

SONOREX TECHNIK

High-power ultrasound



**Intensive cleaning for
Industry – Service – Maintenance**





Find out about our new ultrasonic cleaning units and see them in action. Comprehensive consultation is guaranteed by our experts. Generators, oscillating systems and reactors are for a hands-on experience. BANDELIN electronic is represented at many major trade fairs at home and abroad, for example at the HANNOVER MESSE, Turning-Days, AMB, parts2clean and SURFEX.

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ECONOMICAL

Regular ultrasonic cleaning saves money. Material to be cleaned will last longer due to the more gentle effect of ultrasound resulting in less needed spare parts. Faster cleaning times reduce standstill periods between productions.

EFFICIENT

Ultrasonic cleaning processes are effective. Optimum cleaning results will be achieved. Brushing and wiping is no more necessary. The material to be cleaned – including its surfaces – will not be damaged. Even intricately shaped parts can be cleaned.

FRIENDLY TO THE ENVIRONMENT

Biologically degradable cleaning agents are used instead of ecologically harmful solvents. The consumption of chemicals and waste water can be further reduced by using an oil separator and a bath filtration.

OPERATION-FRIENDLY

Ultrasonic cleaning units are easy to install, easy to operate and do not require special training.



Four main factors for successful ultrasonic cleaning

Ultrasound

Ultrasound produces smallest vacuum bubbles in liquids. These bubbles implode immediately (cavitation). The forces resulting from cavitation cause an intensive and gentle removal of dirt particles from the object.



Temperature

Many cleaning agents become fully effective only at high bath temperatures. The cleaning solution can be heated by the cleaning units heating system.



Chemistry

The cleaning agent supports the cavitation process, reduces the surface tension, separates and binds dirt particles. Depending on the type of dirt accumulation, different cleaning agents are employed.



Time

Compared to other methods, the joint application of chemical agents and ultrasound reduces the time needed for cleaning up to 90 %. Depending on the amount of dirt, that time varies from a few seconds up to a couple of minutes.



Example: Filter cleaning

Filters from water supply systems are cleaned twice a year in an ultrasonic cleaning unit with a 5% solution of TICKOPUR R 27. Ultrasonic cleaning means that the high costs associated with purchasing new filters can be reduced.



Filter contaminated



Filter cleaned in an ultrasonic bath

Typical industrial applications

Precision mechanics

Cleaning of stainless steel, brass and aluminium parts

Mechanical engineering

Cleaning and degreasing of bearings, crankshafts, double-sided plates, work pieces, electrostatic filters

Wood working industry

Cleaning of wood working tools and maintenance of machine parts

Pharmaceutical industry

Cleaning of metal filters and tableting tools

Medicine technology

Cleaning of dentures, implants and joints

Automobile industry

Cleaning of injection nozzles, carburettors, spray guns, nozzles, shock absorbers, engine parts, circuit boards and cutting tools



Transport technology

Cleaning of relays, soldered frames, gear box and engine parts

Pneumatic tools

Removal of grease, oil, abrasion and resinous residues during maintenance

Industrial safety and fire protection

Cleaning of respirator masks and sooty parts



Respirator mask contaminated

Respirator mask cleaned in an ultrasonic unit

Material testing

Cleaning and degreasing of measuring tools

Office technology

Component cleaning of copying machines, printers, postal franking machines, cases and keyboards

Catering trade

Cleaning and degreasing of electrostatic filters and parts of coffee machines

Energy management

Cleaning of armatures and water meters

Mould cleaning

Cleaning of plastic moulding tools

Grinding and polishing shops

Cleaning of lamp shades

Power stations

Cleaning of oil and smoke filters, decontamination

Optical and glass industry

Preliminary and intermediate cleaning of optics and lenses

Thin-layer technology

Cleaning of sensor parts

Service

Cleaning of computer parts

Three product lines with different configurations for application in industry, craft and service

Constantly increasing demands on product quality require also adequate ultrasonic equipment featuring sophisticated technology and high flexibility.

BANDELIN offers a variety of SONOREX TECHNIK equipment for individual cleaning requirements that meet today's demand for high quality, economic efficiency and environment associated factors.

- Units with ultrasound and heating (UH) – for cleaning. The heating supports the cleaning effect of the chemistry.
- Units with ultrasound (U) – for cleaning or rinsing with ultrasound support, without heating
- Units with heating (H) – for rinsing without ultrasound
- Units without ultrasound and without heating – for use with cascade rinsing in several tanks in a row

The following summary gives an overview of the product range and is meant to help in pre-selecting suitable products:

The established



The convenient



The two-parts



| Characteristics | RM 16 to RM 210 | RM 112 to RM 212 | ZM 112 to ZM 212 |
|------------------------|-----------------------|----------------------------|-------------------------------|
| Operating volume | 13 to 210 litres | 115 to 230 litres | 115 to 230 litres |
| Internal tank | right-angled corners | round corners | round corners |
| Tank bottom | flat | inclined toward tank drain | inclined toward tank drain |
| Ultrasonic transducers | at the bottom | at the bottom | at the bottom and at one side |
| Ultrasonic power | fixed | fixed | adjustable |
| Ultrasonic generator | built-in | built-in | separate |
| Ultrasonic frequency | 25 kHz* or 40 kHz | 25 kHz or 40 kHz | 25 or 40 kHz, or both |
| Operating elements | at bottom, right side | at upper right side | at upper right side |

* RM 110 or higher

The established – industrial units RM

One-piece ultrasonic units from 13 to 210 litres

- **Welded cleaning tank**
made of 2 mm stainless steel AISI 316 Ti
- **Weir**
floating contamination like particles, oil and grease can be removed from the bath surface using an oil separator
- **Filling level mark**
well recognizable imprint for the minimum filling level of the cleaning fluid
- **Additional outlet**
for connection of an oil separator or for emptying the fluid behind the weir
- **Drain for 3-way ball valve**
for emptying or refilling the tank or connecting to a filtration
- **Heating**
on/off with pilot lamp, temperature thermostatically adjustable from 30 to 80 °C
- **Drip-proof housing**
made of stainless steel AISI 304



