature and the current actual temperature of the cleaning fluid flashing alternately.



During the heating phase, the ultrasound is switched on briefly multiple times to ensure that the fluid is heated evenly.

The ultrasonic cleaning function will start once the set target temperature has been reached. The Temperature-controlled start symbol will disappear.

12.7 Start ultrasonic cleaning

- ✓ The display shows the current settings.
- ✓ For information on changing the settings, see Set cleaning duration, ultrasound mode and target temperature.
- ✓ The described settings have been configured and should be started.



If necessary, press the **Heating** button to heat the cleaning fluid. The Heating symbol will be shown on the display. The display shows the set target temperature and the current temperature of the cleaning fluid flashing alternately. If necessary, wait until the target temperature has been reached.

Press the **Start/stop** button to begin ultrasound operation in the displayed mode. The Remaining time symbol is shown on the display. The remaining time, the current temperature and the set ultrasound mode are continuously shown on the display.



The ultrasound mode, temperature, duration and heating **on/off** can be changed during ultrasonic cleaning. **Important** Changing the duration switches off ultrasonic cleaning. Press the **Start/stop** button to restart ultrasonic cleaning with the altered time setting.



The End of cleaning symbol and, where applicable, an acoustic signal (depending on the configured parameters) indicate that cleaning has ended. The Remaining time display will disappear.

12.8 Save programmes

You can save up to 4 programmes.

Display in Save mode	Display in Programme mode
<p>To save the currently set programme, use the plus/minus buttons to select a programme number from 1 to 4.</p>	

- ✓ In Normal mode the settings were made in the preset order. Switch on the unit [▶ 22] These settings can be saved as a programme.

Important The auto-degas and temperature-controlled start modes can only be saved separately as individual programmes.



Hold down the **Mode** button (1) for >4 seconds until the display shows all 4 programme numbers (3) and programme number 1 flashes. Now, press one of the **Plus/Minus** buttons repeatedly until the programme number under which you wish to save your settings flashes. Press the **Mode** button (1) again briefly to confirm saving the programme. The saved programme number (4) will be shown on the display.

12.9 Start a saved ultrasonic cleaning programme

- ✓ At least one programme from a possible four programme numbers has been saved.
- ✓ The unit is in Programme mode. The last-used programme number is shown on the display.
- ✓ The unit is in Normal mode. No programme number is shown on the display.

If necessary, switch between Normal mode and Programme mode. See Switch on the unit [▶ 22].



Hold down the **Mode** button until a programme number is shown on the display. The last-used programme number is always shown, e.g. programme number 1.



Press one of the **Plus/minus** buttons to select a programme.



Press the **Start/stop** button to start the displayed programme.

The Remaining time and Heating symbols will be shown on the display (if saved). The remaining time, the current temperature and the ultrasound mode are continuously shown on the display.



IMPORTANT Depending on the settings saved in the programme, ultrasonic cleaning is started with auto-degas (degas flashes) or Temperature-controlled start (only starts once the target temperature has been reached). The respective symbols are shown on the display.



The end of cleaning is indicated by the **End of cleaning** symbol and, where applicable, an acoustic signal (depending on the parameter settings). The Remaining time display will disappear.

12.10 Switch off and save

For information on saving programmes, see Save programmes.

- ✓ The displayed settings are saved when the unit is switched off and are then available the next time the unit is switched on. This function cannot be used to save **Auto-degas** and **Temperature-controlled start**.



Press the **On/off** button to switch off the unit. Any settings made will be saved until the next time the unit is switched on.

12.11 Remove cleaned objects

- ✓ The end of ultrasonic cleaning is indicated by the End of cleaning symbol or, where applicable, an acoustic signal.

