BANDELIN
Ultraschall seit 1955

High-power ultrasound
Use and application

Practices and clinics

BANDELIN – The brand for ultrasonic baths in the medical field

Whether they are used in small practices, medical care centres or Central Sterile Services departments (CSSDs) in hospitals – ultrasonic baths from BANDELIN have been an integral part of these facilities for decades.

Our ultrasonic baths make everyday life easier when it comes to instrument reprocessing by providing effective, time-saving and thorough cleaning.

Ultrasonic baths are usually used in this environment for the pre-cleaning and cleaning of medical instruments. The type of instruments to be treated determines the selection of the appropriate ultrasonic bath. In addition, the user's requirements regarding the ultrasonic bath's performance must be met, and the local conditions must be taken into account.

This guide provides an overview of the contemporary application options for BANDELIN ultrasonic baths. It contains tips and tricks for application and provides assistance with the selection of devices, useful accessories, and the right cleaning and disinfection agent.

This complete overview enables the user to make the best choice of ultrasonic bath and process to suit their needs.

BANDELIN – Ultrasound since 1955

Company portrait

As a Berlin family business in its third generation, we specialise in the development, manufacture and sale of ultrasonic devices, corresponding accessories, and application-specific cleaning and disinfection agents.

We stand out for our high level of vertical integration, modern production facility, and motivated employees, all of which guarantee a constant stream of new, high-quality products. Our devices contribute to our customers' success in the laboratory, medical, dental, pharmaceutical, industrial, trade and service sectors.

Our company began developing and manufacturing high-performance ultrasonic devices back in 1955. Constant expansion of the product range and a sharp rise in sales figures led to an expansion of the production area in 1985. In 1992, ultrasonic homogenisers and controllable, constant-power ultrasonic generators were launched on the market.

The period from 1996 to 2004 was shaped by the development and production of innovative ultrasonic cleaning baths and immersible transducers along with tube reactors for industrial applications.

In the years that followed, BANDELIN's product range was expanded with new ultrasonic devices for the laboratory. After the launch of the ultrasonic bath for the simultaneous cleaning and rinsing of MIS instruments, this was further developed for robotic instruments in 2014.

Today, the reputation of our brands SONOREX, SONOPULS, SONOMIC and TRISON represents the high quality awareness of our employees, and they have come to be synonymous with ultrasound in professional circles.

The most important product groups include:

SONOREX – ultrasonic baths and reactors
SONOPULS – ultrasonic homogenisers
SONOMIC – an ultrasonic bath for rinsable MIS and standard instruments
TRISON – an ultrasonic bath for robotics, rinsable MIS and standard instruments
TICKOPUR – cleaning agents
STAMMOPUR – cleaning and disinfection agents

We are innovators in the development of new ultrasonic devices and in opening up new areas of application, and have now registered 79 patents / utility models and 68 trademarks. Our involvement in various committees for the development of new standards and guidelines contributes to ensuring the highest standards for ultrasonic applications.

BANDELIN is the market leader as the only complete supplier of ultrasonic devices, accessories, and disinfectants and cleaning agents with approvals and certifications in accordance with ISO 9001 and ISO 13485. We have already delivered more than one million devices to our customers.
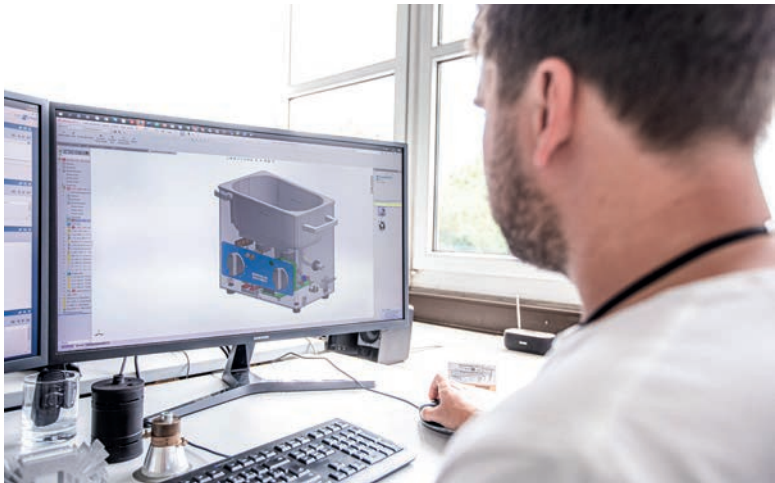
Take a look at our company portrait in the medical field!

1955
SONOREX E 250-12
Manufacture of high-performance ultrasonic cleaning units.

1971
SONOREX TRANSISTOR RK
Ultrasonic baths with transistor technology

1982
SONOREX Z
Two-piece ultrasonic installation devices for the medical field

1990
SONOREX DIGITAL DK
Digital ultrasonic baths

2005
SONOREX DIGITEC DT
Ultrasonic baths with digital control

2006
SONOMIC MC
Ultrasonic bath for MIS instruments

2014
TRISON 3000
Ultrasonic bath for robotic instruments

2023
TRISON 4000.2
Ultrasonic bath for various robotic instruments

Contents

ULTRASOUND IN PRACTICES AND CLINICS

Requirements in practices

Are you a doctor with your own
practice or part of the team?
Find out more about
cleaning and disinfection solutions
for medical instruments undergoing
reprocessing.

from page 10

Requirements in medical care centres and day clinics

Larger than a practice,
but not yet a CSSD.
An ultrasonic bath of the
right size speeds up reprocessing.

from page 11

Requirements in hospitals

Fast sieve cassette cycles are part of
everyday life in the CSSD.
With the right ultrasonic bath, you
can optimise pre-cleaning.

from page 11
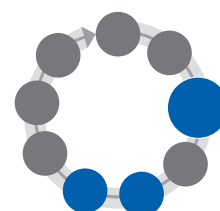
Classification of the ultrasoundapplication in the instrument cycle

Application of an ultrasonic bath in
the instrumentcycle in reprocessing.

from page 12

What is ultrasound?

Discover how ultrasound
and ultrasonic baths work.

from page 14

Advantages of ultrasonic cleaning

Ultrasonic cleaning of
medical instruments
offers many advantages.
Let us show you.

from page 15
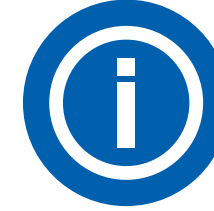
Structure of an ultrasonic bath

Basic structure,
including an explanation of
individual components.

from page 16

Requirements in medical care centres and day clinics

The hygiene requirements in medical care centres or day clinics do not differ fundamentally from the hygiene requirements in a doctor's office. This means that all instrument reprocessing measures correspond to those used in practices.

Nevertheless, instrument reprocessing can be organisationally different from a small practice. On the one hand, the throughput of instruments by several operators is significantly higher. This means more instruments require treatment in less time.

In practices, individual instruments are typically pre-cleaned in an ultrasonic bath before they are transferred for further reprocessing. In larger facilities, this can also be achieved by a significantly larger ultrasonic bath. However, due to the high number of instruments to be reprocessed, it is also possible that entire trays (sieves) of instruments are pre-packed.

BANDELIN offers the appropriate ultrasonic baths and accessories for both options of effective pre-cleaning using ultrasound, i.e., either individual instruments or entire instrument sieves.

Requirements in practices

The reprocessing of medicaldevices is an essential part of practice hygiene. Practices are confronted with high demands on the instrument reprocessing process: the aim is to ensure safe reprocessing to national regulations (e. g. KRINKO/BfArM in Germany) for the protection of patients and the team, to define lean and efficient work processes, and to ensure medical instruments become quickly available again and retain their value.

The variety of different instruments in practices requires efficient solutions for reprocessing.

The breadth and sometimes high complexity of different instruments – depending on the field of practice – make thorough cleaning or pre-cleaning essential for further reprocessing. Pre-cleaning with an ultrasonic bath provides the perfect foundation for reprocessing in medical applications because this process is very effective for the typically occurring impurities and thus ensures the desired results.

Depending on the field – whether general medicine, ENT, gynaecology or practices that work with rigid endoscopes – BANDELIN provides the correct and suitable ultrasonic bath.

Requirements in hospitals

In hospitals, there is a set standard for safe and compliant reprocessing according to national regulations (e. g. KRINKO/BfARM in Germany).. In the form of "CSSD"s (Central Sterile Services departments), hospitals have created their own departments to ensure that instruments are reprocessed in accordance with standards.

In contrast to a private practice, which tends to use compact tabletop ultrasonic baths for pre-cleaning, a CSSD that processes several hundred instrument sieves per day is primarily concerned with optimising the workflow in an ergonomic way. Built-in ultrasonic baths that can be integrated into a stainless-steel row of units in the unclean area of the CSSD are particularly suitable for this.

In terms of dimensions, these ultrasonic baths are designed in such a way that various sieves, such as ISO, DIN, or other variants, could be placed in the ultrasonic bath.

Efficient pre-cleaning for safe instrument reprocessing.

Classification of the ultrasound application in the instrument cycle
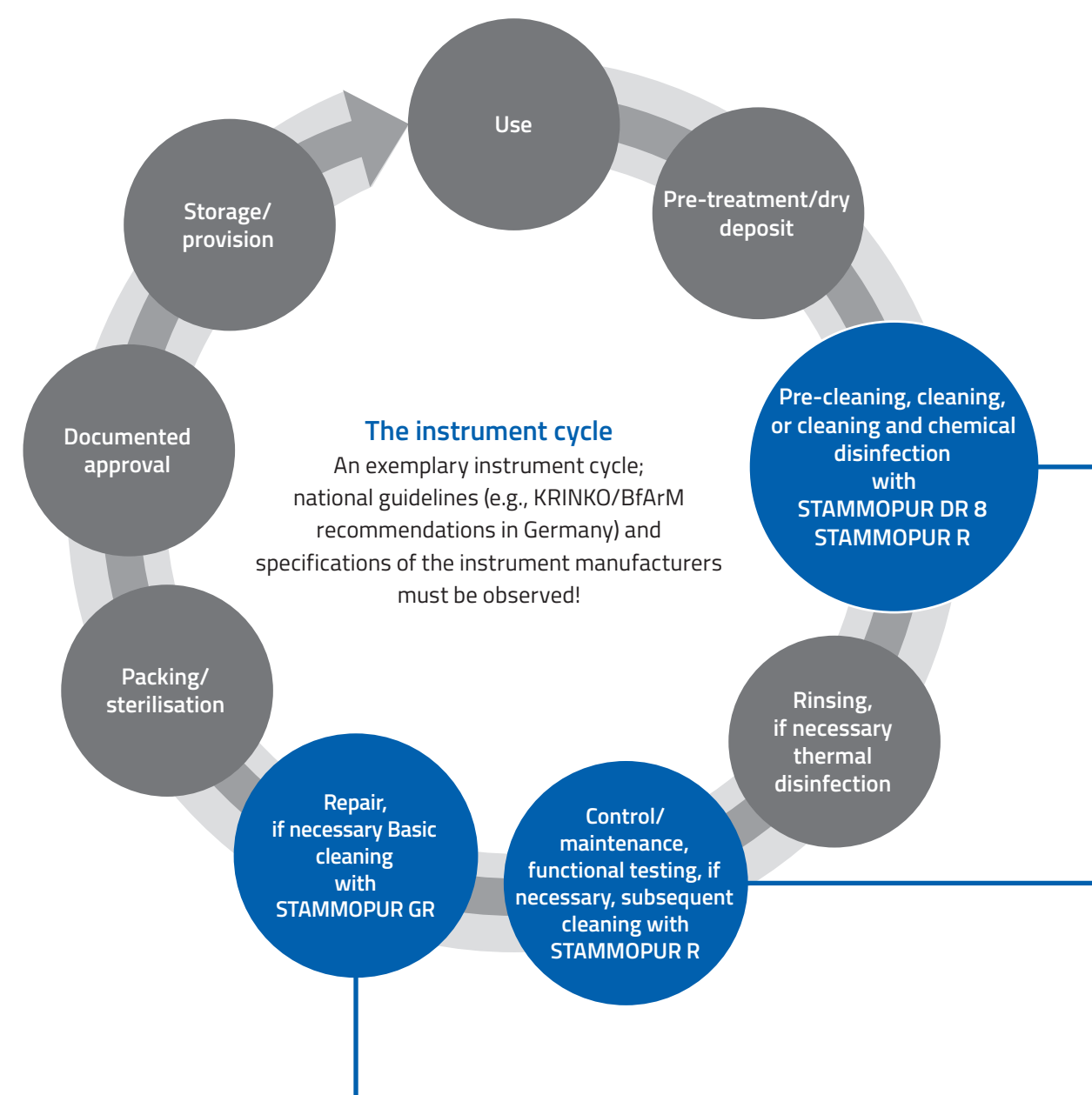
Ultrasound application is one of the most effective and thorough methods for cleaning medical instruments and endoscopes. Highly effective, successful cleaning of the objects to be cleaned is an essential requirement for safe and compliant instrument reprocessing.
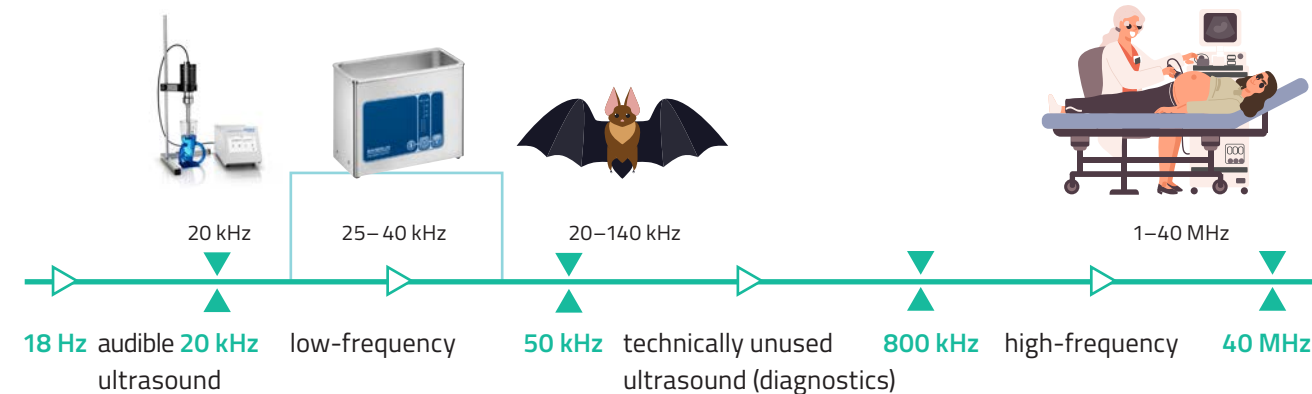
The versatility of an ultrasonic bath is made possible by the combination of ultrasonic application in conjunction with the relevant recommended agent.

That makes the application of an ultrasonic bath an important part of the instrument cycle in a practice.

The instrument cycle

An exemplary instrument cycle; national guidelines (e.g., KRINKO/BfArM recommendations in Germany) and specifications of the instrument manufacturers must be observed!

Use

Pre-treatment/dry deposit

Pre-cleaning, cleaning, or cleaning and chemical disinfection with STAMMOPUR DR 8 STAMMOPUR R

Rinsing, if necessary thermal disinfection

Control/maintenance, functional testing, if necessary, subsequent cleaning with STAMMOPUR R

Repair, if necessary Basic cleaning with STAMMOPUR GR

Packing/sterilisation

Documented approval

Storage/provision

● = Application of the ultrasonic bath

Pre-cleaning and cleaning
Intensive pre-cleaning before the automated reprocessing process and manual cleaning in an ultrasonic bath with **STAMMOPUR R**

Cleaning in a medical laboratory and instrument cleaning in an ultrasonic bath with **STAMMOPUR R**

Cleaning and chemical disinfection
Cleaning and chemical disinfection as part of manual reprocessing in an ultrasonic bath with **STAMMOPUR DR 8**

Disinfectant cleaning before automated reprocessing, also for user protection, in an ultrasonic bath with **STAMMOPUR DR 8**

Secondary cleaning and repeat cleaning
Secondary cleaning of residual impurities afte thermal disinfection in an ultrasonic bath with **STAMMOPUR R**

Repair, if necessary, basic cleaning
Basic cleaning of instruments and accessories that have become unsightly in an ultrasonic bath with **STAMMOPUR GR**

What is ultrasound? How does it work?

20 kHz	25–40 kHz	20–140 kHz		1–40 MHz

18 Hz audible **20 kHz** low-frequency **50 kHz** technically unused **800 kHz** high-frequency **40 MHz**
ultrasound ultrasound (diagnostics)

## What is ultrasound and how does it work?

Vibrations with frequencies above 20 kHz (20,000 vibrations per second) are referred to as ultrasound.

The range of low-frequency ultrasound is used in the laboratory field, while a higher frequency range is used in medical diagnostics.

The low-frequency ultrasonic vibrations generate millions of tiny vacuum bubbles in all liquids, which immediately implode again, creating highly impactful pressure surges. This process is called cavitation. Low frequencies of 20 kHz produce bubbles of a larger diameter with more intense pressure surges compared to higher frequencies of 35 kHz. Low-frequency ultrasound has been used in a wide variety of ultrasonic baths for decades. The process of cavitation ensures

that dirt residues are blasted off the surfaces of the parts present in the liquid very effectively yet gently, even from recesses and drilling holes.