RM 40 UH

- **Ultrasound**
on/off with pilot lamp, timer 1 to 15 min. or continuous operation
- **Ultrasonic generator (built-in)**
frequency 40 kHz

| Model (selection) | Internal tank dimensions (l x w x d) mm | Operating volume litres | External dimensions (l x w x h) mm | Ultrasonic peak power* W | HF power W _{eff} | Heating power W | Current consumption A** |
|--|---|-------------------------|------------------------------------|--------------------------|---------------------------|-----------------|-------------------------|
| RM 16 UH | 325 x 275 x 200 | 13 | 365 x 340 x 390 | 1200 | 300 | 800 | 4,8 |
| RM 40 UH | 480 x 300 x 300 | 30 | 540 x 340 x 500 | 2000 | 500 | 1250 | 7,7 |
| RM 75 UH | 580 x 500 x 300 | 60 | 640 x 540 x 530 | 4000 | 1000 | 1950 | 12,9 |
| Ultrasonic industrial units starting with RM 110 are equipped with spraying pipe, liquid level switch for dry run protection, ultrasonic generator supplying 40 kHz or 25 kHz and height-adjustable feet | | | | | | | |
| RM 110 UH | 600 x 450 x 450 | 110 | 780 x 550 x 800 | 4000 | 1000 | 4800 | 10,5 |
| RM 180 UH | 1000 x 500 x 400 | 160 | 1180 x 600 x 800 | 2 x 4000 | 2 x 1000 | 7200 | 14,8 |
| RM 210 UH | 750 x 650 x 500 | 210 | 930 x 750 x 800 | 2 x 4000 | 2 x 1000 | 7200 | 14,8 |

*Ultrasonic peak power is 4 times higher than HF power caused by modulation of ultrasound

**RM 110 or higher per phase

Mains connection RM 16... - 75...: 230 V~ 50/60 Hz, RM 110.. - 210...: 400 V 3N~ 50/60 Hz, CEKON-plug 16 A.

6 standard sizes in 4 versions each for cleaning and rinsing.

Depending on the cleaning requirements, the equipment can be individually arranged:

RM ... UH with ultrasound and heating
RM ... U with ultrasound

RM ... H with heating
RM ... without ultrasound and without heating

One-piece ultrasonic units from 115 to 230 litres

Basic equipment analogue to RM 110 – 210

welded cleaning tank made of 2 mm stainless steel AISI 316 Ti, ultrasound, heating, filling level mark, welded drain, overflow weir with drain, drip-proof housing made of stainless steel AISI 304

- **Spraying pipe**
generates in connection with an oil separator a movement on the liquid's surface that leads floating oil and grease from the bath surface into the overflow weir
- **Liquid level switch as dry run protection**
for heating and ultrasonic transducers
- **Ultrasonic generator (built-in)**
frequency of 40 kHz or 25 kHz
- **Height-adjustable feet**



RM 112 UH

Additional comfort

- **Round tank corners**
at the bottom and at all sides facilitate the cleaning of the tank. Accumulation of residues is avoided.
- **Operating elements at the upper side of the tank**
facilitate the turning of the knobs for ultrasound and heating
- **Inclined tank bottom**
for improved cleaning results through ideal distribution of ultrasound. It also facilitates the draining of used cleaning liquid. Accumulation of particles and residual fluid on the tank bottom are considerably reduced.

| Model (selection) | Internal tank dimensions (l x w x d) mm | Operating volume litres | External dimensions (l x w x h) mm | Ultrasonic peak power** W | HF power W_{eff} | Heating power W | Current consumption A*** |
|-------------------|---|-------------------------|------------------------------------|---------------------------|--------------------|-----------------|--------------------------|
| RM 112 UH | 600 x 450 x 450/470* | 115 | 780 x 610 x 800 | 4000 | 1000 | 4800 | 10,5 |
| RM 182 UH | 1000 x 500 x 400/420* | 170 | 1180 x 660 x 800 | 2 x 4000 | 2 x 1000 | 7200 | 14,8 |
| RM 212 UH | 750 x 650 x 500/520* | 230 | 930 x 810 x 800 | 2 x 4000 | 2 x 1000 | 7200 | 14,8 |

Ultrasonic peak power is 4 times higher than HF power caused by modulation of ultrasound

**per phase

***inclined tank bottom

RM 112...- 212...: 400 V 3N ~ 50/60 Hz, CEKON-plug 16 A.

3 standard sizes in 4 versions each for cleaning and rinsing.

Depending on the cleaning requirements, the equipment can be individually arranged:

RM ... UH with ultrasound and heating
RM ... U with ultrasound

RM ... H with heating
RM ... without ultrasound and without heating

The two-parts – industrial units ZM

Two-part industrial ultrasonic units from 115 to 230 litres also available in TwinSonic®-versions as multi-frequency units with ultrasonic transducers at the bottom and at one side.

Why two-parts?

- Separate installation of generator apart from the wet area
- The generator is equipped with a serial interface and a remote control connection for external control
- Operation of several cleaning tanks fed by one generator is possible, even if each tank works with a different frequency
- Infinitely variable control of ultrasonic power



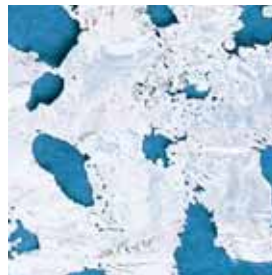
Equipment identical to RM 112... to 212 ...

TwinSonic®-version as multi-frequency unit

Registered utility model DE 20 2004 006 380.8

Multi-frequency units in the TwinSonic® version work with ultrasonic systems of different frequencies at the bottom and at one side. Advantage is a more homogenous distribution of ultrasound and power, thus improving the cleaning efficiency and reducing the time needed for cleaning.

Illustration of the ultrasonic efficiency achieved with an aluminium foil according to IEC/TR 60886.



Single irradiation with 25 kHz



TwinSonic® irradiation with 25 kHz and 40 kHz

| Model (selection) | Internal tank dimensions (l x w x d) mm | Operating volume litres | External dimensions (l x w x h) mm | Ultrasonic peak power** W | HF power W _{eff} | Heating power W | Current consumption A*** |
|-------------------------|---|-------------------------|------------------------------------|---------------------------|---------------------------|-----------------|--------------------------|
| ZM 112 UH ZM 112 UHL | 600 x 450 x 450/470* | 115,0 | 780 x 610 x 800 | 4000 2 x 4000 | 1000 2 x 1000 | 4800 | 4,3 8,6 |
| ZM 182 UH ZM 182 UHL | 1000 x 500 x 400/420* | 170,0 | 1180 x 660 x 800 | 2 x 4000 2 x 6000 | 2 x 1000 2 x 1500 | 7200 | 8,6 13,0 |
| ZM 212 UH ZM 212 UHL | 750 x 650 x 500/520* | 230,0 | 930 x 810 x 800 | 2 x 4000 2 x 6000 | 2 x 1000 2 x 1500 | 7200 | 8,6 13,0 |

*Ultrasonic peak power is 4 times higher than HF power caused by modulation of ultrasound

**per phase

***inclined tank bottom

Mains connection oscillating tank: 400 V 3N~ 50/60 Hz, CEKON-plug 16 A. HF generator: 230 V~ 50/60 Hz

3 standard sizes in 4 versions each with infinitely variable control of ultrasonic power. Units equipped with ultrasonic transducers at the bottom or at the bottom and at one side for cleaning and rinsing.

