



Operating Manual

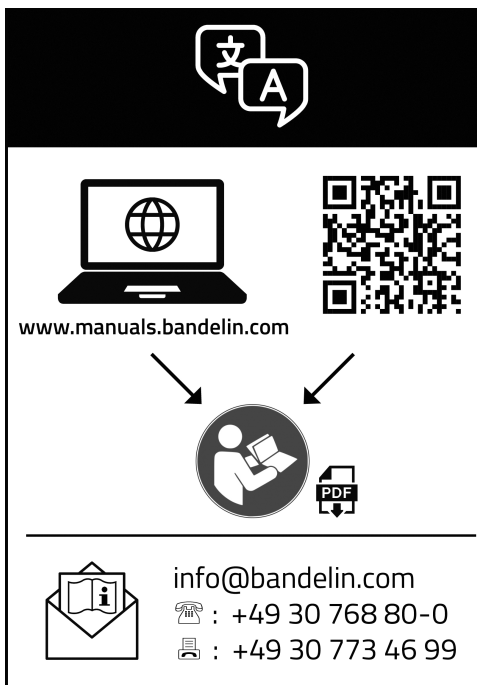
SONOREX DIGITEC ***SONOREX DIGITEC-RC***

High-performance ultrasonic baths



Applies to:

DT 31, DT 31 H, DT 52, DT 52 H
DT 100, DT 100 H, DT 102 H, DT 102 H-RC, DT 103 H, DT 106
DT 156, DT 156 BH
DT 255, DT 255 H, DT 255 H-RC
DT 510, DT 510 H, DT 510 H-RC, DT 512 H
DT 514, DT 514 H, DT 514 BH, DT 514 BH-RC
DT 1028, DT 1028 H, DT 1028 CH
DT 1050 CH



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BANDELIN *electronic* GmbH & Co. KG, Heinrichstr. 3–4, 12207 Berlin, Germany
Phone: +49 30 76880-0, Fax: +49 30 7734699, info@bandelin.com

Certified in accordance with ISO 9001 and ISO 13485

Table of contents

1	About this operating manual	5
2	Safety	6
2.1	Use of the ultrasound bath	6
2.2	To be used in the medical sector	6
2.3	Prevention of cross-contamination and infection	8
2.4	Keep out of reach of children	8
2.5	Danger of electric shock	8
2.6	Harmful to health due to ultrasound noise	9
2.7	Hazards due to high temperature	10
2.8	Danger due to ultrasound	10
2.9	Danger due to preparations used	11
2.10	Disposing of sonication fluid	11
2.11	Erosion of the oscillating tank	12
2.12	Preventing damage to the ultrasound bath	12
2.13	Disturbance of wireless communication	13
2.14	Safety stickers on the ultrasound bath	13
3	Design and function	14
3.1	Structure	14
3.2	Control panel	15
3.3	Function	15
3.4	Remote control	16
4	Preparation for operation	17
4.1	Installation site requirements	17
4.2	Fitting ball valve	17
4.3	Performing a function test	18
4.4	Rinsing out the oscillating tank	18

5	Operation	19
5.1	Direct and indirect sonication	19
5.2	Sonication fluid	19
5.3	Sonication time	20
5.4	Pour in sonication fluid	21
5.5	Switching sonication on and off	23
5.6	Switching the heating on and off	23
5.7	Avoiding retardation of boiling	25
5.8	Degassing the sonication fluid – DEGAS	26
5.9	Adding goods to be treated	26
5.10	Remove treated objects	27
5.11	Empty the oscillating tank	28
5.12	Enabling and blocking continuous operation	29
5.13	Troubleshooting a malfunction	30
6	Maintenance	31
6.1	Cleaning and maintaining the ultrasound bath	31
6.2	Tests	31
6.3	Performing the foil test	33
6.4	Repair	36
7	Disposal	37
8	Device information	38
8.1	Technical data	38
8.2	Ambient conditions	41
8.3	CE conformity	42
9	Dosing table	42
10	Accessories	44

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 ultrasound bath

The following applications are possible with the ultrasound bath:

- Ultrasonic cleaning of objects of various shapes, types and sizes,
- Homogenising, emulsifying,
- Rapid degassing of liquids,
- Sonochemical applications, e.g. for radical production or improved material transport,
- Sample preparation for analysis.

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

Objects to be treated may not be placed on the bottom of the oscillating tank. They must be placed in the sonication fluid in an insert basket or another suitable container. An overview of suitable accessories can be found in chapter **10 Accessories**.

In the case of stains, discolouration, rust, etc., a deep cleaning can be performed using special detergents and indirect sonication.

Do not operate the ultrasound bath while unattended.

2.2 To be used in the medical sector

The medical purpose of the ultrasound bath is to clean instruments. Ultrasonic cleaning takes place in the context of further steps needed for the reprocessing of medical ultrasound baths. In doing so, observe the hygiene requirements according to the applicable regulations. The ultrasound bath is a Class I medical ultrasound bath pursuant to Regulation (EU) 2017/745.

EMDN nomenclature: V0799

Indications/areas of application

Medical instruments can be cleaned in the ultrasound bath as part of manual processing, and before or after automated reprocessing.

The information supplied by the instrument manufacturer specifies whether the instruments are suited for ultrasonic cleaning.

Contraindications/exclusions

- Lenses, camera systems, light cables, mirrors, or objects made of or containing elastic materials (e.g. catheters, respiratory system functional parts, flexible endoscopes) are not suitable for sonication, or are only suitable under certain conditions. The specifications of the respective manufacturer provide information on suitability for ultrasonic cleaning.
- The ultrasound bath is not suitable for cleaning or disinfecting contact lenses.
- The direct sonication of flammable liquids is not permitted.