Other applications include, e.g., degassing or mixing liquids.

> Cleaning with a SONOREX ultrasonic bath from BANDELIN
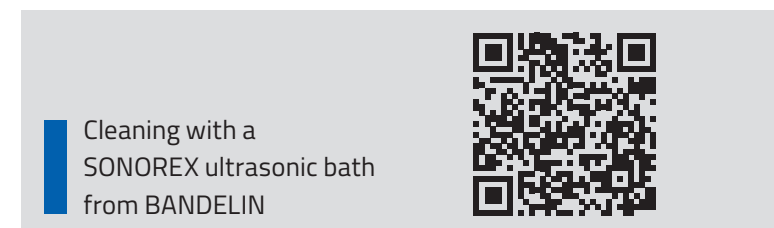
Cavitation

Ultrasound generates an intensive cycle of compression and tension in the water, creating the finest cavitation bubbles, which grow over several cycles and then implode intensely.

The resulting high shear forces and microjets of the implosions quickly blast off any adhering impurities from the surface.

1 nm
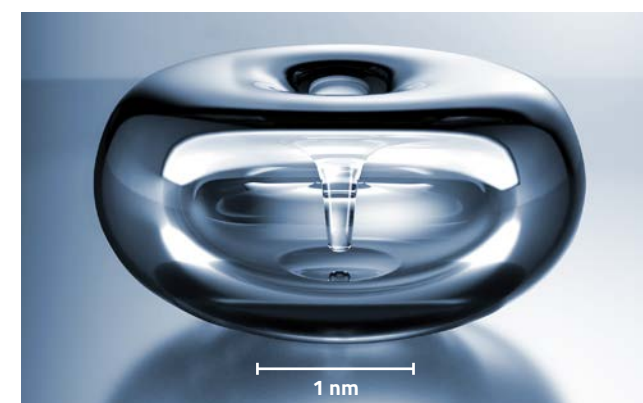
Cavitation bubble

Advantages of ultrasonic cleaning
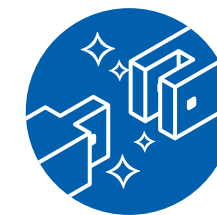
High cleaning effect in hard-to-reach areas, such as drilling holes, joints or gaps
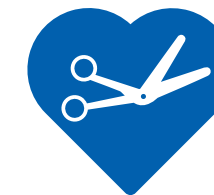
Protection of the instruments

Fast instrument circulation

No time-consuming manual pre-cleaning required
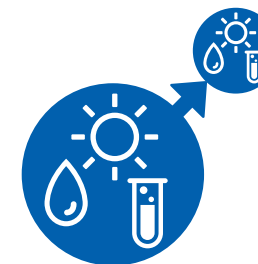
Economical use of water, chemicals and energy

Disinfectant pre-cleaning for user protection

Ultrasound provides fast cleaning results

One application is the sonication of medical instruments contaminated with blood residues in a SONOREX ultrasonic bath and a suitable cleaning agent, such as

STAMMOPUR R. After just a few seconds, the contamination is visibly removed from the instrument.

| Start | 3 seconds | 5 seconds | 8 seconds | 10 seconds |

Structure of an ultrasonic bath

Ultrasonic baths handle a variety of tasks in day-to-day laboratory life. This makes for a correspondingly wide range of devices. The basis for successful application is an understanding of the basic structure of an ultrasonic bath and the resulting selection of equipment features and application parameters based on the application in question.
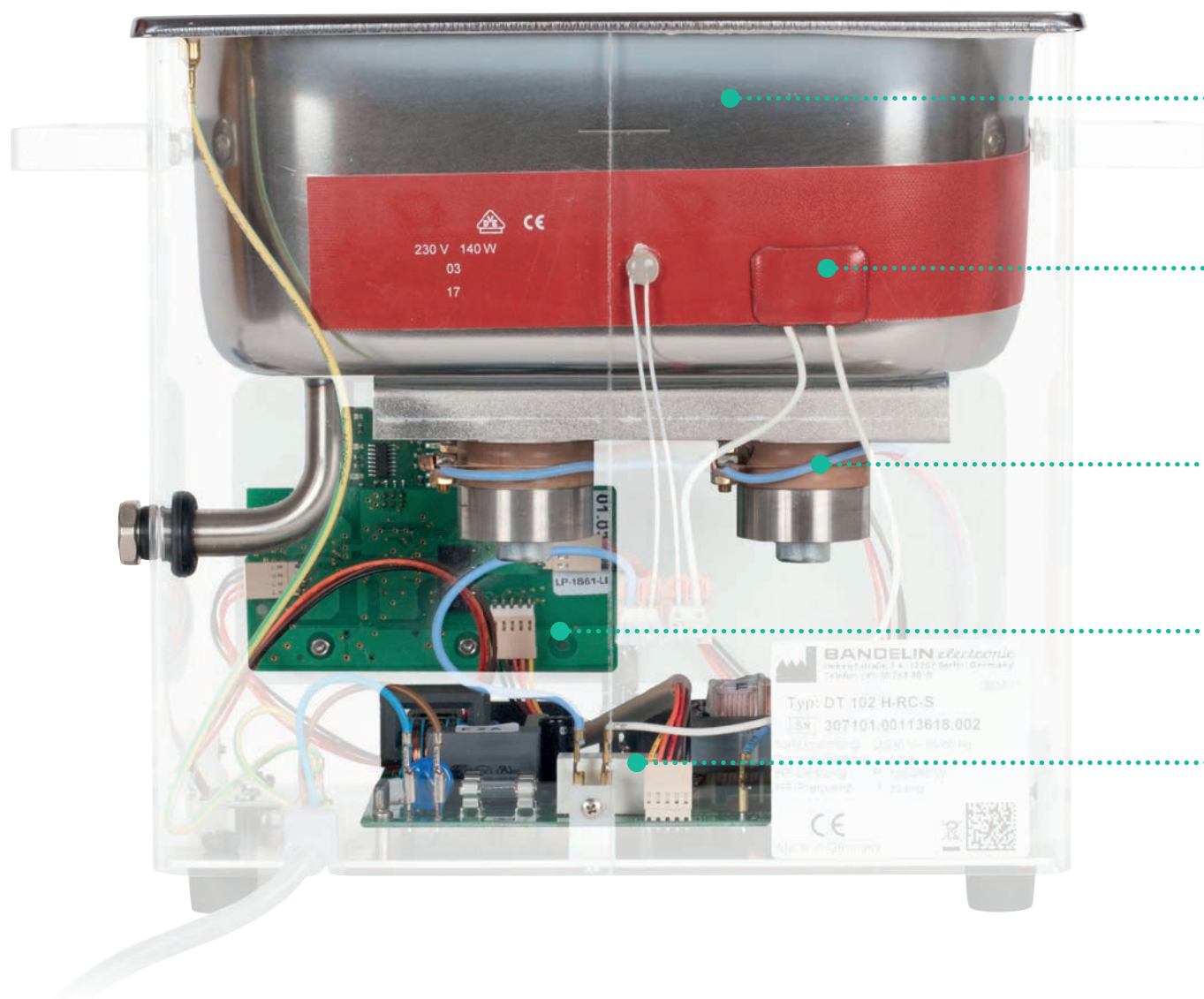
Oscillating tank
made of stainless steel 1.4301 (wrought), SONOREX RK/DT 102 H: additionally hard chromium plated, or some models stainless steel 1.4404 (welded), 2 mm material thickness

Heating
Surface heating elements, with automatic shutdown against excess temperature.

Oscillating systems
Conversion of thehigh-frequency voltage supplied by the generator by means of piezoelectric transducers into mechanical resonant oscillations of the same frequency. The connection between the oscillating systems and the stainless steel tank is made with a high-strength adhesive.

It is crucial to understand that the dimensions of the oscillating elements determine the operating frequency. Once the dimensions have been defined, the operating frequency can no longer be varied. The number of oscillating elements determines the power in the bath.

25 kHz   35 kHz

Control unit
Preselection of the process parameters time and/or temperature.

Ultrasonic generator
Conversion of the low-frequency mains voltage of 50/60 Hz into a high-frequency voltage of 35 or 40 kHz

Areas of application

Note: The majority of medical instruments are suitable for reprocessing in an ultrasonic bath. In principle, however, all instruments must be checked to ensure compatibility for reprocessing in an ultrasonic bath. The instrument manufacturer will provide precise reprocessing instructions.
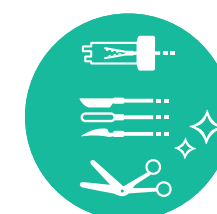
Instrument cleaning

Remove a wide range of impurities from your medical instruments.

from page 20

Instrument cleaning and chemical disinfection

To provide greater safety for the operator. Simultaneous pre-cleaning and chemical disinfection in one work step.

from page 26

Basic cleaning of medical instruments

Old instruments will regain their shine.

from page 28

Instrument cleaning

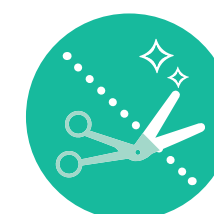BANDELIN ultrasonic baths enable thorough and gentle cleaning of medical instruments with the right accessories and the agents specially manufactured for application in ultrasonic baths. They are used
- as mechanical support for manual cleaning processes
- to remove stubborn residues before or after mechanical reprocessing
- for cleaning support as an integral part of the mechanical reprocessing process.

In practices, day clinics or CSSDs in hospitals, there are a large number of impurities and contaminants that must be removed during instrument reprocessing in accordance with the relevant specifications.

Due to work being performed directly on the patient with medical instruments, it must be assumed that each instrument in use is potentially contaminated. Organic residues, such as adhering blood and secretions, are sometimes hardly visible, but pose a hygiene risk. Thorough pre-cleaning is essential for proper reprocessing (e.g., thermal disinfection or sterilisation). Only completely clean instruments that have been disinfected or sterilised may be used on patients again.

An ultrasonic bath with the right accessories and a suitable cleaning agent therefore provides the best possible foundation for pre-cleaning contaminated instruments.

Examples of objects to be cleaned

Depending on the specialisation, a wide variety of medical instruments are used on patients. The requirements for reprocessing vary depending on the intended use of the instruments. In this case, the main focus is on assessing whether instruments are to be categorised as critical in your classification. This classification applies to all surgical instruments, for example.

Regardless of the intended use and the associated reprocessing steps, the same applies to all instruments: without good cleaning, no disinfection or sterilisation can take place.
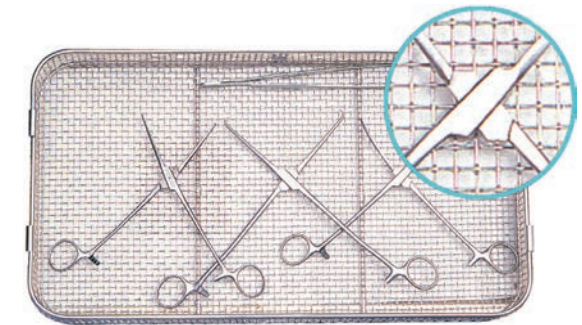
Positioning of the instruments in the ultrasonic bath

The instruments to be cleaned are either placed individually in an insert basket or packed in a sieve directly in the ultrasonic bath and cleaned. Care must be taken here to ensure that the instruments are stored safely in order to avoid damage to the instruments or prevent poorer results. Articulated instruments are always opened to ensure effective cleaning. Multi-part instruments must be disassembled as far as possible.

In general, ultrasound is effective wherever liquid can reach, meaning that overloading or incomplete coverage with the liquid will lead to poor cleaning results.
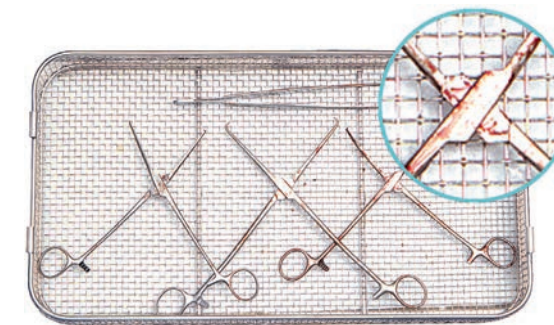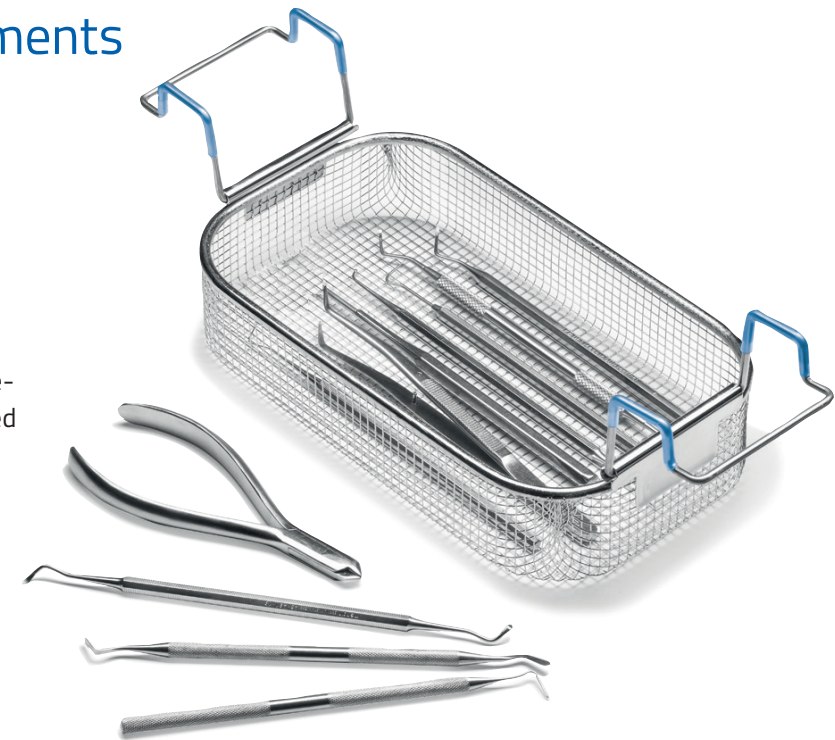
Medical instruments prior to…   … and after ultrasonic cleaning

PRACTICAL TIP

Bath temperature
Ultrasound generates the desired cavitation in the bath liquid, which is what causes the cleaning effect during the process. Cavitation causes the bath liquid to heat up during operation.

When cleaning to remove organic residues, there is a risk that the proteins in these organic residues will become de-natured if temperatures are too high (> 40 °C). This leads to undesired protein fixation (strongly adhering protein contamination), which makes further reprocessing of the instruments more difficult.

That is why you should always pay attention to the bath temperature. We recommend that the bath be cold for cleaning baths, as is also intended for the disinfectants for this reason. Operate the ultrasonic device at room temperature (18–25 °C).

Example equipment for smaller practices

Smaller practices often only have to reprocess individual instruments for non-surgical use. A compact ultrasonic bath such as the SONOREX DT 100 is the right choice.

Example equipment

- DT 100 ultrasonic bath
- Accessories: Insert basket K 3 C, Lid D 100
- Agent: STAMMOPUR R

Insert basket K 3 C

Lid D 100

STAMMOPUR R

DT 100

Example equipment for endoscopy in private practices

Due to their complexity, rigid endoscopes pose increased challenges for reprocessing. In addition, these instruments are quite long.
The SONOREX DT 156 has been developed precisely for this type of instrument.

Example equipment

- DT 156 ultrasonic bath
- Accessories: Insert basket K 6 L, Lid D 156
- Agent: STAMMOPUR R

Insert basket K 6 L

Lid D 156

STAMMOPUR R

DT 156

Example equipment for larger practices

Larger practices that also work with more than one practitioner or which offer areas of surgical specialisation have a higher throughput of instruments for reprocessing. In order to optimise the workflow, a larger ultrasonic bath, e.g., the SONOREX DT 514, is recommended.

Example equipment

- Ultrasonic bath DT 514
- Accessories: Insert basket K 14, Lid D 514
- Agent: STAMMOPUR R

Insert basket K 14

Lid D 514

STAMMOPUR R

Example equipment in medical care centres and day clinics

A variety of instruments, a high throughput: the ultrasonic bath for pre-cleaning should have an appropriate capacity for the quantity of individual instruments to be cleaned. The SONOREX DT 1028 with a matching insert basket is suitable for this.

Example equipment

- Ultrasonic bath DT 1028
- Accessories: Insert basket K 28, Lid D 1028
- Agent: STAMMOPUR R

Insert basket K 28

Lid D 1028

STAMMOPUR R

DT 1028

Same device, but different accessories. If complete instrument trays are used for processing, the SONOREX DT 1028 is the ultrasonic bath of choice. In terms of accessories, only one basket holder is required for this, in order to safely position the trays with the instruments.

Example equipment

- Ultrasonic bath DT 1028
- Accessories: Basket holder KT 30, insert basket K 29 EM
- Agent: STAMMOPUR R

Basket holder KT 30

Insert basket K 29 EM

STAMMOPUR R

DT 1028

Example equipment for CSSDs

The pre-cleaning of medical instruments in CSSDs is usually organised in complete trays (sieves). Due to the high number of instruments to be processed, the workflow, and thus efficient processing, is of the essence. The solution is built-in ultrasonic baths.