1. Carefully remove the lid, and allow any dripping water to drip into the tank. Then, place the lid upside down next to the unit to use as a drip tray.
⚠ CAUTION! If using high cleaning temperatures > 50 °C, allow the liquid to cool down first or use suitable heat-insulating protective gloves.
 2. Lift the basket or insert out of the tank, allow the excess fluid to drain briefly, and place it on the upturned lid.
 - ⇒ The objects are now clean. Check the cleaning result.
- ➔ Check the fill level if you intend to start another ultrasonic cleaning process.
 - ➔ Switch off the unit. If the fluid is dirty or will not be used again, empty out the liquid. See the section Draining the unit for information.

13 Drain the unit

CAUTION



Hot liquids

Danger of burns and scalds caused by spilled fluid!

- Do not move or carry the unit when full.
- Exception: unit sizes Elmasonic 30 and 60. Allow the fluid to cool beforehand, and disconnect the mains plug.

Empty units with drains:

- ✓ Ultrasound operation has been ended.
 - ✓ The basket or insert has been removed.
 - ✓ The drain (1) is connected to an on-site wastewater disposal system.
 1. Open the discharge tap (2) to drain off the cleaning fluid.
 - ⇒ The tank is empty.
 2. Clean the tank, and disinfect it if necessary. See chapter Maintenance for information.
 - ⚠ **CAUTION! Never submerge the unit in water.**
- ➔ The unit is emptied, cleaned and, where necessary, disinfected.



Illustration 6: Drain of Elmasonic Med 60-300 / 500-900

Empty units without drains (Elmasonic Med 30):

- ✓ Ultrasound operation has been ended.
 - ✓ The basket or insert has been removed.
 - ✓ If using temperatures > 50 °C, allow the cleaning fluid to cool.
 1. Disconnect the network cable.
 2. Put the lid on.
 3. Take hold of the unit firmly by the handles holding the lid in place, and carry it carefully to a sink.
 4. Remove the lid.
 5. Slowly tip the unit over the sink with one corner at the lowest point, and carefully pour out the cleaning fluid.
 - ⇒ The tank is empty.
 6. Clean the tank, and disinfect it if necessary. See chapter Maintenance for information.
 - ⚠ **CAUTION! Never submerge the unit in water.**
- ➔ The unit is emptied, cleaned and, where necessary, disinfected.

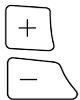
14 Change parameters in Setup

IMPORTANT If parameters marked with an asterisk (*) are changed, the saved programme will be deleted. If necessary, make a note of the settings of the saved programmes before changing them.

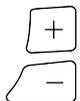
- ✓ The unit is connected to a power supply.
- ✓ The Parameter reference list is required for setting the parameter numbers and values.
- ✓ The unit has been switched off.



Hold down the **Mode** button until the Setup menu is shown on the display.



First, press the **Plus/minus** buttons to set the parameter number, e.g., 01.



Then, press the **Plus/minus** buttons to change the parameter value, e.g., 00/01.
Set and change further parameters as required.



Press the **On/off** button to save the settings.

Parameter reference:

The following unit functions can be adjusted. The preset factory values are shown in bold:

Parameter	Unit function	Value	Effect
01 *	Adjustment range for cleaning duration > 10 min.	00/01	Increments of 5 min./increments of 1 min. (as for cleaning durations up to 10 min.). i NOTE! Saved programmes will be deleted.
02	Show remaining time < 1 min. in seconds	00/01	Off/on
03 *	Temperature unit	°C/°F	Display in degrees Celsius/Fahrenheit . i NOTE! Saved programmes will be deleted.
04 *	Default temperature limit	00/40/45/50/55/60 00/100/110/120/130 /140	Off/40 °C/45 °C/50 °C/55 °C/60 °C Off/100 °F/110 °F/120 °F/130 °F/140 °F i NOTE! Saved programmes will be deleted.
05	Acoustic signal for "End of cleaning"	00/ 01/02	Off/ melody 1/melody 2
06	Acoustic signal for "Error message"	00/ 01/02	Off/ melody 1/melody 2