Possible side effects/restrictions

- Ultrasound does not disinfect. However, processes such as chemical disinfection may be accelerated in the ultrasound bath.
- Cavitation erosion can cause surfaces to be mechanically corroded and their coatings to dissolve.

User group

The ultrasound bath may be used by persons who have been qualified and trained for their work, e.g. the reprocessing of instruments.

Pregnancy is not a contraindication for using the ultrasound bath.

Serious incidents must be reported to
BANDELIN electronic GmbH & Co. KG and to the competent authorities.

2.3 Prevention of cross-contamination and infection

If the ultrasound bath is used in the medical field, regularly clean and disinfect the surfaces of the device with a surface disinfectant that has at least bactericidal, yeasticidal and limited virucidal properties, in order to avoid cross-contamination. Process accessories such as holders, carriers or baskets in a cleaning and disinfection device.

At higher temperatures, vapours and aerosols that are contaminated with introduced impurities may escape from the ultrasound bath. This can lead to infections and disease. When cleaning medical instruments, avoid bath temperatures above 40 °C. If necessary, use a lid, suction device or protective equipment.

2.4 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.

2.5 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.

2.6 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 2 m for an extended period of time may cause damage to health.

- Wear suitable hearing protection.
- Use a lid to reduce noise. The ultrasound bath can also be used in a sound proof box.

2.7 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.
- Lifting from the handles can cause the hands to touch the edge of the oscillating tank, which can be very hot. After operation, allow the ultrasound bath to cool down before lifting it for emptying.

Non-aqueous fluids can heat up many times faster than water. A possible flashpoint can be reached or exceeded after a very short sonication time. 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.
- Small quantities of flammable liquids in sample containers can be sonicated indirectly. Before sonication of flammable liquids, familiarise yourself with the necessary safety measures and applicable regulations for handling these liquids.

2.8 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.

2.9 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.

2.10 Disposing of sonication fluid

Dispose of the sonication fluid according to the information provided by the manufacturer of the ultrasound agents used. The recommended ultrasound agents from the TICKOPUR, TICKOMED and STAMMOPUR product ranges from DR. H. STAMM GmbH are biodegradable according to the articles of Regulation (EC) no. 648/2004 (Detergents Regulation). If necessary, the sonication fluid needs to be neutralised before disposal.

During cleaning, water-polluting substances, e.g. oils or heavy-metal compounds, can contaminate the sonication fluid depending on the type of soiling. If the limit value for these substances is exceeded, the sonication fluid must be reprocessed or disposed of as special waste.

Observe the local waste water regulations.

2.11 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 **10 Accessories**.

2.12 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.

2.13 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.

2.14 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**.

3 Design and function

3.1 Structure

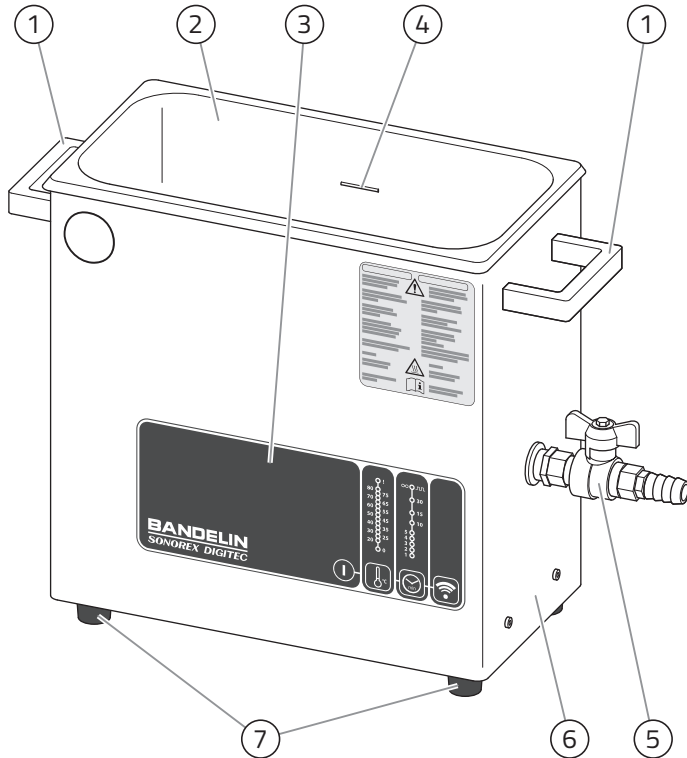


Fig. 1 Overview of the device

- 1 Handles (depending on model)
- 2 Oscillating tank
- 3 Control panel
- 4 Filling level mark
- 5 Drain with ball valve (depending on model)
- 6 Housing
- 7 Device feet

3.2 Control panel

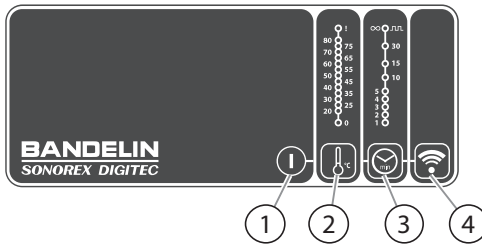


Fig. 2 Controls for devices with heating

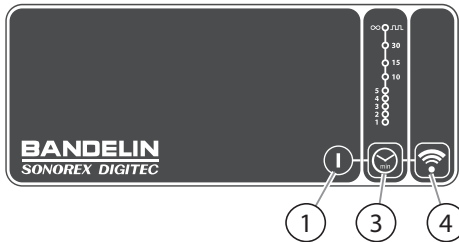


Fig. 3 Controls for devices without heating

- 1 On/off button for switching the device on and off
- 2 Button for setting the heating temperature with temperature scale
- 3 Button for setting the sonication time with time scale
- 4 Start/stop button for ultrasound

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 fluid. 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 fluid flows in.