Example equipment

- Ultrasonic bath ZE 1058 DT
- Accessories: Basket holder KT 57, insert basket K 29 EM, Lid D 57
- Agent: STAMMOPUR R

Basket holder KT 57

Insert basket K 29 EM

Lid D 57

STAMMOPUR R

ZE 1058 DT

If a built-in solution is not possible, the SONOREX DT 1058 M tabletop unit is recommended, which offers the same dimensions and functions as a typical built-in bath.

Example equipment

- Ultrasonic bath DT 1058 M
- Accessories: Basket holder KT 57, insert basket K 29 EM, Lid D 57
- Agent: STAMMOPUR R

STAMMOPUR R

DT 1058 M

Basket holder KT 57

Insert basket K 29 EM

Lid D 57

Cleaning and chemical disinfection of instruments

Practice   Medical care centres/
                day clinics

Thorough pre-cleaning is the basis for the subsequent steps for safe and compliant instrument reprocessing. Pre-cleaning in an ultrasonic bath is the most effective, quickest, and most thorough method for this.

However, the protection of employees must also be taken into particular consideration during pre-cleaning.

STAMMOPUR DR 8 can be used for chemical disinfection and intensive cleaning in an ultrasonic bath. This protects the user from contaminated material during pre-cleaning of the instruments and from the potential risk of infection in the event of contact with this material, for example, in the case of a minor injury. Despite personal protective equipment in the form of gloves, there is a risk of injury due to the sometimes very pointed and sharp-edged instruments.

For optimal user protection, the agent STAMMOPUR DR 8 is bactericidal and levurocidal according to the VAH list of disinfectants and also offers the advantage of limited virucidal activity. For full effectiveness, the dosage information and the duration of sonication must be observed.

Contaminants

- Blood

Agent

- **STAMMOPUR DR 8**
  Certified by the German Association for Applied Hygiene (VAH), 2 % – 5 min: bactericidal, levurocidal, limited virucidal, incl. H5N1 and SARS-CoV-2, 2 % – 10 min: SV40, 3 % – 15 min: Adeno

Objects to be cleaned

- **Instruments made of metal and also light metal**

Application instructions

- Place the objects to be cleaned in the stainless-steel insert basket and hang the basket in the oscillating tank.

Example equipment

- Ultrasonic Bath DT 102 H
- Accessories: Insert basket K 3 C, Lid D 100
- Agent: STAMMOPUR DR 8

Ultrasonic cleaning and disinfection agents

Ultrasonic cleaning, in combination with a disinfecting cleaning agent, offers many advantages in the practice workflow. With STAMMOPUR, BANDELIN offers a comprehensive range of cleaning and disinfection agents.

Advantages of cleaning and chemical disinfection in an ultrasonic bath:

- High level of protection for staff
- No contamination of the cleaning solution
- Thorough removal of contamination
- Protection of the objects to be cleaned
- Protection of the ultrasonic components (oscillating tank and accessories)
- Reduced disinfection time in an ultrasonic bath, as verified by experts

Selection of the right accessories and agent is crucial for optimal cleaning results. BANDELIN offers a wide range of accessories for various applications in the medical field. For a simple and efficient workflow.

Watch our video:
Cleaning and chemical disinfection of medical instruments:
youtube.com/
watch?v=owzVcZzNGvA&t=54s

Basic cleaning of instruments

Over time, instruments can become externally discoloured, stained, or encrusted due to various influences. Instruments undergo soiling in everyday work – both during treatment and during complex reprocessing. It is virtually impossible to remove temper colour or burnt-in soiling caused by sterilisation processes by hand, and oxide or limescale deposits cannot be completely avoided either, despite the best care.

This is why basic cleaning of the instruments in an ultrasonic bath is recommended to remove that soiling. With the right cleaning agent, old instruments will regain their lustre. The refurbishing process supports qualitative and ecological sustainability.

Contaminants

- Stains
- Encrustations
- Discolouration

Objects to be cleaned

- **Medical instruments made of stainless steel**

Agent

- STAMMOPUR GR
  5 %, 3–10 min, 50–60 °C bath temperature
- For the contact liquid agent:
  STAMMOPUR R 2 %, 50–60 °C bath temperature

Application instructions

- The application is performed in an ultrasonic bath with indirect sonication in inset beakers, e.g., in a plastic insert tub or in a beaker.

Example equipment

- Ultrasonic bath DT 102 H
- Accessories: Insert tub KW 3
- Agent: STAMMOPUR GR
- For the contact liquid agent:
  STAMMOPUR R

Performing basic cleaning

Medical instruments made of stainless steel, precious metals, and titanium are suitable for basic cleaning with STAMMOPUR GR.

For basic cleaning, indirect cleaning must be used in order to protect the ultrasonic tank, since strongly acidic solutions such as STAMMOPUR GR can be corrosive to the components of the ultrasonic bath with long-term exposure. In contrast, the instruments do not corrode due to the short duration of use.

To prepare for basic cleaning, an insert tub or an insert beaker is filled with the dosed agent STAMMOPUR GR. The contact liquid, e.g., STAMMOPUR R, 2%, is filled into the ultrasonic tank. For degassing, the insert tub or insert beaker is inserted into the ultrasonic bath and the ultrasound is switched on in accordance with the operating instructions of the ultrasonic device. After degassing, the instruments – disassembled and opened if necessary – are placed in the insert tub or insert beaker. During sonication, the lid must be kept on and, depending on the degree of discolouration, encrustation or stains, a process time of between 2 and 10 minutes in the ultrasonic bath should be selected.

PRACTICAL TIP

In contrast to the cleaning of organic residues, a high temperature is an important factor for success in basic cleaning. We therefore recommend an ultrasonic bath with integrated heating to heat the cleaning solution to an optimum temperature of 50–60 °C. The best results are achieved in this temperature range.

Example equipment

- Ultrasonic Bath RK 514 H
- Accessories: Insert Tub KW 14
- Agent: STAMMOPUR GR
- For the contact liquid agent:
  STAMMOPUR R

Ultrasonic baths

for instrument reprocessing

Criteria for purchasing an ultrasonic bath

Which would be the right ultrasonic bath for you? Our recommendations.

Selection criteria for an ultrasonic bath

Optimal sonication results are achieved by selecting the ultrasonic bath that is suitable for the application, along with the appropriate accessories for holding the instruments. However, optimal selection of the agent is just as crucial, whether for the cleaning effect or for generating a homogeneous sound field in the bath. With STAMMOPUR, BANDELIN offers a comprehensive range of cleaning and disinfection agents.

Table-top device or built-in bath

Ultrasonic baths for medical use are available in two variants: installation-free table-top devices or built-in baths integrated into stainless steel furniture. A table-top device is certainly the right choice for practices. No installation effort, ready for operation after unpacking and, depending on the size, compact in the installation area. Small, compact devices are particularly suitable for smaller practices with little equipment.

Larger practices up to the size of medical care centres usually also use table-top devices, but in larger dimensions. A higher capacity is required for the ultrasonic bath due to the higher quantity of instruments to be cleaned.

Built-in appliances are mainly used in the CSSD department in hospitals. Instruments are not pre-cleaned there individually but packed in trays. For this purpose, integrated built-in devices that are optimally tailored to the workflow of the employees are ideal for making the entire instrument reprocessing process efficient.

Bath size

The choice of the right bath size depends on the applications and the objects to be cleaned. It is thus primarily the objects to be cleaned – in this case, medical instruments – that determine the choice of suitable accessories in which they must be placed, and thus the suitable ultrasonic bath.

It is therefore not the bath volume that is decisive but the space required by the objects to be cleaned. For example, an ultrasonic bath with a small base area and greater bath depth can have the same bath volume as a shallow ultrasonic bath with a larger base area.

The objects to be cleaned must be completely covered with the application liquid when being cleaned in an ultrasonic bath. Overlapping of the objects to be cleaned should also be avoided, so that the cleaning effect, in combination with the ultrasound, can fully take hold.

During indirect sonication, the vessels must be immersed at least 2 cm into the contact liquid so that the ultrasound is transferred into the cleaning agent for the vessels.

If various ultrasonic applications are to be performed, always ensure that the ultrasonic bath is suitable for each application. It can save a lot of time to carry out several applications in one operation. In a larger bath, for example, instruments can be cleaned in a basket, and two beakers with different objects to be cleaned can be sonicated in different cleaning agents at the same time.

Another aspect is the space required for the device on the work surface and the installation conditions.

For rinsable MIS and complex robotic instruments, ultrasonic baths with additional functions, such as rinsing and movement of the instruments, are available to meet the increased requirements for cleaning.

Accessories

The selection of the right accessories is essential for successful cleaning in an ultrasonic bath.

BANDELIN offers a wide range of accessories that are optimally adapted to the cleaning requirements and can be used flexibly.

The objects to be cleaned determine the type of sonication (direct or indirect) and the choice of accessories. The objects to be cleaned must never be placed directly on the tank bottom, to avoid damaging it and the objects to be cleaned.

For small parts, gentle cleaning in a beaker is recommended. For basic cleaning, a plastic insert tub is suitable for particularly gentle and efficient cleaning.

The choice of cleaning agent depends on the degree of soiling and also influences the choice of accessories. Acidic cleaning agents, for example, may only be used for indirect sonication, in order to protect the oscillating tank from corrosion.

Cleaning by direct or indirect sonication

Direct sonication:
The objects to be cleaned are directly exposed to cavitation in the ultrasonic bath, which means that the entire bath volume is available for sonication of the objects to be cleaned.

Indirect sonication:
The objects to be cleaned and sonicated are indirectly exposed to cavitation in an inset beaker, which enables the simultaneous sonication of different cleaning solutions or objects to be cleaned.

Ultrasonic baths with and without heating

The choice of an ultrasonic bath with or without heating depends on the cleaning application. You should take the following into account.

Device without heating:
- For cleaning after dry deposit, at temperatures above 40 °C, there is a danger of protein coagulation.
- Disinfectant liquids must not be heated up.

Device with heating:
- For cleaning after wet deposit or for basic cleaning

- Contaminants such as grease and waxes are removed more quickly.

In devices with heating, this can be switched on, which means that the bath liquid can be heated, or the heating can remain deactivated, depending on the application. Ultrasonic baths from the SONOREX DIGITEC series with heating are equipped with temperature monitoring. A temperature range between 20 and 80 °C can be set. If the set temperature range of 25 °C, for example, is exceeded during an application with a temperature-sensitive part or contamination, this will be signalled by

the red warning LED. The user does not need an external temperature measuring device and will be able to intervene in the cleaning process in good time.
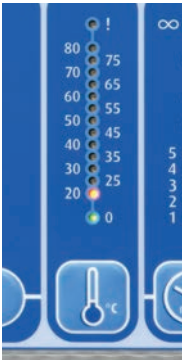
Instrument types to be cleaned

There are a variety of different medical instruments, from simple surgical instruments, such as scalpels, to highly complex robotics instruments.

Ultrasound is always the basis for thorough pre-cleaning for all instrument types. However, if the geometry of the instruments becomes more complex, for example, due to cavities, drive units, joints, etc., it may be helpful to equip the ultrasonic bath with additional modes of action to ensure the cleaning of such complex instruments.

SONOMIC MC 1001

An important type of instrument used in many disciplines are hollow bodies, such as MIS instruments, trocars, rigid endoscopes and other instruments. In addition to the ultrasound, a rinsing function is also integrated here with a special ultrasound bath to ensure thorough internal cleaning.

TRISON 4000.2

For several years, robotics instruments have been becoming increasingly common. These highly complex instruments consist of a long shaft, i.e., a hollow body, in which the finest surgical tool tips can be moved via Bowden and control cables. This type of instrument is becoming more and more common, but also poses greater challenges in reprocessing, especially for users in CSSDs.

Compared to manual pre-cleaning, an ultrasonic bath that mechanically agitates and rinses the instruments achieves the best cleaning results.
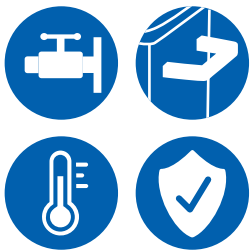
SONOREX SUPER RK and DIGITEC DT compact devices

04

SONOREX series

The most important features of the controls and functions.

Advantages of the SONOREX series

Solid arguments in favour of an ultrasonic bath from BANDELIN.

SONOREX bath sizes and technical specifications

Overview of the SUPER RK and DIGITEC DT device series

SONOREX accessories and configuration example

Combine our accessories to precisely suit your applications.

SONOREX control
Ultrasonic baths in two versions

SONOREX SUPER RK

Conventional operation via a turning knob

Bath sizes of compact baths:
0.9 – 90 litres

Ultrasonic baths with turning knobs, includinga user-friendly crossbar, which allows the time and/or temperature to be selected.

Product features

 Time setting: 1 – 15 min and continuous operation

 Adjustable temperature range (except ZE): with H version 30 – 80 °C, adjustable ± 5, with RK 31 H: 65 permanently set

 Easy and intuitive to control

 Sweep – automatic frequency control ensures a homogeneous sound field

MD **Medical device class I** MDR-compliant

SONOREX DIGITEC DT

Membrane keyboard, with rapid degassing

Bath sizes of compact baths:
0.9 – 90 litres

Ultrasonic baths with digital controls, which enable temperature and/or time to be set and rapid degassing to be activated.

Product features

 Time setting: 1, 2, 3, 4, 5, 10, 15, 30 min and continuous operation

 Adjustable temperature range (except ZE): with H version 20 – 80 °C, adjustable ± 2.5

 Excess temperature signal (except ZE) if the set temperature is exceeded, warning LED

 Membrane keypad, particularly hygienic

 Safety shut-down after 12 hours

 Data memory for 1 program

 DEGAS function, Rapid degassing

 Ultrasound active/deactivated

 Pulse function – increases the wave frequency and thereby enhances the ultrasound effect

 Sweep – automatic frequency control ensures a homogeneous sound field

MD **Medical device class I** MDR-compliant

Advantages of the *SONOREX* compact devices at a glance

MD Medical device class I
MDR-compliant

SONOREX SUPER RK 102 H

SONOREX DIGITEC DT 102 H

Durable design

- Compact, easy-care, stainless-steel housing
- Oscillating tank:
  made of stainless steel 1.4301 (wrought)
  SONOREX RK/DT 102 H: additionally hard chromium plated,
  on some models stainless steel 1.4404 (welded),
  2 mm material thickness
- High-performance oscillation systems made with highly stable ceramic piezoelectric materials
- Made in Germany

MADE IN
GERMANY

Filling level mark

Easily recognisable embossing for the minimum filling level of the cleaning agent — makes filling the bath easier.
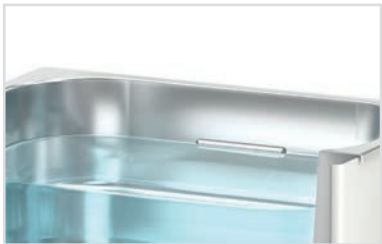
Welded outlet
with ball valve for emptying the ultrasonic bath (from RK/DT 102 H).

The outlet elbow is welded to the tank bottom and is not screwed on. This prevents leaks in the device and makes cleaning easier.
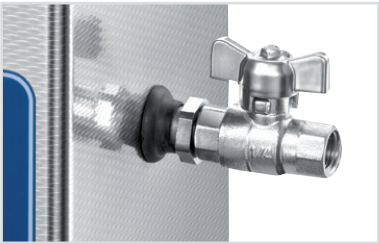
Fixed mains cable

In contrast to the plug-in mains cables that are otherwise usually found, these are permanently installed in SONOREX ultrasonic baths. This rules out ingress of liquid at this connection and the associated danger of a short circuit.

