BANDELIN
Ultraschall seit 1955

Operating Instructions

SONOREX TECHNIK

High-performance ultrasonic and rinsing baths

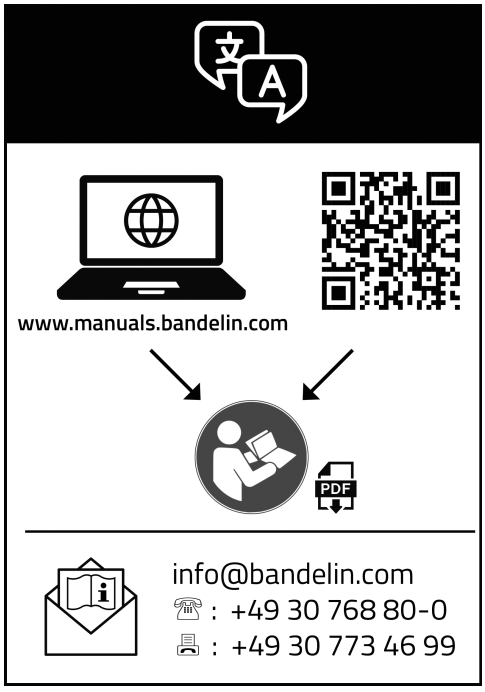
Valid for:

RM 16.2 /U /H /UH

RM 40.2 /U /H /UH

RM 75.2 /U /H /UH

23846-000 en/2022-11



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Certified in accordance with ISO 9001 and ISO 13485

Table of contents

1 About this operating manual

These instructions for use contain necessary and useful information on how to operate the ultrasound bath safely and efficiently.

- Read these instructions for use before using the ultrasound bath.
- Pay special attention to chapter **2 Safety**.
- If you pass this ultrasound bath on to others, please enclose these instructions for use.
- Contact your specialist dealer or BANDELIN if any of your questions are not answered in these instructions for use. Information on service can be found in chapter **6.4 Repair**.

Illustrations are provided as examples and are not to scale.

2 Safety

2.1 Use of the device

The devices are intended for the sonication of aqueous liquids. The sonication of non-aqueous or flammable liquids is not permitted. They work on the basis of low-frequency ultrasound and can be used in versatile ways. Their main application is the gentle and intensive cleaning of objects of diverse shapes, types and sizes.

A solution of water and a special ultrasound preparation is used as the sonication liquid. Information on the sonication liquid can be found in chapter **5.2 Sonication liquid**.

Objects to be treated may not be placed on the bottom of the oscillating tank. They must be placed in the sonication liquid in an insert basket or another suitable container. An overview of suitable accessories can be found in chapter **9 Accessories**.

Do not operate the ultrasound bath while unattended.

2.2 Keep out of reach of children

Children cannot identify hazards posed by the ultrasound bath. Therefore, keep the ultrasound bath out of the reach of children.

2.3 Danger of electric shock

The ultrasound bath is an electrical device. Failure to follow safety rules can result in a life-threatening electric shock.

- Protect the ultrasound bath from moisture and wetness. Keep the surface and controls clean and dry.
- Only transport the ultrasound bath in empty condition.
- Only drain the ultrasound bath when it is switched off.
- Do not spray or expose the ultrasound bath to splashing water.
- Always disconnect the ultrasound bath from the mains before cleaning or maintenance.
- Only connect the ultrasound bath to a power outlet with a grounded socket.
- If you notice a defect in the ultrasound bath, disconnect the mains plug immediately. Do not connect a defective ultrasound bath to the mains.
- Repairs should only be carried out by the manufacturer. See chapter **6.4 Repair**.
- Position the ultrasound bath so that it is easy to unplug the mains connection at any time and without difficulty.

2.4 Harmful to health due to ultrasound noise

The ultrasound noise typical of the process can be perceived as very unpleasant. Remaining within a radius of 5 m for an extended period of time may cause damage to health.

- Wear suitable hearing protection.
- Use a lid to reduce noise.

2.5 Hazards due to high temperature

The ultrasound bath, the sonication fluid and the sonication objects can become hot during operation. Contact with these products may cause burns. The temperature can be set at up to 80 °C.

Ultrasound energy warms up the sonication fluid even without additional heating. Prolonged ultrasound operation can lead to very high temperatures. In an ultrasound bath with heating, the set temperature can be significantly exceeded by the energy of the ultrasound.

- Observe the treatment times recommended by the manufacturer of the ultrasound preparation. Do not leave the ultrasound switched on for longer than necessary.
- Do not reach into the sonication fluid with your hand. Remove sonication objects with the insert basket or forceps.
- Allow the sonication objects to cool before touching them.
- When lifting from the handles, the hands may touch the edge of the tank which could be very hot.

In the case of high-boiling liquids, the bath temperature can rise to over 120 °C due to the energy input of the ultrasound. This can lead to fires and severe burns.

- Do not use combustible, explosive, non-aqueous liquids (e. g. petrol, solvents) or mixtures with combustible liquids (e. g. alcoholic solutions) directly in the stainless steel oscillating tank.

2.6 Danger due to ultrasound

The strong ultrasound in the ultrasound bath destroys cell structures. If a body part is immersed in the sonication fluid during operation, this can lead not just to skin damage, but also to internal tissue damage. On fingers, the periosteum can become damaged.

- Do not touch the sonication fluid during operation.
- Never sonicate living beings.

2.7 Danger due to preparations used

Preparations used in the ultrasound bath may be toxic or corrosive. They can irritate the eyes, skin and mucous membranes. Vapours and aerosols can also be dangerous.

- Wear gloves and safety goggles when handling hazardous preparations.
- Do not ingest the preparations and do not allow them to come into contact with the eyes or skin. Do not lean over the ultrasound bath, in order to avoid vapours from coming into contact with the eyes or from being inhaled.
- Place a lid on the ultrasound bath during operation. In case of dangerous vapours, use a suction device.
- Observe the information on the label and in the safety data sheet of the preparation.
- Keep the preparations away from children and untrained persons.

