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Operating Instructions

Elmasonic EASY

Ultrasonic Cleaning Units

CE

• english •

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Contents

1 General

The present Operating Instructions are part of the delivered equipment. They must be ready for use at any time and remain with the unit in case of resale.

We reserve the right to carry out technical modifications on the unit due to advanced development.

An operating manual cannot take account of every conceivable use. An operating manual cannot take account of every possible use. Contact your dealer or the manufacturer for further information or in the event of problems which are not covered or not sufficiently covered in this operating manual.

2 Important safety warnings

Please observe any additional national safety regulations that may apply.

2.1 Instructions for the use of the present manual

Carefully read the Operating Instructions before you operate the unit. Do not use the present electrical unit for any purpose other than described in the Operating Instructions.

Warning symbols used in the present manual:


This symbol warns of the risk of injury caused by electricity.


This symbol warns of the risk of injury caused by explosion and/or deflagration.


This symbol warns of the risk of injury caused by hot surfaces and liquids.


This symbol warns of the risk of injury.


This symbol warns of the risk of damage to the equipment.


This symbol marks additional information.

Signal words used in the present manual

Danger The signal word Danger warns of a potential risk of serious injury and danger to life.

Warning The signal word Warning warns of the risk of serious injury and heavy damage to the equipment.

Caution The signal word Caution warns of the risk of light injury or damage to the equipment.

Attention The signal word Attention warns of the risk of damage to the equipment.

2.2 Instructions for the use of the unit

Intended use

The present Elma ultrasonic cleaning unit has been designed for the treatment of **items** and **liquids** only.

No cleaning of living beings or plants!

User

Operation of the unit by authorized and instructed staff only. Observe the instructions given in the manual.

Mains connection

For safety reasons, the present unit must be connected to a correctly grounded socket only. The technical details indicated on the nameplate must correspond with the available mains connection details, in particular those of the mains voltage and current connected value.

Prevention of electrical accidents

For purposes of maintenance and care of the unit, in the case of suspected humidity inside the unit or in the case of malfunctions and after operation, unplug the mains plug.
The unit must only be opened by authorised specialised personnel.

Cleaning liquid

Fill the unit with a sufficient quantity of cleaning liquid before switch-on. Flammable liquids must not be treated by ultrasound directly in the cleaning tank: risk of fire and explosion!

Hot surfaces and liquids

Risk of burning and scalding! Depending on the operational period of the unit, unit surfaces, cleaning liquid, basket and cleaning items can heat up considerably.

Noise emission

Ultrasonic units can produce annoying sounds.
Wear personal ear protection devices when working close to an ultrasonic unit which is operated without cover.

Sound transmission at physical contact

Do not reach inside the cleaning liquid or touch sound-carrying parts (tank, basket, cleaning items, etc.) during operation.

Exclusion of liability

The manufacturer cannot be held liable for damages on persons, equipment or cleaning items caused by improper use. The operator is responsible for the instruction of the operating staff.

Storage and transport conditions

Temperature during storage: +5 C (+41 F) to +40 C (+104 F)

Temperature during transport: -15 C (+5 F) to +60 C (+140 C)

Humidity and air pressure during storage and transport:

10 % - 80 % relative humidity; non-condensing

Pressure range 500 hPa – 1060 hPa absolute

Risk of splashing fluid when switching on the ultrasound

There is a risk of splashing fluid when a unit filled with fluid is switched on. This means that drops of fluid may spray out of the tank.

2.3 Intended use as medical device

Intended purpose

Ultrasonic pre-cleaning of

- surgical and medical instruments
- microinstruments and
- rigid endoscopes and accessories

Only reusable medical devices that are approved for ultrasonic cleaning and authorised for the reprocessing are permitted to be cleaned (see information of the medical device manufacturer according to, e.g. EN ISO 17664).

The pre-cleaning of medical devices with Elmasonic Easy-Line products does not replace the subsequent cleaning, disinfection or sterilisation in automated standard processes (e.g. cleaning and disinfection unit (CDU) or autoclave).

The user is responsible for checking the cleaning result.

Intended use

Ultrasonic cleaning machines are exclusively intended for ultrasonic irradiation of objects and liquids. Thereby, no flammable liquids are permitted to be used directly in the cleaning tanks.

The machine is only permitted to be operated by trained personnel and not by children. Operation and placement must be performed in accordance with the conditions and media defined in the operating manual.

The service intervals and regional regulations for checking the equipment must be complied with.

2.4 Safety instructions on the machine

Observe operating instructions!

Observe warnings and safety instructions given in the operating manual!

This symbol warns about the risk of injury from hot surfaces and liquids.

The unit cannot be disposed with household waste! Observe regional waste regulations!

2.5 Information for particular groups of people

Pregnant woman

Ultrasonic energy emitted through the air is not hazardous to your health. However, high sonic emissions do arise during ultrasound operation that may, under circumstances, cause hearing damage to the foetus.

