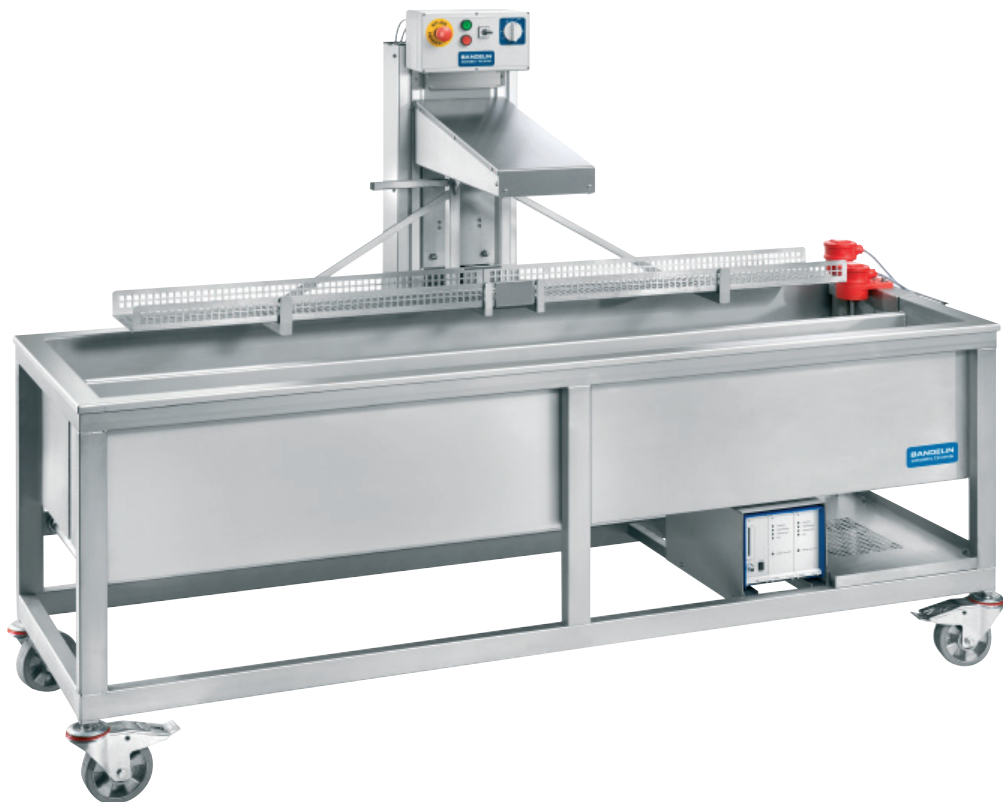


SONOREX TECHNIK

Stainless steel double tank L 220 / L 320 for cleaning and rinsing in one unit and Lifting device LB 220 / LB 320



Example **SONOREX TECHNIK** L 220 with lifting device LB 220 and insert heating H 220

Cleaning units, accessories and cleaning agents have strictly to be used according to the instruction manual or the corresponding product information.

Keep cleaning units and cleaning agents away from children and also away from persons not instructed for correct use by means of these instructions.

In case of improper use, the manufacturer does not take any responsibility for safety and proper functioning. Unauthorized changes/modifications will additionally cause expiration of the C E-conformity.

2416t GB/2018-05

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1 Safety instructions - observe without fail



General

- The unit may only be used for its intended purpose and corresponding to these operating instructions.
- Keep the unit and cleaning agents away from children and also from persons who have not been instructed in their operation by reference to these instructions.
- Do not immerse any parts of the body (e.g. hand, foot) or living beings (animals and plants) in the tank, especially do not immerse them in the cleaning liquid during ultrasonic cleaning.
- Do not bring cleaning agents into contact with eyes or skin.
- Do not consume or breath in cleaning agents.
- The unit is intended exclusively for operation with aqueous cleaning liquids.
- Do not operate the unit without liquids!
- Do not fill any hot water into the ultrasonic tanks. The filling temperature may not be higher than 50 °C.
- Do not put any object to be cleaned in the tank that has aggressive impurities such as acids, chlorine ions, etc.
- Do not fill the tank with the following liquids:
 - combustible liquids, solvents (not aqueous) and non-combustible liquids such as TRI, PER, methylene chloride and similar.
 - aggressive cleaning agents such as acids and chemicals that e.g. contain or split off chlorine ions, such as some disinfectants, dishwashing detergents, household cleaners or salt solutions.
- Do not expose the unit to corroding influences.
- Loss of warranty in the case of unit damage caused by using unsuitable cleaning chemicals/ agents.
- Place the unit in horizontal position on a dry, firm base.
- Keep the unit surface and controls clean and dry!
- Move the unit only when it is empty!
- Empty the tanks **only in switched off condition!**
- Use only the connection material supplied.
- The operating instructions with their safety instructions must remain with the unit and must be observed without fail!
- If the unit is passed on, the operating instructions with the safety instructions must also be handed over.
- All safety instructions of the LG generator operating instructions apply.