- ZM ... UH unit with ultrasonic transducers at the bottom and with heating
- ZM ... UHL unit with ultrasonic transducers at the bottom and at one side and with heating
- ZM ... U unit with ultrasonic transducers at the bottom
- ZM ... UL unit with ultrasonic transducers at the bottom and at one side

Accessories



Insert baskets MK

protect the parts to be cleaned and the unit against damage.



Lid MD

made of stainless steel, to protect the liquid from contamination.

| Model | RM 16 | RM 40 | RM 75 | RM 112 ZM 112 RM 110 | RM 182 ZM 182 RM 180 | RM 212 ZM 212 RM 210 |
|--|----------------|-----------------|-----------------|----------------------------|----------------------------|----------------------------|
| Accessories | | | | | | |
| Insert basket | MK 16 B | MK 40 B | MK 75 B | MK 110 | MK 180 | MK 210 |
| Insert basket load up to 40 kg | - | MK 40 S | MK 75 S | MK 110 S | MK 180 S | MK 210 S |
| Insert basket for lifting device | MK 16 B | MK 40 B | MK 75 B | MK 110 B | MK 180 B | MK 210 B |
| Insert basket for lifting device, load up to 40 kg | - | MK 40 BS | MK 75 BS | MK 110 BS | MK 180 BS | MK 210 BS |
| Lid | MD 16 | MD 40 | MD 75 | MD 110 | MD 180 | MD 210 |
| Drop plate between 2 units | TB 16 | TB 40 | TB 75 | TB 110 | TB 180 | TB 210 |



MO 16.2

Oscillation MO

The electrically driven oscillation MO enables automatic movement of the basket in tanks of the production line RM 16 or RM 40.

The oscillating movement of the parts intensifies the cleaning efficiency of the ultrasonic irradiation and helps to remove dirt particles more efficiently.

| Model | RM 16 | RM 40 |
|-----------------------------|----------------|--------------|
| Additional equipment | | |
| Oscillation | MO 16.2 | MO 40 |
| Tank rack for 1 unit | WO 16-1 | - |

Further tank racks WO on request.



WO 16

Tank rack WO

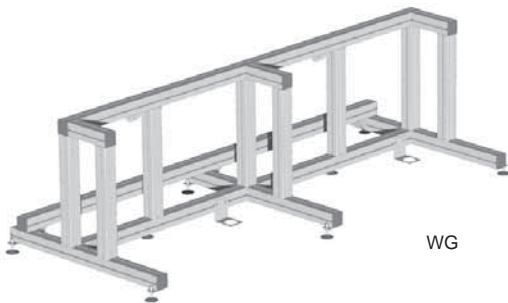
The tank racks are designed for up to 4 units of the production line RM 16, in connection with oscillation MO 16.2.



Lifting device MB with oscillation

Registered utility model No. 296 17 375

The electrically driven lifting device with oscillation facilitates the lowering of the basket and its removal. In connection with a tank rack, the basket can be transported from one unit to the other. The oscillating movement of the parts intensifies the cleaning efficiency of the ultrasonic irradiation and removes dirt particles more efficiently.



WG

Tank rack WG

The tank racks are designed for up to 4 units and can be combined with the electrically driven lifting device MB.

| Model | RM 16 | RM 40 | RM 75 | RM 112 ZM 112 RM 110 | RM 182 ZM 182 RM 180 | RM 212 ZM 212 RM 210 |
|--|----------------|----------------|----------------|----------------------------|----------------------------|----------------------------|
| Additional equipment | | | | | | |
| Lifting device with oscillation, fixed, for one unit | - | - | - | MB 110 | MB 180 | MB 210 |
| Lifting device with oscillation, movable, for tank rack WG | MB 16 | MB 40 | MB 75 | MB 110 B | MB 180 B | MB 210 B |
| Tank rack for 2 units | WG 16-2 | WG 40-2 | WG 75-2 | WG 110-2 | WG 180-2 | WG 210-2 |

Further tank racks WG on request.



Filtration FA

To be connected to the ultrasonic cleaning tank. Removed particles are retained by filter. This prolongs the use of the cleaning liquid while its cleaning capacity remains unchanged.



Oil separator OX

To be connected to the ultrasonic cleaning tank, if oil and grease has to be removed. Dirt accumulations floating on the bath's surface are led via the weir into the oil separator and are separated by gravitation.



DI-water treatment WA

To be connected to a rinsing bath in order to remove stain making water residues on the cleaned parts.



Trough dryer TO

The cleaned parts are dried after rinsing in order to rapidly remove residual moisture.

| Model | RM 16 | RM 40 | RM 75 | RM 112 ZM 112 RM 110 | RM 182 ZM 182 RM 180 | RM 212 ZM 212 RM 210 |
|--------------------|-------|-------|-------|----------------------------|----------------------------|----------------------------|
| Peripheral units | | | | | | |
| Filtration | FA 16 | FA 40 | FA 75 | FA 110 | FA 180 | FA 210 |
| Oil separator | OX 16 | OX 40 | OX 75 | OX 110 | OX 180 | OX 210 |
| DI-water treatment | WA 16 | WA 40 | WA 75 | WA 110 | WA 180 | WA 210 |
| Trough dryer | TO 16 | TO 40 | TO 75 | TO 110 | TO 180 | TO 210 |

Examples of modular installations

Variable set-up: modules are rearrangeable for different requirements

RM 16 units with oscillation



Modular line RM 16 UH + RM 16 U + RM 16 H + MO 16.2 + WO 16-3



Modular line RM 16 UH + RM 16 UH + RM 16 H + RM 16 + WG 16-4 + MB 16

**RM units up to 60 litres
with lifting device**

**RM units above 115 litres
with lifting device**



Modular line RM 210 UH + RM 210 H + RM 210 + RM 210 + TO 210 + WG 210-5 + MB 210 B

Saw blade holder SA 16 and SA 40 for cleaning saw blades and cutting tools, no additional cleaning necessary



SA 16 with RM 16 UH

Features

- Simple placement on existing ultrasonic units SONOREX TECHNIK RM 16 and RM 40
- Removal of persistent dirt, like resin residues
- Axis for different bore diameters

Specification

- Adaptable axis for different bore diameters: 20 to 50 mm
- Maximum load 8.0 kg
- Rotation speed approx. 1 rpm
- Timer 1 to 15 min and continuous operation
- Timer and motor inside an ABS-housing
- Mains connection 230 V~ 50/60 Hz

Planing head holder HA 40, HA 110 and HA 112 for cleaning of planing heads and cutting tools, no additional cleaning necessary



HA 40 with RM 40 UH

Features

- Simple retrofitting to existing ultrasonic units SONOREX TECHNIK RM 40 UH, RM 110 UH and RM 112 UH
- Motorised axle drive
- Useable planing heads diameter d_a : 280 to 480 mm

Specification

- Planing head holding axle 3/4", other holding axles (dia. 20 to 50 mm) usable
- Maximum load 80.0 kg
- Rotation speed of the drive roller approx. 1 rpm
- Timer 1 to 15 min and continuous operation
- Timer and motor inside stainless steel housing
- Mains connection 230 V~ 50/60 Hz

Air agitation LU for rinsing support by injection of air bubbles into the rinsing tank



LU 180

Compressed air supply up to 6 bar
Material made of stainless steel 1.4301

LU 110 for SONOREX TECHNIK RM 110/112 rinsing tanks

LU 180 for SONOREX TECHNIK RM 180/182 rinsing tanks

LU 210 for SONOREX TECHNIK RM 210/212 rinsing tanks

SONOREX TECHNIK W 65 and W 300 with higher free board

Application

Cleaning of

- oil filters
- valves
- cylinder heads

Specially designed for use on ships.