We recommend pregnant people not to spend long periods of time near an ultrasonic cleaning device.

People with active implants

Elma Schmidbauer products with the CE mark comply with the European EMC and Low Voltage Directive and adhere to the prescribed EMC limit values so that the electromagnetic radiation emitted by the devices is harmless to healthy people. A binding statement for people with implants, such as those with cardiac pacemakers or implanted defibrillators, can only be made at the specific occupational site and upon consulting the manufacturer of the implants.

3 Functioning

Today, cleaning by ultrasound is the most modern fine cleaning method.
The electric high-frequency energy created by an ultrasonic generator is transformed into mechanical energy by piezo-electrical transducer systems and is then transmitted into the bath.
This process creates millions of tiny vacuum bubbles which implode due to the variations of pressure caused by the ultrasonic activity. Highly energetic liquid jets are created. These jets remove dirt particles from surfaces and even from the smallest grooves and bores.

3.1 Ultrasonic cleaning factors

Basically, the cleaning result depends on four factors:

Mechanical energy

Ultrasonic energy is probably the most important mechanical factor in the cleaning process. This energy must be transmitted through a liquid medium to the surfaces which are to be cleaned. The present Elmasonic unit is fitted with the innovative sweep function device: electronic oscillation of the sound field (sweep function) prevents the formation of zones of low performance in the ultrasonic bath.

Cleaning media

For saponification and removal of the dirt particles a suitable cleaning agent is required. Elma has a large range of cleaning media on offer.

Cleaning chemicals are also necessary to reduce the surface tension. This increases considerably the efficiency of the ultrasonic activity.

Temperature The effect of the cleaning medium is improved by the optimised temperature of the cleaning liquid.

For Elma cleaning products please observe the instructions given on the label or the product information leaflets.

Cleaning period The cleaning period depends on the degree and the kind of contamination and on the correct selection of ultrasonic energy, cleaning agent and temperature.

4 Product description

4.1 Elmasonic EASY product features

- Transducer tank made of cavitation-resistant stainless steel
- Case made of hygienically easy to clean stainless steel
- Sandwich power transducer systems
- Sweep function for optimal sound field distribution in the cleaning liquid
- Pulse Mode for intensification of the ultrasonic cleaning effect.
- Liquid fast drain on the machine rear side (starting from Elmasonic EASY 60 H)
- Heating with dry-running protection *
- Machine can be plugged in to mains power socket
- Electronic selector switch
- Drip-proof control unit
- Plastic carrying handles (starting from Elmasonic EASY 60 H)
- Automatic safety shutdown after 8 hours operation to prevent accidental continuous operation
- Automatic safety shutdown at 90 °C bath temperature
- Protection against unintended restart, e.g. after automatic safety shutdown or power failure

*on units with heating

4.2 CE conformity

This Elma ultrasonic cleaner meets the requirements for the CE marking based on the EC/EU Low Voltage, Electromagnetic Compatibility (EMC) and RoHS Directives. Some models are also registered as medical devices.

Refer to the EC/EU Declaration of Conformity that can be obtained from the manufacturer for details.

4.3 RFI Statement (European Union)

This is a Class A product.

Please note:

This equipment has been approved for business purposes with regard to electromagnetic interference.

In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
For this please contact your supplier or the manufacturer of the unit.

4.4 Delivered equipment

- Ultrasonic cleaning unit
- Mains cable
- Tube socket with tube clamp
  (starting from Elmasonic EASY 60 H)
- Operating Instructions

4.5 Unit front view / side view

Illustration 4.5 Front view / side view Elmasonic EASY 30 H

A **Filling line** (not available on Elmasonic EASY 10 / S 10 H) indicates the recommended maximum filling level. This level should not be exceeded even with cleaning items inside.

B **Plastic carrying handles** (from Elmasonic EASY 30 H) for the safe transportation of the unit even with hot casing.

C **Turning knob for the draining of the tank** (from Elmasonic EASY 60 H) functional description *see section 4.7.*

D **Operating panel** for the control of the operating functions. Description see *section 4.8* and *4.9.*

4.6 Unit back view

Illustration 4.6 Unit back view (as delivered)

A **Liquid drain duct** for draining the tank (up from EASY 30)

B **Mains supply socket** for quick and easy removal of the mains cable e.g. for transportation purposes