Damage and defects

- After removing the packaging, check the housing and controls of the unit for possible transport damage.
If transport damage is found, do not connect the unit to the power supply, but immediately report the damage in writing to the carrier and the supplier.
Keep the original packaging.
- Pull the mains plug out immediately in the case of defects.
- In the case of defects, only authorized skilled personnel or the manufacturer may repair the unit.
- Replace defective parts only by SONOREX original parts or parts of equal quality.
- Replace a defective mains cable completely.

Operation

- Connect the unit only to a grounded socket.
- Observe the environmental conditions (chapter 8).
- When the cleaning liquid is preheated, the liquid must be stirred or ultrasound must be switched on at least every 15 minutes (otherwise delayed boiling – risk of scalding)!
- The ultrasonic energy also heats up the cleaning liquid in the tanks without additional heating. Check the temperature regularly in more lengthy operation.
- Do not place anything on the bottom of the tank, put objects to be cleaned in the suitable accessory (insert basket, etc.).
- Cavitation noises arise during ultrasonic cleaning.
When working continuously within a radius of 5 m from the cleaning tanks or oscillating systems, wear ear protectors for protection against injuries to health!
- The objects to be cleaned must be covered completely with cleaning liquid in every ultrasonic cleaning.
- The ultrasonic cleaning duration is 1 to 15 min according to the contamination and the cleaning liquid used (observe information on the labels).
Ultrasonic cleaning takes longer in the case of stubborn contamination.
- Do not touch moving parts during operation.
- There is a risk of being crushed between tank edge and basket after the lifting device (LB) is switched on.
- Remove/insert objects to be cleaned only with the unit switched off.



2 Purpose

2.1 General description of the unit

With the SONOREX TECHNIK L units slender objects to be cleaned such as venetian blinds, vertical blinds, filters, lamp grids and reflectors can be cleaned and rinsed quickly and thoroughly.

Cleaning and rinsing in the same unit are possible thanks to the double chamber design. The objects to be cleaned are exposed to ultrasound and cleaned in the ultrasonic chamber equipped with immersible transducers.

They are then rinsed in the separate rinsing chamber.

The cleaning process can be supported optionally with a lifting device as well as with an insert heating system. A filtration unit FA can be connected to lengthen the service life of the cleaning liquid.

When additional equipment is used, observe the relevant operating instructions.

The unit is operated at the front. SONOREX TECHNIK L units are designed as floor-standing units.

2.2 CE conformity

The units fulfill the CE marking criteria of the European Directives.

- "Low-voltage directive"
- "Electromagnetic compatibility" directive
- "Machinery directive" (only lifting device)

in their relevant current valid version.

The declaration of conformity can be requested from the manufacturer.

3 Principle of ultrasonic cleaning

The PZT ultrasonic transducers fastened in the immersible transducers convert electrical energy into mechanical energy. These cause the cleaning liquid to oscillate at 40 kHz. Very small vacuum bubbles are formed which implode. This process is called cavitation. Due to the cavitation **contamination is removed quickly, thoroughly and deep down in the pores even at inaccessible places** such as cavities, scores, etc.

Note:

Apart from the desired cleaning effect, cavitation is also the cause of a hissing noise. The VDI directive 2058, sheet 3 is used to assess the process-typical cavitation noise in the ultrasonic cleaning units. 85 dB-AU are stated as limit for the noise level; dB-AU means that the measurement was made with a filter corresponding to DIN IEC 1012.

The cavitation noise is reduced considerably if the ultrasonic tank is covered with a suitable lid. The following also reduce the noise:

- bringing the objects to be cleaned into a different position, e.g. turning,
- changing the immersion depth of the object to be cleaned; placing nothing on the tank bottom,
- changing the filling level of the cleaning bath slightly, possibly draining off or filling some liquid; the filling level must not go below the embossed filling level mark.

4 Scope of delivery and accessories

The unit is delivered completely preassembled with:

1× double tank with immersible transducers

1× LG generator

4.1 Optional accessories

	for type	L 220	L 320
Grating per chamber Dimensions (l×w×h): 1000 × 285 × 110 mm		LR 220 two-part	LR 320 three-part
Lid with handles		D 220 two-part	D 320 three-part
Lid with handles (for unit with heating)		D 220 H two-part	D 320 H three-part

4.2 Additional equipment

	for type	L 220	L 320
Lifting device with oscillation and parallel displacement over the tanks including basket (open at the narrow sides) dimensions (l×w×h) approx.		LB 220 950×215×60 mm	LB 320 1440×215×60 mm
Insert heating with temperature controller 6.3 kW / 7 kW		H 220	H 320
Filtration with prefilter and main filter including connection set		FA 220	FA 320

4.3 Additional equipment for the LG generator

Remote control with timer (1 to 15 min/continuous operation) cable length 7 m	FS 15 L
Remote control cable with 7 m cable length, one end with plug	FS 7