Device feet (plastic)

For a secure footing on any surface.
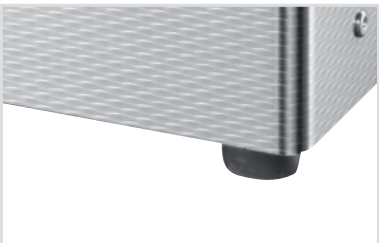
Handles

For easy and safe handling
(except RK/DT 31, RK/DT 52, RK/DT 100, RK/DT 103 H, RK/DT 106, RK/DT 156, RK 170 H, RK 1040).
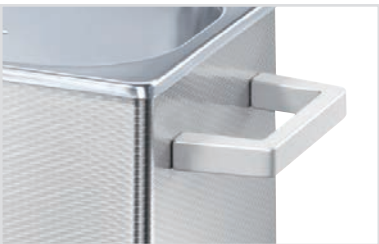
Heating

Depending on the model, with integrated heating.
Adjustable temperature ranges:
- RK 30–80 °C, except RK 31 H–: 65 °C fixed
- DT 20–80 °C

Protection against dry running

- Automatic switching off in the event of excessive temperature,
  e.g., triggered by an insufficient filling level.
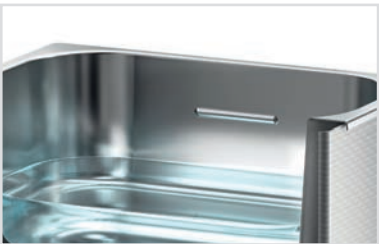
SONOREX SUPER RK
Bath sizes and technical specifications

SONOREX SUPER RK 102 H

Type	Internal dimensions of the oscillating tank L × W × D [mm]	Capacity [l]	Code no.	External dimensions L × W × H [mm]	Ultrasonic peak power* [W]	Ultrasonic nominal power [W]	Heating power [W]	Outlet ball valve
RK 31 RK 31 H	190 × 85 × 60	0.9	329 7523	205 × 100 × 180	160 160	40 40	– 70	– –
RK 100 RK 100 H RK 102 H	240 × 140 × 100	3.0	301 312 303	260 × 160 × 250	320 320 480	80 80 120	– 140 140	– – G ¼
RK 156	500 × 140 × 100	6.0	305	530 × 165 × 245	640	160	–	G ¼
RK 156 BH	500 × 140 × 150	9.0	646	530 × 165 × 300	860	215	600	G ¼
RK 255 RK 255 H	300 × 150 × 150	5.5	3066 316	325 × 175 × 295	640 640	160 160	– 280	G ¼ G ¼
RK 510 RK 510 H	300 × 240 × 150	9.7	327 321	325 × 265 × 300	640 640	160 160	– 400	G ½ G ½
RK 512 H	300 × 240 × 200	13.0	795	325 × 265 × 350	860	215	400	G ½
RK 514 RK 514 H	325 × 300 × 150	13.5	277 207	355 × 325 × 305	860 860	215 215	– 600	G ½ G ½
RK 514 BH	325 × 300 × 200	18.7	263	355 × 325 × 385	860	215	600	G ½
RK 1028 RK 1028 H	500 × 300 × 200	28.0	322 324	535 × 325 × 400	1200 1200	300 300	– 1300	G ½ G ½
RK 1028 C	500 × 300 × 300	45.0	661	540 × 340 × 500	2000	500	–	G ½
RK 1028 CH	500 × 300 × 300	45.0	143	540 × 340 × 500	1200	300	1450	G ½
RK 1050	600 × 500 × 200	58.0	323	640 × 540 × 425	2400	600	–	G ½
RK 1050 CH	600 × 500 × 300	90.0	184	640 × 540 × 530	2400	600	1950	G ½

*Corresponds to 4 times the ultrasonic nominal power

SONOREX DIGITEC DT
Bath sizes and technical specifications

SONOREX DIGITEC DT 102 H

Type	Internal dimensions Oscillating tank L × W × D/D+ [mm]	Capacity [l]	Code no.	External dimensions L × W × H [mm]	Ultrasonic peak power* [W]	Ultrasonic nominal power [W]	Heating power [W]	Outlet ball valve
DT 31 DT 31 H	190 × 85 × 60	0.9	3200 3220	205 × 100 × 180	160 160	40 40	– 70	– –
DT 100 DT 100 H DT 102 H	240 × 140 × 100	3.0	3210 3230 3235	260 × 160 × 250	320 320 480	80 80 120	– 140 140	– – G ¼
DT 156	500 × 140 × 100	6.0	3275	530 × 165 × 245	640	160	–	G ¼
DT 156 BH	500 × 140 × 150	9.0	3221	530 × 165 × 300	860	215	600	G ¼
DT 255 DT 255 H	300 × 150 × 150	5.5	3215 3240	325 × 175 × 295	640 640	160 160	– 280	G ¼ G ¼
DT 510 DT 510 H	300 × 240 × 150	9.7	3245 3206	325 × 265 × 300	640 640	160 160	– 400	G ½ G ½
DT 512 H	300 × 240 × 200	13.0	3226	325 × 265 × 350	860	215	400	G ½
DT 514 DT 514 H	325 × 300 × 150	13.5	3250 3211	355 × 325 × 305	860 860	215 215	– 600	G ½ G ½
DT 514 BH	325 × 300 × 200	18.7	3216	355 × 325 × 385	860	215	600	G ½
DT 1028 DT 1028 H	500 × 300 × 200	28.0	3255 3231	535 × 325 × 400	1200 1200	300 300	– 1300	G ½ G ½
DT 1028 CH	500 × 300 × 300	45.0	3266	540 × 340 × 500	1200	300	1450	G ½
DT 1050 CH	600 × 500 × 300	90.0	3271	640 × 540 × 530	2400	600	1950	G ½
DT 1058 M	600 × 400 × 200/220+	50.0	304120	670 × 470 × 400	2400	600	–	G ¾

*Corresponds to 4 times the ultrasonic nominal power; +inclined tank bottom

SONOREX accessories

The right accessories make application of ultrasound easier and, at the same time, protect the oscillating tank and the instruments. **Do not place objects to be cleaned or containers on the tank bottom!**
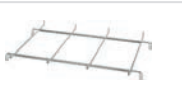
Insert baskets made of stainless steel

compatible with	Type	Code no.	Internal dimensions L × W × D [mm]	Mesh size [mm]	Figure
RK 31/H, DT 31/H	K 08	209	170 × 65 × 50	4 x 4	
RK 100/H, 102 H, DT 100/H, 102 H	K 3 C	3025	200 × 110 × 40	5 x 5	
RK 255/H, DT 255/H	K 5 C	3027	260 × 110 × 40	5 x 5	
RK 106, DT 106	K 6	356	215 × 215 × 50	5 x 5	
RK 156, DT 156	K 6 L	202	460 × 100 × 50	5 x 5	
RK 514/H, DT 514/H	K 14	354	275 × 245 × 50	5 x 5	
RK 1028/H, DT 1028/H	K 28	358	455 × 245 × 50	5 x 5	

Insert basket made of stainless steel

compatible with	Type	Code no.	Internal dimensions L × W × D [mm]	Mesh size [mm]	Figure
RK 1028/H, DL 1028 H, DT 1028/H	K 29 EM	688	470 × 240 × 45	4 x 4	

Basket holder

compatible with	Type	Code no.	Figure	compatible with	Type	Code no.	Figure
RK 1028/H, DL 1028 H, DT 1028/H	KT 30	7517		DT 1058 M	KT 57	7504	
RK 1028/H, DL 1028 H, DT 1028/H	KT 30 Z	7507		DT 1058 M	KT 57 Z	3078	

Silicone knob mat
for use in the insert basket

compatible with	Type	Code no.	For insert basket	External dimensions L × W [mm]	Figure
RK 100/H, 102 H, DT 100/H, 102 H	SM 3	7513	K 3 C	170 × 97	
RK 255/H, DT 255/H	SM 5	101	K 5 C	213 × 97	
RK 156, DT 156	SM 6	110	K 6 L	426 × 97	
RK 514/H, DT 514/H	SM 14	118	K 14, K 14 EM	235 × 245	
RK 1028/H, DT 1028/H	SM 29	178	K 28, K 29 EM	2 pcs. of 235 × 245	

Insert tub made of plastic

compatible with	Type	Code no.	Internal dimensions L × W × D [mm]	Material	Figure
RK 100/H, 102 H, 103 H, DL 102 H, DT 100/H, 102 H/H-RC, 103 H	KW 3	715	195 × 115 × 88	Polyethylene – low density	
RK 255/H, DL 255 H, DT 255/H/H-RC	KW 5	240	254 × 96 × 130	Polyethylene – low density	
RK 514/H, DT 514/H	KW 14	613	280 × 215 × 145	Tank: polypropylene Lid: polycarbonate	
RK 1028/H/C/CH, DL 1028 H, DT 1028/H/C/CH	KW 28-0	717	437 × 230 × 155	Polypropylene	

Lid made of stainless steel
for when using insert baskets

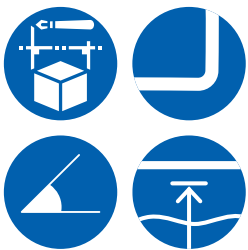| compatible with	Type	Code no.	Figure
RK 31/H, DT 31/H	D 08	218	
RK 100/H, 102 H, 103 H, DL 102 H, DT 100/H, 102 H/H-RC, 103 H	D 100	3003	
RK 255/H, DL 255 H, DT 255/H/H-RC	D 255	3007	
RK 106, DT 106	D 6	346	
RK 156/BH, DL 156 BH, DT 156/BH	D 156	3004	
RK 514/H/BH, DL 514 BH, DT 514/H/BH/BH-RC	D 514	3010	
RK 1028/H, DT 1028/H, DL 1028 H	D 1028	3011	
DT 1058 M	D 1058 M	7526	

Foil test frame

The foil test is a simple method for displaying the intensity and distribution of cavitation in an ultrasonic bath.

compatible with	Type	Code no.	Dimensions L × W [mm]	Figure
RK 31/H, DT 31/H	FT 1	3190	160 × 110	
RK 100/H, 102 H, DT 100/H, 102 H, RK 106, DT 106, RK 255/H, DT 255/H	FT 4	3074	160 × 200	
RK 156, DT 156	FT 6	3222	220 × 410	
RK 514/H, DT 514/H	FT 14	3084	220 × 380	
ZE 1031/DT, ZE 1032/DT	FT 36	3673	470 × 360	
DT 1058 M	FT 37	3674	550 × 470	
RK 1028/H/C/CH, DT 1028/H/C/CH	FT 40	3094	420 × 430	

Configuration example with SONOREX DT 514 H

In addition to choosing the right ultrasonic bath size, the right accessories, based on the application, are also essential. Various applications with the relevant accessories are listed below by way of example.

Cleaning of instruments in the insert basket directly in the oscillating tank

Indirect cleaning of instruments in the insert tub when using solvents, acids or distilled water

Silicone knob mat for use in the insert basket. For cleaning sensitive instruments.

D 510

SM 5

K 10

KW 10-0

K 5 C

SONOREX DT 514 H

SONOREX built-in devices

Advantages of the SONOREX ZE built-in devices (series)

Solid arguments in favour of an ultrasonic bath as a built-in device from BANDELIN.

from page 50

SONOREX ZE bath sizes and technical specifications

All relevant facts about our built-in baths at a glance.

from page 54

SONOREX ZE accessories

Necessary and optional accessories for all installation variants.

from page 56

SONOBOARD Standard

The ready-for-use solution for standard instruments.
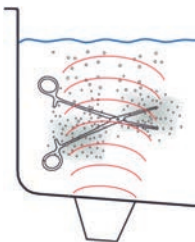
from page 58

48   49

SONOREX built-in baths

Bath sizes:

29 – 46 litres

Equipment variants

Bottom sonication
The oscillating systems are mounted on the bottom of the tank.
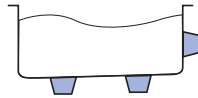
Bottom and lateral sonication
The oscillating systems are mounted on one side of the tank and on its bottom.

Rinsing bath
Rinsing baths without ultrasound, e.g., for secondary rinsing with water.

Built-in baths with bottom and lateral sonication

Based on the illustrations for the foil test below, it can be clearly seen that ultrasonic baths with bottom and lateral sonication produce a more homogeneous sound field than other baths equipped only with bottom sonication. This means a more uniform and gentle cleaning experience. This is an important aspect, especially with highly sensitive and sensitive instruments.

- Optimal sound distribution and reduction of acoustic shadows through additional lateral sonication

- electronically generated sound field movements due to TwinSonic technology reduce local peak effects
- no additional oscillation required for the instrument basket, no additional space required in the work area
- latest generator technology with Sweep
- existing built-in tanks with bottom sonication only can be easily replaced thanks to the unchanged tank edge design

Integrated or mobile?

The SONOREX ZE 1058 DT is available in two variants: as a built-in device or as a mobile device in a rollable cabinet, the SONOBOARD Standard.

For optimal workflows, integration of the SONOREX ZE built-in bath into a row of stainless-steel units is the best possible variant.

However, space in the CSSD is often limited, or conversion of the stainless-steel row of units is not possible at a certain time. In such cases, the SONOBOARD variant can be obtained (more on this on page 58). The SONOBOARD is a ready-to-use set; i.e., all components are preassembled in a rollable stainless-steel cabinet. When the device is put into service, only the necessary media (electricity, sewerage and, if applicable, the dosing system) have to be connected, and the device will be ready for immediate use. No complex installation and no conversion, but a high degree of flexibility on site.

Fits into any pre-cleaning process

SONOBOARD Standard

All the advantages of the **SONOREX** built-in baths at a glance

MD Medical device class I
MDR-compliant

Durable design
Compact, easy-care, stainless-steel housing. Stainless-steel oscillating tank with high-performance oscillating systems.

MADE IN GERMANY

Rounded tank corners
on the sides and on the bottom make it easier to clean the tank. For hygienic handling of the ultrasonic bath.

Tilted tank bottom
for better cleaning results through optimal sound propagation. The emptying of the tank is facilitated by the tank bottom, which is inclined towards the outlet, and dirt accumulation and residual liquid on the bottom are largely avoided.

Outlet
Easy outlet via an integrated rotary wheel in the front panel of the stainless-steel cabinet.

Optimal workflow
The system is integrated into a stainless-steel cabinet to optimise the working height and ergonomics for the user.
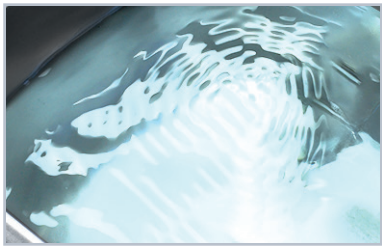

Wide range of applications
Accommodates all common sieves and baskets, which means that BANDLEIN built-in devices can be used universally in CSSDs.
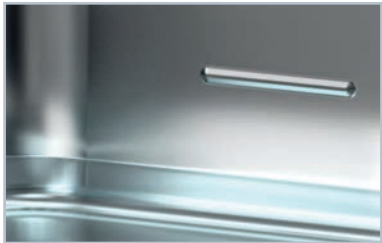

Maintenance-free
SONOREX ZE built-in devices are maintenance-free. This saves on costs, and downtimes during operation are largely avoided.
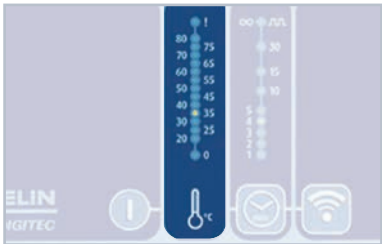

Filling level marking
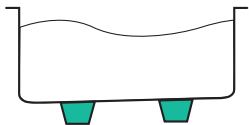as a clearly recognisable embossing for the minimum filling level of the cleaning agent; makes filling the bath easier.

Temperature display (SONOREX ZE ... DT)
for greater safety (prevention of proteincoagulation). If the bath liquid heats up to ≥ 40 °C, a red warning LED will also flash.
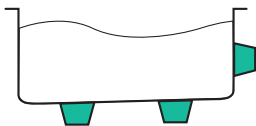
Ultrasonic baths for installation with bottom sonication

Type	Code no.	Internal dimensions Oscillating tank L × W × D/D+ [mm]	Capacity [l]	External dimensions L × W × H/H+ [mm]	Ultrasonic peak power* [W]	Ultrasonic nominal power [W]	Current consumption** [A]	Outlet Ball valve
ZE 1031	3060	510 × 300 × 200/220+	29.0	570 × 360 × 270/290+	1200	300	1.4	Bead 1 ½
ZE 1031 DT	3217	510 × 300 × 200/220+	29.0	570 × 360 × 270/290+	1200	300	1.4	Bead 1 ½
ZE 1058	3050	600 × 400 × 200/220+	46.0	660 × 460 × 270/290+	2400	600	2.7	Bead 1 ½
ZE 1058 DT	3234	600 × 400 × 200/220+	46.0	660 × 460 × 270/290+	2400	600	2.7	Bead 1 ½

*corresponds to 4 times the ultrasonic nominal power **at 230 V~ (± 10%), 50/60 Hz +inclined tank bottom, installation from below

Ultrasonic baths for installation with bottom and lateral sonication

Type	Code no.	Internal dimensions Oscillating tank L × W × D/D+ [mm]	Capacity [l]	External dimensions L × W × H/H+ [mm]	Ultrasonic peak power* [W]	Ultrasonic nominal power [W]	Current consumption** [A]	Outlet Ball valve
ZE 1032	3075	510 × 300 × 200/220+	29.0	570 × 404 × 270/290+	1760	440	1.9	Bead 1 ½
ZE 1032 DT	3223	510 × 300 × 200/220+	29.0	570 × 404 × 270/290+	1760	440	1.9	Bead 1 ½
ZE 1059	3085	600 × 400 × 200/220+	46.0	660 × 504 × 270/290+	2400	600	2.7	Bead 1 ½
ZE 1059 DT	3248	600 × 400 × 200/220+	46.0	660 × 504 × 270/290+	2400	600	2.7	Bead 1 ½

*corresponds to 4 times the ultrasonic nominal power **at 230 V~ (± 10%), 50/60 Hz +inclined tank bottom, installation from below

Rinsing baths for installation without ultrasound

Type	Code no.	Internal dimensions of the oscillating tank L × W × D/D+ [mm]	Capacity [l]	External dimensions L × W × H [mm]	Description
SW 31 Z	3048	510 × 300 × 200/220+	29.0	570 × 360 × 205/225+	Bead 1 ½, without drain set
SW 58 Z	3049	600 × 400 × 200/220+	46.0	660 × 460 × 205/225+	Bead 1 ½, without drain set
G 1 ½ type V drain set	31661	–	–	–	with turning knob and stainless-steel plug

+inclined tank bottom, installation from below

Scope of delivery of a built-in ultrasonic bath

An ultrasonic bath set for installation always consists of the components oscillating tank, generator and control unit. The set also includes a suitable foil test frame for the foil test. An optional drain set and accessories, such as a basket holder and lid, are available.