4.7 Turning knob for draining the tank (from EASY 60 H)

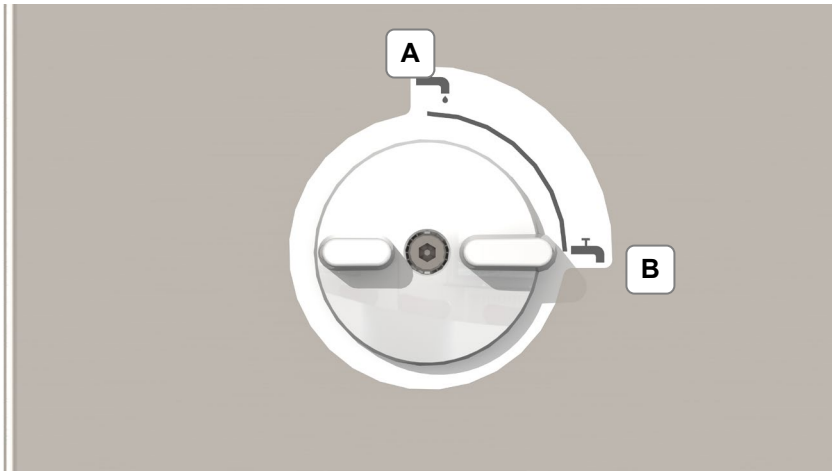

Illustration 4.7 View turning knob for draining the tank

A **Vertical position**: drain open

B **Horizontal position**: drain shut

4.8 Description of operating elements

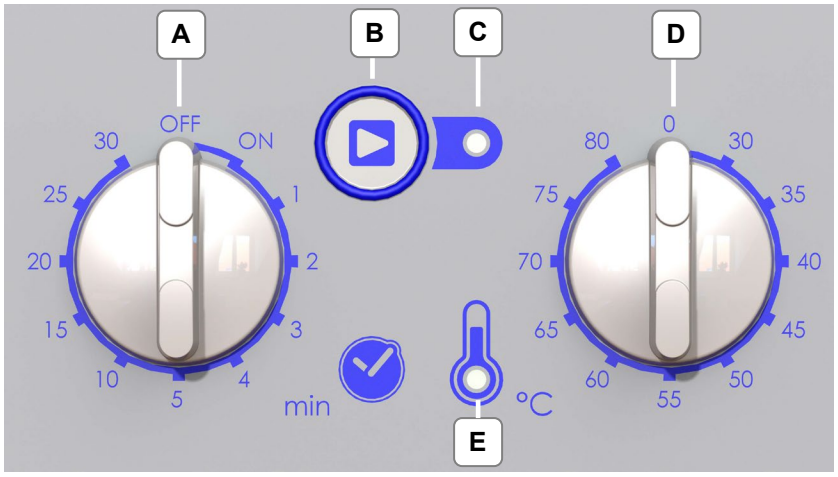

Illustration 4.8 View operating elements (unit with heating)

A On/Off switch

Cleaning time preselection * Setting options Short time operation: 1; 2; 3; 4; 5; 10; 15; 20; 25; 30 min (with automatic switch-off).
Continuous setting ON for continuous operation. The switch-off must be performed manually here.
However, the machine is switched off automatically after 8 hours continuous operation for safety reasons.

B Start/Stop button for ultrasound operation

Activation of the Pulse mode by pressing and holding for more than 3 seconds.

C Ultrasound operation LED indicator

Fault indicator (flashes - see *chapter 11*)

D Temperature preselection * for machines with heater.
Temperature selection range in 5 °C steps from 30°C – 80°C

E Heater operation LED indicator for machines with heater, lights when the heater is active.

Fault indicator (flashes - see *chapter 11*)

* setting the preselection: turn **clockwise**
reset of the preselection: turn **anticlockwise**

4.9 Description of LED indicators

Ultrasound operation LED indicator	Device status
off	ultrasound off
lights	ultrasound on (Sweep function) ultrasound time running
flashes slowly (1x/sec)	ultrasound on (Pulse-mode) ultrasound time running

Heater operation LED indicator	Device status
off	heater off or setpoint temperature reached
lights	heater is heating
flashes quickly (4x/sec)	specified limit temperature exceeded
lights for approx. 3 seconds, then goes out	temperature limit has been programmed

Ultrasound operation LED indicator and heater operation LED indicator	Device status
pause, flashes, flashes, pause…	temperature of liquid too high
pause, flashes, flashes, flashes, pause…	temperature sensor defective
pause, flashes, flashes, flashes, flashes, pause…	ultrasound power too low
pause, flashes, flashes, flashes, flashes, flashes, pause	unknown program error

4.10 Operating and display functions

Action	Input	Result	Display
Switch on machine	Turn On/Off rotary switch from the "OFF" (12 o'clock) position to the "ON" (1 o'clock) position	Machine operational	The heater is activated if the heater rotary switch is not in the "0" (12 o'clock) position
Start ultrasonic cleaning (sweep mode)	Cleaning time rotary switch ≠ "OFF" **and** Start/Stop button pressed briefly	Ultrasound operating for the specified time in sweep mode	Ultrasound LED indicator lights
Start ultrasonic cleaning (Pulse mode)	Cleaning time rotary switch ≠ "OFF" **and** Start/Stop button pressed and kept pressed (> 2 seconds)	Ultrasound operating for the specified time in Pulse mode	Ultrasound LED indicator flashes slowly
Stop ultrasonic cleaning before expiry	Adjust cleaning time rotary switch **or** Press Start/Stop button briefly	Ultrasound off	Ultrasound LED indicator off
Switch on heater	Heater rotary switch not in "0" position **and** Cleaning time rotary switch ≠ "OFF"	Heater LED indicator lights until setpoint temperature is reached, then extinguishes	