SONOREX ultrasound baths use SweepTec®, a technology in which the ultrasonic frequency often fluctuates around the value of the operating frequency. The optimal operating frequency depends on the load, filling level, temperature and type of sonication fluid. 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.

3.4 Remote control

The devices with the additional designation "RC" are equipped with an infrared interface for remote control from a PC. For communication, you require the WINSONIC-DT remote control, which consists of the infrared adapter IR 1 and software (order no. 3090).

Various additional functions allow easy operation using a PC to control processes and for quality control. The WINSONIC DT software required for this is not part of the standard scope of delivery of the devices. You can install the software on operating systems from Windows 2000. For further information, refer to the user manual for the WINSONIC DT software.

The command set for the infrared interface will be provided free of charge by the manufacturer on request. The user is responsible for the program-related implementation required for communication. This is not supported by the manufacturer. The manufacturer only guarantees the correct functioning of the infrared interface.

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 fluid. For weight and work content, see chapter **8.1 Technical data**.
- Adequate ventilation must be ensured. The air supply under the bottom of the unit may not be obstructed. If a sound proof box is used, it must also ensure sufficient ventilation.
- 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

Concerns devices from DT 102 H / DT 102 H-RC.

Fit the supplied ball valve, the hose grommet and the hose as described in the assembly instructions included with the ball valve.

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. Insert the mains plug for the device into an earthed mains socket.
2. Press the on/off button to switch on the device.
3. Switch the ultrasound on briefly. Do this by pressing the start/stop button. After 1 to 2 seconds, press the start/stop button again to switch off the ultrasound.

Result

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

Contact our service department if you cannot hear any noise.

A foil test should be performed before the first use. This is used to document the effectiveness of the ultrasound. See chapter **6.3 Performing the foil test**.

4.4 Rinsing out the oscillating tank

Thoroughly rinse the ultrasound bath's oscillating 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 Direct and indirect sonication

Objects can be sonicated directly or indirectly in the ultrasound bath.

Direct sonication is the standard procedure. 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 fluid.

Indirect sonication is used in the following cases:

- Sonication of sample fluids,
- Use of chemically aggressive or flammable liquids,
- Use of demineralised water without additives,
- Removal of chemically aggressive contamination,
- Removal of stains, discolouration and rust using acidic preparations.

The objects or liquids to be sonicated are introduced in the contact liquid in an inset beaker, for transfer of the ultrasound in the oscillating tank. The contact liquid in the oscillating tank must contain a surfactant preparation.

For suitable accessories for direct and indirect sonication, see chapter **10 Accessories**.

5.2 Sonication fluid

A solution made from water and a special ultrasound agent is used as the sonication fluid. 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.

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

Observe the information on dosing provided by the ultrasound agent manufacturer. Please refer to the dosing table for the required quantities of ultrasound agent and water. See chapter **9 Dosing table**.

You can calculate the quantities yourself in the same way as the following example:

10 l ready to use solution, 2.5%:

$$\frac{10 \text{ l} \times 2,5 \%}{100 \%} = 0,25 \text{ l agent}$$

$$10 \text{ l} - 0,25 \text{ l} = 9,75 \text{ l water}$$

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 fluid

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.

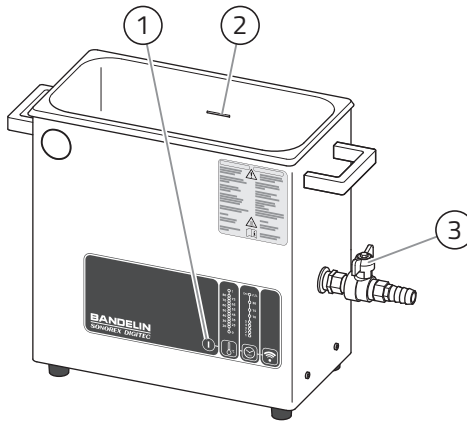


Fig. 4 Fill oscillating tank

- 1 On/off button for switching the device on and off
- 2 Filling level mark
- 3 Drain with ball valve (depending on model)

Requirements

- The ball valve must be closed in ultrasonic baths with a drain.
- The device must be switched off.

Procedure

1. Fill the ultrasonic oscillating tank with water up to $\frac{1}{3}$.
2. Pour the correct quantity of agent into the ultrasonic oscillating tank. See chapter **9 Dosing table**.
3. Fill the tank with water up to the filling level mark while avoiding foam formation. When using indirect sonication, take the displacement caused by inset vessels into consideration.

Result

- » The device is ready to switch on.

5.5 Switching sonication on and off

Requirements

- The ultrasonic oscillating tank has been filled.
- The mains plug has been connected to an earthed mains socket.

Procedure

1. If available, place the lid on the device.
2. Press the on/off button to switch on the device.
3. Press the button for setting the sonication time repeatedly until the required sonication time or the ∞ symbol for continuous operation is displayed.
4. Press the start/stop button.
 - » The ultrasound is switched on. You will hear the ultrasound noise.
 - » A running light indicates the remaining sonication time.
5. To switch off the sonication, press the start/stop button.