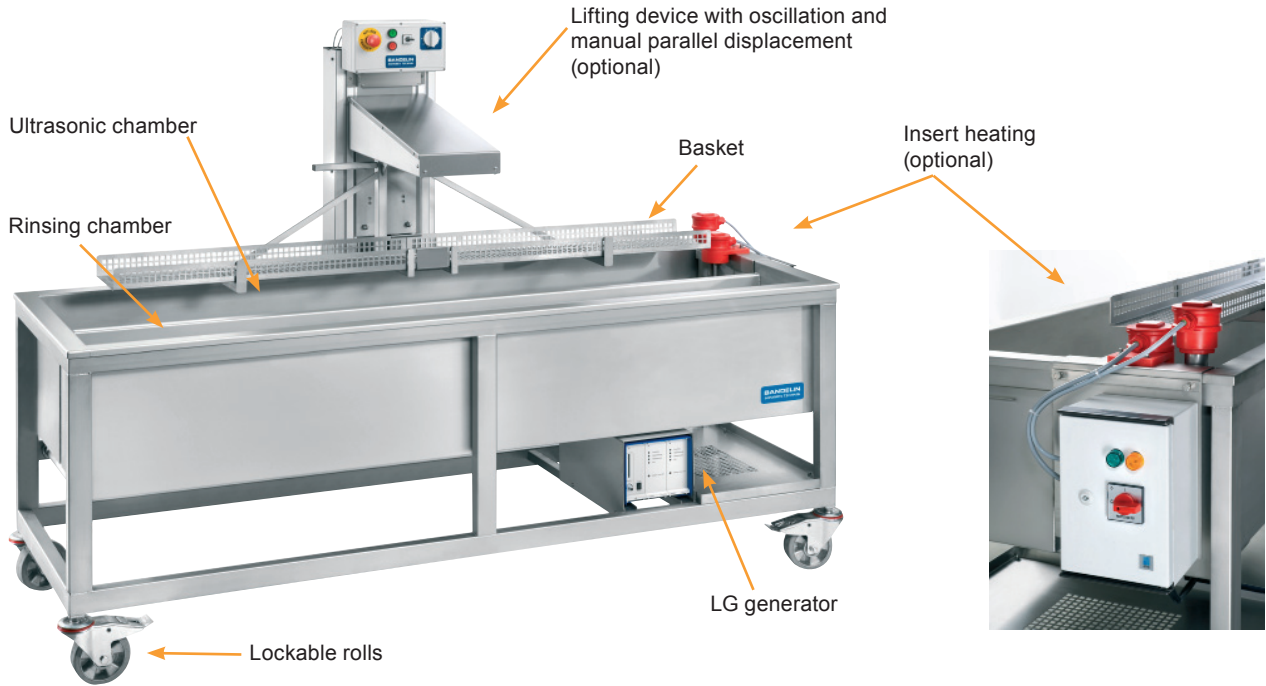
Note:

The additional equipment for the LG generator is expedient only for operation without lifting device. For operation with lifting device, an operating cable is already connected in the factory to the remote control connection of the LG generator.

5 Unit construction

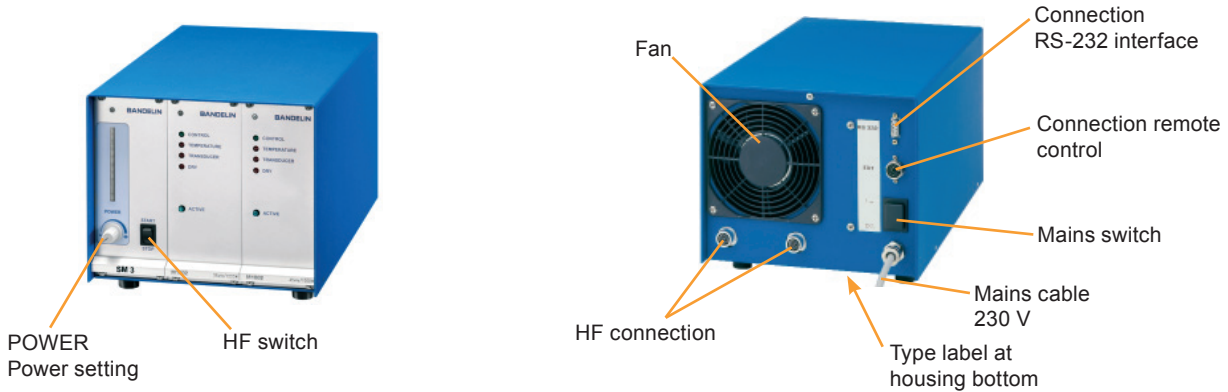
Example of SONOREX TECHNIK L 220 double tank with lifting device LB 220 and basket as well as insert heating H 220 in the ultrasonic chamber.