Switch off heater	Heater rotary switch in the "0" position **or** Cleaning time rotary switch ≠ "OFF"	Heater LED off	
Program temperature limit	Cleaning time rotary switch in "OFF" position **and** Heater rotary switch = desired temperature limit **and** Press Start/Stop button and keep pressed (> 2 seconds)	Specified temperature is programmed (also remains saved after switching off the machine)	The heater LED indicator lights for approx. 3 seconds, then goes out

5 Initial operation

Packing

Please keep the original packing or dispose of it according to the relevant waste disposal regulations. You can also return the packing to the manufacturer destination (to your account). The machine must only be sent in the original packaging for transport (e.g. in the case of service).

Check for transport damages

Check the Elmasonic EASY for possible transport damages before initial operation. In case of visible damage do not connect the unit to the mains. Contact your supplier and forwarding agent.

Placement

For operation, place the unit on a dry and solid surface. Ensure that the workplace is sufficiently ventilated! Do not use a soft surface (e.g. a carpet) as this may impede the ventilation of the unit.

DANGER

Risk of electrocution due to humidity inside the unit!
Protect the unit from entering humidity.

The unit inside is splash-water-proof. Keep workplace and casing dry in order to prevent electrical accidents and damages on the unit.

Ambient conditions

- Allowed ambient temperature during operation: +5 °C (+41 °F) to +40 °C (+104 °F)
- Allowed relative humidity of air during operation: max. 80 %
- In-door operation only

5.1 Set up of the liquid drain (EASY 60 H – 300 H)

On the delivered unit, the drain duct for the cleaning liquid is closed off with a plastic screw cap. For setting up the liquid drain fix the delivered tube socket to the drain duct.

Proceed as follows

1. Unscrew (anti-clockwise) the plastic screw cap *(see illustration 5.1.1)*
2. Screw the tube socket (included in delivery) onto the inside thread of the drain duct (clockwise).
3. Turn the tube socket into the required drain position *(see illustration 5.1.2)*.
   The plastic thread is self-sealing when the socket has been screwed in by hand as far as possible.
   Note: Unscrewing the tube socket (anti-clockwise) can cause a leak of the thread.

4. The drain duct is now ready for connection to a customer-provided discharge system. Use a standard tube (dia 1/2"). Push the tube onto the socket and fix it with the clamp included in the delivery.

Illustration 5.1.1
Drain with plastic screw cap

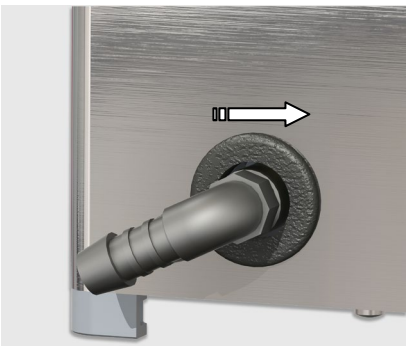

Illustration 5.1.2
Drain fitted with standard tube

5.2 Connecting the unit to the mains

Required mains conditions

Earth grounded socket:
1 phase (220-240 V); 1 N; 1 PE protective earth.

The power supply must be protected by an earth leakage circuit breaker.

Connect mains cable

Use the plug-in mains cable delivered with the unit. Connect the unit to a grounded shockproof socket only. Ensure that the values indicated on the nameplate of the unit correspond with the available connecting conditions.
The mains plug must be connected to an easily accessible socket only, as it serves as interrupted device!

6 Putting unit into operation

6.1 Filling of the unit

Shut the drain

Shut the drain duct before filling the tank. (Turning knob for draining of the tank into horizontal position (*see section 4.7*).

Observe filling level

Fill the cleaning tank with a sufficient quantity of a suitable cleaning liquid before switch-on.

The optimum filling level is approx. 2/3 of the tank volume.

The marked maximum filling level of the tank (not available on EASY 10 / EASY 10 H) indicates the recommended filling level with cleaning items in the bath (*see also section 4 Illustration 4.5*).

Suitable cleaning agents

Ensure that the chosen cleaning agent is suitable for treatment in an ultrasonic bath and observe the instructions on dosage and the compatibility of the material.
We recommend the use of the cleaning agents listed in *section 8.3.*

WARNING

Risk of splashing fluid when switching on the ultrasound!

There is a risk of splashing fluid when a unit filled with fluid is switched on.

This means that drops of fluid may spray out of the tank.