The extra high tank freeboards avoid overflow of the cleaning liquid during cruising.

Specification

- Tank made of 2 mm stainless steel AISI 316 Ti, with high freeboard
- W 65 frequency 35 kHz, W 300 frequency 40 kHz or 25 kHz
- Built-in heating, thermostatically adjustable from 30 to 80° C

Oil filter
cleaning with ultrasonic



dirty

clean



W 65



W 300

Accessories

Basket **WK 65**

Lid **WD 65**

Basket **WK 300** up to a load of 20 kg

Basket **WK 300 S** up to a load of 40 kg

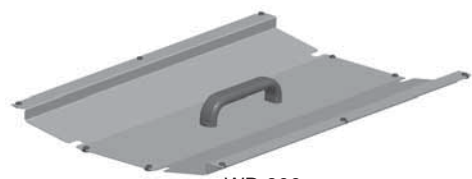
Lid **WD 300**



WK 65



WD 65



WD 300

| Model | Inner tank dimensions (l x w x d) mm | Operating volume litres | External dimensions (l x w x h) mm | Ultrasonic peak power* W | HF power W _{eff} | Heating power W | Current consumption A |
|--------------|--|----------------------------|--|--------------------------------|---------------------------------|-----------------------|-----------------------------|
| W 65 | 500 x 300 x 450 | 30,0 | 560 x 360 x 650 | 1200 | 300 | 1450 | 7,0 |
| W 300 | 1000 x 500 x 600 | 185,0 | 1180 x 600 x 1000 | 2 x 4000 | 2 x 1000 | 7200 | 14,8** |

*Ultrasonic peak power is 4 times higher than HF power caused by modulation of ultrasound

**per phase

W 65 mains connection 230 V~ alternatively 115 V~ 50/60 Hz, W 300 mains connection 400 V 3N~ 50/60 Hz

On request additional with integrated autotransformer for connection on the existing voltage of the ship.

SONOREX TECHNIK RL 70 UH, long tank



Perfectly suitable for cleaning of long parts such as tubes, profiles, mill saw blades, long cutting blades

Accessories

- Basket holder **KT 70 L**
- Basket inset **RE 70 L**
- Saw blade inset **SE 70 L**
- Lid **MD 70**



Basket holder KT 70 L with basket inset RE 70 L



Basket inset KT 70 L with saw blade inset SE 70 L

| Model | Inner tank dimensions (l x w x d) mm | Operating volume litres | External dimensions (l x w x h) mm | Ultrasonic peak power* W | HF power W_{eff} | Heating power W | Current consumption A |
|----------|--------------------------------------|-------------------------|------------------------------------|--------------------------|--------------------|-----------------|-----------------------|
| RL 70 UH | 1700 x 250 x 250 | 70,0 | 1750 x 300 x 450 | 4000 | 1000 | 2000 | 13,1 |

Mains connection 230 V~ 50/60 Hz

SONOREX TECHNIK L 220/L 320 - two-chamber configuration for cleaning and rinsing in a single unit



L 220 with lifting device LB 220 for placement and removal of the basket and for oscillating movement of parts in the cleaning or rinsing chamber.

Application

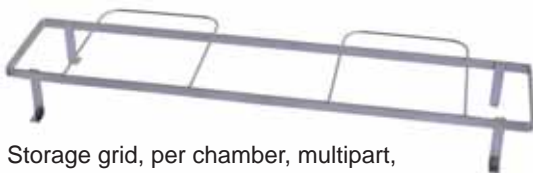
Cleaning of blinds, lamp grids, reflectors, weaving healds, preforms and slat blinds

SONOREX TECHNIK L 220

- Separate HF generator LG 2002 T
- Frequency 40 kHz
- Mains connection 230 V~ 50/60 Hz
- Optional lifting device LB 220 with basket

SONOREX TECHNIK L 320

- Separate HF generator LG 4004 F
- Frequency 40 kHz
- Mains connection 400 V 3N~ 50/60 Hz
- Optional lifting device LB 320 with basket



Storage grid, per chamber, multipart, for cleaning without lifting device **LR 220** and **LR 320**



Lifting device with oscillation and with basket **LB 220** and **LB 320**

Additional accessories such as a heating device can be supplied on request.

| Model | Inner tank dimensions (l x w x d) mm | Operating volume per chamber litres | External dimensions (l x w x h) mm | Ultrasonic peak power* W | HF power W_{eff} | Current consumption A** |
|-------|--------------------------------------|-------------------------------------|------------------------------------|--------------------------|--------------------|-------------------------|
| L 220 | 2200 x 300 x 300/370 ^o | 185 | 2320 x 750 x 850 | 2 x 4000 | 2 x 1000 | 8,6 |
| L 320 | 3200 x 300 x 370/370 ^o | 270 | 3320 x 750 x 850 | 4 x 4000 | 4 x 1000 | 8,6** |

*Ultrasonic peak power is 4 times higher than HF power caused by modulation of ultrasound **per phase ^oultrasonic-/rinsing chamber

High-power transducers

Immersible transducers and flat transducer plates from 200 W to 2000 W

Immersible transducers for quick installation

Immersible transducers are used for sonication in large tanks or sinks without modifying the existing equipment to a large extent.



Features

- Stainless steel housing of 2 mm, AISI 316 Ti, TIG welded
- Ultrasonic frequency 25 kHz or 40 kHz
- Drip-proof or hose-proof HF cable connections
- 10 different versions create a variety of application



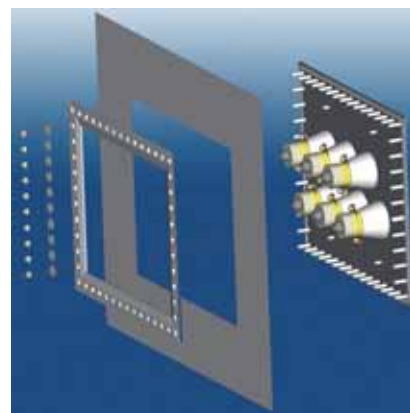
Flat transducer plates P – for space-saving installation

Flat transducer plates are installed into the side wall or into the tank bottom, if space is limited. The nominal tank dimensions remain unchanged.