5.1 Overall construction

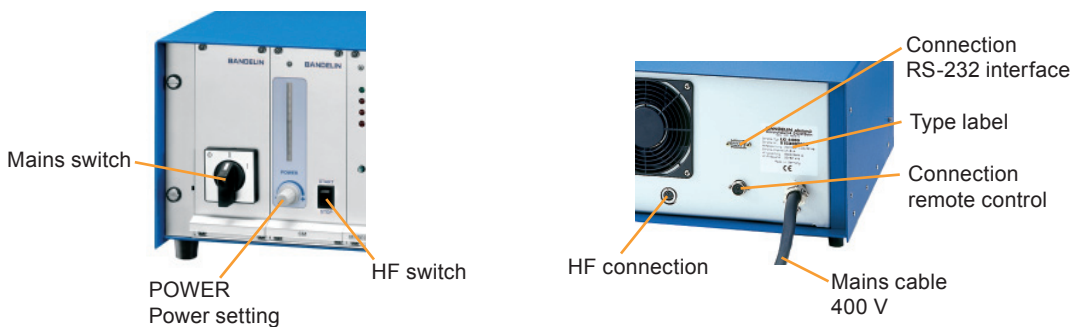


5.2 LG generator

Illustration: LG 2002 T - front and back



Detail illustration: LG 4004 F - front and back



5.3 Lifting device LB

In operation together with the lifting device, the SONOREX TECHNIK L unit is operated at the operating panel of the lifting device.

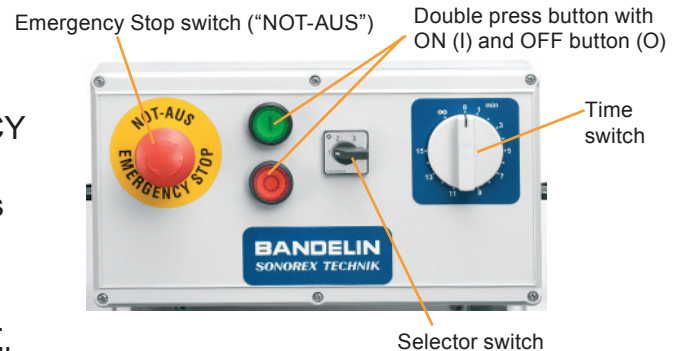
Description of the operating panel

EMERGENCY Stop switch

In the case of danger press the red EMERGENCY stop switch → the lifting device is out of operation. The basket is not brought back into its initial position. To unblock again, turn the knob to the left. The oscillation is stopped in spite of unblocking the emergency stop (safety reasons). The oscillation will be continued or the basket will be lifted to its final position only if the green ON (I) button will be pressed.

Caution:

The EMERGENCY Stop switch operates the lifting device only. Ultrasound and further peripheral devices possibly connected must be shut down separately.



Double press button

The lifting device must be provided with electrical power by using the green ON button (I), e.g. after switching off or after the EMERGENCY STOP button has been pressed.

After finishing work, the lifting device must be switched off or deactivated with the red OFF button (O) .



ON/OFF switch

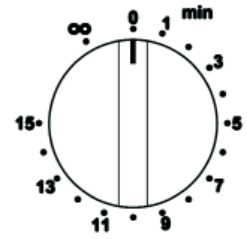
Controls LG generator and lifting device

Switch position	LG generator	Lifting device LB
Position 1	off	on
Position 2	on	on
Position 3	on	off

Time switch

Setting the required operating time, either to continuous or short-time operation.

If the time switch on the lifting device is set back to "0" during operation, the oscillation is interrupted and the basket is lifted back into the initial position.



Continuous operation (position ∞)

- Turn the knob to the left until it snaps into place.
- The unit does not switch off automatically. To switch off, turn the knob to the right back to "0".

Short-time operation

- Set the knob to the right to the required time.
- The time switch switches off automatically after the end of the time.
- The time can be shortened or the unit switched off by turning the knob back.

Note

An "engaging" of the time switch is barely felt if mains voltage is not present, e.g. if the mains plug is disconnected or the fuse is blown.

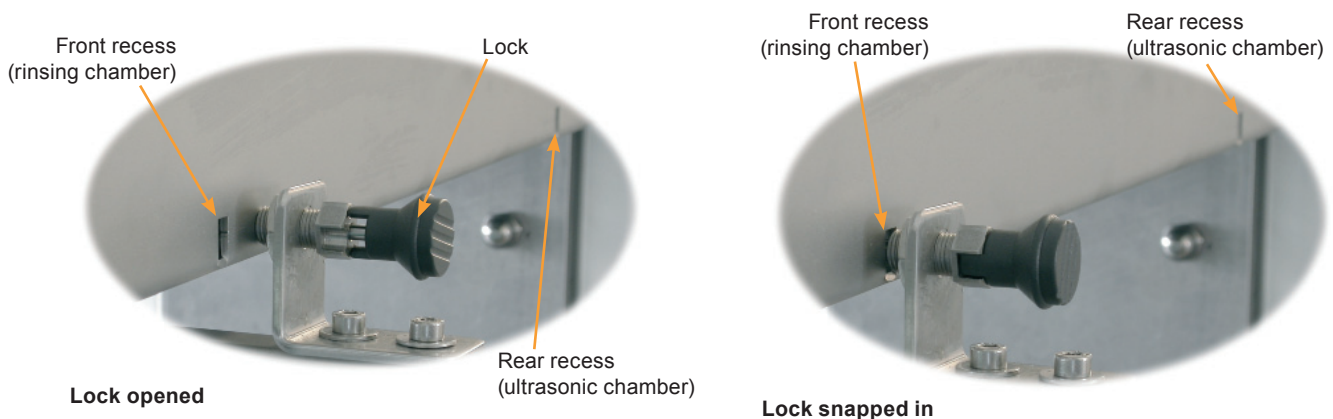
The time switch only works if mains voltage is present.

