Operating Instructions

english

Elmasonic xtra TT

Ultrasonic Cleaning Unit

DOMINIQUE DUTSCHER SAS

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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.

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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 authorized specialized 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 – 1060 hPa absolute

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3 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.

3.1 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!

3.2 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.

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4 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.

4.1 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 optimized 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.

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5 Product description

5.1 Elmasonic xtra TT product features

- Efficient 37 kHz ultrasonic high-performance transducers
- Cleaning tank made of cavitation-resistant stainless steel
- User-friendly and clearly arranged operating panel; sealed against liquid intrusion to protect the electronics
- LED display for ultrasonic function
- Rotary switch for easy preselection of the cleaning line
- Continuous operating or short-term operation between 1 and 30 minutes
- Permanent Sweep function for optimized sound field distribution through frequency modulation
- Switchable Dynamic function increases the peak ultrasonic performance. This improves the effectivity of cleaning and makes it possible to remove even the most stubborn contaminants dry-run protected heating
- Temperature selectable by rotary switch; from 30 to 80 °C in increments of 5 °C (for H units)
- LED display for heating operation (for H units)
- Detachable power cord with IEC plug
- Selectable temperature threshold with alarm
- Automatic safety shutdown after 8 hours of continuous operation
- Automatic safety shutdown at a bath temperature of 90 °C

5.2 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.

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

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5.3 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.

5.4 Delivered equipment

- Ultrasonic cleaning unit
- Mains cable
- Operating Instructions
- Stainless-steel cover

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5.5 Unit front view / side view

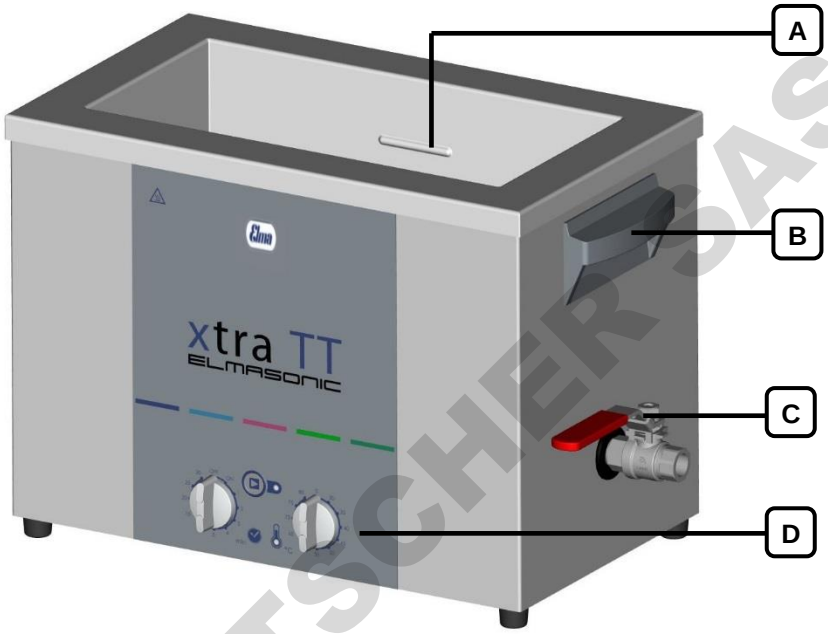

Illustration 4.5: Front view / side view Elmasonic xtra TT 60 H

A **Filling line** indicates the recommended maximum filling level. This level should not be exceeded even with cleaning items inside.

B **Plastic carrying handles** for the safe transportation of the unit even with hot casing.

C **Ball valve for the draining of the tank** functional description *see section 5.7.*

D **Operating panel** for the control of the operating functions. Description see *section 5.8* and 5.9*.*

E **Stainless-steel cover** to be placed on the tank edge. *(not illustrated)*

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5.6 Unit back view

Illustration 4.6: Unit back view

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

B **Name plate** with important information about the unit

5.7 Ball valve for draining the tank

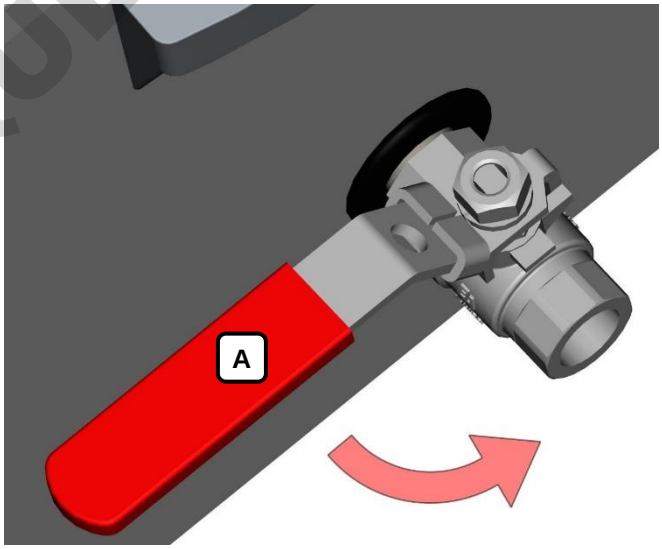

Illustration 4.7: View ball valve for draining the tank

A **Ball valve closed**: Open in direction of the arrow.