Scope of delivery of the SONOREX ZE 1058 DT:

- TE 1058.2 oscillating tank
- GT 1003 M-C generator
- ST 30.1 DT control unit
- FT 37 foil test frame

Digital control unit with membrane keyboard and temperature display***

Type	Code no.	compatible with	Time setting	Description
ST 30.1 DT	309810	ZE 1031 /DT, ZE 1032 /DT, ZE 1058 /DT, ZE 1059 /DT	1, 2, 3, 4, 5, 10, 15, 30 min, ± 5% and continuous operation (∞)	The ST 30.1 DT digital control unit has an integrated temperature display and offers the user more security to prevent protein coagulation. If the bath liquid heats up to > 40 ° C, a red warning LED will also flash. Recommendation of the Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute (RKI) and the Federal Institute for Drugs and Medical Devices (BfArM) Federal Health Gazette 2012 ▪ 55:1244–1310

***Recommendation of the Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute (RKI) and the Federal Institute for Drugs and Medical Devices (BfArM) Federal Health Gazette 2012 ▪ 55:1244–1310

Simple control unit with turning knob

Type	Code no.	compatible with	Time setting	Description	Figure
ST 15.1	1851	ZE 1031 /DT, ZE 1032 /DT, ZE 1058 /DT, ZE 1059 /DT	1 – 15 min, ± 5% and continuous operation (∞)	Control unit with turning knob, without temperature monitoring	

Drain set

Type	Code no.	compatible with	Description	Figure
Drain set	31661	ZE 1031 /DT, ZE 1032 /DT, ZE 1058 /DT, ZE 1059 /DT	Complete drain set, including Bowden cable actuation and stainless-steel plug.	

Accessories

The right accessories make application of ultrasound easier and, at the same time, protect the oscillating tank and the instruments. **Do not place objects to be cleaned or containers on the tank bottom!**

Required accessories

Type	Code no.	compatible with	Description	Figure
Insert basket K 29 EM	688	ZE 1031 /DT, ZE 1032 /DT, ZE 1058 /DT, ZE 1059 /DT	Insert basket for holding the objects to be cleaned. A basket holder is required. Internal dimensions: 470 × 240 × 45 mm (L × W × D), mesh size: 4 × 4 mm, load: max 10 kg Material: stainless steel	
Basket holder KT 30	7517	ZE 1031 /DT, ZE 1032/DT	Basket holder **without handles** as a supplement to the insert basket. 1/-DIN basket or ISO basket Material: Stainless steel	
Basket holder KT 57	7504	ZE 1058 /DT, ZE 1059 /DT	Basket holder **without handles** as a supplement to the insert basket. 1/-DIN basket or ISO basket Material: Stainless steel	
Basket holder KT 30 Z	7507	ZE 1031 /DT, ZE 1032/DT	Basket holder **with handles** as a supplement to the insert basket. 1/-DIN basket or ISO basket Material: Stainless steel	
Basket holder KT 57 Z	3078	ZE 1058 /DT, ZE 1059 /DT	Basket holder **with handles** as a supplement to the insert basket. 1/-DIN basket or ISO basket Material: Stainless steel	
Drain set	31661	ZE 1031 /DT, ZE 1032 /DT, ZE 1058 /DT, ZE 1059 /DT	Complete drain set, including Bowden cable actuation and stainless-steel plug.	

Optional accessories

Type	Code no.	compatible with	Description	Figure
Lid D 30	7522	ZE 1031 /DT, ZE 1032 /DT,	Lid for when using insert baskets. Material: Stainless steel	
Lid D 57	7520	ZE 1058 /DT, ZE 1059 /DT	Lid for when using insert baskets. Material: Stainless steel	
Hinged lid D 1031 G	3232	ZE 1031 /DT, ZE 1032/DT	Hinged lid with gas spring and EPDM gasket Material: Stainless steel	
Hinged lid D 1058 G	3232	ZE 1058 /DT, ZE 1059 /DT	Hinged lid with gas spring and EPDM gasket Material: Stainless steel	
Silicone knob mat SM 29	178	ZE 1031 /DT, ZE 1032 /DT, ZE 1058 /DT, ZE 1059 /DT	Silicone knob mat as a supplement to the insert basket K 29 EM. For the safe storage of sensitive items during the cleaning process. External dimensions: 235 × 245 mm, PU 2 pieces	
Insert tub KW 28-0	717	ZE 1031 /DT, ZE 1032/DT	Made of plastic with lid. Especially for basic instrument cleaning in STAMMOPUR GR.	
Foil test frame FT 36	3673	ZE 1031 /DT, ZE 1032/DT	For functional testing of the ultrasonic bath with the foil test	
Foil test frame FT 37	3674	ZE 1058 /DT, ZE 1059 /DT	For functional testing of the ultrasonic bath with the foil test	

SONOBOARD Standard
The ready-for-use solution for standard instruments

The practical addition to your sink system or for individual use.

For selected ultrasonic baths, BANDELIN offers ready-to-use sets, consisting of an ultrasonic bath and a practical stainless-steel cabinet. The double-walled, stainless-steel cabinets are fitted with overlapping fronts and all-round rubber seals on doors and panels. Their flexible positioning, thanks to lockable castors, the ergonomic working height, and the additional storage space make them high-quality and indispensable hospital equipment.
SONOBOARD offers high resistance to scratches and impacts and is extremely resistant to chemicals. The smooth, stainless-steel surfaces reduce the accumulation of germs and bacteria to a minimum and meet the highest hygiene requirements.

▌ Putting into service and control are quick and easy to do!

SONOBOARD is delivered as a ready-to-use set; only the media connections need to be established.

SONOBOARD STANDARD features
- Control on the front side
- Digital control unit with temperature monitoring according to KRINKO recommendation*
- Suitable for 1/1 DIN and ISO baskets

*Recommendation of the Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute (RKI) and the Federal Institute for Drugs and Medical Devices (BfArM), Federal Health Gazette 2012 • 55:1244-1310

Ready-to-use set:
- Ultrasonic bath SONOREX ZE 1058 DT with accessories
- Functional cabinet FS 900 S

MD Medical device class I
MDR-compliant

Technical information

Internal dimensions of the oscillating tank, L × W × D [mm]	600 × 400 × 200/220^{+}
Capacity [l]	46.0
Operating volume [l]	3232
Code no. (Version)	3452
External dimensions, incl. castors, L × W × H [mm]	900 × 700 × 930
Ultrasonic peak power* [W]	2400
Ultrasonic nominal power [W]	600
Ultrasonic frequency [kHz]	35
Pulse function	✓
Sweep	✓
Time setting [min]	1,2,3,4,5,10,15,30, infinite
Temperature monitoring	✓
Thickness of tank material [mm]	2
Filling level mark	✓
Outlet	G 1½ fitting with turning knob and stainless-steel plug, siphon G 1½ with hose
Mains supply: 230 V~ (± 10%), 50/60 Hz 115 V~ (± 10%), 50/60 Hz	✓ ✓

*Corresponds to 4 times the ultrasonic nominal power $^{+}$inclined tank bottom

Accessories

For standard instruments Codeno.	Basket holder KT 57 Z 3078	Insert basket K 29 EM 688	KT 57 Z	K 29 EM
Lid Codeno. (Version)		D 57 7520		
Hinged lid Codeno.		D 1058 G 3232		
Foil test frame Codeno.		FT 38 3672		

SONOMIC

Ultrasonic baths for MIS and standard instruments

SONOMIC – Ultrasonic baths for MIS and standard instruments

Clean instruments comfortably and reliably.
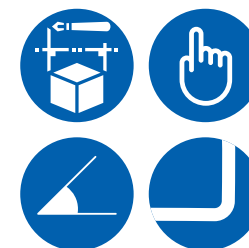
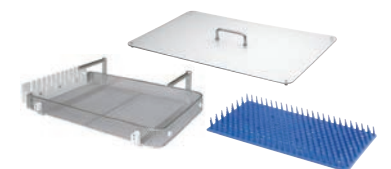**Advantages of the SONOMIC**

Impressively easy to use and clean.

SONOMIC technical specifications

Overview of the most important key data.

SONOMIC accessories and spare parts

Perfectly equipped for every application.

SONOMIC

Ultrasonic baths for MIS and standard instruments

Three patents in one device!

The reliable internal cleaning of MIS instruments and rinsable parts of other instruments ensures their usability. SONOMIC has been specially developed for these instruments and combines
- **gentle ultrasonic cavitation,**
- **effective suction flushing** and
- **individual instrument testing**

in one device.

The integrated flow control for each connected instrument ensures safe cleaning results and prevents instrument malfunctions.

The advantages at a glance:
- Safety through patented individual instrument rinsing and testing
- Patented suction flushing principle
- Patented universal adapter for connecting instruments up to 10 mm in diameter

- Temperature and level monitoring
- Reproducible program schedule
- Versatile use: use also for standard instruments
- Documentation by means of log printing
- Available as a tabletop or built-in device

### Individual instrument testing instead of overall testing
If different MIS instruments are rinsed at the same time, the rinsing result for individual instruments cannot be controlled.

In SONOMIC, this problem is solved with the innovative channel selector. It only ever activates one instrument for rinsing and thus enables single flow control. The minimum flow rate is 2 ml/s at 0.8 bar negative pressure; otherwise, the instrument is identified as "non-passing" and displayed on the touchscreen. This process monitoring, with determination, assignment and clear display of the successful rinsability of each individual instrument, ensures better safety during reprocessing.

SONOMIC suction rinsing compared to pressure rinsing from other suppliers
As a rule, the largest proportion of contamination collects at the distal end of the MIS instruments. With comparable devices from other manufacturers, MIS instruments are often rinsed with pressure from the distal end. Contaminants are transported through the entire lumen of the instruments, which poses an increased risk of unwanted deposits, especially at constrictions in the area of the handles and other difficult areas of the instruments. The direct introduction of the dissolved contaminants into the bath liquid is to be regarded as a further negative effect. The suction rinsing function of the SONOMIC at the distal ends of the instruments removes dirt counter to the direction of penetration.

At the same time, fresh cleaning solution flows in. This prevents unnecessary contamination of the rear lumen parts of the instruments. Suctioned contaminants pass via the adapters into the replaceable filter and thus not back into the bath liquid.

SONOMIC suction rinsing

Pressure rinsing from other suppliers
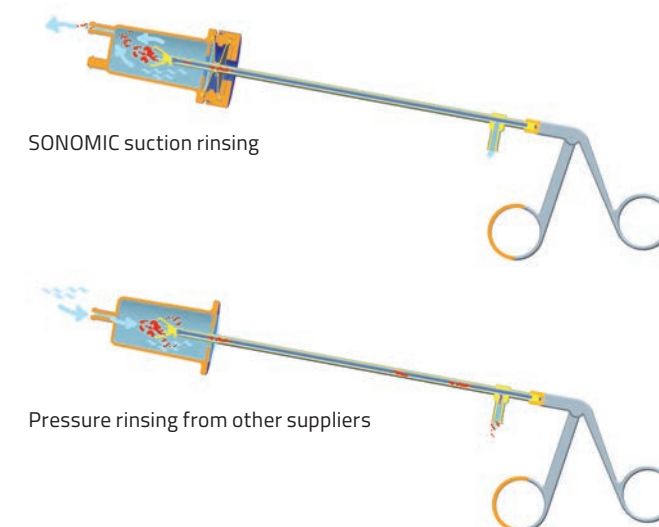
Instrument connection to universal adapter without seal change
In SONOMIC, twelve rinsable MIS instruments with diameters from 3 to 10 mm can each be connected to one of the identical adapters, without the adapter seal having to be changed. The twisting principle of the seal guarantees a complete seal on the outer shaft of the instruments. The highly elastic sealing material is ultrasonically tested and resistant to the STAMMOPUR R and STAMMOPUR DR 8 agents.

Rotation principle of the adapter seal

### Filling level and temperature monitoring
In the SONOMIC, the correct bath filling level is monitored with the integrated filling level sensor. In the event of non-compliance, sonication cannot be started, and the user receives an error message on the touchscreen. A temperature sensor checks before each cycle whether the bath temperature is within the permissible range. If the temperature of the bath liquid is too low (< 18 °C), the heating will switch on automatically. To prevent protein coagulation, a warning message is displayed at a temperature of approx. 40 °C.

Safety through reproducible program schedule
The operating program of the SONOMIC contains a self-test and gives the user clear instructions on all necessary work steps. This includes, for example, the adapter check, which is indispensable for the reliable identification of non-continuous instruments.
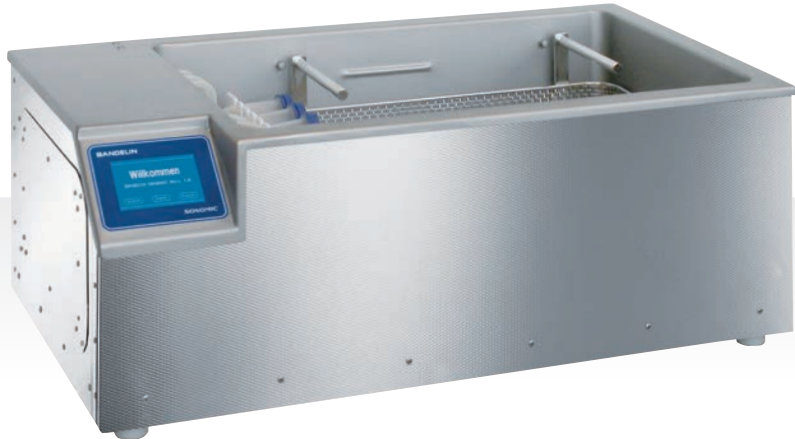
Documentation by means of log printing
The SONOMIC has several interfaces available for quality verification. If necessary, logs with the following data can be printed: cleaning mode, temperature of the bath, evaluation of the continuity, and much more.
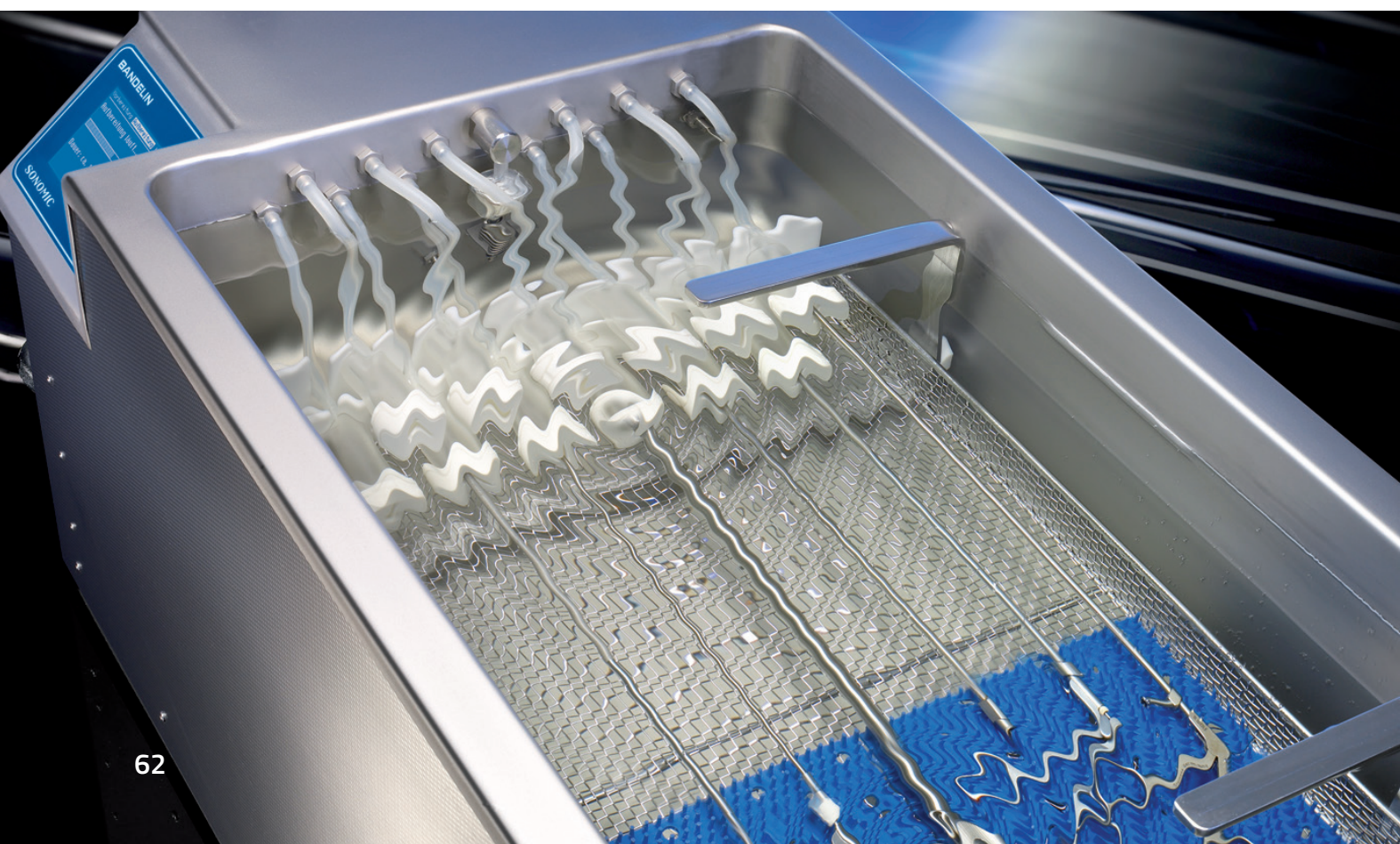
All the advantages of the *SONOMIC* at a glance

MD Medical device class I
MDR-compliant

Durable design
- Easy-care stainless-steel housing
- Stainless-steel oscillating tank
- High-performance oscillating systems made of stable materials
- Made in Germany

MADE IN
GERMANY

Rounded tank corners
on the sides and on the bottom make it easier to clean the tank. For hygienic handling of the ultrasonic bath.
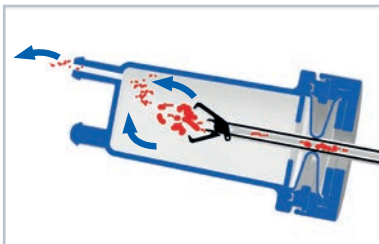

Tilted tank bottom
for better cleaning results through optimal sound propagation. The emptying of the tank is facilitated by the tank bottom, which is inclined towards the outlet, and dirt accumulation and residual liquid on the bottom are largely avoided.
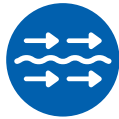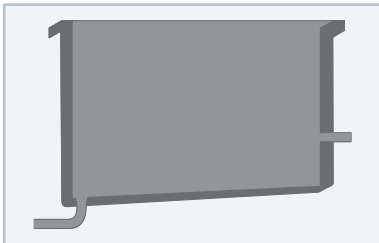
SONOMIC suction rinsing
optimises rinsing, as impurities are removed directly at the distal end.