2.8 Disposal of sonication liquid

Dispose of the sonication liquid in accordance with the specifications of the manufacturer of the ultrasound medium used. The recommended ultrasound media in the TICKOPUR product line by DR. H. STAMM GmbH are biodegradable in accordance with the provisions of Regulation (EC) No. 648/2004 (Detergents Regulation). If necessary, the sonication liquid must be neutralised before disposal.

Depending on the type of contamination involved, water-polluting substances like oils or heavy metal compounds may be introduced to the sonication liquid during cleaning. If the threshold values for these substances are exceeded, the sonication liquid must be processed or disposed of as special waste.

Observe local wastewater regulations.

2.9 Erosion of the oscillating tank

The surface of the oscillating tank is subject to erosion. How quickly this erosion takes place depends on the use of the ultrasound bath. The erosion leads to leakage in the oscillating tank. Bath liquid can thus penetrate into the interior of the ultrasound bath. Moisture on electrical components can cause an electric shock or fire.

- Stop using the ultrasound bath if you notice a leak. Disconnect the mains plug immediately. Empty the oscillating tank.

You can extend the lifespan of the oscillating tank by observing the following instructions:

- Replace sonication fluid that is visibly contaminated by particles.
- Only use demineralised water (DI water) with an ultrasound-compatible preparation.
- Do not use chemicals that contain or release chloride ions in the oscillating tank. This is the case with some disinfectants, household cleaners and dishwashing detergents. Chloride ions will corrode stainless steel.
- Only use the ultrasound bath with accessories that are suitable for the device and the objects to be treated, e.g. a basket. Do not place any objects to be treated directly on the bottom of the oscillating tank. An overview of suitable accessories can be found in chapter **9 Accessories**.

2.10 Preventing damage to the ultrasound bath

- Only use aggressive preparations in inset beakers or insert tubs. When working with aggressive preparations, avoid splashing in the contact liquid or on the stainless steel surface. Immediately replace contaminated sonication fluid. Clean surfaces and wipe them dry.
- If strongly acidic preparations are used, the ball of the ball valve can become corroded. The ball valve will leak. If the use of a strongly acidic detergent cannot be avoided, use a stainless steel ball valve.
- Do not operate the ultrasound bath without sonication fluid in the oscillating tank. Make especially sure that the heating is switched off when the oscillating tank is empty. The fill level must always be at or slightly above the filling level mark.

2.11 Disturbance of wireless communication

The ultrasound bath may interfere with other wireless communication ultrasound baths in the immediate vicinity, such as:

- mobile phones,
- WLAN devices,
- Bluetooth devices.

If interference occurs with the operation of a wireless device, move it further away from the ultrasound bath.

The ultrasound bath meets the requirements for class B devices according to EN 55011.

2.12 Safety stickers on the ultrasound bath

- Observe all safety labels on the ultrasound bath.
- Keep the safety stickers in legible condition. Do not remove them. Replace them if they are no longer legible. To do so, please contact our Customer Service. See chapter **6.4 Repair**.

2.13 Do not overload accessories

Observe the specified load-bearing capacity or resilience of the respective accessory used.

- Accessories can be baskets and holders.
- The required data can be found in the appendix or in the dimension sheet. If you do not have this data, contact the manufacturer.

3 Design and function

3.1 Structure

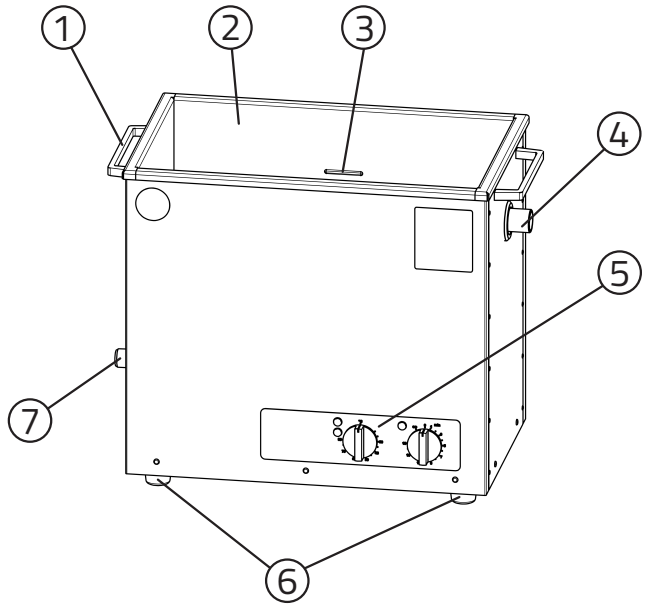


Fig. 1 Overview of the device

1 Handles
2 Tank
3 Filling level mark
4 Connector socket – overflow
5 Control panel
6 Device feet
7 Connector socket – outlet

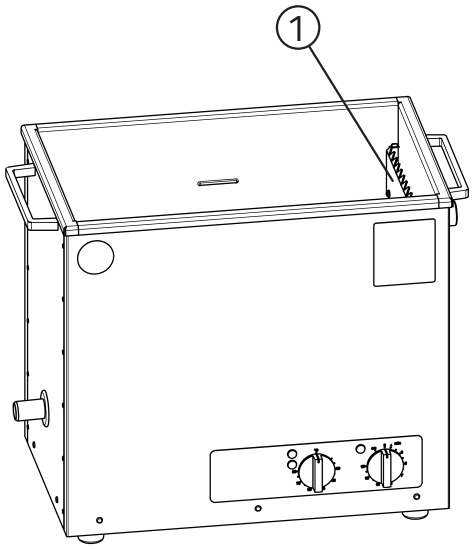


Fig. 2 Overview of the device

1 Overflow gutter

3.2 Control panel

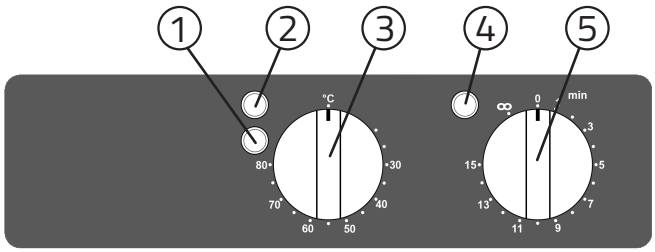


Fig. 3 Operating elements for all devices with ultrasound (U) and heating (H)