Information

- The ultrasound switches off automatically as soon as the set sonication time has elapsed. Then only the LED with the most recently set sonication time will light up. In continuous operation, the green LED next to the ∞ symbol lights up continuously. The ultrasound does not switch off automatically.
- You can extend, shorten or switch off the sonication at any time.
- If you do not press a button for more than 12 hours, the ultrasonic bath will be switched off automatically.

5.6 Switching the heating on and off

Concerns the following devices:

- DT 31 H, DT 52 H,
- DT 100 H, DT 102 H, DT 102 H-RC, DT 103 H,
- DT 156 BH,
- DT 255 H, DT 255 H-RC,
- DT 510 H, DT 510 H-RC, DT 512 H,
- DT 514 H, DT 514 BH, DT 514 BH-RC,
- DT 1028 H, DT 1028 CH,
- DT 1050 CH

Heated sonication fluid intensifies the effect of the ultrasound. Based on experience, the best results are achieved at working temperatures between 50 and 60 °C. This allows the sonication time to be reduced. At higher working temperatures, the effect of the ultrasound decreases again.

Do not heat the sonication fluid used to reprocess medical instruments above 45 °C.

Ultrasound also heats the sonication fluid. During continuous operation, the working temperature of the sonication fluid 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 fluid is ideal. See chapter **5.8 Degassing the sonication fluid – DEGAS**.
- Before pre-heating, remove the basket or other accessories from the ultrasonic oscillating tank. Cover the ultrasonic oscillating tank with the lid if available.

 Information

The heater is equipped with overtemperature protection. If there is no heating function, disconnect the device from the mains and allow it to cool down to below 50 °C before putting it back into operation.

Requirements

- The ultrasonic oscillating tank has been filled.
- The mains plug has been connected to an earthed mains socket.
- Device is switched on. The green "0" LED on the temperature scale lights up.

Procedure

1. Press the button for setting the temperature repeatedly until the required temperature between 20 and 80 °C is displayed.
 - » The target temperature is indicated by a continuously lit yellow LED.
2. To switch off the heating, hold down the button for setting the heating temperature for at least 2 seconds.
 - » The "0" LED on the temperature scale lights up.

 Information

- The current temperature is indicated by a flashing yellow LED. Below the set target temperature, the LED flashes quickly and the heating is on. Above the set target temperature, the LED flashes slowly and the heating is off.
 - The yellow LED will light up steadily as soon as the target temperature and the actual temperature are the same.
 - The red "!" LED will flash if the working temperature exceeds 85 °C.
-

5.7 Avoiding retardation of boiling

At temperatures above 60 °C, the ultrasound is activated automatically for 3 seconds every minute to mix the fluid to avoid retardation of boiling. This function cannot be switched off. You can configure the system so that this function is always active when the heating is switched on, even at temperatures below 60 °C.

Requirement

- Device is switched off.

Procedure

Hold down the button for setting the heating temperature and press the on/off button to switch on the ultrasonic bath.

- » As soon as the heating is switched on, the ultrasound is activated once per minute regardless of the temperature.

 Information

- The device does not save the setting. The next time it is switched off and back on again, the function for preventing retardation of boiling will be active again from 60 °C.
-

5.8 Degassing the sonication fluid – DEGAS

Sonation fluid that has been freshly filled or left in the ultrasonic oscillating tank for a long period must be degassed before use. Degassing the sonication fluid increases the effect of the ultrasound. You can use the DEGAS function to perform rapid degassing of the sonication fluid.

1. Press the start/stop button for at least 2 seconds.
 - » The ultrasound is switched on.
 - » The LEDs indicate the remaining degassing time.
2. To end degassing earlier, press the start/stop button.



Information

The ultrasound noise becomes quieter during degassing. This means that the ultrasonic effect is increasing.

5.9 Adding goods to be treated

To achieve good results, observe the following information when inserting goods to be treated:

- Each time before sonication, check whether the sonication fluid is contaminated. If there is visible contamination, replace the sonication fluid.
- The sonication fluid must be degassed. See chapter **5.8 Degassing the sonication fluid – DEGAS**.
- The sonication fluid must be preheated to the required working temperature before you add objects.
- Use suitable accessories, e.g. a basket. Do not place any objects directly on the bottom of the ultrasonic oscillating tank. Use a studded silicone mat for sensitive objects. See chapter **10 Accessories**.
- Insert objects so they are distributed. Do not stack them. Sensitive objects may not touch other objects.
- The ultrasound must be switched off while objects are being inserted.
- Check the filling level. The goods to be treated must be completely submerged in the fluid. Inset beakers for indirect sonication need to be submerged at least 2 cm in the sonication fluid.
- Remove air bubbles from cavities. Rotate the objects accordingly. Remove air bubbles under inset beakers. The ultrasound

only works where the fluid is in contact with the goods to be treated or the inset beaker.

- Position the side with greater soiling so it is facing downwards. Insert objects with joints (e.g. scissors or tongs) in open condition so that the whole surface is optimally reached by the sonication fluid.

5.10 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.

5.11 Empty the oscillating tank

WARNING

Danger of electric shock

- Disconnect the mains plug before lifting the ultrasound bath.
- Do not place the ultrasound bath in a sink for emptying.
- 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 preparation 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 ultrasound bath to empty it, disconnect the mains plug.
2. If the ultrasound bath has an outlet, open the ball valve. If the ultrasound bath has no outlet, carefully pour out the oscillating tank contents over the corner.
3. Rinse the oscillating tank thoroughly.
4. Wipe the ultrasound bath dry with a soft cloth.
5. If necessary, disinfect the ultrasound bath with a suitable surface disinfectant.