Please take this into account when using corrosive or other dangerous cleaning agents.

Move away from the unit and wear the appropriate protective equipment as specified in the safety data sheet for the cleaning agent in use.

Prohibited cleaning agents

Flammable products are generally not allowed for use in an ultrasonic bath. Observe the safety warnings given in *section 8.1.*

DANGER

Risk of fire and explosion!

Never use flammable liquids or solvents directly in an ultrasonic cleaning bath.

Use the cleaning chemicals listed in *section 8.3*.

Ultrasonic activity increases the vaporisation of liquids and creates a very fine mist which can catch fire on any ignition source.
Observe the instructions on limitations of use given in *section 8.1.*

CAUTION

Risk of damage to the transducer tank!
Do not use any acid cleaning agents (pH value < 7) directly in the stainless steel tank if the cleaning items or the contamination of the cleaning items contain halogenides (fluorides, chlorides or bromides). The same applies to NaCl solutions.
Use the cleaning chemicals listed in *section 8.3*.

The stainless steel tank can be destroyed by crevice corrosion in a very short time. Substances that cause crevice corrosion can be contained in household cleaners.
Observe the instructions on limitations of use given in *section 8.2.* For queries please contact the manufacturer or your supplier.

CAUTION

Danger of damage to the transducer system!

Fill no liquid > 60 °C and < 10 °C in the ultrasonic tank.

6.2 Placement of cleaning items

Caution! The ultrasonic bath has been designed for the ultrasonic treatment of items and liquids only.
Do not clean living beings or plants!

CAUTION

Do not reach inside the tank during ultrasonic operation!

Cell walls can be damaged by prolonged exposure to ultrasonic activity.

For placing and taking out the cleaning items always switch off the unit.

No cleaning items on the bottom of the tank

Do not place the cleaning items directly onto the bottom of the cleaning tank, as this might lead to damages to the unit.

Use cleaning basket

Place the cleaning items into the stainless steel cleaning basket (accessory equipment).

Acid tank

For the use of cleaning chemicals which might destroy or damage the stainless steel tank use a separate container. For the special plastic cleaner tank for acid chemicals please contact your supplier.

6.3 Degassing of liquid

Freshly mixed cleaning liquids are saturated with air which lessens the cleaning effect of the ultrasonic activity. By sonification of the liquid over a period of several minutes before the cleaning process the tiny air bubbles in the liquid are eliminated.

Ultrasound button Degas the fesh cleaning liquid for approx. 5 - 10 minutes.

7 Ultrasonic cleaning process

Please observe the following instructions before starting the ultrasonic cleaning process. It is the user's responsibility to check the cleaning results.

CAUTION

Risk of scalding by hot surfaces and cleaning liquid!

Ultrasonic energy is physically transformed into heat.

The unit and the cleaning liquid in the tank heat up during ultrasonic operation even with the heating switched off.
During permanent operation with cover temperatures exceeding 60°C can be reached.

During permanent operation with cover and heating temperatures exceeding 80°C can be reached.

Do not reach inside the bath.
If necessary touch unit and basket with protecting gloves!

CAUTION

Ultrasonic units can produce annoying sounds.

Wear personal ear protection devices when working close to an ultrasonic unit which is operated without cover.

ATTENTION

Sensitive surfaces can be damaged when exposed to ultrasound over prolonged periods, particularly at low cleaning frequencies.

Ensure that sensitive surfaces are exposed to ultrasonic acitivity for a suitable period only.

If in doubt check the cleaning progress regularly and observe the state of the surface material.

ATTENTION

Ultrasonic energy is physically transformed into heat.

The unit and the cleaning liquid in the tank heat up during ultrasonic operation even with the heating switched off.
During permanent operation with cover temperatures exceeding 60 °C can be reached.

For the cleaning of temperature-sensitive items please take into consideration the heating-up of the cleaning liquid.

Please observe that the temperature of the cleaning media remains below 42 °C when cleaning parts contaminated with fresh protein or blood.

7.1 Heating up of the cleaning liquid (units with heating)

Depending of the degree and kind of contamination and on the cleaning medium used it might be required to heat up the cleaning liquid. For a quick heating-up process and in order to prevent unnecessary energy losses we recommend to use a cover (optional accessory equipment).

The ultrasonic energy is transformed physically into heat. Low set temperatures can be exceeded during ultrasonic operation.

The cleaning effect through ultrasonic cavitation is reduced when cleaning with high temperatures. We recommend not to exceed a temperature of 80°C inside the tank.

For the recommended cleaning temperature please observe the product information of the used elma clean cleaner.

CAUTION

High temperatures! Risk of burning and scalding!

Cleaning liquid, cleaning tank, casing, cover, basket and cleaning items can heat up considerably.

Do not reach inside the bath.
If necessary wear protective gloves when touching unit and basket!