Fig. 4 Operating elements for all devices with ultrasound (U) only

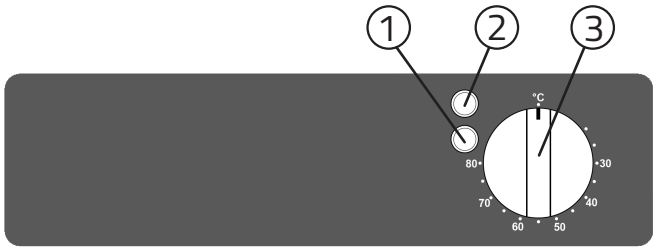


Fig. 5 Operating elements for all devices with heating (H) only

1 Yellow indicator light, on models with heating (H)
When lit: heating is turned on
2 White indicator light, on models with heating (H)
- When lit: heating is turned on
- When lit: heating regulation active
3 Turning knob to adjust the heating temperature
4 Green indicator light, on models with ultrasound (U)
When lit: ultrasound is turned on
5 Turning knob to set the ultrasound duration

3.3 Function

The ultrasound bath uses cavitation triggered by low-frequency ultrasound. Piezoelectric oscillating systems are located on the underside of the oscillating tank. The ultrasound generates strong pressure fluctuations in the sonication liquid. Cavitation bubbles are formed at the pressure minima. At higher ambient pressure around the bubbles, they collapse very quickly. This results in strong local microcurrents on the surfaces of the objects being treated. This removes dirt from the surface of the objects. Dirt particles are removed and fresh sonication liquid flows in.

The device uses SweepTec®, a technology in which the ultrasonic frequency often fluctuates around the operating frequency. The optimal operating frequency depends on the load, filling level, temperature and type of sonication liquid. The operating frequency can deviate significantly from the nominal frequency. SweepTec® creates an especially homogeneous ultrasonic field in the bath volume for consistently optimal results.

4 Preparation for operation

4.1 Installation site requirements

The installation location of the ultrasound bath must meet the following conditions:

- The installation surface must be horizontal, firm and dry.
- The load-bearing capacity must be sufficient for the ultrasound bath with the sonication liquid. For weight and work content, see chapter **8.1 Technical data**.
- Adequate ventilation must be ensured. The air supply under the bottom of the device may not be obstructed.
- A water connection should be available nearby to fill the ultrasound bath. A basin must be available to drain or pour out the sonication fluid.

4.2 Fitting ball valve

Mount the supplied 3-way ball valve, the hose sockets and the hoses according to the enclosed installation instructions.

4.3 Performing a function test

Requirement

- The device has adapted to the climatic conditions at the setup location for at least 2 hours.

Procedure

1. Make sure that the ultrasound bath is switched off.
   If present, the turning knob to set the ultrasound duration must be set to “0”.
   If present, the turning knob to set the heating temperature must be set to “°C”.
2. Plug the power cord of the ultrasound bath into a socket with earthing contact.
3. Briefly switch on the ultrasound. To do this, turn the knob to the right for the ultrasound duration, and turn it back to “0” after 1 to 2 seconds.

Results

» A noticeable noise can be heard when the ultrasound is switched on.

Contact our service department if you cannot hear any noise.

4.4 Rinse the tank

Thoroughly rinse the device's tank with water before first use.

In order to protect the surface during transport and storage, the ultrasound bath is covered with an oily preservative. Before the ultrasound bath is put into service, this preservative must be removed with a suitable cleaning agent.

5 Operation

5.1 Ultrasonic operation

The objects to be treated are introduced in the oscillating tank with suitable accessories, e.g. a basket. There they have direct contact with the sonication liquid.

For suitable accessories for sonication, see chapter **9 Accessories**.

5.2 Sonication liquid

A solution made from water and a special ultrasound agent is used as the sonication liquid. Drinking water or demineralised water can be used for the water.

Water without any additives is unsuitable for sonication. Use of demineralised water without an ultrasound agent leads to increased erosion of the ultrasonic oscillating tank.

The ultrasound agent used must foster cavitation and be biodegradable, easy to dispose of, material-compatible and long-lasting. BANDELIN recommends ultrasound agents from the TICKOPUR, TICKOMED and STAMMOPUR product ranges from DR. H. STAMM GmbH, see chapter **Recommended agents**.

- Telephone advice: +49 30 76880-280
- Internet: www.dr-stamm.de

Observe the information on dosing provided by the ultrasound agent manufacturer.
You can calculate the required quantities of ultrasound agent and water yourself:

31 l ready-to-use solution, 2%

Calculation of agent:

$$\frac{31\ \text{l} \times 2\ \%}{100\ \%} = 0{,}62\ \text{l}$$

Calculation of water volume:

31 l - 0,62 l = 30.38 l

5.3 Sonication time

NOTICE

Risk of damage to the goods to be treated
Excessively long sonication can damage the surface of the goods to be treated.
- Select a short sonication time where possible.