5.3.1 Locking the parallel displacement

The lock is located on the right side of the lifting device.

It can be loosened by pulling it out and turning it (90°). Then the basket can be pushed manually over the ultrasonic chamber or over the rinsing chamber. The correct position of the basket is reached at the front or back stop.

Secure the lock by turning (90°) and letting it snap into the recess.



Note:

The oscillation of the lifting device can only be switched on if the lock has snapped in correctly.

6 Installation and connections

After removal of the packaging, check the unit, LG generator, if necessary additional equipment such as lifting device, filtration and insert heating for possible transport damage! If transport damage is found, do **not** connect the corresponding unit(s) to the mains, but report the damage **immediately in writing** to the delivering carrier and the supplier!

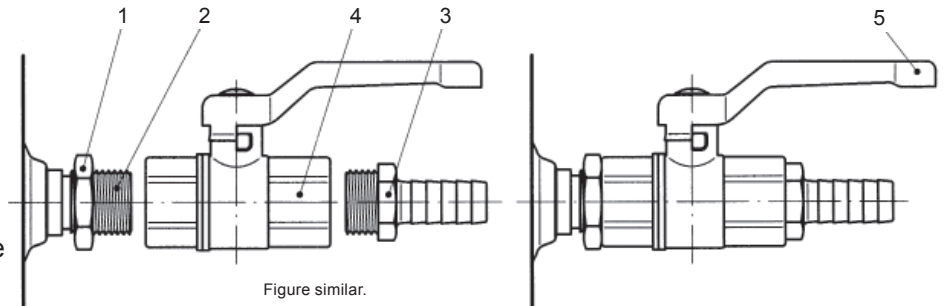
Keep the original packaging!

- ① Install the cleaning unit in a dry room and secure it with the lockable rollers.
- ② Fit the separately packed ball valves for each tank at the outlet as follows.
 1. Wind the white PTFE sealing tape in several layers to the right round the threaded pipe end 2.
 2. Wind PTFE tape round the thread of the hose socket 3.
 3. Screw the hose socket 3 into the outlet of the ball valve 4, use the wrench SW 38 for this.
 4. Screw the ball valve onto the threaded pipe end.

Caution:

Do not screw the ball valve on up to the stop or screw it back by turning it slightly to the left, this would cause the PTFE tape to lose its sealing effect.

5. Secure the ball valve against turning with the lock nut 1 (already screwed on on delivery), use a wrench SW 46 for this.
6. Close the ball valves, turn the lever 5 to the left up to the stop for this purpose.



- ③ Place the gratings on the bottom of the ultrasonic and rinsing chambers.
In operation with lifting device, place the basket for the objects to be cleaned on the basket holder of the lifting device.
- ④ Check switch positions on the LG generator.
The mains switch and the HF switch must be in the "OFF" position:
LG 2002 T → Mains switch to "0", HF switch to "STOP"
LG 4004 F → Toggle switch to "0", HF switch to "STOP"
- ⑤ Check connections of the immersible transducers:
HF cable → If the plugs are not correctly plugged in and locked this can lead to failure of the connection (scorching) or of the LG generator.
- ⑥ Connect the LG generator to a grounded socket:
LG 2002 T → 230 V~ (± 10 %) 50/60 Hz
LG 4004 F → 400 V (± 10 %) 3N~ 50/60 Hz
In operation with lifting device, connect mains plug of the LG generator to the integrated grounded socket of the lifting device.

⑦ Connect peripheral devices if necessary ⇒ observe separate operating instructions. Before connection check that every device is switched off.

- Unscrew transport protection devices on the lifting device. Check that the connection of the remote control is plugged in correctly on the LG generator. Only then connect the **lifting device LB 220/320** to three-phase current **400 V (± 10 %) 3N~ 50/60 Hz** and **check the correct rotating field direction of the socket.**

The red control lamp (OFF button) on the control box lights up for a maximum of 3 seconds.

If the red control lamp glows permanently, authorized personal has to check:

1) Are the voltages of the phases at the socket correctly?