Cleaning temperature recommendations in the medical sector:

Please observe that the temperature of the cleaning media remains below 42 °C when cleaning parts contaminated with fresh protein or blood.

Please observe the temperature even when using low or no heating.

How to proceed

Press the on/off key to start the unit.

Heating control by turning temperature knob

Set the desired cleaning temperature at the temperature selector switch for the temperature preselection.

The heater is active until the preselected temperature is reached.

The LED indicator lights while the heater is active.

The LED extinguishes as soon as the preselected temperature is reached.

7.2 Starting the cleaning process manually

Switch on the machine using the on/off button.

Short time operation

Turn the selector switch clockwise to the desired cleaning time for short time operation.

Press the ► button to start the ultrasound operation.

The ultrasound is automatically switched off after expiry of the setpoint time.

Continuous operation

Turn the selector switch clockwise to the ON position for continuous operation. No automatic switch-off is performed in the "Continuous operation" position. The ultrasound function must be switched off by the user after the cleaning by pressing the ► button. Or put the selector switch back into the OFF position.

Attention: Only turn the selector switch anticlockwise back to the 0 position!

Elmasonic EASY machines are equipped with safety shutdown to prevent inadvertent continuous operation. The machine is completely shut down automatically after 8 hours of continuous operation. If you want to continue operating the machine immediately, you only need to restart it.

The selector switch of the time setting must first be turned to the "0" position to prevent any unintended operation after external interruption of the mains power supply. For further operation, select the desired cleaning time again to activate the ultrasound and heating functions.

7.3 Sweep function

Elmasonic EASY machines are also equipped with an automatic Sweep function.

How it Works Homogeneous irradiation in the cleaning tank is reached by constant shifting of the maximum zones of the sound pressure.

7.4 Pulse Mode

Special function for intensification of the ultrasonic cleaning effect. Particularly beneficial for stubborn soiling.

How it Works The ultrasound effect is increased by 20 % by increasing the amplitude of the ultrasound signal.

Procedure Keep the Start/Stop button for the ultrasound operation ► pressed for at least 3 seconds.

This function can also be activated at any time during operation.

7.5 Programme temperature limit

This function activates an optical signal when a pre-set temperature limit is reached.

This allows the user to take action in good time to prevent temperature-sensitive items from becoming damaged or from coagulating if blood or egg white is being cleaned.

The LED indicator for heating mode will flash rapidly when the pre-set temperature limit is reached (4 sec.).

The unit emits an optical signal as a warning only.

ATTENTION The user is responsible for any action required, such as switching off the unit or removing the cleaned item.

How to proceed

1. Turn the **"Cleaning time rotary switch"** to **"OFF".**
2. Turn the **"Temperature rotary switch"** to the required temperature limit.
3. Press the **"Start/Stop button"** for at least 2 seconds.

➢ The heater LED indicator will light up for around 3 seconds.

The pre-set temperature limit is now programmed and will also be stored in the memory when the unit is switched off.

Proceed as follows to delete the programmed temperature limit:

1. Turn the **"Cleaning time rotary switch"** to **"OFF".**
2. Turn the **"Temperature rotary switch"** to **"0".**
3. Press the **"Start/Stop button"** for at least 2 seconds.

➢ The heater LED indicator will light up for around 3 seconds.

The pre-set temperature limit is now deleted.

7.6 After the cleaning

Follow-up treatment of cleaning items

When the cleaning process is finished rinse the cleaning items, e.g. under the tap.

Drain the unit

Drain the liquid as soon as it is dirty or when the unit is not operated over a prolonged period of time. Certain residues and types of contamination may destroy or damage the stainless steel tank.

Use the quick-drain duct to drain the cleaning tank (*see section 4.7*).

8 Cleaning media

WARNING

The cleaning chemical to be used must be suitable for the use in an ultrasonic bath to prevent damage to the tank or injuries to the user. Use the recommended cleaners mentioned in *section 8.3*. Observe the restrictions to cleaners containing solvents and aqueous cleaners mentioned *in sections 8.1* and *8.2.*

For queries please contact the manufacturer or your supplier.

Exclusion of liability

Damages caused by non-compliance with the instructions given in *sections 8.1* and *8.2* will not be covered by the manufacturer's warranty!

8.1 Limitations of use of cleaners containing solvents

DANGER

Never use flammable liquids or solvents directly in an ultrasonic cleaning tank. Risk of fire and explosion!

Ultrasound increases the volume of vaporisation of liquids and creates a very fine mist that can catch fire on any ignition source at any time.

Do **not** fill potentially explosive substances and flammable solvents

- marked in compliance with the EEC directives by symbols and safety warnings R 1 to R 9
- or E, F+, F, O or R 10, R 11 or R 12 for flammable substances

into the stainless steel tank for ultrasonic treatment.