5.12 Enabling and blocking continuous operation

The function can be blocked to prevent accidental activation of continuous operation.

Requirement

- The mains plug is disconnected.

Procedure

Press and hold down the button for setting the sonication time. At the same time, insert the mains plug into an earthed mains socket.

» The yellow "1 min" LED lights up.



Information

- You can enable continuous operation again in the same way.
The green LED next to the ∞ symbol lights up to confirm this.

5.13 Troubleshooting a malfunction

Error	Possible causes	Troubleshooting
Insufficient ultrasound effect, loud noises	<ul style="list-style-type: none"> ▪ Sonication fluid contains gases. ▪ There are too many sonication objects in the oscillating tank. 	<ul style="list-style-type: none"> ▪ Degas the sonication fluid. See chapter 5.8 Degassing the sonication fluid – DEGAS. ▪ Reduce the number of objects to be treated.
Uneven noises (wobbling)	<ul style="list-style-type: none"> ▪ Inadequate fill level in the oscillating tank. 	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ The heater has switched off due to overtemperature. ▪ The heating is defective. 	<ul style="list-style-type: none"> ▪ Disconnect the ultrasound bath from the mains and allow it to cool down to below 50 °C before putting it back into operation. ▪ 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 checks only on the filled ultrasonic bath.

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

Checking indicator lamps

Requirement

- Device is switched off.

Procedure

1. Hold down the start/stop button and press the on/off button.
 - » All LEDs light up briefly one after the other. Then all LEDs light up at the same time.
2. Press the start/stop button twice.
 - » The sonication time that was set last is then displayed again on the time scale. The "0" LED lights up on the temperature scale (if present).
 - » The device is ready for operation again.

Check the output of the ultrasound and the heating.

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

Procedure

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

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

Checking ultrasonic effect

Check the effect of the ultrasound upon commissioning and at regular intervals. We recommend a check every 3 months. See chapter **6.3 Performing the foil test.**

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 fluid,
- Degassing time,
- Frame positioning,
- Foil type (brand, thickness),
- Sonication time,
- Type and concentration of the ultrasound preparation.

Fluid 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,
- TICKOMED 1,
- STAMMOPUR R,
- STAMMOPUR DR 8.

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 dis-

tribution – 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.

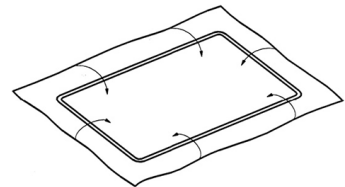


Foils can also be archived if done in a suitable manner (scanning, photos, etc.). This allows foils to be compared at any time.

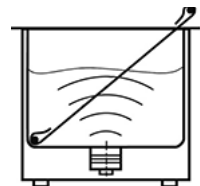
Conducting the foil test

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 fluid.
See chapter **5.8 Degassing the sonication fluid – DEGAS**.

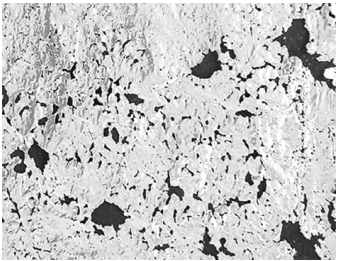
3. Stretch aluminium foil (household foil, 10 µm to 25 µm thick) over the foil test frame.
Depending on the tank size, it is possible that the frame will protrude outside the tank. Covering the part of the foil test frame that is covered by the sonication fluid will be enough.



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.

You can order suitable foil test frames from BANDELIN electronic GmbH & Co. KG. The foil test frames are configured for a wide range of tank dimensions. Aluminium foil is additionally required to perform the test as it is not included in the delivery.

Type	Order no.	For
FT 1	3190	DT 31/H, DT 52/H
FT 4	3074	DT 100/H, DT 102 H/H-RC, DT 103 H, DT 106, DT 255/H/H-RC
FT 6	3222	DT 156/BH
FT 14	3084	DT 510/H/H-RC, DT 512 H, DT 514/H/BH/ BH-RC
FT 40	3094	DT 1028/H/CH
FT 45	3204	DT 1050/CH

6.4 Repair

WARNING

Health risk due to contaminated ultrasound bath

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

If the ultrasound bath needs to be repaired, send it to the manufacturer.

Clean the ultrasound bath before shipping it.

Decontaminate the ultrasound bath if it has come into contact with toxic, corrosive, radioactive or biologically hazardous substances. Also clean and decontaminate any accessories that you send in.

Download the "Certificate of Decontamination" form here:

<https://www.bandelin.com/downloads>

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

Send the ultrasound bath 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

Operating voltage	230 V~ (± 10%) 50/60 Hz
Operating voltage (optional)	115 V~ (± 10%) 50/60 Hz
Protection class	I
Degree of protection	DIGITEC: IP 33 DIGITEC-RC: IP 23
Ultrasonic frequency	35 kHz
Measuring accuracy of temperature sensor	± 2.5 °C

Type	Ultrasonic peak power/ultrasonic nominal output	Heating output	Power consumption (230 V)	Power consumption (115 V)
	[W]	[W]	[A]	[A]
DT 31	160/40	–	0.2	0.4
DT 31 H	160/40	70	0.5	1.0
DT 52	240/60	–	0.3	0.6
DT 52 H	240/60	140	0.9	–
DT 100	320/80	–	0.4	0.7
DT 100 H	320/80	140	1.0	2.0
DT 102 H	480/120	140	1.2	2.3
DT 102 H-RC	480/120	140	1.2	2.3
DT 103 H	560/140	200	1.5	–
DT 106	480/120	–	0.6	1.1