The ideal sonication time depends on several factors:
- Type and concentration of agent
- Working temperature of sonication fluid
- Type of soiling
- Type of goods to be treated, in particular materials

Note the information on the recommended sonication time from the agent manufacturer. To begin with, select as short a sonication time as possible to protect the objects to be sonicated and the ultrasonic oscillating tank. Check the result. Lengthen the sonication time if the result is not sufficient.

5.4 Pour in sonication liquid

⚠ CAUTION

Risk of scalding
- Do not pour hot water into the ultrasonic oscillating tank.
- Maximum filling temperature: 50 °C.

NOTICE

Damage due to condensation in the ultrasonic bath
At high humidity, condensation forms inside the device if you fill it with cold water.
- Do not pour cold water into the ultrasonic oscillating tank when humidity is high.

NOTICE

If you use an agent in powder form, do not pour it directly into the ultrasonic oscillating tank.
- Mix agents in powder form in another container before you pour them into the ultrasonic oscillating tank.
- Only pour the agent into the ultrasonic oscillating tank once it has dissolved completely.

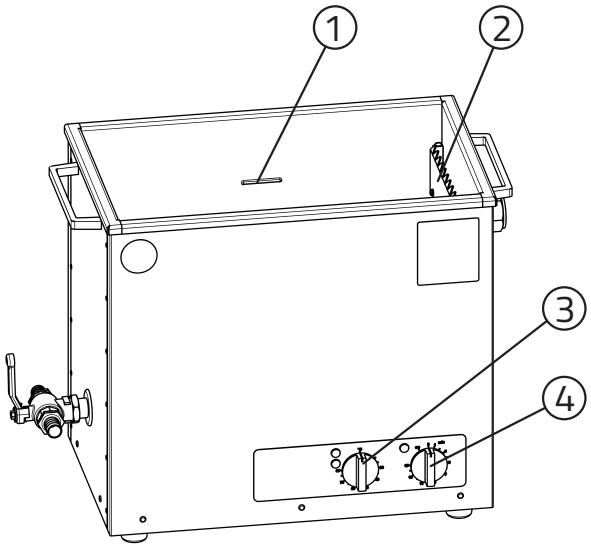


Fig. 6 Fill oscillating tank

1 Filling level mark
2 Overflow gutter
3 Turning knob to adjust the heating temperature
4 Turning knob to set the ultrasound duration

Requirements

- The 3-way ball valve must be closed.
- The ultrasound and heating must be turned off.

Procedure

1. Fill the ultrasonic oscillating tank with water up to ⅓.
2. Pour the correct quantity of agent into the ultrasonic oscillating tank.
3. Fill the tank with water up to the filling level mark while avoiding foam formation.

Results

» The device is ready to switch on.

5.5 Switching the sonication on and off

Requirements

- The oscillating tank is filled.
- The mains plug is plugged into a socket with earthing contact.

Procedure

1. If there is a lid, place it on the ultrasound bath.
2. Rotate the turning knob for the ultrasound duration to the desired sonication time or to the ∞ symbol for continuous operation.
   » The ultrasound is switched on. The sound from the ultrasound can be heard.
   » The green indicator light is lit.
   » If the turning knob is not set to ∞, it will slowly move counter-clockwise, indicating the remaining sonication time. As soon as it is set to "0", the ultrasound switches off.
3. To switch off the sonication, rotate the turning knob to "0" for the ultrasound duration.
   » The green indicator light goes out.

Information

- You can turn the knob in both directions.
- You can extend, shorten or switch off the sonication at any time.
- The timer only works if mains voltage is present. Without mains voltage, the locking of the turning knob can hardly be felt.

5.6 Switching the heating on and off

WARNING

Risk of scalding

During heating, vapour bubbles can rise explosively under certain conditions (boiling delay).

- Stir the sonication liquid occasionally during heating or switch on the ultrasound.

Heated sonication liquid intensifies the effect of the ultrasound. Experience has shown that the best results are obtained with a temperature of 50 to 60 °C. This can reduce the sonication time. At higher working temperatures, the effect of the ultrasound decreases again.

Ultrasound also heats the sonication liquid. During continuous operation, the working temperature of the sonication liquid can rise above the set value – particularly if the ultrasonic oscillating tank is covered. Therefore, check the working temperature when processing temperature-sensitive objects.

- Note the information on the optimum working temperature from the agent manufacturer.

- Pre-heating during the degassing of the sonication liquid is ideal. See chapter **5.7 Degas the sonication fluid**.
- Before pre-heating, remove the basket or other accessories from the ultrasonic oscillating tank. Cover the ultrasonic oscillating tank with the lid if available.

Turn on the heating by turning the knob to the desired temperature.

- The yellow and white indicator lights will light up.
- When the target temperature is reached, the yellow indicator light goes out.

5.7 Degas the sonication fluid

Freshly-filled sonication fluid or fluid that has remained in the oscillating tank for a long period of time must be degassed prior to use. Degassing of the sonication fluid increases the ultrasound effect.

- Cover the ultrasonic oscillating tank with the lid if available.
- For degassing, switch on the ultrasound. The degassing time is 30 minutes.

Information

During degassing, the ultrasound noise becomes quieter. This means that the ultrasound effect increases.

5.8 Insert objects to be treated

To achieve good results, observe the following instructions when inserting objects for sonication:

- Before each round of sonication, check that the sonication liquid is not contaminated. If contamination is visible, replace the sonication liquid.
- The sonication liquid must be degassed. See chapter **5.7 Degas the sonication fluid**.
- Preheat the sonication liquid to the desired temperature before inserting objects.
- Use suitable accessories, e.g., a basket. Do not place objects directly on the bottom of the oscillating tank. See chapter **9 Accessories**.
- Distribute objects around the container. Do not stack them. Make sure that delicate objects do not touch other objects.
- The ultrasound must be switched off while inserting objects.
- Check the fill level. Make sure the liquid completely covers all objects undergoing sonication.
- Remove air bubbles from cavities. Rotate the objects accordingly. The ultrasound process will only be effective in places where the liquid comes into contact with the object undergoing sonication.
- Place the more heavily soiled side facing down. Place objects with joints (e.g., scissors, forceps) into the container open so that the sonication liquid reaches the entire surface optimally.