Features

- Drilling jigs and bores for mounting bolts are not required!
- Installation in rectangular outcut in tank
- Stainless steel plate of 3 mm, AISI 316 Ti
- Ultrasonic frequency 25 kHz or 40 kHz
- Drip-proof HF cable connection



Examples

| HF power W_{eff} | Radiating surface* (l × w) mm | Immersible transducer 25 or 40 kHz External dimensions** (l × w) mm | Flat transducer plates 25 or 40 kHz External dimensions (l × w) mm |
|-----------------------|----------------------------------|---|--|
| 200 | 170 × 160 | 230 × 160 | 255 × 230 |
| 300 | 325 × 235 | 385 × 235 | 380 × 305 |
| 400 | 325 × 160 | 385 × 160 | 380 × 230 |
| 500 | 325 × 235 | 385 × 235 | 380 × 305 |
| 1000 | 415 × 325 | 475 × 325 | 480 × 380 |
| 1500 | 595 × 355 | 655 × 355 | 680 × 430 |
| 2000 | 565 × 355 | 625 × 355 | 630 × 430 |

* Radiating surface = external dimensions of installation type B
**external dimensions of installation types E, P, R and W.

Separate project advices on request.

CONVEXON®-Immersible transducer TC - patent DE 100 13 120



TC 40 30 6 P

Features

- Convex radiating surface
- Consistent distribution of ultrasound
- Homogeneous cleaning effect
- Little surface erosion
- Extended life span
- Stainless steel material of 2 mm AISI 316 Ti, TIG-welded
- Ultrasonic frequency 40 kHz

Applications

- Super fine cleaning of sensitive parts
- Near field irradiation in process technology

| HF power W_{eff} | Radiating surface * (l x w) mm | Immersible transducers TC External dimensions ** (l x w x h) mm |
|------------------------------|-----------------------------------|---|
| 300 | 634 x 90 | 694 x 90 x 68 |
| 600 | 634 x 172 | 694 x 172 x 68 |
| 1000 | 634 x 260 | 694 x 260 x 68 |

* Radiating surface = external dimensions of installation type B

**external dimensions of installation types E, P, R and W.

CONCAVON®-Immersible transducer TN - patent DE 100 13 120



TN 40 10 6 RF

Features

- Concave radiating surface
- Uniform distribution of ultrasound
- Focussed cleanig effect
- Stainless steel material of 2 mm, AISI 316 Ti, TIG-welded
- Ultrasonic frequency 40 kHz

Applications

- Focused intensive cleaning of longish or fibrous parts
- Especially suitable for wire cleaning

| HF power W_{eff} | Radiating surface * (l x w) mm | Immersible transducers TN external dimensions ** (l x w x h) mm |
|------------------------------|-----------------------------------|---|
| 300 | 634 x 90 | 694 x 90 x 84 |

* Radiating surface = external dimensions of installation type B,

**external dimensions of installation types E, P, R and W.

Explosive plated compound ultrasound with extended life span



patent EP 0 552 696

Special design

Solid plates of aluminium and stainless steel are inseparably connected by explosive force. PZT elements are screwed onto this compound plate without using any adhesives.

Features

- Long life span caused by low erosion
- Stainless steel 3 mm, AISI 316 Ti
- High temperature stability up to 125 °C max.
- Suitable for pressure and vacuum applications
- New radiating characteristics
- Equal power along the entire surface
- Increased mechanical stability due to rugged design
- High reliability due to nonbonded transducers
- Ultrasonic frequencies: 25 kHz or 40 kHz
- Immersible transducers and flat transducers plates are available in this technology



Mounting example

Explosive plated compound ultrasound mounted as flat transducer plate in a tank.

Examples

| Compound sound | 25 kHz immersible transducers TQ and flat transducer plates PQ | | | 40 kHz immersible transducers TQ and flat transducer plates PQ | | |
|----------------|--|--------------------------------------|-----------------------------------|--|--------------------------------------|-----------------------------------|
| | Radiating surface * (l x w) mm | TQ external dimensions ** (l x w) mm | PQ external dimensions (l x w) mm | Radiating surface * (l x w) mm | TQ external dimensions ** (l x w) mm | PQ external dimensions (l x w) mm |
| 500 | 558 x 198 | 622 x 198 | 605 x 255 | 384 x 134 | 448 x 134 | 430 x 205 |
| 750 | 414 x 342 | 478 x 342 | 455 x 405 | 284 x 234 | 348 x 234 | 330 x 305 |
| 1000 | 558 x 342 | 622 x 342 | 605 x 405 | 384 x 234 | 448 x 234 | 430 x 305 |
| 1500 | 702 x 414 | 766 x 414 | 730 x 480 | 384 x 334 | 448 x 334 | 430 x 405 |