Type	Ultrasonic peak power/ultra-sonic nominal output	Heating out-put	Power con-sumption (230 V)	Power con-sumption (115 V)
	[W]	[W]	[A]	[A]
DT 156	640/160	–	0.7	1.4
DT 156 BH	860/215	600	3.6	7.1
DT 255	640/160	–	0.7	1.4
DT 255 H	640/160	280	2.0	3.9
DT 255 H-RC	640/160	280	2.0	3.9
DT 510	640/160	–	0.7	–
DT 510 H	640/160	400	2.5	–
DT 510 H-RC	640/160	400	2.5	–
DT 512 H	860/215	400	2.7	5.4
DT 514	860/215	–	1.0	1.9
DT 514 H	860/215	600	3.6	7.1
DT 514 BH	860/215	600	3.6	7.1
DT 514 BH-RC	860/215	600	3.6	7.1
DT 1028	1200/300	–	1.4	–
DT 1028 H	1200/300	1300	7.0	14.0
DT 1028 CH	1200/300	1450	7.7	15.3
DT 1050 CH	2400/600	1950	11.1	17.9

Dimensions and weights

Type	Internal dimensions of oscillating tank (L × W × H)	Operating volume	Connection for ball valve (drain)	Weight
	[mm]	[l]		[kg]
DT 31	190 × 85 × 60	0.6	–	2.0
DT 31 H	190 × 85 × 60	0.6	–	2.3
DT 52	150 × 140 × 100	1.2	–	2.4
DT 52 H	150 × 140 × 100	1.2	–	2.5
DT 100	240 × 140 × 100	2.0	–	3.2
DT 100 H	240 × 140 × 100	2.0	–	3.3
DT 102 H	240 × 140 × 100	2.0	G $\frac{1}{4}$	4.0
DT 102 H-RC	240 × 140 × 100	2.0	G $\frac{1}{4}$	4.0
DT 103 H	240 × 140 × 150	2.5	G $\frac{1}{4}$	4.2
DT 106	Ø 240 × 130	4.0	G $\frac{1}{4}$	5.2
DT 156	500 × 140 × 100	4.0	G $\frac{1}{4}$	6.0
DT 156 BH	500 × 140 × 150	6.0	G $\frac{1}{4}$	7.2
DT 255	300 × 150 × 150	3.8	G $\frac{1}{4}$	4.8
DT 255 H	300 × 150 × 150	3.8	G $\frac{1}{4}$	4.8
DT 255 H-RC	300 × 150 × 150	3.8	G $\frac{1}{4}$	4.8
DT 510	300 × 240 × 150	6.6	G $\frac{1}{2}$	7.3
DT 510 H	300 × 240 × 150	6.6	G $\frac{1}{2}$	7.4
DT 510 H-RC	300 × 240 × 150	6.6	G $\frac{1}{2}$	7.4
DT 512 H	300 × 240 × 200	8.7	G $\frac{1}{2}$	8.2
DT 514	325 × 300 × 150	9.0	G $\frac{1}{2}$	8.5

Type	Internal dimensions of oscillating tank (L × W × H)	Operating volume	Connection for ball valve (drain)	Weight
	[mm]	[l]		[kg]
DT 514 H	325 × 300 × 150	9.0	G ½	8.7
DT 514 BH	325 × 300 × 200	12.5	G ½	9.8
DT 514 BH-RC	325 × 300 × 200	12.5	G ½	9.8
DT 1028	500 × 300 × 200	19.0	G ½	13.9
DT 1028 H	500 × 300 × 200	19.0	G ½	14.6
DT 1028 CH	500 × 300 × 300	30.0	G ½	23.3
DT 1050 CH	600 × 500 × 300	60.0	G ½	37.0

8.2 Ambient conditions

Overvoltage category:	II
Degree of contamination:	2
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 ultrasound bath is a medical ultrasound bath and meets the CE marking criteria of the European Union:

- 2017/745/EU – MDR
- 2014/35/EU – Low Voltage Directive
- 2014/30/EU – EMC Directive
- 2011/65/EU RoHS Directive

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

9 Dosing table

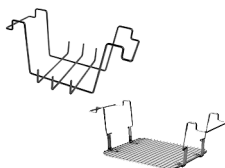
Type	Operating volume	Dosage				
		Water + agent				
	[l]	1 %	2 %	3 %	5 %	10 %
DT 31, DT 31 H	0.6	590 ml + 10 ml	585 ml + 15 ml	580 ml + 40 ml	570 ml + 30 ml	540 ml + 60 ml
DT 52, DT 52 H	1.2	1.1 l + 15 ml	1.1 l + 25 ml	1.1 l + 40 ml	1.1 l + 60 ml	1.0 l + 120 ml
DT 100, DT 100 H, DT 102 H, DT 102 H-RC	2.0	1.9 l + 20 ml	1.9 l + 40 ml	1.9 l + 60 ml	1.9 l + 100 ml	1.8 l + 200 ml
DT 103 H	2.7	2.6 l + 30 ml	2.6 l + 55 ml	2.6 l + 85 ml	2.5 l + 140 ml	2.4 l + 270 ml
DT 106, DT 156	4.0	3.9 l + 40 ml	3.9 l + 80 ml	3.8 l + 120 ml	3.8 l + 200 ml	3.6 l + 400 ml
DT 156 BH	6.0	5.9 l + 60 ml	5.8 l + 120 ml	5.8 l + 180 ml	5.7 l + 300 ml	5.4 l + 600 ml
DT 255, DT 255 H, DT 255 H-RC	3.8	3.7 l + 40 ml	3.7 l + 80 ml	3.6 l + 120 ml	3.6 l + 190 ml	3.4 l + 380 ml