5.9 Remove treated objects

⚠ WARNING

Risk of burns
The sonication fluid, objects to be treated, the surface of the ultrasound bath and accessories may be very hot.
- Do not touch the surface of the ultrasound bath or accessories such as the lid. Do not reach into the sonication fluid.
- Allow the sonication objects to cool before touching them.

Switch off the ultrasound before removing the sonication objects.

Do not remove sonication objects by hand. Carefully remove e.g. the insert basket with the sonication objects and place it on a level surface.

Rinse sonication objects with clean water.

Do not leave sonication objects in the sonication fluid for too long. This can damage the objects.

5.10 Empty the oscillating tank

⚠ WARNING

Danger of electric shock
- Make sure that no liquid can get into the housing.

⚠ CAUTION

Hot sonication fluid and oscillating tank
There is a risk of burns when lifting the ultrasound bath to empty it.
- Allow the ultrasound bath to cool down before lifting it.

Contamination on the bottom of the oscillating tank reduces the ultrasonic output. Empty and clean the oscillating tank if the sonication fluid is visibly contaminated.

Also, observe the specifications of the manufacturer of the agent regarding the service life of the sonication fluid.

Replace used sonication fluid completely. Do not freshen the fluid by topping it up.

Procedure
1. Switch off the ultrasound. If present, switch off the heating. If you need to move the ultrasonic bath to empty it, disconnect the mains plug.
2. Open the 3-way ball valve.
3. Rinse the oscillating tank thoroughly.
4. Wipe the ultrasonic bath dry with a soft cloth.
5. If necessary, disinfect the ultrasonic bath with a suitable surface disinfectant.

Information

Rinsing tanks with heating can become hot.

5.11 Troubleshooting a malfunction

Error	Possible causes	Troubleshooting
Insufficient ultrasound effect, loud noises	▪ Sonication fluid contains gases. ▪ There are too many sonication objects in the oscillating tank.	▪ Degas the sonication fluid. See chapter **5.7 Degas the sonication fluid**. ▪ Reduce the number of objects to be treated.
Uneven noises (wobbling)	▪ Inadequate fill level in the oscillating tank.	▪ Slightly change the fill level of the sonication fluid in the oscillating tank. In doing so, observe the minimum fill level and correct dosing of the preparation. ▪ Reposition the objects to be treated.
Heating is not working	▪ The heating is defective.	▪ Have the ultrasound bath repaired.

6 Maintenance

6.1 Cleaning and maintaining the ultrasound bath

Cleaning the housing

- Wipe the housing with a damp cloth. Wipe dry with a soft cloth.
- Do not use abrasive cleaning agents, only care products without scouring additives.
- If necessary, disinfect the housing with a suitable surface disinfectant.

Care of the oscillating tank

Impurities in the oscillating tank accelerate the tank's wear, can lead to corrosion and reduce the ultrasound effect. Therefore, please observe the following instructions:

- Rinse the oscillating tank thoroughly with water after each use. Wipe dry with a soft cloth.
- Clean edges and remove residues with a stainless steel care product without abrasive additives.
- Do not use steel wool, scrapers or shavers to clean the oscillating tank.
- Metal parts and rust particles in the oscillating tank cause corrosion. Therefore, do not leave any metal parts in the oscillating tank. If rust stains are visible, remove them immediately with a soft cloth and a stainless steel cleaning product without abrasive additives.

6.2 Tests

NOTICE

Damage to the device

– Perform the checks listed in the following section only on a filled device.

If one of the checks does not lead to the desired result, contact our service department. See chapter **6.4 Repair**.

Checking indicator lamps

Check the operation of the indicator lights.

- Briefly switch on the ultrasound.
  - The green indicator light will remain lit as long as the ultrasound is switched on.
- Switch on the heating briefly with the turning knob set to above 30 °C.
  - The white and yellow indicator lights are lit as long as the heating is switched on.

Check the ultrasonic and heating power

The output can be checked with a wattmeter between the device mains plug and the socket.

Procedure

1. Fill the tank with water.
2. Switch the ultrasound and, if present, the heating on and off, one after the other. Read the power.
3. Compare the readings with the technical data. See chapter **8.1 Technical data**.

The measured values may deviate by a maximum of ± 20% from the values in the technical data.

6.3 Performing the foil test

Before the first use and at regular intervals, e.g. every 3 months, a foil test should be conducted. This serves to ensure the consistent effect of the ultrasound. The frequency with which these tests are carried out is your responsibility.

The foil test is a simple procedure to demonstrate the intensity and distribution of cavitation in an ultrasonic bath. It involves stretching aluminium foil over a foil test frame. This frame will be perforated or destroyed to a certain degree by cavitation, depending on the sonication time.

In order to compare the results, it is **important for the conditions of the foil test to always remain the same**:
- Filling the oscillating tank to the filling level mark,
- Temperature of the sonication liquid,
- Degassing time,
- Frame positioning,
- Foil type (brand, thickness),
- Sonication time,
- Type and concentration of the ultrasound preparation.

liquid for the foil test

In order to obtain a sufficiently strong cavitation effect, the foil test also requires the surface tension of the water used to be reduced using surfactant preparations.

We recommend the following ultrasound preparations:
- TICKOPUR R 33,
- TICKOPUR R 30,
- TICKOPUR TR 7.

If none of these products are available, a neutral or mildly alkaline product that does not destroy aluminium may be used. The product must be approved by the manufacturer for use in ultrasonic baths.