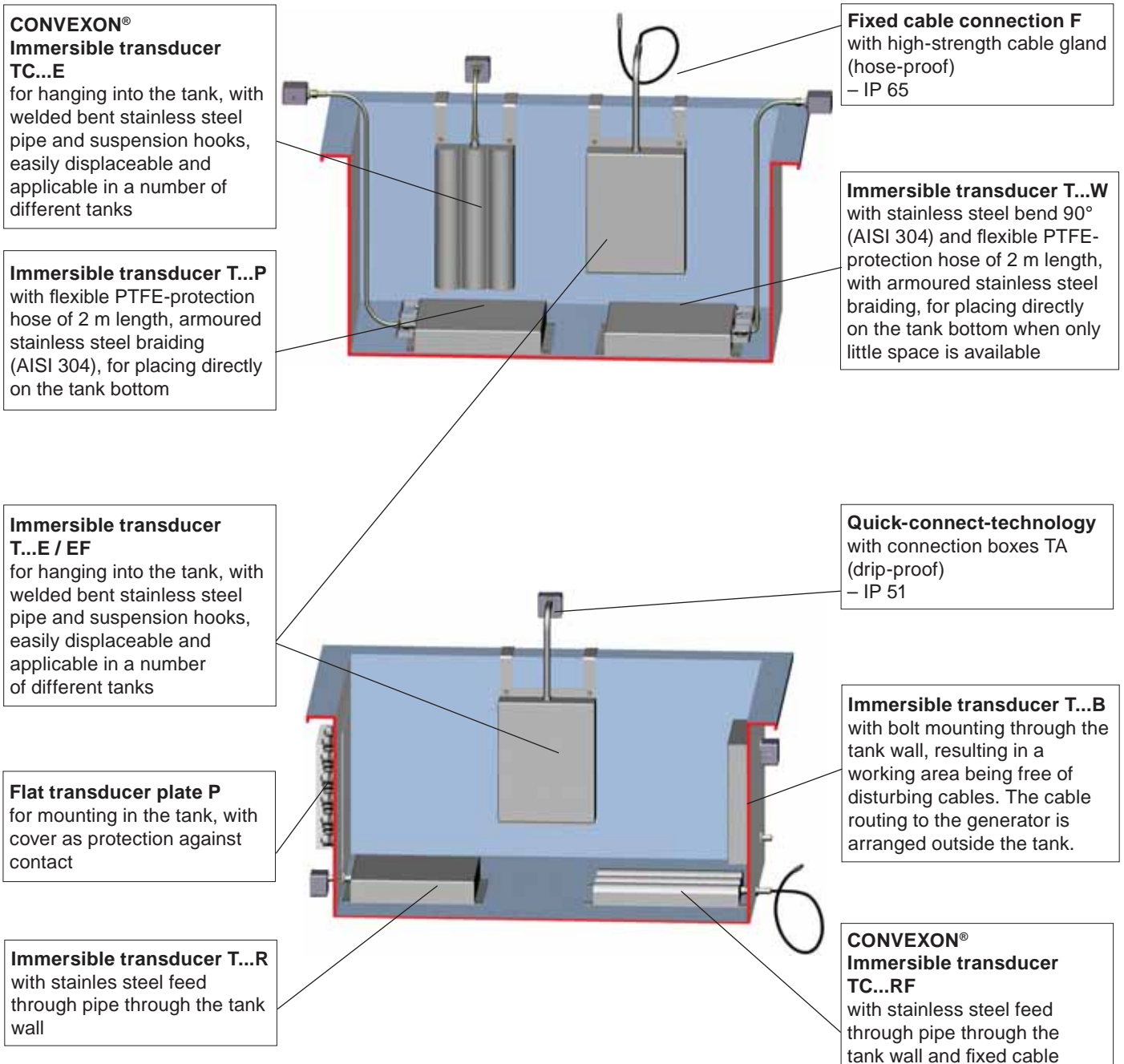
* Radiating surface = external dimensions of installation type B

**external dimensions of installation types E, P, R and W.

Separate project advices on request.

Examples for mounting of ultrasonic transducers

For mounting in existing tanks alternative with pluggable HF cables in Quick-connect-technology (IP 51) or with fixed HF cable (IP 65)



Quick-connect-technology

Immersible transducers are normally equipped with connection boxes with HF sockets for plug-in of HF cables. When operating the equipment in wet surroundings, we recommend a fixed cable connection (F) with high-strength cable gland (hose-proof). Flat transducer plates are equipped with HF sockets only, without connection boxes.



Ultrasonic generators

High power ultrasonic generators

High power ultrasonic transducer systems are operated with powerful generators. The microprocessor controlled LG generators deliver the required HF power up to a range of 9000 Watt.

Modular structure

All modules of the LG generator can be easily inserted or exchanged from the front. The generator is set up by the operating modules SM 3 or PRO 3.

Power is controlled via power modules M.

Flexibility

In order to increase the generator's power, additional power modules can be easily inserted into vacant slots. Mixed installation of modules with different frequencies (25 or 40 kHz) is possible. Ultrasonic transducers of other manufacturers can be connected to the power modules as well.

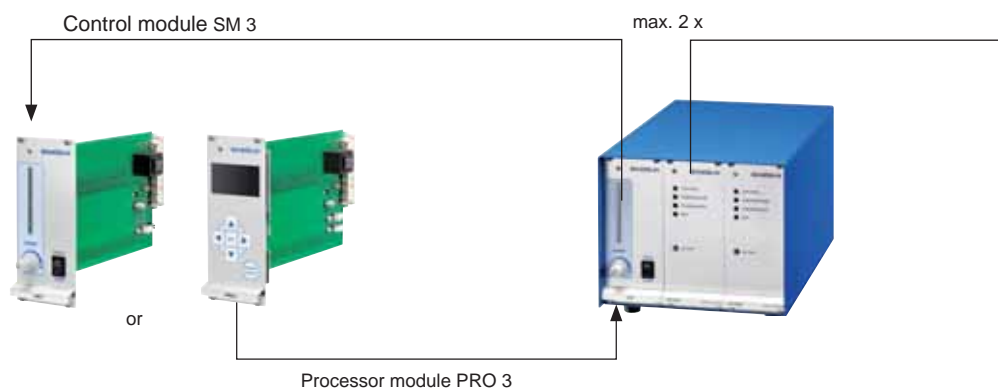
Generators

Desktop housing (T) up to 3 kW

Dimensions (l x w x h):
405 x 218 x 198 mm

Mains connection:
230 V~ 50/60 Hz

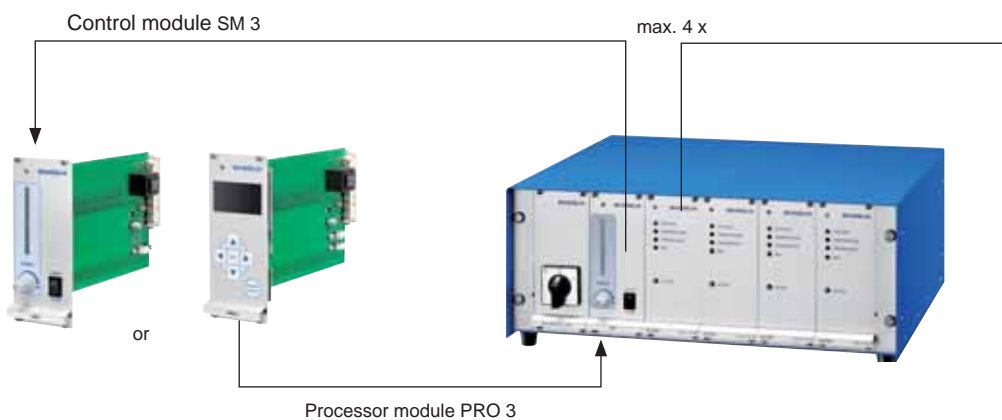
Operating modules



Industrial housing (F) up to 6 kW

Dimensions (l x w x h):
405 x 488 x 203 mm
or 19"-plug-in unit
for electrical cabinet