Exception

In compliance with the general regulations on the protection of labour, certain limited volumes of flammable liquids (max. 1 litre) can be used in an ultrasonic cleaning unit under the following conditions: these liquids must be filled into a suitable separate vessel (e.g. beaker) with sufficient ventilation; this vessel (beaker) can then be put into the stainless steel tank which is filled with non-flammable liquid (water with a few drops of surfactant).

8.2 Limitations on aqueous cleaners

Do not use aqueous cleaning media with pH values in the acid range (pH < 7) directly in the ultrasonic tank if fluoride (F^-), chloride (Cl^-) or bromide (Br^-) ions can be taken in by the removed dirt or through the cleaning chemical. These can destroy the stainless-steel tank by crevice corrosion within a very short period of ultrasonic operation.

Acids and alkaline solutions

Other media which can destroy the stainless-steel tanks when used in high concentrations or with high temperatures during ultrasonic operation are: hydrochloric acid, nitric acid, sulphuric acid, formic acid, hydrofluoric acid (even diluted). (Completeness of list not guaranteed.)

Risk of damage to the unit: do not use cleaning solutions containing more than 0.5 mass % alkali (KOH and/or NaOH) in an ultrasonic cleaning tank.

Entrainment of chemical substances

The above limitations for the use of chemicals in an ultrasonic bath also apply for the aforementioned chemicals when these are brought into an aqueous (particularly distilled water) bath through entrainment or from the removed dirt.

Acid-resistant tank

For the ultrasonic treatment with the above mentioned media use an acid-resistant tank (available as accessory equipment).

Disinfectants

The limitations of use also apply to the standard cleaners and disinfectants if these contain the above mentioned compounds.

Safety regulations

Observe the safety warnings indicated by the manufacturer of the chemicals (e.g. goggles, gloves, R and S phrases).

For queries please contact the manufacturer or your supplier.

8.3 List of recommended cleaning media

Elma has a large range of suitable cleaning products on offer developed by chemical engineers in the Elma laboratory. Please contact your supplier to find the most suitable cleaning chemical for your application.

Product informations and safety data sheets are available from the manufacturer (www.elma-ultrasonic.com/produkte/reinigungsmittel).

9 Maintenance

9.1 Maintenance / Care

ATTENTION

Pull the mains plug before carrying out any maintenance works!

Electrical security
The present Elmasonic EASY unit is maintenance-free. Check the casing and the mains cable for damage regularly in order to prevent electrical accidents.

Care of transducer tank
Lime deposits on the stainless-steel tank can be cleaned gently e.g. with elma clean 40 or elma clean 115C (operate the unit with concentrate + water).

Grid of air fan
Check regularly the grid of the air fan at the bottom of the unit (not existent in all units).

Remove dirt if necessary to allow sufficient ventilation inside the unit.

Care of casing
Residues of cleaning media can be wiped away with a household cleaner or decalcifier depending on the kind of contamination. **Do not put the unit in or under water!**

Disinfection
If the unit is used for medical and sanitary purposes it is necessary to disinfect the transducer tank and the surfaces regularly (standard surface disinfectants).

9.2 Service life of the transducer tank

The transducer tank and particularly the ultrasound transmitting surfaces are wear parts. The changes on the surfaces that occur after a certain operating period are visible first as grey areas and later on as material abrasions, the so-called cavitation erosion.

To prolong the service life of your ultrasonic unit even more we recommend to observe the following instructions:

- Regularly remove any cleaning residues, in particular metal particles and rust films.
- Use suitable cleaning chemicals, with particular caution concerning the kind of removed contamination (see instructions *section 8.2*).
- Abrasive particles from removed contaminations (e.g. polishing pastes) must be drained and removed from the cleaning tank as frequently as possible (exchange the cleaning bath).
- Exchange the cleaning medium before it is too heavily contaminated.
- Do not operate the ultrasound unnecessarily; switch off after the cleaning process.

9.3 Repair

Opening by authorised specialised personnel only

Repair and maintenance works which require the unit to be connected and opened must be carried out by authorised and specialised personnel only.

DANGER

Risk of electrocution due to live parts inside the unit!

Pull the mains plug before opening the unit!

The manufacturer cannot be held responsible for any damage caused by unauthorised maintenance or repair works on the unit.

In the case of a break-down of the unit, please contact the manufacturer or your supplier.