Welded outlet
with ball valve for emptying the ultrasonic bath.
The outlet elbow is welded to the tank bottom and is not screwed on. This prevents leaks in the device and makes cleaning easier.

Filling level marking and level sensor
as a clearly recognisable embossing for the minimum filling level of the cleaning agent – makes filling the bath easier.
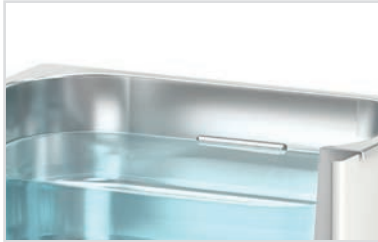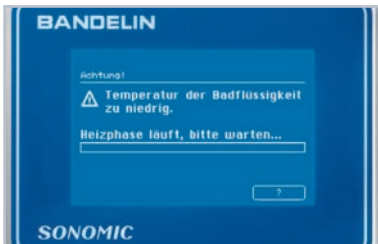

User-friendly
operation via a modern touchscreen (96 x 61 mm). The clearly structured operating program guides you through all the necessary work steps.
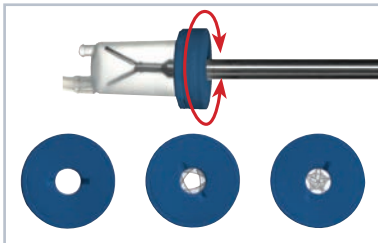

Heating and temperature monitoring
program-controlled heating to achieve the minimum temperature and temperature monitoring.

Universal adapter
for holding a wide range of hollow body and MIS instruments with a diameter of 3 to 10 mm.

Sweep – automatic frequency control
ensures a homogeneous sound field

Technical information

SONOMIC MC 1001

Ready-to-use set:

- Ultrasonic bath MC 1001
- Basket K 1001 MC
- 12 adapters with seals and ADS 1000 hose
- 12 x AD 1000 adapter seals
- Adapter testing strips APB 1000
- 30 EF 1001 filter inserts
- Foil test frame FT 38

Oscillating tank internal dimensions L × W × D [mm]	650 × 400 × 160/170+
Capacity [l]	42.5
Operating volume [l]	27.0
Code no.	3315
External dimensions L × W × H [mm]	860 × 490 × 325
Ultrasonic peak power * [W]	2400
Ultrasonic nominal power [W]	600
Ultrasonic frequency [kHz]	40
Operation: Touchscreen 96 × 61 mm	3
Heating, program-controlled [W]	400
Pulse function	3
Sweep	3
Temperature monitoring	3
Thickness of tank material [mm]	2.0
Filling level mark	3
Level sensor	3
Outlet	Ball valve ¾", Threaded sleeve G ¾, at rear on the right
Interfaces	USB-B, RS-232, LPT

*Corresponds to 4 times the ultrasonic nominal power +inclined tank bottom

Accessories and consumables

Accessories

|	Type	Code no.	Description	Figure
Loose lid	D 1000 MC	3312	Protects the bath liquid from contamination, and condensation water is drained into the oscillating tank. Recommended pursuant to the German Technical Rules for Biological Agents (TRBA) 250.	
Hinged lid	D 1001 G	3310		
Insert basket	K 1001 MC	3324	with comb bar for adapters, internal dimensions 520 × 340 × 50 mm L × W × D, mesh size 5 × 5 mm	
Silicone knob mat	SM 1000 MC	3313	Total dimensions of 2 pcs. in a set 245 × 340 mm L × W	
Foil test frame	FT 38	3672	–	

Consumables

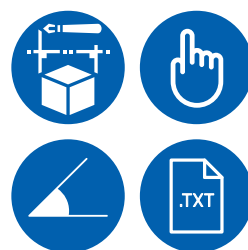|	Type	Code no.	PU [pcs]	Figure
Filter cartridge	EF 1001	3365 3366	30 100	
Adapter seal	AD 1000	3353 3354 3355	12 24 36	
Adapter with gasket and hose	ADS 1000	3350 3351	1 12	
Adapter testing strip	APB 1000	3358	2	
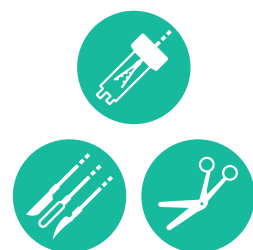
TRISON 4000.2
Ultrasonic bath for robotics, MIS and standard instruments

The future of cleaning solutions – versatile, precise and efficient.

Advantages of the TRISON
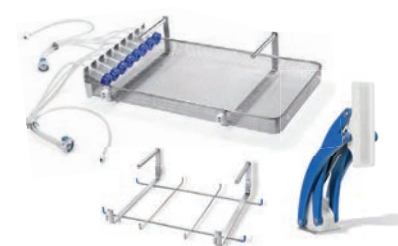
Compilation of the most important features and strengths.

TRISON technical specifications

From operating volume to ultrasonic peak power.

TRISON accessories and consumables
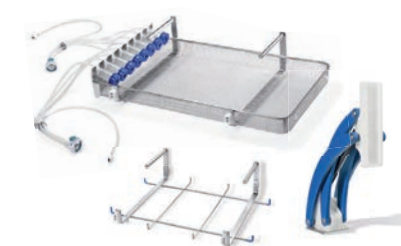
Indispensable aids for various requirements.

SONOBOARD TRISON
Ready-to-use set

The practical addition to your sink system or for individual use.

SONOBOARD TRISON
Accessories and consumables

Simplify everyday cleaning processes

TRISON 4000.2

Ultrasonic bath for robotics, MIS and standard instruments

Robot-assisted surgery? The future starts now.

The robotic systems now used in many clinics to support surgical treatment offer the surgeon numerous advantages. First of all, they ensure a gentle and highly precise, minimally invasive procedure that can be carried out in such a way that nerves and organs can be preserved.

For patients, interventions can be better tolerated and put less strain on the body, and the recovery time is shortened. The highly complex technology has long been a standard in modern surgery and will become even more relevant for other medical disciplines in the future.
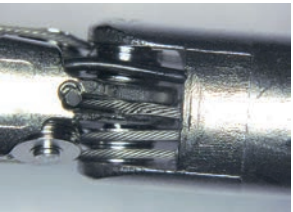

Complex instruments = complex treatment?

Due to their complex structure, robotic instruments have many critical points for treatment. The non-disassemblable instruments consist of a housing with a long, thin shaft, various filigree Bowden cables and complex tips.

Due to their nature and surgical use, robotic instruments must be prepared in many individual process steps for the next application on the patient. Particular attention is paid to effective pre-cleaning before the actual disinfection and sterilisation processes. Purely manual pre-cleaning, which not only requires a lot of staff because of the repeated manual rinsing, moving and cleaning, but is also prone to error, is not acceptable as a treatment step for many users.

The alternative: an ultrasonic bath, specially developed for pre-cleaning robotics instruments – the TRISON 4000.2.

Robotics instrument before ...   ... and after cleaning

TRISON 4000.2 – the standard for pre-cleaning of robotic instruments

It is an innovative, modular ultrasonic bath adapted to robotics instruments, which enables the 3 basic functions of cleaning, rinsing and movement of the instruments in one process. This process ensures the best and reproducible cleaning results, saves time during pre-cleaning, optimises the overall treatment process and also offers valid process documentation. The intuitive operation via the large touch display also ensures safe handling.

Ultrasound
achieves the best possible cleaning results.

**Movement**
improves cleaning performance.

Rinsing
ensures effective interior cleaning.

1 device – 3 possible uses

The TRISON has been specially developed for robotic instruments. MIS and standard instruments can also be cleaned effectively with the appropriate accessories. In order to meet the particular cleaning requirements in the best possible way, a cleaning program is available for each type of instrument.
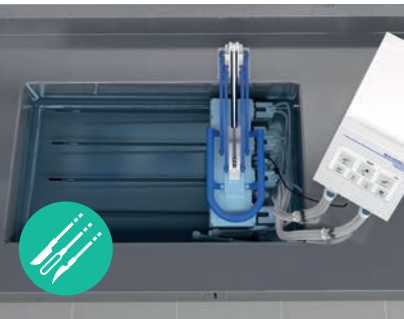
Robotics
For simultaneous cleaning of up to 4 robotic instruments using the Twist moving device and corresponding hose connections for rinsing.
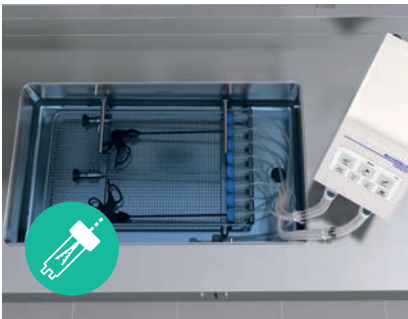
MIS
Ultrasonic cleaning and sequential individual rinsing of up to 8 MIS instruments in the specially developed TRISON rack. The rinsing pipe is monitored in the MIS program.

Standard
For cleaning instruments in DIN and ISO sieves before further machine processing.
A basket holder is required.

Integrated or mobile?

Fits into any pre-cleaning process

The TRISON 4000.2 is available in two variants: as a built-in device or as a mobile device in a rollable cabinet, the SONOBOARD TRISON.

For optimal workflows, the integration of the TRISON into a stainless-steel row of units is the best possible variant. Depending on the orientation of the pre-cleaning area, the ultrasonic bath can be installed on the left or right side.

However, space in the CSSD is often limited, or conversion of the stainless steel line is not possible at a certain time. In such cases, the TRISON can be obtained as the SONOBOARD variant (more on this on page 80). The SONOBOARD is a ready-to-use set; i.e., all components are preassembled in a rollable stainless-steel cabinet. When the device is put into service, only the necessary media (electricity, sewerage and, if applicable, the dosing system) have to be connected, and the device will be ready for immediate use. No complex installation and no conversion, but a high degree of flexibility on site.

The TRISON is integrated into a stainless-steel row of units.

The TRISON as the SONOBOARD variant.

Easy control – safe processes

Control via 7-inch touch display

Everything at a glance

The programs can be selected directly with one click on the home screen. Other useful functions, such as rapid degassing, device care and settings, can be easily selected by means of large buttons with supporting icons.

User-optimised menu navigation:

- Program short start or supporting program management
- Illustration of individual steps
- Help pages with explanations
- Individual settings (language, process times, warning temperatures, etc.)
- Program favourites
- Initial configuration when the device is put into service
- Service access

Process screen with successful rinsing.

Illustration of individual steps.

Process documentation

The TRISON 4000.2 has an interface concept for digital process documentation. For each individual cleaning process, a protocol is created with all relevant parameters for the cleaning. The protocols can be transmitted via the USB interface. Alternatively, the TRISON can be integrated into CSSD management software via the integrated network interface.
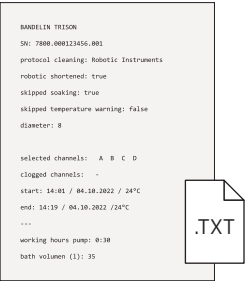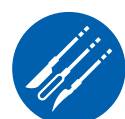
All the advantages of the
TRISON at a glance

MD **Medical device class I**
MDR-compliant

Durable design
- Easy-care stainless-steel housing
- Stainless-steel oscillating tank
- High-performance oscillating systems made of stable materials
- Made in Germany

MADE IN **GERMANY**

Robotics
For simultaneous cleaning of up to 4 robotic instruments using the Twist moving device and corresponding hose connections for rinsing.

MIS
Ultrasonic cleaning and sequential individual rinsing of up to 8 MIS instruments in the specially developed TRISON rack. The rinsing pipe is also monitored in the MIS program.
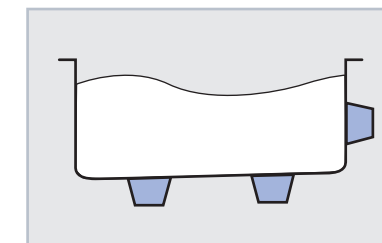
Standard
For cleaning instruments in DIN and ISO sieves before further machine processing.
A basket holder is required.

Bottom and lateral sonication
for more uniform and gentle cleaning through optimal sound distribution and reduction of acoustic shadows.

Flexible assembly
Available as a left or right version – for integration into a row of units or as a single solution in a rollable cabinet.

Tilted tank bottom
for better cleaning results through optimal sound propagation. The emptying of the tank is facilitated by the tank bottom, which is inclined towards the outlet, and dirt accumulation and residual liquid on the bottom are largely avoided.

Temperature monitoring with warning function
Ensures that the set limit values are complied with.

User languages
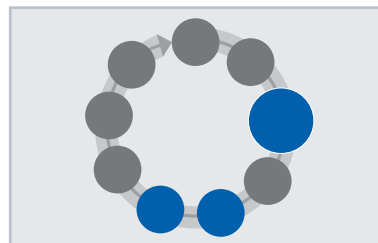Easy selection of different language outputs.

Process safety through self-monitoring
Control of all functions to avoid incorrect operation. The process result is clearly displayed.

Overall process optimisation
Increases the quality and reproducibility of the entire reprocessing chain.

Process documentation
The TRISON 4000.2 has an interface concept for digital process documentation.

```
BANDELIN TRISON
SN: 7800.000123456.001
protocol cleaning: Robotic Instruments
robotic shortened: true
skipped soaking: true
skipped temperature warning: false
diameter: 8
```
.TXT

Ease of use
The programs can be selected directly with one click on the home screen. Other useful functions, such as rapid degassing, device care and settings, can be easily selected by means of large buttons with supporting icons.
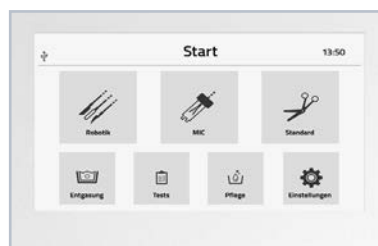
User-optimised menu navigation
Illustration of individual steps and Help pages with explanations

Including:

- TRISON TE 4000 oscillating tank with drain set ①
- TRISON GT 4000 M-C ultrasonic generator②
- TRISON Base TB 4000.2 control unit ③
- Moving device TRISON Twist
  TT 4000 Xi ④ or TT 4000 Si ⑤
- TRISON Lift TL 4000 pivot-mounted arm ⑥
- 30 EF 1001 filter inserts
- FT 42 Foil test frame

Technical information

	TRISON 4000.2 Xi		TRISON 4000.2 Si	
Oscillating tank internal dimensions L × W × D [mm]	770 × 420 × 165/190⁺			
Capacity [l]	60.0			
Operating volume [l]	35.0			
Codeno. (Version)	7861 (right)	7862 (left)	7859 (right)	7860 (left)
External dimensions L × W × H [mm]	Oscillating tank: 770 × 420 × 165/190⁺ / Ultrasonic generator: 400 × 360 × 170 Control unit (including rotary base): 370 × 200 × 360 Pivot arm: 240 × 95 × 350			
	Moving device Xi: 345 × 160 × 175		Moving device Si: 405 × 205 × 190	
Ultrasonic peak power* [W]	3040			
Ultrasonic nominal power [W]	760			
Ultrasonic frequency [kHz]	38			
Lateral sonication	✓			
Pulse function	✓			
Sweep	✓			
Temperature monitoring	✓			
Thickness of tank material [mm]	2.0			
Filling level mark	✓			
Outlet	G 1 ¼, fitting with turning knob and stainless-steel plug			
Installation in work plate	from below			
Mains supply: 230 V~ (± 10%), 50/60 Hz	✓			
Current consumption** [A]	3.5			
Interfaces	USB, Ethernet			

*corresponds to 4 times the ultrasonic nominal power ** at 230 V~[± 10%] 50/60 Hz ⁺inclined tank bottom

Accessories and consumables

	Type	Code no.		External dimensions L × W × H [mm]	Function and compatibility
Moving device TRISON Twist Xi / Si	TT 4000 Xi TT 4000 Si	Right 7821 7820	Left 7921 7920	345 × 160 × 175 405 × 205 × 190	for XI or Si robotic instruments Right and left version available Use with the TRISON Lift
Pivot-mounted arm TRISON Lift	TL 4000	7930		240 × 95 × 350	for TRISON Twist 4000.2
TRISON Rack	TR 3001	Right 7631	Left 7731	640 × 405 × 150	Basket with connections for up to 8 rinsable MIS instruments; right and left version available
Insert basket	K 29 EM	688		470 × 240 × 45	Receptacle for the objects to be cleaned (e.g., standard instruments)
Basket holder	KT 3000 Z	7761		–	Receptacle for the insert basket
Lid	D 4000 A	Right 7955	Left 7956	–	Universally applicable for all TRISON applications; for TRISON Twist only in lowered position; right and left version available
Spacer	TX 4000 Xi	7763		–	Spacer of the TRISON Twist Xi for stackers; VE 2 pcs.
Foil test frame	FT 42	3224		700 × 440	The foil test is a simple method for displaying the intensity and distribution of cavitation in an ultrasonic bath.