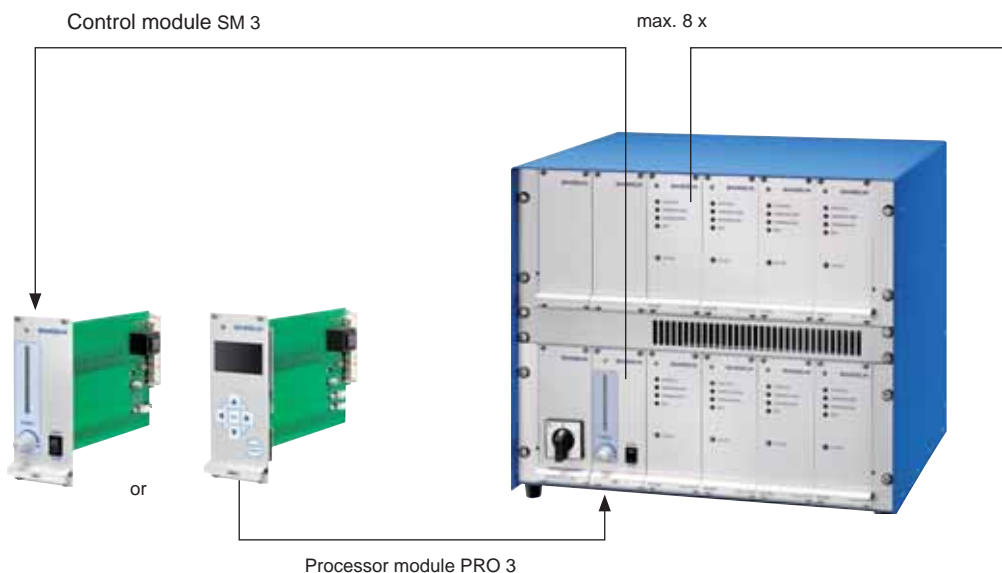
Mains connection:
400 V 3N~ 50/60 Hz



Industrial housing (D) up to 9 kW

Dimensions (l x w x h):
405 x 488 x 425 mm
or 19"-plug-in unit
for electrical cabinet

Mains connection:
400 V 3N~ 50/60 Hz



Keypart of every generator are uniform power modules up to 1500 W equipped with an on-board microprocessor for exact control of all working parameters.

Communication

The connections for remote control and serial interface at the rear side allow the integration of the generators into higher ranking monitoring and controlling equipment.

Selection

The selection of the generators and the installation of power and operating modules depend on the needed total power of the ultrasonic transducers and on the desired way of controlling.

Power modules

patent DE 196 49 975



M 1003 or
M 1503



M 1003 or
M 1503



M 1003 or
M 1503

Selection of generators

LG 1001 T
LG 1001 T PRO

LG 1510 T
LG 1510 T PRO

LG 2002 T
LG 2002 T PRO

LG 3020 T
LG 3020 T PRO

LG 3003 F
LG 3003 F PRO
LG 4004 F
LG 4004 F PRO

LG 4530 F
LG 4530 F PRO

LG 6040 F
LG 6040 F PRO

LG 5005 D
LG 5005 D PRO

LG 6006 D
LG 6006 D PRO

LG 7007 D
LG 7007 D PRO
LG 7550 D
LG 7550 D PRO

LG 8008 D
LG 8008 D PRO

LG 9060 D
LG 9060 D PRO

Power modules M 1003 and M 1503

patent DE 196 49 975

- LEDs indicate the working condition
- Module switch for individual activation of separate power modules
- Power deviation $\pm 2\%$
- Protected against idle motion, short circuits and over load



Control module SM

- Continuous setting of the nominal power range from 10 to 100 % via rotary controller
- START-STOP switch for switching on/off of the HF power



Processor module PRO 3

- Individual programming of each power module
- Degassing
- Error indication



Ultrasonic compact generators TG – especially for mechanical engineering



TG 3003

TG 1503

For operating high power ultrasonic transducer systems. The microprocessor controlled ultrasonic generators are factory-programmed with a power of 300 to 3000 W. The operating frequency is 25 kHz or 40 kHz; a combination is also possible for the TG 3003. Wall installation is possible using an angle bracket (optional).

Compact generator TG 1503 - 1,5 kW

Dimensions (l x w x h): 250 x 460 x 110 mm
Mains connection: 230 V~ 50/60 Hz

Compact generator TG 3003 - 3,0 kW

Dimensions (l x w x h): 250 x 460 x 160 mm
Mains connection: 230 V~ 50/60 Hz

Separate documents on request.

Remote control

The generators can be switched on/off via an external control contact at the rear side.

FS 7: Cable for remote control, 7 m length, with plug at one side

FS 15 L: Remote control with timer 1 to 15 min and continuous operation, cable for remote control, 7 m length, with plug

Interface RS 232 for PLC or PC

The integration of the generator into higher ranking controlling and monitoring equipment is possible via its interface. The power modules are controlled directly by the PLC equipment.



Generator



PLC

WINSONIC® LG-Software



The PC software WINSONIC® LG allows comfortable operation and process planning under direct control through a PC. The PC connection is made via the serial interface of the generator.

Individual setting of performance parameters is possible as well as programming, saving and databasing of process data for various applications. Operating status, nominal and actual power of the power modules as well as processing times are displayed clearly.

WINSONIC® LG:

PC programm on CD, 5 m serial cable (SUB-D; 9-poles)

SONOREX TECHNIK VORTEX® reactor



Applications

- Intensifying of industrial, biotechnological and chemical processes
- Degassing
- Support of disinfection (bacterial elimination)
- Disinfection of liquids
- Producing of finest polishing pastes for wafer industry
- Homogenizing

Ready for use vortex reactor WR consisting of:
Vortex reactorbloc WB and HF generator LG



WR 4-1503.01

SONOREX TECHNIK Tubular reactor SONOBLOC®



Applications

- Ultrasonic intensive treatment of fibrous and bandshaped products
- Support of industrial and biotechnological processes
- Wire cleaning
- Degassing
- Support of disinfection (bacterial elimination)
- Acceleration of disintegration
- Dispersing of solid particles in liquids

Ready for use tubular reactor SB consisting of:
Tubular reactorbloc RB and HF generator LG



SB 8-1002.01

| Technical Data | Vortex reactorbloc - WB | | | Tubular reactorbloc - RB | |
|-------------------------------------|--|-----------------------|-----------------------|---|--------------|
| | WB 4-1402... | WB 4-1503... | WB 4-1604... | RB 8-1002... | RB 8-1004... |
| Filling volume | ~5 l | | | ~2,5 l | |
| Ultrasound volume | 2.9 l | | | 2.0 l | |
| Ultrasound distance | 500 mm | | | 910 mm | |
| Flow-through rate | 1 - 50 l/min | | | 1 - 100 l/min | |
| Reaction tube (inside) | - | | | dia. 53 mm | |
| Reaction gap | 15 mm | | | - | |
| Power density, max. | 480 W/l | 520 W/l | 550 W/l | 500 W/l | |
| Power, max. | 1400 W _{eff} | 1500 W _{eff} | 1600 W _{eff} | 1000 W _{eff} | |
| Frequency | 25 kHz | 25 and 40 kHz | 40 kHz | 25 kHz | 40 kHz |
| Housing dimensions (l x w x h) | 290 x 290 x 642 mm | | | 260 x 150 x 990 mm | |
| Tube material / dimensions | Stainless steel AISI 316 Ti / dia. 139.7 x 2.6 mm ; dia. 104 x 2 mm | | | Stainless steel AISI 316 Ti / dia. 60.3 x 3.6 mm | |
| HF connecting cable (EMC-protected) | 1 x 5 m | 2 x 5 m | | 1 x 5 m | |
| Solid particles | < 5 mm | | | - | |
| Internal pressure, max. | 10 bar | | | 10 bar | |
| Weight, net | approx. 50 kg | | | approx. 35 kg | |
| HF generator (separate) | LG 1510 T | LG 2002 T | | LG 1001 T | |

Customized assemblies with ultrasonic oscillating systems

Tanks, sinks, plates, flanges and other elements made of metal or synthetics can be directly equipped in a customized fashion with PZT oscillating systems to be used for cleaning or for other sonication processes. PZT oscillating systems are glued to the external surfaces so that the irradiation efficiency is directed into the liquid or to an object placed within the liquid.