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5.8 Description of operating elements

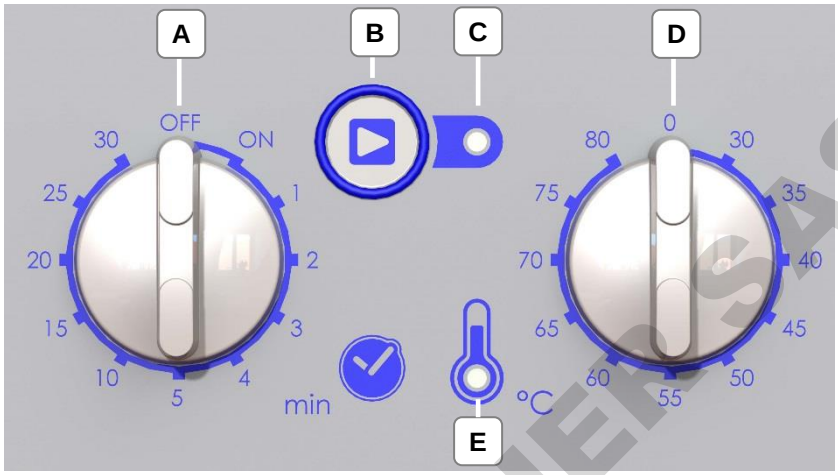

Illustration 4.8: View operating elements (unit with heating)

A **Cleaning time rotary switch *** 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 Dynamic mode by pressing and holding for more than 3 s.

C **Ultrasound LED indicator**

Fault indicator (flashes - see *chapter 11*)

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

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

Fault indicator (flashes - see *chapter 11*)

* setting the rotary switch: turn **clockwise**
reset of the rotary switch: turn **anticlockwise**

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5.9 Description of LED indicators

Ultrasound operation LED indicator	**Device status**
off	ultrasound off
lights	ultrasound on (Sweep mode) ultrasound time running
flashes slowly (1x/sec)	ultrasound on (Dynamic mode) ultrasound time running
Heater operation LED indicator	**Device status**
off	heater off or set point 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 2x, pause…	temperature of liquid too high
pause, flashes 3x, pause…	temperature sensor defective
pause, flashes 4x, pause…	ultrasound power too low
pause, flashes 5x, pause…	unknown program error
pause, flashes 6x, pause…	mains voltage too low
pause, flashes 7x, pause…	mains voltage too high

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5.10 Operating and display functions

Action	Input	Result	LED indicator
Switch on machine	Turn cleaning time rotary switch from the "OFF" (12 o'clock) position to the "ON" (1 o'clock) position	Machine operational	no indicator
Start ultrasonic cleaning (Sweep mode)	Cleaning time rotary switch ≠ "OFF" **and** Press Start/Stop button briefly	Ultrasound operating for the specified time in sweep mode	Ultrasound LED indicator lights
Start ultrasonic cleaning (Dynamic mode)	Cleaning time rotary switch ≠ "OFF" **and** Press the Start/Stop button for > 2 seconds	Ultrasound operating for the specified time in Dynamic 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	Temperature rotary switch not in "0" position **and** Cleaning time rotary switch ≠ "OFF"	Heater LED indicator lights until set point temperature is reached, then extinguishes	

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Switch off heater	Temperature 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** Temperature rotary switch = desired temperature limit **and** Press Start/Stop button for > 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

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6 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 free 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 unit 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

6.1 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!

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7 Putting unit into operation

7.1 Filling of the unit

Shut the drain

Shut the drain duct before filling the tank. (Ball valve - *see section 5.7*).

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 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 9.2.*

Prohibited cleaning agents

Flammable products are generally not allowed for use in an ultrasonic bath. Observe the safety warnings given in *section 9.2.*

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 9.2*.

Ultrasonic activity increases the vaporization 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 9.2.*

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 9.2*.

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 9.1.* 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.

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7.2 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.

7.3 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.

How to proceed

1. Adjust the **“Cleaning time rotary switch”** to 5 or 10 minutes.
2. Press the **“Start/Stop button”.**
3. Degas the fresh cleaning liquid for approx. 5 - 10 minutes.

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8 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 activity 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.

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8.1 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!

How to proceed

1. Start the unit with the **“Cleaning time rotary switch”.**
2. Set the desired cleaning temperature at the **“Temperature rotary switch**” for the temperature preselection.
3. The heater is active until the preselected temperature is reached.
4. The LED indicator lights while the heater is active.
5. The LED extinguishes as soon as the preselected temperature is reached.