Consumables

Filter cartridge Code no.		EF 1001 to 30 pcs. 3365		EF 1001, 100 pcs. 3366
Adapter seals Codeno.		AD 1000, 8 pcs. 3361		AD 1000, 24 pcs. 3354
Adapter with seal Code no.		ADT 1000, 1 pc. 7770		ADT 1000, 8 pcs. 3359
Adapter testing strip Code no.		APB 3000, 2 pcs. 7771		
Hose set with couplings for TRISON Twist Code no.		For Xi: SLS 4000 TT 1 pc. 3362		For Si: SLS 3000 TT, 1 pc. 3363
Hose set with couplings for TRISON rack, without adapter Codeno.		SLS 3000 TR 3364		

SONOBOARD TRISON 4000.2
Ready-to-use set

The practical addition to your sink system or for individual use!

For selected ultrasonic baths, BANDELIN offers ready-to-use sets, consisting of an ultrasonic bath and a practical stainless-steel cabinet. The double-walled, stainless-steel cabinets are fitted with overlapping fronts and all-round rubber seals on doors and panels. Their flexible positioning, thanks to lockable castors, their ergonomic working height, and the additional storage space make them high-quality and irreplaceable hospital equipment.

SONOBOARD offers high resistance to scratches and impacts and is extremely resistant to chemicals. The smooth, stainless-steel surfaces reduce the accumulation of germs and bacteria to a minimum and meet the highest hygiene requirements.

█ Putting into service and control are quick and easy to do!

SONOBOARD is delivered as a ready-to-use set; only the media connections need to be established.

Features

- Improved cleaning by combining ultrasound, rinsing and movement for robotics instruments
- Design optimised for robotics instruments
- Safety through individual instrument rinsing and testing
- Easy to connect the instruments
- Temperature monitoring (robotics and MIS mode)
- Logging function
- Available as right and left version

Ready-to-use set:

- TRISON 4000.2 Xi ultrasonic bath with accessories
- Functional cabinet FS 1200 TR

MD Medical device class I
MDR-compliant

Technical information

Internal dimensions of the oscillating tank, L × W × D [mm]	770 × 420 × 165/190⁺	
Capacity [l]	60.0	
Operating volume [l]	35.0	
Code no. (Version)	7855 (right)	7854 (left)
External dimensions, incl. castors, L × W × H [mm]	1200 × 700 × 930	
Ultrasonic peak power* [W]	3040	
Ultrasonic nominal power [W]	760	
Ultrasonic frequency [kHz]	38	
Pulse function	✓	
Sweep	✓	
Time setting [min]	menu-driven	
Temperature monitoring	✓	
Thickness of tank material [mm]	2.0	
Filling level mark	✓	
Outlet	G 1½ fitting with turning knob and stainless-steel plug, siphon G 1½ with hose	
Mains supply: 230 V~ (± 10%), 50/60 Hz 115 V~ (± 10%), 50/60 Hz	✓ ✓	
Current consumption** [A]	3.5	
Interfaces	USB-A, Ethernet	

*corresponds to 4 times the ultrasonic nominal power ** at 230 V~(± 10%) 50/60 Hz ⁺inclined tank bottom

Accessories

for robotics instruments Codeno. (Version)	TRISON Twist TT 4000 Xi 7821 (right), 7921 (left)	TRISON Twist TT 4000 Si 7820 (right), 7920 (left)	
for MIS instruments Codeno. (Version)	TRISON Rack TR 3001 7631 (right), 7731 (left)		
for standard instruments Codeno.	Basket holder KT 3000 Z 7761	Insert basket K 29 EM 688	KT 3000 Z K 29 EM
Lid Codeno. (Version)	D 4000 A 7955 (right), 7956 (left)		
Foil test frame Codeno.	FT 42 3224		

CLEANING AND DISINFECTION AGENTS

Cleaning and disinfection agents

Optimal cleaning and disinfection results in the ultrasonic bath are achieved by using special cleaning and disinfection agents that are formulated for this process.

Agent for cleaning and chemical disinfection

STAMMOPUR DR 8

Cleaning agents

In instrument reprocessing:
STAMMOPUR R

Special application
Instrument repair: STAMMOPUR GR

Dosing aids for accessories

Dosing calculator, dosing table and hygiene plan supplement

Agents FAQ

Short answers to the most important questions.

STAMMOPUR
Cleaning and disinfection agents

The use of ultrasonic cleaning for successful instrument reprocessing has proven itself for decades and is all the more topical today, as the requirements for instrument reprocessing are constantly being increased. The method of "ultrasonic cleaning of medical instruments" is at the cutting edge of technology and science due to its highly effective cleaning performance.

Specially formulated cleaning and disinfection agents are required to achieve optimal reprocessing results in an ultrasonic bath. With the special disinfectants from DR.H.STAMM GmbH Chemische Fabrik, BANDELIN offers highly effective cleaning and VAH-listed cleaning and disinfection agents. With their cavitation-promoting properties, the agents support the cleaning process while also being gentle on the objects to be cleaned and helping to prolong the service life of the ultrasonic device.

The high-quality agents achieve reliable results, save resources, and effectively utilise valuable time and labour in daily instrument reprocessing.

STAMMOPUR is formulated for the optimal interaction of ultrasound and agent – competence for the benefit of the user.

All agents, as well as the ultrasound equipment, are made in Germany.

| Product information and EC safety data sheets can be downloaded as a PDF file at bandelin.com/en/docs-category/downloads/

Note: Some common cleaning and disinfection agents from other manufacturers may contain components that attack the ultrasonic oscillating tank and can lead to equipment failure due to, for example, pitting.

The interaction of ultrasonic cleaning and the cleaning and disinfection device

The state of the art in science and technology is to subject the instruments to a (disinfecting) pre-cleaning in an ultrasonic bath, even when using automated reprocessing in a cleaning and disinfection device. This pretreatment in an ultrasonic bath ensures the best results in the overall treatment process in combination with the cleaning and disinfection device.

Non-pre-cleaned instruments that still contain impurities after reprocessing in the cleaning and disinfection device must go through the reprocessing cycle again after post-cleaning. The often stubborn impurities caused by the high temperatures during thermal disinfection in the cleaning and disinfection device can be reliably cleaned with STAMMOPUR R in an ultrasonic bath.

Basic cleaning of instruments with STAMMOPUR GR

Over time, instruments can become externally discoloured, stained, or encrusted due to various influences. Instruments undergo soiling in everyday practice – both during use and during complex reprocessing. It is virtually impossible to remove temper colours or burnt-in soiling caused by sterilisation processes by hand. Oxide or limescale deposits cannot be completely avoided either, despite the best care. Basic cleaning of the

instruments in an ultrasonic bath is recommended to remove these impurities. With the special cleaning agent STAMMOPUR GR, old instruments will regain their lustre. The refurbishing process supports qualitative and ecological sustainability.

Medical programme overview

Agent \ Application	Instrument cleaning	Pre-cleaning	Disinfectant pre-cleaning	Cleaning and disinfection	Disinfection	Special application
STAMMOPUR DR 8 Instrument disinfection and intensive cleaning, concentrate, mildly alkaline	✓	✓	✓	✓	✓	
STAMMOPUR R Instrument cleaner, concentrate, mildly alkaline	✓	✓				
STAMMOPUR GR Basic instrument cleaner, concentrate, strongly acid						✓

DR·H·STAMM – Quality

The many decades of successful co-operation between DR.H.STAMM GmbH Chemische Fabrik and BANDELIN electronic GmbH & Co. KG in the development of cleaning and disinfection agents has led to a wealth of expertise in all areas of ultrasonic cleaning.

The decades of experience and extensive knowledge of DR.H.STAMM GmbH Chemische Fabrik are reflected in our compliance with the **Medical Device Regulation (MDR)** , among other regulations.

All STAMMOPUR agents are medical devices and are already certified pursuant to Regulation (EU) 2017/745, or the MDR for short. All agents fulfil the new, current regulatory requirements to ensure the long-term safety of your processes used in instrument reprocessing as part of cleaning and disinfection.

All agents must be used in accordance with the **national guidelines (e.g., KRINKO/BfArM recommendations in Germany)**.

Their listing by the German Association for Applied Hygiene (**VAH listing**) underlines the quality and reliability of the ...

An overview of all medical products for medical and dental application.

| Detailed information can be found on the following pages and additionally on the Internet at:
www.dr-stamm.de/produktinformationen/
www.dr-stamm.de/manuals/
www.dr-stamm.de/sicherheitsdatenblaetter/

STAMMOPUR DR 8

Instrument disinfection and intensive cleaning

Intensive cleaning and chemical disinfection of medical instruments and accessories

- VAH certification, $C\epsilon$ 0483
- Bactericidal, levurocidal, limited virucidal
- Effective against avian influenza virus H5N1 and SARS-CoV-2
- Very powerful cleaning effect in an ultrasonic bath
- Very short ultrasonic treatment times alongside low concentration in use
- Very high material compatibility
- Mildly alkaline
- Economical due to low concentration in use
- Free of aldehydes, chlorine and phenols

STAMMOPUR DR 8 is a concentrate for manual chemical disinfection and disinfecting, non-fixing intensive cleaning in ultrasonic baths as well as in immersion baths of **medical instruments and accessories** made of metal, including light metal, titanium, glass, ceramic, porcelain, plastic and rubber.

It is for **application** in instrument reprocessing for general, surgical, invasive and non-invasive medical instruments and accessories in CSSDs, in clinics, in doctors' surgeries and in medical foot care.

STAMMOPUR DR 8 is also successfully used for the treatment of rigid endoscopes and MIS instruments in an ultrasonic bath.

In the case of critical and semi-critical medical products, further processing steps are required. Do not use for final disinfection.

Active ingredients: amines, propionates
Mildly alkaline, pH 9.4 at 1% in demineralised water, biodegradable.

Application in an ultrasonic bath (dosage ▪ treatment time)
2% · 5 min: *bactericidal[1], levurocidal[2], limited virucidal[3] incl. H5N1 and SARS-CoV-2*
2% · 10 min: *SV40[3]*
3% · 15 min: *Adeno[3]*

Application without ultrasound (dosage ▪ treatment time)
1% · 60 min: *bactericidal[1], levurocidal[2]*
2% · 30 min or 3% · 15 min: *bactericidal[1], levurocidal[2], limited virucidal[3] incl. H5N1 and SARS-Cov-2; additionally SV40[3]*

[1]EN 13727, EN 14561, DGHM, high load; [2]EN 13624, EN 14562, DGHM, high load; [3]EN 14476, high load

Effectiveness reports are available and can be requested.

Litres	1	2	5	10
Code no.	–	972	974	6028

MD

STAMMOPUR R

Instrument cleaner

Cleaning and pre-cleaning of medical instruments and accessories

- Very powerful cleaning effect in an ultrasonic bath
- High blood-dissolving capacity
- Also removes stubborn, dried-up soiling
- Very short ultrasonic treatment times alongside economical, low concentration in use
- Very high material compatibility
- Mildly alkaline
- Pleasant smell
- Also recommended for pre-cleaning
- Can be used as a contact liquid

STAMMOPUR R is a concentrate for manual cleaning and pre-cleaning in an ultrasonic bath or in an immersion bath process of **general, surgical, invasive and non-invasive medical instruments and accessories and components of medical products** made of metal, titanium, glass, porcelain, ceramic and plastic.

It is for **application** in the instrument reprocessing process in CSSDs (Central Sterile Services departments), in clinics, in doctors' surgeries and in medical foot care.

For endoscopes and endoscopic accessories, the suitability recommendations of Karl Storz GmbH and Richard Wolf GmbH are available. The specifications of the manufacturers of endoscopes and their accessories must be strictly observed during treatment with STAMMOPUR R, especially in an ultrasonic bath.

Base: tensides
Mildly alkaline, pH 9.5 at 1% in demineralised water, biodegradable.

Dosage ▪ Treatment time

Application in an ultrasonic bath:
2% · 3 – 10 min

Application without ultrasound:
3 – 5% · max. 12 h
depending on the nature and persistence of the soiling.

Litres	1	2	5	10
Code no.	988	934	989	6029

MD

STAMMOPUR GR

Basic instrument cleaner

Basic cleaning for the restoration of medical instruments and accessories

- Basic cleaning as a downstream instrument reprocessing process
- Very powerful cleaning effect, though it will only work in conjunction with the ultrasonic effect in the ultrasonic bath at 50 – 60 °C.
- Very high material compatibility
- Strongly acid
- Economical due to low concentration in use
- Application exclusively by indirect sonication in the inset beaker

STAMMOPUR GR is a concentrate for manual basic cleaning, in an ultrasonic bath, of **medical instruments, accessories and components of medical products** made of stainless steel, precious metal, titanium, glass, porcelain, ceramic and plastic.

This agent is intended for removing temper colours, oxides, stains, mineral residues and burnt-on residues.

It is for **application** in the process of repairing and maintaining medical instruments, accessories and components of medical products, in CSSDs, in clinics and in doctor's practices.

In the process of basic cleaning during maintenance and repair for refurbishing, STAMMOPUR GR supports qualitative and ecological sustainability.

Not suitable for acid-sensitive materials, such as light metals, or for damaged chrome plating.

Dosing ▪ Treatment time ▪ Temperature

Application in an ultrasonic bath:
5 % ▪ 3 – 10 min ▪ 50 – 60 °C

Application exclusively by indirect sonication in the inset beaker

STAMMOPUR R
(dosage: 2 %), for example, can be used as a contact liquid.

Base: phosphoric acid, tensides
strongly acidic, pH 1.9 at 1 % in demineralised water, biodegradable

Litres	1	2	5	10
Code no.	968	938	969	6031

MD

Dosing aids

Dosing pump
This makes it easy to remove cleaning and disinfectant products from the jerrycans and reliably prevents spillage.

	For use with	Code no.
Dosing pump	5-l jerrycan	268
Dosing pump	10-l jerrycan	2660
Measuring cup	100 ml	294

Measuring cup
For precise dosing of the cleaning and disinfection agent volumes taken from the dosing table.

Dosing pump   Measuring cup
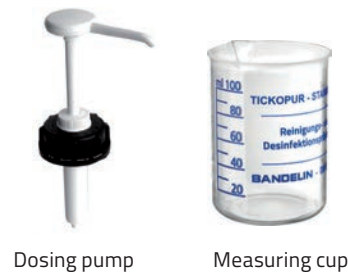
Dosing calculator
The cleaning and/or disinfection agent used is key for a successful ultrasonic application. The correct dosage of the concentrate is crucial.

If the dosage is too low, this will prevent success and constitutes misuse. That is why dosages and treatment times must be strictly adhered to.

Overdosing also constitutes misuse, because that can have an effect on material compatibility.

A safe and successful application can be determined by using the dosing calculator at bandelin.com/en/service/dosing-calculator/.

After entering the desired concentration and the amount of working solution to be prepared, the dosing calculator will indicate how much concentrate and water are required.

The required concentration depends on the application to be performed. Detailed information can be found in the operating instructions for the agent in question.

The amount of working solution refers to the operating volume of the existing device. The operating volume refers to the filling volume of the tank up to the filling level mark. You can find it in the relevant operating instructions for the ultrasound device.

Desired concentration of the working solution (%)	
Desired quantity of working solution (l)	
Calculate	Calculate Clear fields

Dosage of the agents

The medical agents are subject to fixed dosages and treatment times in order to ensure the effectiveness of the disinfection. The information provided on the agent must not be deviated from. To make dosing easier, we provide an online dosing table bandelin.com/chemie_Dr_STAMM/Dosiertabellen/Dosing_table_GB_BANDELIN.pdf, which is based on our ultrasonic baths.

> **▍ Download**
> **the dosing table**

Dosing table for ultrasonic cleaners

The hygiene plan supplement

As a supplement to the hygiene plan of the practice or laboratory, we provide the hygiene plan supplement as a template. The hygiene plan supplement can be accessed at bandelin.com/chemie_Dr_STAMM/Hygieneplan_Medizin_BANDELIN.pdf for the medical field.

> **▍ Download the**
> **hygiene plan supplement**
> **(only german)**

Hygieneplan-Ergänzung Medizin

Agents FAQ

Which liquids can be used?
In general, only agents that have been approved for operation in an ultrasonic bath can be used. We recommend STAMMOPUR agents that have been specially developed for use in ultrasonic baths in the medical field. It should be noted that water or demineralised water without cleaning agent has no capacity to clean.

How do I achieve a homogeneous solution in an ultrasonic bath?
The bath can only have a complete effect if the solution is thoroughly mixed.