10 Technical Details

	Bath maximum volume (approx. l)	Bath working volume (approx. l)	Bath Internal dimensions W x D x H (approx. mm)	Machine External dimensions W x D x H (approx. mm)	Basket Internal dimensions W x D x H (approx. mm)	Weight (approx. kg)
EASY 10 | H	0.8	0.7	190x85x59	206x120x182	177x73x30	2.0
EASY 20 | H	1.75	1.20	137x123x99	176x176x219	112x103x50	2.1
EASY 30 H	2.75	1.90	225x124x99	264x176x219	198x106x50	3.3
EASY 40 H	4.25	3.20	220x118x149	263x176x269	190x105x75	4.0
EASY 60 H	5.75	4.30	281x132x149	341x196x269	255x115x75	5.1
EASY 100 H	9.5	7.50	281x222x149	339x281x272	255x200x75	5.9
EASY 120 H	12.75	11.30	276x216x199	342x285x322	250x190x115	7.5
EASY 180 H	18.00	12.90	303x273x199	371x347x322	280x250x115	8.5
EASY 300 H	28.00	20.60	477x274x199	544x347x322	455x250x115	11.0

	Mains voltage variants (V AC)	Ultrasound frequency (kHz)	Total power consumption (W)	Effective ultrasound power (W)	Max. ultrasound peak power* (W)	Heat output (W)
EASY 10	100-120 220-240	37	30	30	240	0
EASY 10 H			90			60
EASY 20	100-120 220-240	37	35	35	280	0
EASY 20 H			155			120
EASY 30 H	115-120 220-240	37	280	80	320	200
EASY 40 H	115-120 220-240	37	340	140	560	200
EASY 60 H	115-120 220-240	37	550	150	600	400
EASY 100 H	115-120 220-240	37	550	150	600	400
EASY 120 H	115-120 220-240	37	1000	200	800	800
EASY 180 H	115-120 220-240	37	1000	200	800	800
EASY 300 H	115-120 220-240	37	1500	300	1200	1200

* EASY 10 – EASY 20 H: Pulsed ultrasound; EASY 30 H – EASY 300 H: Double half-wave sound. The selection of the signal form has been adapted to the bath geometry. Due to the signal form, the quadruple or octuple value is produced for the maximum peak value of the ultrasound power.

11 Troubleshooting

Problem	Possible cause	Remedy
Case damaged	• External influence, transport damage	• Send machine to the supplier or manufacturer
Mains power cable damaged	• External influence, transport damage	• Obtain original mains power cable from manufacturer or supplier
No machine functions; All LED indicators dark	• Mains plug not plugged in	• Plug in the mains plug
	• De-energised power socket	• Check power socket / fuse
	• Mains power cable damaged / interrupted	• Replace mains power cable
	• Electronics fault	• Send machine to manufacturer / supplier
	• Machine operates in continuous operation, no operation, safety shutdown takes effect after 8 hours	• Switch off machine (OFF) and then switch on again
	• Machine has been disconnected from the mains power supply during ultrasound operation using a central switch / mains plug has been unplugged	• Connect machine again, switch off machine (OFF) and then switch on again
No ultrasound function; ultrasound LED indicator dark	• Ultrasound operation selector switch in "0" position	• Put ultrasound operation selector switch in "ON" position
	• Machine is switched off	• Switch on machine with on/off button
	• (ultrasound) button ►not pressed	• Press ► button
	• Electronics fault	• Send machine to manufacturer / supplier
No ultrasound function; ultrasound LED indicator lights	• Machine has been switched off / on, e.g. via an external power outlet strip. • Power failure	• Turn time setting selector switch to the "0" position and then set a time preselection again.

Problem	Possible cause	Remedy
Cleaning result not satisfactory	• Possibly no or unsuitable cleaning agent	• Use appropriate cleaning agent
	• Cleaning temperature may not be optimal	• Heat cleaning liquid
	• Cleaning time may be too short	• Repeat cleaning interval
Machine does not heat up; LED temperature indicator dark	• Temperature selector switch in "0" position	• Put temperature selector switch in "ON" position
	• Machine is switched off	• Switch on machine with on/off button
	• Electronics fault	• Send machine to manufacturer / supplier
Heating up time not satisfactory	• Heat energy escapes	• Use cover (optional accessory)
	• No circulation of the cleaning liquid	• e.g. also switch on ultrasound
Machine produces cooking noises during heating	• No circulation of the cleaning liquid	• e.g. also switch on ultrasound
Specified temperature is exceeded	• Temperature sensor is not measuring the average temperature (no circulation)	• Circulate liquid manually or with ultrasound
	• Temperature preselection too low	• Do not use heater for low setpoint temperatures
	• Ultrasound energy continues to heat the liquid (physical process)	• Only switch on ultrasound for a short time
LED indicators	pause, flashes, flashes, pause…	temperature of liquid too high
LED indicators	pause, flashes, flashes, flashes, pause…	temperature sensor defective
LED indicators	pause, flashes, flashes, flashes, flashes, pause…	ultrasound power too low
LED indictors	pause, flashes, flashes, flashes, flashes, flashes, pause…	unknown program error

12 Putting out of action and waste disposal

The machine components can be disposed of through electronics and metal recycling facilities. The manufacturer also accepts old components for disposal.

13 Manufacturer's contact address

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Do you have any queries or suggestions concerning the present unit, its operation or the Operating Instructions?
Please contact us, we will be glad to assist:

Technical Support

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