If yes,

2) two phases in the three-phase plug must be changed around 180°. Therefore turn the two pins in the middle with a screwdriver.



< 3 s



- Connect **filtration FA 220/230** with the enclosed connection material with the ultrasonic cleaning bath and connect it to a grounded socket **230 V~ (± 10 %) 50/60 Hz**.
- Connect **insert heating H 220/320** to three-phase current **400 V (± 10 %) 3N~ 50/60 Hz**.

7 Start-up

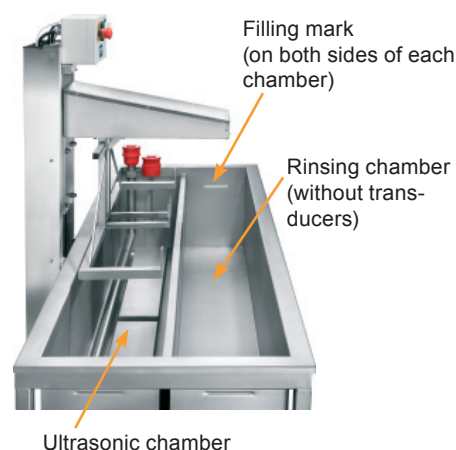
7.1 Filling

Fill ultrasonic chamber with water and TICKOPUR R33 venetian blind and vertical blind cleaner, application 3%, up to the filling level mark.

Fill the rinsing chamber with water up to the filling level mark.

Unit	Working filling quantity			
	Ultrasonic chamber			Rinsing chamber
	Water	+	TICKOPUR R 33	Water
L 220	179.5 l	+	5.5 l	205 l
L 320	262 l	+	8.0 l	295 l

View with lifting device without basket



Notes:

- The liquid may not sink below the filling level mark, to **protect the unit against irreparable damage** by the ultrasonic transducers running dry.

Notes on temperature / heating

- Switch the insert heating on separately ⇒ Observe separate operating instructions.
- During preheating of the cleaning liquid, the liquid must be stirred or ultrasound must be switched on at least every 15 minutes (delayed boiling!).
- Ultrasound also heats up the cleaning liquid in the ultrasonic cleaning bath without additional heating.
- The temperature of the cleaning liquid can rise over the setting value in continuous operation and by covering the ultrasonic bath.
- Cover the ultrasonic cleaning bath in continuous operation so that not too much cleaning liquid evaporates.
- For safety reasons ultrasonic cleaning baths and rinsing baths should be covered when not in operation, to prevent operating and external personnel inadvertently grasping in the cleaning and rinsing liquid and injuring themselves in liquids that are still hot.

7.2 Degassing

Degassing the cleaning liquid increases the cleaning effect.

Cleaning liquids contain dissolved gases (e.g. oxygen) which reduce the ultrasonic effect. Therefore degas freshly filled cleaning liquid or cleaning liquid remaining in the ultrasonic chamber for a longer time for around 30 min.

The cavitation noise changes during degassing, loud degassing noises arise at the end of the degassing process, the unit apparently works more quietly. A lower noise level means no reduction of the ultrasonic power, but the end of the degassing process and an improvement of the cleaning effect.

7.2.1 Degassing without lifting device

- Switch LG generator on:
LG 2002 T → Mains switch to "I",
LG 4004 F → Toggle switch to "I"
- Switch ultrasound on for 30 min: HF switch on the LG generator to "START".

7.2.2 Degassing with lifting device

- Switch LG generator on:
LG 2002 T → Mains switch to "I",
LG 4004 F → Toggle switch to "I"
- HF switch on the LG generator to "START".

Operation is then exclusively at the lifting device:

- Selector switch to "3"
- Switch on the lifting device by pressing the green ON button (I)
- Set time to continuous operation (for 30 min). Ultrasound is switched on automatically.

Caution

The unit does not switch off automatically!

7.3 Cleaning

Cleaning takes place in the ultrasonic chamber.

Before the unit is switched on, the objects to be cleaned must be placed on the grating or, in operation with the lifting device, in the basket. Do not place anything on the ultrasonic immersible transducers on the bottom of the ultrasonic chamber.

Place the more strongly contaminated side downwards and do not stack too many parts on one another, ultrasound is absorbed.

Check the filling level, especially after a longer period not in use or longer operation. (For more information see chapter 7.1.)

7.3.1 Cleaning without lifting device

- Switch LG generator on:
LG 2002 T → Mains switch to "I",
LG 4004 F → Toggle switch to "I"
- Switch ultrasound on: HF switch on the LG generator to "START", if necessary set the required cleaning time on the timer of the remote control FS 15 L.
- Rinse the objects to be cleaned after ultrasonic cleaning manually in the rinsing chamber.