For this purpose, the ultrasonic tank is filled with the correspondingly determined amount of water, the agent is then dosed and the solution is stirred until it is homogeneously mixed.

Alternatively, the ultrasonic tank can be filled with half the amount of water determined, and then the agent can be subsequently added, as well as the remaining amount of water. This normally leads to sufficient mixing.

The performance of the ultrasound alone does not lead to sufficient mixing of the solution.

How many parts can be cleaned at the same time?
If there are too many parts in the bath at the same time, the cleaning result will not be satisfactory. Instruments should not be stacked. Articulated instruments, e.g., forceps or scissors, must be opened completely or, if necessary, dismantled. The instruments must be completely covered with the solution.

Can I use STAMMOPUR DR 8 for a final disinfection?
In the case of critical and semi-critical medical products, further processing steps, such as sterilisation, are required. Do not use for final disinfection.

Can I carry out additional/subsequent dosing?
The dosage for preparing the cleaning solution is taken from the label or from the hygiene plan, and subsequent re-dosing is not permitted.

Can I add additives to the solution?
No, because the agents are medical products whose effectiveness can only be guaranteed when they are unchanged.

Can I change the dosing and treatment times?
For the disinfectant solutions, the values specified on the label must be strictly adhered to in order to maintain the effectiveness of the instrument reprocessing.

Can I heat cleaning solutions?
In principle, cleaning and disinfecting solutions are cold-prepared to protect against denaturation of the protein-containing impurities (coagulation).
Fresh blood or protein residues coagulate from a temperature of 40 °C. For this reason, freshly contaminated items may only be cold-cleaned with these contaminants.

For stubborn, already dried soiling, the solution can be heated up to 60 °C for cleaning with STAMMOPUR R.

In the basic cleaning for the restoration of instruments (e.g., for the removal of oxides, tarnish paints, mineral residues, etc.) with STAMMOPUR GR, a temperature of 50 – 60 °C is required.

What is the shelf life of the agents?
Disinfectants
The shelf life of originally sealed agents from DR.H.STAMM GmbH Chemische Fabrik is three years from the date of manufacture if the generally accepted storage conditions are observed. The expiry date is indicated on the label in the form YYYY-MM below ⧗ .

Cleaning agents
The shelf life of originally sealed cleaning agents from DR.H.STAMM GmbH Chemische Fabrik is at least six years from the date of manufacture, provided that the generally accepted storage conditions are observed. The expiry date is indicated on the label in the form YYYY-MM below ⧗ .

How should the agents be stored correctly?
Store agents upright, closed, clean, dry and at normal storage temperatures between +5 °C and +40 °C. Storage at the user's premises in the area of application should be at room temperature.

KNOWLEDGE & SERVICE

Quick start

The most important steps for a quick start with the SONOREX ultrasonic bath.

The foil test

Performance testing of an ultrasonic bath using the foil test.
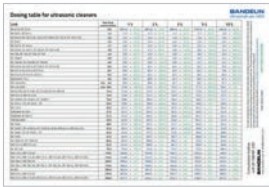
Dosage of the agents

The full effectiveness of the agents is only guaranteed if dosing is performed according to the instructions.
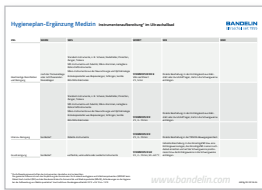
The hygiene plan supplement

The hygiene plan supplement for the STAMMOPUR agents and TICKOMED 1 guides you safely through the steps in your hygiene plan.

Ultrasonic baths for hire

Hire one of our ultrasonic baths for a specific period only.

FAQs

The important questions, briefly answered.

Quick start –
For using appliances in the medical field

1 **Structure of the ultrasonic bath**
a. See operating instructions

2 **Selection of accessories, suitable for the application**
a. The selection of accessories depends on the objects to be cleaned and on the degree of contamination
b. Selecting the method – direct or indirect sonication

Note: The objects to be cleaned must not be placed directly on the tank bottom!

3 **Filling the ultrasonic bath**
a. Filling the bath with tap water or demineralised water with a disinfectant

Note: Note the filling level mark. The filling level must not fall below the mark. Please note that the objects to be cleaned or inset beaker may also displace water and cause the bath to overflow.

Filling an ultrasonic bath

4 **Selecting the disinfectant**
a. Selecting the appropriate disinfectant
b. Determining the correct concentration. Use our dosage table for this and follow the usage instructions for the disinfectant

Note: With the STAMMOPUR agents, BANDELIN offers a wide range of agents that are specifically developed for ultrasonic cleaning.

5 **Degassing bath liquid**
Remove the dissolved gases by switching on the ultrasound or using the DEGAS function (for SONOREX DIGITEC DT).
Guide values for degassing times:
Bath volume up to 10 litres: approx. 10 min,
Bath volume > 10 litres: approx. 30 min

Degassing an ultrasonic bath

6 **Introducing objects to be cleaned**
a. Place the objects to be cleaned in the basket, the holder or the inset beaker.
b. You can generally use the accessories of your choice, e.g., suitable for the activities before and/or after sonication, if you choose the device accordingly

Notes: The objects to be cleaned must not overlap. Instruments with joints must always be inserted in an opened state. There should be no air-filled cavities. The objects to be cleaned must be completely covered with cleaning agent.

7 **Setting the sonication parameters**
Setting the temperature and sonication time:
a. Based on your own experience or
b. in accordance with the application instructions or the usage instructions for the disinfectant

Notes: First select a low sonication time, e.g., 3 minutes for cleaning instruments. Ultrasonic cleaning is extremely effective in a very short time.

8 **Starting the application**
Note: Caution when cleaning instruments with organic residues: Ensure the correct bath temperature to avoid protein denaturation.

9 **Completing the cleaning process**
a. Rinse the objects to be cleaned thoroughly and, if necessary, perform further reprocessing steps.
b. Care of the ultrasonic bath (observe the operating instructions)

**Note:** Correct operation and proper care of the ultrasonic bath will result in a long lifespan.

The foil test – Functional test for an ultrasonic bath

Functional test for an ultrasonic bath

The foil test is recommended for the functional testing of an ultrasonic bath – when it is first put into service, and then at regular intervals thereafter (e.g., quarterly). The user is responsible for how often it is performed. The foil test is a simple method for displaying the intensity and distribution of cavitation in an ultrasonic bath. It is performed by inserting aluminium foil stretched over a foil test frame. Depending on the sonication time, the foil will be perforated or destroyed to a certain extent by cavitation.
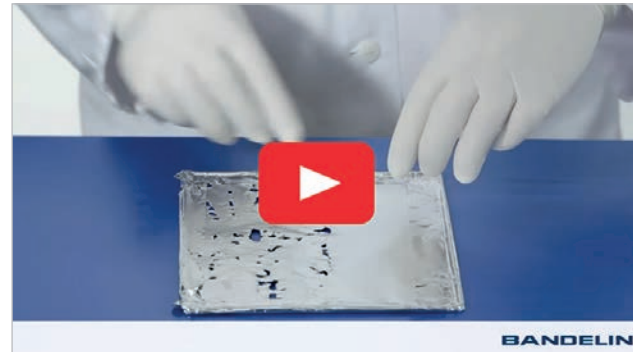
bandelin.com/en/applications/foil-test

In order to be able to reproduce the test results, it is important that the test conditions are always the same:

- The oscillating tank is filled up to the filling level mark Temperature of the sonication fluid
- Duration of degassing
- Positioning of the frame
- Foil type (brand, thickness)
- Sonication time
- Type and concentration of the ultrasound agent

The foils can be archived in a suitable manner (scan, photo, etc.). This makes it possible to compare the foils at any time. The perforated areas of the foils should be of roughly the same size and distribution – they are never identical. Regular foil tests are the only way to check the process, e.g., when reprocessing medical devices. For the foil test, various FT foil test frames can be requested from the manufacturer BANDELIN. The foil test frames are available for a wide range of tank dimensions. Aluminium household foil is also required for the test procedure; this is not included in the scope of delivery.

Performing the foil test

To document the foil tests you have performed, download the foil test documentation template from
bandelin.com/en/docs/downloads/documentation-forms

A website with information on the foil test with a download section

Ultrasonic baths for hire

Would you like to see the performance and quality of our ultrasonic baths for yourself before buying them? Then you can start by renting the appropriate device.

Do you need a replacement device at short notice to tide you over while yours is being repaired, or as an interim solution for a new purchase? We also offer rental devices for this purpose.

All devices used in the medical environment, whether compact devices, SONOMIC or TRISON, are available for loan.

Please note: Rental is only possible within Germany. The rental of ultrasonic baths is only offered to commercial customers. The minimum rental period is one week.

4 simple steps for hiring your device

For more information:
bandelin.com/en/service/#miete

1 Select the device type on the website or the information sheet

2 Request a hire contract and questionnaire, fill it in by phone or email, and send it back.

3 The ultrasonic bath will be delivered at the agreed time and place.

4 After application, please return the device to us **together with the completed Certificate of Decontamination**.

Download the Certificate of Decontamination:
bandelin.com/fragebogen/Dekontamination_GB_BANDELIN.pdf

Devices

Type	Internal dimensions of the oscillating tank L × W × D /D⁺ [mm]	Opera-ting volume [l]	External dimensions L × W × H** [mm]	Ultrasonic peak power* [W]	Ultra-sonic nominal power [W]	Ultrasonic frequency [kHz]	Heating power [W]	Outlet
RK 31/H, DT 31/H	190 × 85 × 60	0.6	205 × 100 × 180	160	40	35	70	–
RK 100/H, DT 100/H	240 × 140 × 100	2.0	260 × 160 × 250	320	80	35	140	–
RK 102 H, DT 102 H	240 × 140 × 100	2.0	260 × 160 × 250	480	120	35	140	Ball valve G ¼, right
RK 255/H, DT 255/H	300 × 150 × 150	3.8	325 × 175 × 295	640	160	35	280	Ball valve G ¼, right
RK 514/H, DT 514/H	325 × 300 × 150	9.0	355 × 325 × 305	860	215	35	600	Ball valve G ½, left
RK 1028/H, DT 1028/H	500 × 300 × 200	19.0	535 × 325 × 400	1200	300	35	1300	Ball valve G ½, left
DT 1058 M	600 × 400 × 200/220⁺	35.0	670 × 470 × 400	2400	600	35	–	Ball valve G ¾, right
RK 1050	600 × 500 × 200	41.0	640 × 540 × 425	2400	600	35	–	Ball valve G ½, left
RK 1050 CH, DT 1050 CH	600 × 500 × 300	60.0	640 × 540 × 530	2400	600	35	230 V – 1950 W, 115 V – 1450 W	Ball valve G ½, left

*corresponds to 4 times the ultrasonic nominal power   **without ball valve and handles   ⁺inclined tank bottom

Type	Internal dimensions of the oscillating tank L × W × D/D⁺ [mm]	Opera-ting volume [l]	External dimensions L × W × H [mm]	Ultrasonic peak power* [W]	Ultrasonic nominal power [W]	Ultrasonic frequency [kHz]
SONOMIC MC 1001	650 × 400 × 160/170⁺	27.0	860 × 490 × 325	2400	600	40
SONOBOARD TRISON 4000.2	770 × 420 × 165/190⁺	35.0	Moving device Xi: 345 × 160 × 175 Movement device Si: 405 × 205 × 190	3040	760	38

*corresponds to 4 times the ultrasonic nominal power   ⁺inclined tank bottom

Accessories

Rental devices are always supplied with the appropriate accessories.

FAQs

Ultrasound and cavitation – what is it?

Vibrations with frequencies above 20 kHz (20,000 vibrations per second) are referred to asultrasound. These vibrations generate millions of tiny vacuum bubbles in all liquids during the tension phase, which implode in the pressure phase, creating highly effective pressure surges. This process is called cavitation.

Which ultrasonic bath should I choose?

Representation of a cavitation bubble

Close-up of an ultrasonic transducer.

The size of the objects to be cleaned determines the size of the tank and thus the required type of device. The basket dimensions must be taken into account when selecting the device. To avoid overloading the device, it is advisable to choose a slightly larger device. This will also provide room for further applications.

Further decision criteria include, in particular, the operating elements and the desired design – see the following page. For rinsable MIS and complex robotic instruments, ultrasonic baths with additional functions, such as rinsing and movement of the instruments, are available to meet the increased requirements for cleaning.

Does an ultrasonic bath need to have heating?

For cleaning after dry deposit, devices without heating are primarily used, because at temperatures above 40 °C there is a danger of protein coagulation. Devices with heating are used for the basic cleaning of instruments, as the cleaning time is shortened by the heating of the bath liquid, and dirt is removed more quickly.

Which accessories are necessary?

Objects to be cleaned must not lie on the tank bottom. Baskets and other inset beakers prevent scratches on objects to be cleaned and the tank bottom. For cleaning very small or sensitive parts, other accessories are useful, for example, for careful storage. For reasons of occupational safety, it is recommended to cover the ultrasonic baths during operation (see TRBA 250).

Which liquids can be used?

STAMMOPUR disinfectants are specially developed for application in ultrasonic baths. Water without cleaning agent does not clean. Do not use household cleaning agents or pure demineralised water! When working with acids, a plastic insert tub must be used. Do not use combustible or explosive liquids directly in the oscillating tank!

How can ultrasonic baths be tested?

The effect of ultrasonic baths is determined by the intensity and distribution of the process-typical cavitation in the oscillating tank. The foil test (according to IEC TR 60886) is a simple method for displaying the intensity and distribution of cavitation in an ultrasonic bath. For this purpose, an inserted aluminium foil is perforated or destroyed to a certain extent by cavitation, depending on the duration of sonication. The same test conditions are important for the reproducibility of the foil test. Suitable frames for carrying out the foil test are available as accessories for the ultrasonic baths.
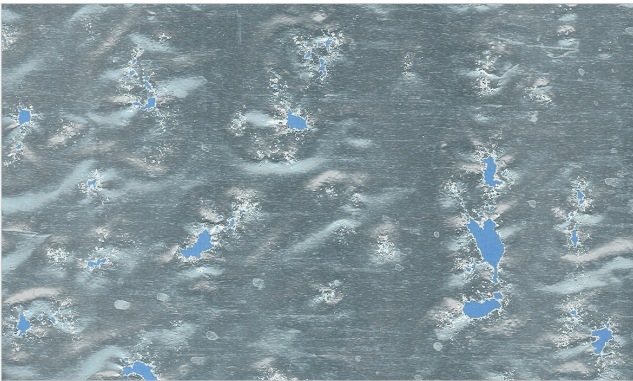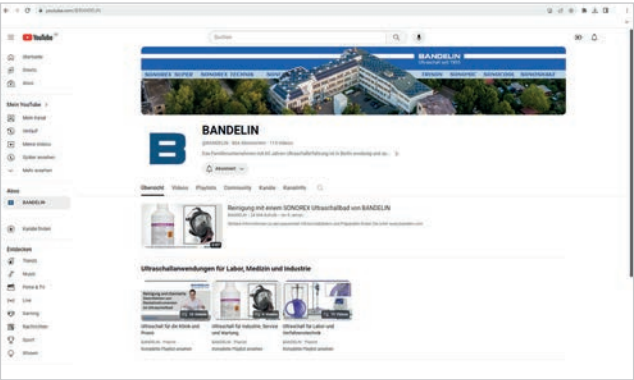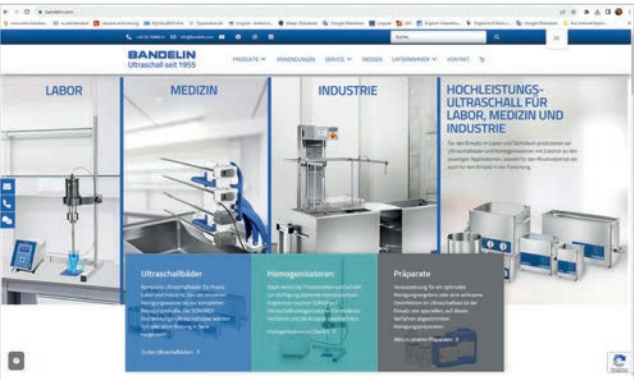
Above: Performing a foil test.
Below: Perforated foil after the test.

Take a look at our application video:
bandelin.com/en/
applications/folientest

If you would like to find out more...

... visit our website with our own YouTube channel and many helpful application videos!
Or contact us directly... We will be happy to advise you – call us on 030 76880-212!

Your contact person
in the medical field

We will be happy to advise you personally.
Ask our expert.

Florian Knuth

Sales Manager
Medical Ultrasound

+49 30 76880-212

florian.knuth@bandelin.com

Contact

Address:

BANDELIN electronic
GmbH & Co. KG
Heinrichstr. 3–4
12207 Berlin
GERMANY

+49 30 76880-0

info@bandelin.com

www.bandelin.com

Visit us on social media:

Made in Germany

BANDELIN electronic
GmbH & Co. KG
Heinrichstr. 3 – 4
12207 Berlin
GERMANY
☎ +49 30 76880-0
🖷 +49 30 7734699
info@bandelin.com

**Certified in accordance with
ISO 9001 and ISO 13485**

Certified
Quality System
ISO 9001
◈mdc

Certified
Quality System
ISO 13485
◈mdc

We will be happy to advise you personally.
Ask our experts.

+49 30 76880-0

www.bandelin.com