Test results and documentation

Assuming constant test conditions, the test result is evaluated based on the perforated surfaces of the foils. The perforated surfaces of all foils should have approximately the same reach and distribution – they are never identical. Consistency of process validations, e.g. for the treatment of medical devices, can only be ensured through regular foil tests.

To document the test results, you can download a documentation template here:

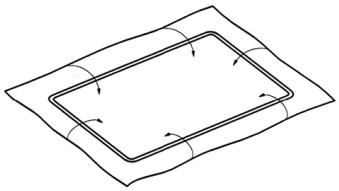
https://bandelin.com/folientest/

Here you will also find an application video.

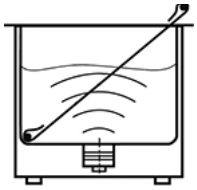
Foils can also be archived if done in a suitable manner (scanning, photos, etc.). This allows foils to be compared at any time.

Conducting the foil test

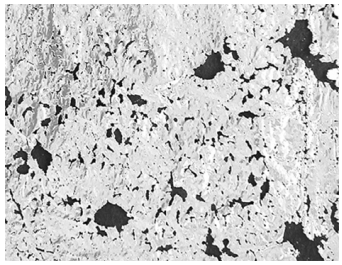
1. Fill the oscillating tank to the filling level mark with water and a suitable ultrasound preparation, in the concentration specified by the manufacturer.
2. Degas the sonication liquid.
   See chapter **5.7 Degas the sonication fluid**.
3. Stretch aluminium foil (household foil, 10 µm to 25 µm thick) over the foil test frame. Depending on the tank size, it is possible that the frame will protrude outside the tank. Covering the part of the foil test frame that is covered by the sonication liquid will be enough.



4. Place the covered foil test frame diagonally in the centre of the oscillating tank. Fasten it if necessary.



5. Switch on the ultrasound. Sonicate the foil for at least one minute until visible perforations or holes are produced. With sturdier foils (thicker or coated ones), the sonication time may be up to 3 minutes.
6. Switch off the ultrasound. Remove the foil test frame. Remove the aluminium foil from the foil test frame and allow it to dry.
7. The foil must be perforated, see image. Else, we recommend having the device checked by the Service department at BANDELIN electronic GmbH & Co. KG: See chapter **6.4 Repair**.



8. Archive the foil with the test date and serial number of the ultrasonic bath. The foil test document template can also be completed and archived.
9. Rinse the oscillating tank thoroughly to remove any detached foil particles.

Suitable foil test frames can be ordered from BANDELIN electronic GmbH & Co. KG. The foil test frames are designed for a wide range of tank dimensions. Aluminium foil is also required to conduct the test, but it is not included in the scope of delivery.

Type	Order No.	for
FT 14	3084	RM 16.2 U /UH
FT 40	3094	RM 40.2 U /UH
FT 45	3204	RM 75.2 U /UH

6.4 Repair

⚠ WARNING

Health risk due to contaminated device

- Decontaminate the device before shipping if it has come into contact with hazardous substances.

If the device needs to be repaired, send it to the manufacturer.

Clean and decontaminate the device and accessories before shipping.

The "Certificate of Decontamination" is intended to protect the occupational health and safety of our employees pursuant to the German Protection against Infection Act and the trade association accident prevention regulations.
Before sending the device back to us for inspection/repair, the device and accessories must be cleaned pursuant to current laws and regulations and, if necessary, must also be disinfected with a surface disinfection agent listed by the VAH (Alliance for Applied Hygiene).
Please understand that we cannot start work until this Certificate is completed in full and submitted.

Download the “Certificate of Decontamination” form here:

https://www.bandelin.com/downloads

Fill out the form and attach it to the outside of the packing so that it is clearly visible. Acceptance will be refused without a completed form.

Send the device to the following address:

BANDELIN electronic GmbH & Co. KG

Heinrichstr. 3-4
12207 Berlin
Germany

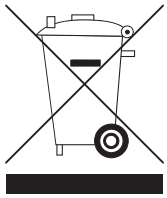
+49 30 76880-13
service@bandelin.com

7 Disposal

⚠ WARNING

Health risk due to contaminated ultrasonic bath

- Decontaminate the ultrasonic bath before disposal if it has come into contact with hazardous substances.
- Also decontaminate accessories before disposal.



Dispose of the ultrasonic bath properly as electronic waste if it can no longer be used. Do not dispose of the ultrasonic bath with household waste. Observe the locally applicable regulations for the disposal of electronic waste.

The vibrating elements contain sintered ceramics made of lead titanium zirconium oxide.

- EC No. 235-727-4
- CAS No. 12626-81-2

This use is authorised in accordance with RoHS Directive 2011/65/EU, Annex III, exception 7c. I.

Dispose of accessories as metal scrap or plastic waste depending on the materials used.

8 Device information

8.1 Technical data

Electrical data, general

Operating voltage	230 V~ (± 10%) 50/60 Hz
Protection class	I
Degree of protection	IP 32
Ultrasonic frequency	40 kHz

Electrical data and weights for tank size RM 16.2

Type	Ultrasonic peak power/ ultrasonic nominal power	Heating capacity	Fuse, heating	Generator fuse	Weight
	[W]	[W]			[kg]
RM 16.2 UH	1200/300	800	F8A	F2A	16
RM 16.2 H	–	800	F8A	–	15
RM 16.2 U	1200/300	–	–	F2A	15
RM 16.2	–	–	–	–	14

Dimensions for tank size RM 16.2

Type	Interior dimensions (L × W × H)	Capacity	Filling volume	Operating volume	Inlet and outlet	Outlet, overflow gutter
	[mm]	[l]	[l]	[l]		
RM 16.2 UH	325×275×200/210	20	14	13	G 1/2	G 1
RM 16.2 H	325×275×200/210	20	14	13	G 1/2	G 1
RM 16.2 U	325×275×200/210	20	14	13	G 1/2	G 1
RM 16.2	325×275×200/210	20	14	13	G 1/2	G 1