Note:

In a longer period not in use switch the LG generator off:

LG 2002 T → Mains switch to "0",

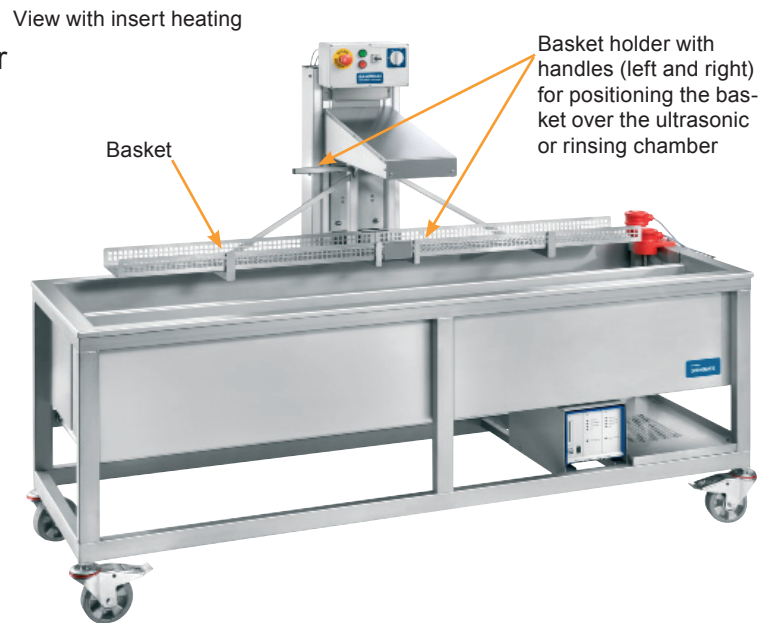
LG 4004 F → Toggle switch to "0"

7.3.2 Cleaning with lifting device

- Push basket holder with objects to be cleaned over the ultrasonic chamber (rear position, up to the stop - refer to chapter 5.3.1).
- Switch LG generator on:
LG 2002 T → Mains switch to "I",
LG 4004 F → Toggle switch to "I"
HF switch on the LG generator to "START".

Operation then exclusively at the lifting device:

- Selector switch to "2"
- Switch on the lifting device by pressing the green ON button (I)
- Set time switch to required time.
The lifting device lowers the basket automatically into the tank and begins with oscillation. Ultrasound is switched on automatically.
- After the end of the set time or setting the time switch back to "0", the basket lifts back automatically into the initial position, ultrasound is switched off.



Caution:

The unit does not switch off automatically in continuous operation!

Note:

When not in use for a long time, set the double press button on the operating panel back to "0".

7.4 Rinsing

Rinsing takes place in the rinsing chamber after cleaning.

7.4.1 Rinsing without lifting device

For rinsing place or set the objects to be cleaned on the grating in the rinsing chamber.

Note on rinsing with an external hand shower:

Empty the chamber or leave the ball valve open.

7.4.2 Rinsing with lifting device

- Pull basket holder with objects to be cleaned over the rinsing chamber up to the stop - refer to chapter 5.3.1).

Operation exclusively at the lifting device:

- Selector switch to "1"
- Switch on the lifting device by pressing the green ON button (I)
- Set time switch to required time.
The lifting device lowers the basket automatically into the tank and begins with oscillation.
- After the end of the set time, the basket is automatically lifted back into the initial position.

Caution:

The unit does not switch off automatically in continuous operation!

Note on rinsing with an external hand shower:

- Empty the chamber or leave the ball valve open.
- Stop basket in the lower bath position: press the double press button - red OFF button (O) during the oscillation.
- After the rinsing process has ended, switch selector switch back to "I" and set time switch to "0"
-
the basket moves back to its initial position.

7.5 Emptying

Before emptying the baths, especially the ultrasonic chamber, check that ultrasound is switched off.

7.5.1 Emptying without lifting device

- Switch ultrasound off: HF switch on the LG generator to "STOP".
- Switch LG generator off:
LG 2002 T → Mains switch to "I",
LG 4004 F → Toggle switch to "0"
- Open the ball valve of the corresponding chamber or both ball valves.

7.5.2 Emptying with lifting device

- Switch ultrasound off: HF switch on the LG generator to "STOP".
- Switch on the lifting device by pressing the green ON button (I)
- Open the ball valve of the corresponding chamber or both ball valves.

8 Technical data

8.1 Ultrasonic cleaning bath L 220 / 320

Unit	L 220	L 320
Internal dimensions per chamber (l × w × d) in mm	2200 × 300 × 300/370*	3200 × 300 × 300/370*
Working capacity in l	185/205*	270/295*
Material of the chambers	Stainless steel, non-rusting	
Outflow per chamber	G 1	
Total outside dimensions (l × w × h) in mm	2320 × 750 × 850	3320 × 750 × 850
Ultrasound power / immersible transducers	2000 W / 2 × T 4024 AB	4000 W / 4 × T 4020 AB
HF frequency	40 kHz	
type	B (bolt version)	
Material	Stainless steel 1.4571, 2 mm, non-rusting	
Power consumption in kW	2.5	4.5
Mains fuse in A	16**	3 × 16
Net weight in kg	260	330

* Ultrasonic/rinsing chamber

** on delivery with lifting device 3 × 16 A

8.2 LG generator

Overload protection, short circuit and no-load resistant, radio interference suppressed and C E marked. Compliance with the limits according to EN 55011, EN 61000-6-1/08.2002, EN 61 010-1 and EN 60 204-1.