07	Acoustic signal for "Temperature limit exceeded"	00/ 01 /02	Off/ melody 1 /melody 2
08	Response if temperature limit is exceeded	00/ 01 /02/03	No action/ ultrasound off /heating off/ultrasound and heating off
09	Display brightness	01/02/ 03 /04	Dim/medium/ normal /bright
10	LED test	00 /01	Off /all display LEDs on for approx. 5 sec.
20 ***	Autostart on restoration of power supply	00 /11/12/13	Off /ultrasound on/heating on/ultrasound and heating on ⚠ CAUTION! Risk of damage to the unit if the unit runs dry.
30 *	Reset unit settings	00 /11	Off /on: "11" resets all settings to the factory settings. i NOTE! Saved programmes will be deleted.
31 **	Response if dry-run monitor is triggered	00/ 01	No action/ ultrasound and heating off, display Dry run symbol.

** Not available for unit sizes 500/900.

*** The unit starts up immediately in heating and/or ultrasound operation when plugged in or when the power supply is switched on.

15 Malfunctions/fault messages

15.1 Troubleshooting

Fault	Possible cause	Resolution
Display does not light up.	Unit not switched on or no power available.	<ul style="list-style-type: none"> • Switch on the unit. • Check that the power cable is correctly connected and undamaged; replace if necessary. • Check the power supply.
Buttons not working.	Controls defective.	<ul style="list-style-type: none"> • Contact the manufacturer.
Not possible to set a high bath temperature.	A low temperature limit has been defined.	<ul style="list-style-type: none"> • Check the unit settings [▶ 29]; increase or deactivate the temperature limit as required.
Displayed bath temperature incorrect.	Temperature sensor defective.	<ul style="list-style-type: none"> • Contact the manufacturer.
Heating not working.	Heating element defective.	<ul style="list-style-type: none"> • Contact the manufacturer.
Ultrasonic operation does not start.	Ultrasonic unit defective.	<ul style="list-style-type: none"> • Contact the manufacturer.
Display shows Er .	Error message.	<ul style="list-style-type: none"> • Check the error code and rectify the fault; contact the manufacturer if necessary.
Blower is off (only units with blowers)	Ultrasound is off and bath temperature < 50 °C or blower defective.	<ul style="list-style-type: none"> • Check the blower if the ultrasound is switched on or the bath temperature is > 50 °C; contact the manufacturer if necessary.

15.2 Fault messages

If a fault occurs, the display shows the type of fault using a symbol or error number.

You can rectify the following faults yourself:

Display	Fault type	Possible remedies
	Filling level too low (dry run detected).	Top up fluid. If the symbol continues to be displayed, have the heating system repaired.
	Temperature limit exceeded.	Switch off the unit and allow it to cool. Disconnect from mains power if necessary.
Er 21	Max. perm. bath temperature 90 °C / 194 °F exceeded.	Switch off the unit and allow it to cool. Disconnect from mains power if necessary.
Er 40–44	Power supply faulty.	Connect the unit to a socket of a different power circuit.

Display	Fault type	Possible remedies
Er 45 -46	Ultrasonic power faulty.	Change fill level, reduce/increase if needed Remove basket, if necessary, reduce the number of objects being cleaned.

Table 3: Error messages

Contact the service centre or the manufacturer in the following cases:

- The measures described here do not remedy the faults.
- The faults recur (repeatedly), even after performing the following measures:
 - Disconnect the unit from the mains power, then reconnect and restart the unit after approx. 1 minute.
 - The unit has been reset to factory settings.
- The error number displayed is not listed here: Make a note of the error number; the unit must be repaired at the factory.

IMPORTANT Empty the unit completely and clean and disinfect it thoroughly before sending it for repair.

16 Maintenance



CAUTION

Faulty power cord

Electric shock or damage to the device

- Check the power cord regularly for damage.

IMPORTANT

Keep the unit and tank clean and dry to prolong its service life. Regularly remove all dirt residues and accumulated dust from the blower.

See also

📖 Controls [▶ 17]

16.1 Replace the network cable

- ✓ The network cable or plug contacts are visibly damaged.
 - Replace damaged network cables immediately.
 - i NOTE! Removable network cables may not be replaced with insufficiently measured network cables!**
- ➔ The network cable has been replaced.