Electrical data and weights for tank size RM 40.2

Type	Ultrasonic peak power/ ultrasonic nominal power	Heating capacity	Fuse, heating	Generator fuse	Weight
	[W]	[W]			[kg]
RM 40.2 UH	2000/500	1300	F10A	F2A/F4A	26
RM 40.2 H	–	1300	F10A	–	23
RM 40.2 U	2000/500	–	–	F2A/F4A	25
RM 40.2	–	–	–	–	22

Dimensions for tank size RM 40.2

Type	Interior dimensions (L × W × H)	Capacity	Filling volume	Operating volume	Inlet and outlet	Outlet, overflow gutter
	[mm]	[l]	[l]	[l]		
RM 40.2 UH	475×300×300/315	46	36	31	G 3/4	G 1
RM 40.2 H	475×300×300/315	46	36	31	G 3/4	G 1
RM 40.2 U	475×300×300/315	46	36	31	G 3/4	G 1
RM 40.2	475×300×300/315	46	36	31	G 3/4	G 1

Electrical data and weights for tank size RM 75.2

Type	Ultrasonic peak power/ ultrasonic nominal power	Heating capacity	Fuse, heating	Generator fuse	Weight
	[W]	[W]			[kg]
RM 75.2 UH	4000/1000	1950	T12.5A	F8A	42
RM 75.2 H	–	1950	T12.5A	–	37
RM 75.2 U	4000/1000	–	–	F8A	41
RM 75.2	–	–	–	–	36

Dimensions for tank size RM 75.2

Type	Interior dimensions (L × W × H)	Capacity	Filling volume	Operating volume	Inlet and outlet	Outlet, overflow gutter
	[mm]	[l]	[l]	[l]		
RM 75.2 UH	575×500×300/315	92	72	62	G 3/4	G 1
RM 75.2 H	575×500×300/315	92	72	62	G 3/4	G 1
RM 75.2 U	575×500×300/315	92	72	62	G 3/4	G 1
RM 75.2	575×500×300/315	92	72	62	G 3/4	G 1

8.2 Ambient conditions

Overvoltage category:	II
Degree of contamination:	1
Permissible ambient temperature:	5 - 40 °C
Permissible relative humidity up to 31 °C:	80 % (non-condensing)
Permissible relative humidity up to 40 °C:	50 % (non-condensing)
Altitude	< 2000 m above sea level
For indoor operation only	

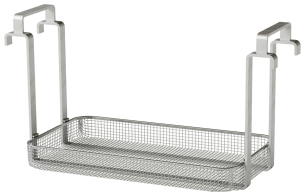
8.3 CE conformity

The device satisfies the CE-marking criteria of the European Union:
- 2014/35/EU – Low Voltage Directive
- 2014/30/EU – EMC Guideline
- 2011/65/EU RoHS Directive

A declaration of conformity can be requested from the manufacturer by providing the serial number.

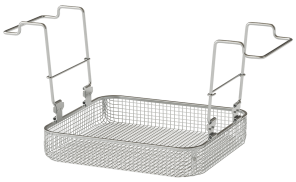
9 Accessories

Inset baskets MK ... B
made of stainless steel
Maximum load up to 10 kg



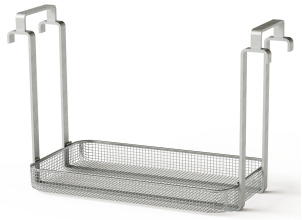
Inset baskets MK ... S
made of stainless steel
Maximum load up to 40 kg

For series RM 40.2 and RM 75.2



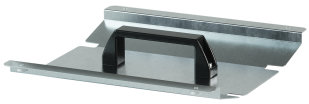
Inset baskets MK ... MB
made of stainless steel
Maximum load up to 10 kg

For use with lifting device MB, starting from version MB 16.2, MB 40.2 and MB 75.2

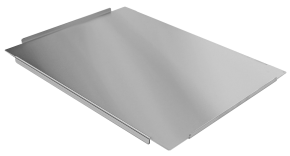


Inset baskets MK ... BS
made of stainless steel
Maximum load up to 40 kg

For use with lifting device MB
For series RM 40.2 and RM 75.2



Lid MD ...
made of stainless steel



Drop plate TB ...
made of stainless steel
between 2 tanks

Additional equipment

Base frame UG ...
To adjust the working height
With height-adjustable feet

For series RM 40.2 and RM 75.2

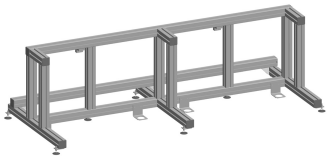
Transport trolley TW ...
To adjust the working height and easy transport of the devices.
With lockable rollers

For series RM 40.2 and RM 75.2

Oscillation MO ...
The oscillating movement intensifies the cleaning effect and rinses away dissolved soiling better.

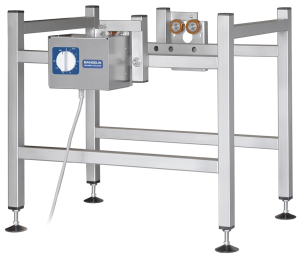
For series RM 16.2 and RM 40.2

Lifting device MB ...
The electrically-driven lifting device with oscillator facilitates the lifting and lowering of the workpiece basket. The cleaning efficiency is increased and loosened dirt particles are rinsed off.



Tank rack WG ...
Tank racks for positioning the lifting device are designed for 2 to 4 tanks.

Cascade pipes KV ...
To improve the rinsing process, two rinsing tanks are connected to each other with the cascade piping.



Planing head holders HA ...
For efficient cleaning of planing heads and saw blades.

For series RM 40.2

Peripheral devices

Filtration FA ...
Continuous filtering of the loosened particles extends the lifetime of the tank and preserves the cleaning power.