For operation see separate operating instructions.

LG 2002 T	230 V~ (± 10 %) 50/60 Hz, mains cable length 2 m
LG 4004 F	400 V (± 10 %) 3N~ 50/60 Hz, mains cable length 2 m
HF frequency	40 kHz
Degree of protection	IP 20

Environmental conditions according to EN 61 010-1

Overvoltage category:	II
Degree of contamination:	1
Permissible ambient temperature:	5 to 40 °C
Permissible relative humidity up to 31 °C:	80 %
Permissible relative humidity up to 40 °C:	50 %

Non-condensing.

Only for indoor operation.

8.3 Lifting device LB 220 / LB 320

Mains connections:	400 V (± 10 %) 3N~ 50/60 Hz, mains cable length 5 m
Load:	max. 40 kg
Frequency:	15/min
Amplitude:	40 mm
Degree of protection	IP 20

Lifting devices are radio interference suppressed and $\text{C} \in$ marked.

Agreement with DIN EN 60204-1 and compliance with the limits according to EN 61000-6-1 and EN 61000-6-3.

Environmental conditions according to EN 61 010-1

Degree of contamination:	1 to IEC 60664-1:11.02
Overvoltage category:	II
Permissible ambient temperature:	5 to 40 °C
Permissible relative humidity up to 31 °C:	80 %
Permissible relative humidity up to 40 °C:	50 %

Non-condensing.

Only for indoor operation.

9 Cleaning and care

- Keep the units clean and dry.
- Renew consumed cleaning liquids in the ultrasonic chamber, do not freshen up by after dosing.
- Layers of dirt on the sound emitting surface of the immersible transducers reduce the power and must therefore be removed. To do this drain liquid from the chamber and clean immersible transducers with a soft cloth and commercially available stainless steel care agents without abrasive additives, do not use any steel wool, scratchers or scrapers for this.
- If after longer use edges remain on the stainless steel surface of the chambers, remove these with a commercially available stainless steel care agent without abrasive additives.
- Observe maintenance and care instructions of the filtration unit that may be connected by reference to its operating instructions.
- In the case of an operating fault of the LG generator, observe the instructions of the separate operating instructions.

Note on stainless steel

BANDELIN uses non-rusting stainless steel 1.4571 for the manufacture of the ultrasonic tanks. Nevertheless, if rust spots are noticed on the stainless steel surface of the oscillating tank, then the cause is extraneous rust, caused by “disturbance factors” coming **from the outside**, such as

- rust particles (iron oxide) or rusty metal particles from the water piping system or from objects to be cleaned that are susceptible to rust,
- metal parts such as screws, metal chips, metal dust left lying on the stainless steel surface.

In time extraneous rust penetrates the passive layer of the stainless steel, “activates” it and there is pitting corrosion, especially on the sound emitting surface. Apart from extraneous rust, media which split off chloride ions, for example, during ultrasonic cleaning also lead to pitting corrosion on the stainless steel.

Pitting corrosion is a locally non-uniform corrosion attack, characterized by pinpoint sized black holes, which destroys the stainless steel.

How can extraneous rust on stainless steel be prevented?

- Use water with at least drinking water quality.
- Remove metal parts, chips etc., lying on the stainless steel surface.
- Remove small rust spots **immediately**, to do this use a soft cloth with commercially available stainless steel cleaning liquids without abrasive additives. Do not use any steel wool, scratchers or scrapers.
- Do not fill the ultrasonic cleaning tank with any chemicals that split off chorine ions (acids, some disinfectants, washing-up liquids, household cleaners, salt solutions).
- **TICKOPUR agents** are recommended for ultrasonic cleaning.
- Observe the dosage instructions of the cleaning liquid manufacturer.

9.1 Maintenance and service

9.1.1 Maintenance

The vertical guide rails (hard chrome plated) must be cleaned and lightly greased (any non-acidic grease) at regular intervals (around 4 weeks) to prolong their life.

10 Recommendation for the cleaning agent

The highest cleaning effect is achieved with the TICKOPUR R 33 agent. It has been developed especially for ultrasonic cleaning, promotes cavitation, is environmentally sound since biologically decomposable and thus easy to dispose of.

TICKOPUR R 33

- Cleaning concentrate, material-conserving, mildly alkaline, pH 0.0 (1%)
- Application 3%
- Removes general contamination, grinding, polishing and lapping residues, residues containing oil and grease, soot, ink, etc., from metal, glass, ceramics, plastics and rubber.

- Order No.: Contents:

831	5 l
835	25 l
837	200 l