16.2 Clean enclosure

- ✓ The enclosure is dirty.
- ✓ The network cable is unplugged.
 - Wipe all surfaces using a damp cloth.
 - ⚠ WARNING! Do not spray the outside of the unit with water.**
- ➔ The enclosure has been cleaned.

16.3 Cleaning the tank

- ✓ The tank is full of limescale or dirty.
- ✓ The tank is empty.
 1. Use a damp cloth to wipe out limescale and dirt residue. If necessary, rinse the tank using a shower set.
 - ⚠ CAUTION! Do not spray the outside of the unit with water.**
 - ⇒ The tank has been cleaned.
 2. To descale the tank, fill it with tap water up to the fill level marking in the tank.
 3. Heat up the unit to 40 °C.
 4. Add 4–10% of Elma clean 60 or Elma clean 115C.
 5. Once 40 °C has been reached, switch off the unit.
 - ⇒ Leave the solution to work for approx. 12 hours.
 6. Then, switch on eco ultrasound mode for approx. 15 min.
 7. Empty the tank.
 8. Use a damp cloth to wipe out the remaining limescale and dirt residue. If necessary, rinse the tank using a shower set.
 - ⚠ CAUTION! Do not spray the outside of the unit with water.**
- ➔ The tank has been descaled and cleaned.

16.4 Disinfect

We recommend the following surface disinfectants:

- Incidin Liquid by Ecolab (ready-to-use, quick disinfectant).
 - Terralin protect by Schülke.
- ✓ The unit is used in the medical and health sector.
 - i NOTE! Observe local directives and cleaning regulations. This particularly applies to the cleaning of medical products.**
 - ✓ Use the disinfectant in accordance with the manufacturer's instructions.
 - Disinfect the tank and the housing using a commercially available surface disinfectant on a regular basis. **⚠ CAUTION! Test the disinfectant on a small area first to ensure it does not affect the materials, particularly the controls.**
- ➔ The unit is ready for further use.

16.5 Clean the blower, and check that it is working correctly.

Dust and dirt adhering to the protective grille of the blower can impair the cooling performance or cause unit malfunctions.

- Regularly remove accumulated dust and dirt.
- ✓ The unit is ready for operation and filled with fluid to enable the functions to be checked.
 1. Heat the unit up to approx. 55 °C by pressing the **Heating** button.
 2. The blower will start after > 50 °C is reached.
 - ⇒ If the blower is defective, the sound made by it will be clearly audible or the display will show the error message "Er 47".
 3. Press the **On/Off** button to switch off the unit.

The blower function has been checked. If no sound can be heard from the blower or if the error message is shown, send the unit for repair immediately.

16.6 LED test

Test the LED function (see Controls [▶ 17])

Regularly check the function of all LEDs on the display to ensure reliable operation. The display showing all LED indicators is illustrated in the chapter Controls. Send the unit for repair immediately if any LED indicators are not displayed.

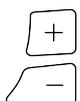
- ✓ The unit is switched off.



Hold down the **Mode** button until the Setup menu is shown on the display.



To set the LED test function, press the **Plus/minus** buttons repeatedly until the parameter number 10 is shown.



Then, press the **Plus** button to change the parameter value from 00 to 01.



The LEDs will light up for approx. 5 seconds. The parameter value will be reset automatically. Repeat this procedure as required.



Press the **On/off** button to end the LED test.

17 Disposal

CAUTION

Once the unit has reached the end of its service life, ensure that the unit and accessories are disposed of safely and correctly:



- Clean and disinfect the old device and accessories before disposal.
 - Do not dispose of old devices with household waste, but instead at the local collection and disposal points.
 - Secure the old device against unauthorised access until removal; if necessary, dispose of the power cable separately.
 - Observe regionally applicable disposal directives.
 - Data protection notice: The end user is responsible for deleting personal and confidential data from the unit being discarded.
-