Type	Operat- ing vol- ume	Dosage Water + agent				
	[l]	1 %	2 %	3 %	5 %	10 %
DT 510, DT 510 H, DT 510 H-RC	6.6	6.5 l + 70 ml	6.4 l + 140 ml	6.4 l + 200 ml	6.2 l + 330 ml	5.9 l + 660 ml
DT 512 H	8.7	8.6 l + 90 ml	8.5 l + 180 ml	8.4 l + 270 ml	8.2 l + 440 ml	7.8 l + 870 ml
DT 514, DT 514 H	9.0	8.9 l + 90 ml	8.8 l + 180 ml	8.7 l + 270 ml	8.5 l + 450 ml	8.1 l + 900 ml
DT 514 BH, DT 514 BH-RC	12.5	12.3 l + 130 ml	12.2 l + 250 ml	12.1 l + 380 ml	11.8 l + 630 ml	11.2 l + 1.3 l
DT 1028, DT 1028 H	19.0	18.8 l + 190 ml	18.6 l + 380 ml	18.4 l + 570 ml	18.0 l + 950 ml	17.1 l + 1.9 l
DT 1028 CH	30.0	29.7 l + 300 ml	29.4 l + 600 ml	29.1 l + 900 ml	28.5 l + 1.5 l	27.0 l + 3.0 l
DT 1050 CH	60.0	59.4 l + 600 ml	58.8 l + 1.2 l	58.2 l + 1.8 l	57.0 l + 3.0 l	54.0 l + 6.0 l

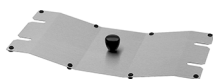
10 Accessories



Insert basket K ...,
made of stainless steel, screen mesh.
Protects goods to be treated and avoids damage to the tank bottom.
Optimum transfer of the ultrasound.



Utensil holder GH ...,
made of stainless steel, mesh size 12 x 12 mm.
For large individual parts.
GH 1 for glass flasks up to 105 mm diameter.



Lid D ...,
made of stainless steel.
For use with inserted basket.
Protects against contamination from outside. Condensation water is guided into the ultrasonic oscillating tank. Reduces noise.



Inset basket K ... EM,
made of stainless steel.
An alternative to DIN insert trays in the medical field. Basket holder KT required.



Basket holder KT ..., made of stainless steel.
For inset baskets K...EM or DIN insert trays in the medical field.



Lid D ... T,
made of stainless steel.
For use with inset baskets without handles (K ... EM).



Insert tub KW ...,
made of plastic, with lid.
For use of chemicals that attack the stainless steel tank. Note temperature and chemical resistance of PE (KW 3 ... KW 5) and PP (from KW 10-0).

Type	Insert basket	Utensil holder	Lid D ...	Inset basket	Basket holder	Lid D ... T	Insert tub
DT 31 /H	K 08	–	D 08	–	–	–	–
DT 52 /H	K 1 C	GH 1	D 52	–	–	D 1 T	–
DT 100 /H, DT 102 H /H-RC	K 3 C	GH 1	D 100	–	–	D 3 T	KW 3
DT 103 H	K 3 CL	–	D 100	–	–	D 3 T	KW 3
DT 106	K 6	–	D 6	–	–	–	–
DT 156	K 6 L	–	D 156	–	–	–	–
DT 156 BH	K 6 BL	–	D 156	–	–	–	–
DT 255 /H /H-RC	K 5 C	–	D 255	–	–	D 5 T	KW 5
DT 510 /H/ H-RC	K 10	GH 10	D 510	–	–	D 10 T	KW 10-0
DT 512 H	K 10 B	–	D 510	–	–	D 10 T	–
DT 514 /H	K 14	–	D 514	K 14 EM	KT 14	D 14 T	KW 14
DT 514 BH / BH-RC	K 14 B	–	D 514	–	–	D 14 T	KW 14 B
DT 1028 /H	K 28	GH 28	D 1028	K 29 EM	KT 30	D 28 T	KW 28-0
DT 1028 CH	K 28 C	–	D 1028 C	–	–	–	KW 28-0
DT 1050 CH	K 50 C	–	D 1050 C	–	–	–	KW 50 B-0


Inset baskets KD ..., PD ...,

Sieve cloth.

Suitable for inset beakers, for cleaning small parts.

KD 0: Stainless steel, interior Ø 75 mm;

PD 04: Plastic, interior Ø 60 mm.

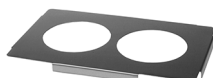

Inset beakers

SD ... (glass), EB ... (stainless steel), KB ..., PD ... (plastic).

For indirect cleaning of small parts, suitable for positioning lid and beaker holder diameter 87 mm. With ring and lid.

KB 04, SD 04 and SD 05 Ø 76 mm, without lid.

SD 09 without lid.


Positioning lid DE ...,

made of stainless steel.

For holding inset beakers. Positioning for optimum utilisation of ultrasonic energy.


Beaker holder ES ...,

made of stainless steel.

For holding 4 inset beakers in larger ultrasonic baths. Positioning for optimum utilisation of ultrasonic energy.


Impression tray holder LT 102,

made of stainless steel.

For cleaning impression trays.


Insert basket PK ... C and K ... P,

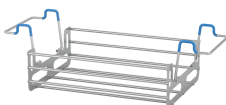
made of plastic, perforated.

For gentle cleaning of sensitive surfaces, e.g. on instruments like probes, syringes and test plugs.