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8.2 Starting the cleaning process manually

Short time operation

1. Turn the **“Cleaning time rotary switch”** clockwise to the desired cleaning time for short time operation.
2. Press the **“Start/Stop button”** to start the ultrasound operation.
3. The ultrasound is automatically switched off after expiry of the set point time.

Continuous operation

Turn the **“Cleaning time rotary switch”** clockwise to the **ON** position for continuous operation. No automatic switch-off is performed in the "Continuous operation". The ultrasound function must be switched off by the user after the cleaning by pressing the **“Start/Stop button”**. Or put the **“Cleaning time rotary switch**” back into the **OFF** position.

ATTENTION

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

Elmasonic xtra TT units 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.

8.3 Sweep function

Elmasonic xtra TT units 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.

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8.4 Activate Dynamic function

Special function to intensify the ultrasonic cleaning effect thanks to maximum ultrasonic power and optimized sound field distribution, particularly advantageous for stubborn stains.

How it works

Increasing the ultrasonic signal amplitude magnifies the ultrasonic effect. The system repeatedly switches to the Sweep function periodically, thus achieving optimized sound field distribution.

How to proceed

1. Use the **"Cleaning time rotary switch"** to select the time duration for cleaning.
2. Press the **"Start/Stop button"** for at least 3 seconds.

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

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8.5 Program temperature limit

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

This allows the user to act 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.

8.6 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 ball valve to drain the cleaning tank (*see section 4.7*).

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9 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 9.2* and *9.1.*

For queries please contact the manufacturer or your supplier.

Exclusion of liability

Damages caused by non-compliance with the instructions given in *sections 9.2* and *9.1* will not be covered by the manufacturer's warranty!

9.1 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.

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9.2 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 vaporization 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 liter) 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).

9.3 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 https://www.elma-ultrasonic.com/produkte/reinigungsmittel/.

Product information and safety data sheets are available from the manufacturer.

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10 Maintenance

10.1 Maintenance / Care

Pull the mains plug before carrying out any maintenance works!

ATTENTION

Electrical security

The present Elmasonic 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!**

10.2 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 9.1*).
- 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.

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10.3 Repair

Opening by authorized specialized personnel only

Repair and maintenance works which require the unit to be connected and opened must be carried out by authorized and specialized 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 unauthorized maintenance or repair works on the unit.

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

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11 Technical Details

Elmasonic xtra TT	30H	60H	120H	200H
Mechanical data				
Max. tank capacity (l)	3	6,5	14	18
Recom. operating capacity (l)	2	5	10	13
Tank internal dim. W/D/H (mm)	240/130/100	300/150/150	300/240/200	320/280/200
Unit external dim. W/D/H (mm)	360/230/250	420/250/300	440/340/350	420/390/330
Weight (kg)	6,0	10,0	11,0	13,0
Max. basket loading (kg)	1,0	3,0	7,0	8,0
Ball valve (")	3/8			
Electrical data				
Mains voltage (V~)	115-120 / 220-240			
Ultrasound frequency (kHz)	37			
Total power consumption (W)	540	550	1000	1500
Effective ultrasound output (W)	140	150	200	300
Max. peak ultrasound output * (W)	560	600	800	1200
Heating power (W)	400	400	800	1200

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Accessories				
Stainless steel basket (W/D/H) mm	196/112/39	257/132/74	262/222/114	280/250/114
Noise level				
Sound pressure level (L_{pAU})**	**<80 dB**			
Ultrasound level (L_{pZ})**	**<100 dB**			

* Due to the signal shape, four times the value results for the maximum peak value of ultrasound output.

** Measured sound pressure level with basket and noise protection cover at a distance of 1 meter.

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12 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-energized 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	• Cleaning time rotary switch in "OFF" position	• Put cleaning time rotary switch in "ON" position
	• Start/stop button not pressed	• Press start/stop button
	• Electronics fault	• Send machine to manufacturer / supplier
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

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Problem	Possible cause	Remedy
Machine does not heat up; LED temperature indicator dark	• Temperature rotary switch in "0" position.	• Adjust a temperature with the temperature rotary switch.
	• Machine is switched off	• Put cleaning time rotary switch in “ON” position
	• 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 set point temperatures
	• Ultrasound energy continues to heat the liquid (physical process)	• Only switch on ultrasound for a short time
LED indicators	Pause, flashes 2x, pause…	Temperature of liquid too high
LED indicators	Pause, flashes 3x, pause…	Temperature sensor defective
LED indicators	Pause, flashes 4x, pause…	Ultrasound power too low
LED indicators	Pause, flashes 5x, pause…	Unknown program error
LED indicators	Pause, flashes 6x, pause…	Mains voltage too low
LED indicators	Pause, flashes 7x, pause…	Mains voltage too high

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13 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.

14 Manufacturer's contact address

Elma Schmidbauer GmbH
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78224 Singen (Germany)
www.elma-ultrasonic.com

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