Oil separator OX ...
Impurities that rise to the surface of the tank are led via the weir into the oil separator, where they are separated by gravity.

Air circulation dryer UT ...
The cleaning objects are dried after rinsing to quickly remove any residual moisture.

10 Appendix

Recommended agents

The selection of one of the following concentrates depends on the cleaning task and degree of soiling.

TICKOPUR R 33
Universal detergent with corrosion protection for Service, Industry, Technology and Laboratories, gentle to materials, mildly alkaline, pH 9.9 (1%), application 3-5%

Removes general soiling, drilling, grinding, polishing and lapping residues, oil- and grease-based residues, soot, ink, etc.

From metal, glass, ceramics, plastics, rubber, windows, goggles, E-filters, respiratory masks (EXAM certificate No.: 5734/06), etc. Caution with tin and zinc.

TICKOPUR R 30
Neutral cleaner with corrosion protection, gentle to materials, neutral, pH 7 application 1-5%

Removes light drilling, grinding, polishing and lapping residues, dust, soot, oil- and grease-based contaminants, etc.

From metal, glass, ceramics, plastics, rubber, etc.

TICKOPUR TR 3
Special cleaner based on citric acid, gentle to materials, phosphate-free, with corrosion protection, slightly acidic, pH 3.0 (1%), application 5%

Removes mineral residue, flash rust, grease, oils, waxes, pigments; drilling, grinding, polishing and lapping residues, etc.

From metal, glass, ceramics, plastics, rubber, etc.

TICKOPUR R27
Special cleaner based on phosphoric acid, for decalcification and rust removal with corrosion protection, acidic, pH 1.9 (1%) application 5%

Removes heavy mineral residue (limescale, silicates, phosphates, cements, etc.), rust, temper colours, metal oxides, grease and oil films, etc.

From steel, stainless steel, precious metals, glass, ceramics, plastics, rubber. Not for light or non-ferrous metals, tin, zinc.

TICKOPUR TR 2
Special cleaner, demulsifying, based on phosphoric acid, gentle to materials, with corrosion protection, slightly acidic, pH 3.6 (1%) application 0.1-5%

Removes mineral residue, flash rust, grease, oils, waxes, pigments; drilling, grinding, polishing and lapping residues, etc.

From metal, glass, ceramics, plastics, rubber, etc. Be careful with light metals, tin and zinc.

TICKOPUR TR 14
Flux remover, surfactant-free, non-foaming, gentle to materials, phosphate-free, alkaline, pH 10.7 (1%), application 10%

Removes resinous flux, soldering pastes, ionic and non-ionic residue; drilling, grinding, polishing and lapping residues, fingerprints, grease, oils, etc.

From non-ferrous and light metals, steel, stainless steel, glass, ceramics, plastics, rubber, assembled and unassembled PC boards, soldered frames, electronic components, modular components, etc.

TICKOPUR R 32
Special cleaner, free of complexing agents, gentle to materials, with corrosion protection, mildly alkaline, pH 11.1 (1% in DI water), application 0.25-5%

Removes distillation residue, organic and inorganic residues, oil- and grease-based contaminants, etc.

From metals including burnished metals, glass, ceramics, plastics, rubber, etc. Especially for galvanic, laser and analytical applications. Dilute with DI water.

TICKOPUR R 36
Special cleaner, tenside-free, for analytical and technical laser applications, for the cleaning of blinds, gentle to materials, non-foaming, mildly alkaline, pH 10 (1%), application 0.25-5%

Removes general soiling, oils, greases, distillation residues, organic and inorganic residues.

From steel, light and precious metals, ceramics, plastics, rubber, glass, optical glasses, vertical and horizontal blinds. Caution with tin and zinc.

TICKOPUR TR 7
Universal cleaner, demulsifying, for fast separation of oil and grease, mildly alkaline, pH 8.9 (1%), application 0.1-5%

Removes oils, greases, waxes, pigments, flux, soldering pastes, drilling, grinding, polishing and lapping residues.

From steel, stainless steel, non-ferrous, precious and light metals, glass, ceramics, plastics, rubber, soldered frames.

TICKOPUR TR 13
Intensive cleaner, demulsifying for stubborn soiling, phosphate- and silicate-free, alkaline, pH 11.9 (1%), application 0.1-10%

Removes gumming, coking residue, soot, oils, grease, waxes, pigments, coatings; drilling, grinding, polishing and lapping residues, etc.

From steel, stainless steel, glass, ceramics, plastics, rubber. Not for light alloys, tin, zinc. Non-ferrous heavy metals may become corroded.

TICKOPUR RW 77
Special cleaner with ammonia, phosphate-free, mildly alkaline, pH 9.9 (1%), application 5-10%

Removes gumming, soot, fats, oils, waxes, pigments, coatings, silicone oils, flux, oxide on non-ferrous and precious metals.

From non-ferrous and precious metals, iron, steel, glass, ceramics, plastics, rubber, test sieves, circuit boards for service. Caution with light metals.

TICKOPUR R 60
Intensive cleaner, phosphate-free, strongly alkaline, pH 12.3 (1%), application 2-20%

Removes coking residue, gumming, soot, pigments, greases, oils, waxes, silicone oil, coatings; drilling, grinding, polishing and lapping residues, etc.

From steel, stainless steel, glass, ceramics, plastics, rubber. Not for light alloys, tin, zinc.

TICKOPUR KS 1
Universal corrosion protection for all ferrous metals, solvent-free, neutral, pH 7.4 (1%), application 0.2-2%

Suitable for all ferrous metals such as cast irons, unprotected steels of diverse alloys.

Effective corrosion protection for indoor storage after cleaning with TICKOPUR agents and subsequent rinsing with water. No formation of oily or greasy films.

BANDELIN
Ultraschall seit 1955

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