Injection nozzle holder ED ...,

made of stainless steel.

For suspending in the ultrasonic oscillating tank. Holder for different sizes of injection nozzle.


Cassette holder KAH ...,

made of stainless steel.

For suspending in the ultrasonic oscillating tank. Holder for up to three cassette levels.

Type	Inset basket	Insert beaker	Position- ing lid/ beaker holder	Impres- sion tray holder	Insert basket	Injection nozzle holder	Cassette holder
DT 31 /H	PD 04	KB 04, SD 05	DE 08	–	–	–	–
DT 52 /H	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 52	–	PK 1 C	ED 0	–
DT 100 /H, DT 102 H /H-RC	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 100	LT 102	PK 2 C	ED 9	–
DT 103 H	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 100	–	PK 3 C	–	–
DT 106	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 6	–	–	–	–
DT 156	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 156	–	–	–	–
DT 156 BH	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 156	–	–	–	–
DT 255 /H /H-RC	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 255	–	K 5 P	–	–
DT 510 /H /H-RC	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 510	–	–	ED 9	–
DT 512 H	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 510	–	–	–	–
DT 514 /H	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 514	–	–	–	KAH 14.3
DT 514 BH/BH-RC	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	DE 514	–	–	ED 14	–
DT 1028 /H	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	ES 4	–	–	–	–
DT 1028 CH	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	ES 4	–	–	–	–
DT 1050 CH	KD 0, PD 04	SD 06, SD 09, PD 06, EB 05	ES 4	–	–	–	–


Mounting brackets EK ...,

made of stainless steel, for laboratory flasks.

Prevents flasks floating to the surface. For screwing into insert baskets and utensil holders.

EK 10 – 10 ml, max. diameter 31 mm

EK 25 – 25 ml, max. diameter 42 mm

EK 50 – 50 ml, max. diameter 52 mm

EK 100 – 100 ml, max. diameter 65 mm

EK 250 – 250 ml, max. diameter 85 mm


Handle adapter GV ...,

made of stainless steel.

For insert baskets and utensil holders.


Test tube holder RG ...,

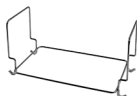
made of stainless steel.

For simultaneous sonication of 6 test tubes up to 25 mm diameter and 8 test tubes up to 16 mm diameter. Can also be used as a test tube stand. Content of test tubes remains visible.


Tableting punch holder TH ...,

made of stainless steel.

For holding tableting punches with different diameters.


Sieve holder SH 7,

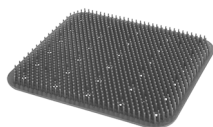
made of stainless steel.

For single sieve cleaning.


Sieve holder SH 28 C,

made of stainless steel.

For the simultaneous and gentle cleaning of up to 5 analysis sieves with 200 mm diameter.


Studded silicone mat SM ...

For contact-free storage of highly sensitive instruments. Fastening in basket prevents instruments from floating to the surface and being damaged. Ultrasound permeable.


Fixation clamps FE 12

Set with 2 large and 5 small plastic clamps for safely securing the flexible endoscope accessories in the basket. Prevents damage to biopsy forceps and instruments.

Type	Mounting brackets for laboratory flasks	Handle adapter	Test tube holder	Tableting punch holder	Sieve holder	Stud- ded sili- cone mat	Fixation clamps
DT 31 /H	–	–	–	–	–	–	–
DT 52 /H	EK 10, EK 25, EK 50, EK 100, EK 250	GV 3	RG 2	–	–	–	–
DT 100 /H, DT 102 H /H-RC	EK 10, EK 25, EK 50, EK 100, EK 250	GV 3	RG 2	–	–	SM 3	–
DT 103 H	EK 10, EK 25, EK 50, EK 100, EK 250	GV 3	RG 2	–	–	–	–
DT 106	EK 10, EK 25, EK 50, EK 100, EK 250	–	–	–	SH 7	–	–
DT 156	EK 10, EK 25, EK 50, EK 100, EK 250	GV 3	–	–	–	SM 6	FE 12
DT 156 BH	EK 10, EK 25, EK 50, EK 100, EK 250	GV 3	–	–	–	SM 6	FE 12
DT 255 /H /H-RC	EK 10, EK 25, EK 50, EK 100, EK 250	GV 3	–	–	–	SM 5	FE 12
DT 510 /H /H-RC	EK 10, EK 25, EK 50, EK 100, EK 250	GV 10	–	–	–	–	–
DT 512 H	EK 10, EK 25, EK 50, EK 100, EK 250	GV 10	–	–	–	–	–
DT 514 /H	EK 10, EK 25, EK 50, EK 100, EK 250	GV 10	–	TH 14 B	–	SM 14	FE 12
DT 514 BH /BH-RC	EK 10, EK 25, EK 50, EK 100, EK 250	GV 10	–	TH 14 B-S 22 TH 14 B-S 28	–	–	–
DT 1028 /H	EK 10, EK 25, EK 50, EK 100, EK 250	GV 10	–	TH 28-S 22 TH 28-S 28	–	SM 29	FE 12
DT 1028 CH	EK 10, EK 25, EK 50, EK 100, EK 250	GV 10	–	TH 28 C TH 28 C-S 22 TH 28 C-S 28	SH 28 C	–	–
DT 1050 CH	–	–	–	–	–	–	–

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BANDELIN *electronic* GmbH & Co. KG

Heinrichstr. 3–4
12207 Berlin
Germany

Phone: +49 30 76880-0
Fax: +49 30 7734699

info@bandelin.com
www.bandelin.com