Ultrasonic generators starting at 30 W deliver the required ultrasonic power with a frequency of 40 kHz or 25 kHz. The connection to the HF generator is made via an HF cable with AMP plug or the reliable Quick-connect-technology.

Adequate protection covers for the ultrasonic assemblies can be supplied on request.

Examples



PVDF tank for sonication of aggressive media



Foulard ponds for sonication of dye baths



Probe flange of a refractometer



Polarimeter tube for analysis

Selection of ultrasonic oscillating systems

| PZT oscillating system (selection) | Designation | HF power W_{eff} |
|---|--|--------------------|
| PD 40 12 | oscillating system, 40 kHz | 50 |
| PD 40 12 K | oscillating system, 40 kHz, for synthetics | 30 |
| PD 25 17 | oscillating system, 25 kHz | 50 |
| HF cable of 2 m length, fixed connection | | |
| - with AMP plug for TG generators | | |
| - with Quick-connect-plug for LG generators | | |
| Cover made of aluminium (IP 20), fastened with screws | | |
| - up to 1000 W | | |
| - more than 1000 W | | |

Ultrasonic generators for connection to special assemblies



TG 50

TG generators

HF power up to 500 W
Ultrasonic frequency 40 kHz or 25 kHz



LG 1510 T

LG generators

HF power starting at 500 W
Ultrasonic frequency 40 kHz or 25 kHz

| Max. HF power W_{eff} | Generator without timer | Generator with timer* | Dimensions |
|-------------------------|-------------------------|-----------------------|--------------------|
| 50 | TG 50 | TG 50 Z | 235 x 160 x 100 mm |
| 100 | TG 100 | TG 100 Z | 235 x 160 x 100 mm |
| 200 | TG 200 | TG 200 Z | 235 x 160 x 100 mm |
| 300 | TG 300 | TG 300 Z | 305 x 310 x 142 mm |
| 500 | TG 500 | TG 500 Z | 305 x 310 x 142 mm |

For individual assembling, the generator can be supplied as circuit board without housing and without CE mark.

Mains connection: 230 V~ 50/60 Hz

*1 to 15 min and continuous operation

Table top units

Applications in service, repair, maintenance and industry

Specification

- Oscillating tank made of stainless steel, RK/DT 102 H hard chromium-plated
- HF frequency 35 kHz - SweepTec®
- Mains connection 230 V~ 50/60 Hz, on request 115 V~ 50/60 Hz

SONOREX SUPER RK

- Timer for 1 – 15 min or continuous operation
- Heating, thermostatically adjustable from 30 – 80 °C
- Drip-proof stainless steel housing, with outlet

SONOREX DIGITEC DT

- Time setting 1 – 30 min or continuous operation
- Heating 20 – 80 °C, thermostatically adjustable
- Spray-proof stainless steel housing, with outlet
- Alert LED for over temperature



DT 514 BH



Drill head cleaning in the ultrasonic cleaning unit RK 102 H

SONOREX SUPER

| Internal tank dimensions (l x w x d) mm | Capacity litres | Model (selection) | External dimensions (l x w x h) mm | Ultrasonic peak power * W | HF power W _{eff} | Heating power W | Current consumption A |
|---|-----------------|-------------------|------------------------------------|---------------------------|---------------------------|-----------------|-----------------------|
| 240 x 140 x 100 | 3,0 | RK 102 H | 260 x 160 x 250 | 480 | 120 | 140 | 1,2 |
| 500 x 140 x 150 | 9,0 | RK 156 BH | 530 x 165 x 300 | 860 | 215 | 600 | 3,6 |
| 1000 x 200 x 200 | 39,0 | RK 170 H | 1050 x 250 x 385 | 1520 | 380 | 1600 | 8,7 |
| 300 x 150 x 150 | 5,5 | RK 255 H | 325 x 175 x 305 | 640 | 160 | 280 | 2,0 |
| 300 x 240 x 150 | 9,7 | RK 510 H | 325 x 265 x 305 | 640 | 160 | 400 | 2,5 |
| 325 x 300 x 150 | 13,5 | RK 514 H | 355 x 325 x 305 | 860 | 215 | 600 | 3,6 |
| 325 x 300 x 200 | 18,7 | RK 514 BH | 355 x 325 x 385 | 860 | 215 | 600 | 3,6 |
| 500 x 300 x 200 | 28,0 | RK 1028 H | 535 x 325 x 400 | 1200 | 300 | 1300 | 7,0 |
| 500 x 300 x 300 | 45,0 | RK 1028 CH | 540 x 340 x 500 | 1200 | 300 | 1450 | 7,7 |
| 600 x 500 x 300 | 90,0 | RK 1050 CH | 640 x 540 x 530 | 2400 | 600 | 1950 | 11,1 |

SONOREX DIGITEC

| | | | | | | | |
|-----------------|------|------------|-----------------|------|-----|------|------|
| 240 x 140 x 100 | 3,0 | DT 102 H | 260 x 160 x 250 | 480 | 120 | 140 | 1,2 |
| 500 x 140 x 150 | 9,0 | DT 156 BH | 530 x 165 x 300 | 860 | 215 | 600 | 3,6 |
| 300 x 150 x 150 | 5,5 | DT 255 H | 325 x 175 x 305 | 640 | 160 | 280 | 2,0 |
| 300 x 240 x 150 | 9,7 | DT 510 H | 325 x 265 x 305 | 640 | 160 | 400 | 2,5 |
| 325 x 300 x 150 | 13,5 | DT 514 H | 355 x 325 x 305 | 860 | 215 | 600 | 3,6 |
| 325 x 300 x 200 | 18,7 | DT 514 BH | 355 x 325 x 385 | 860 | 215 | 600 | 3,6 |
| 500 x 300 x 200 | 28,0 | DT 1028 H | 535 x 325 x 400 | 1200 | 300 | 1300 | 7,0 |
| 500 x 300 x 300 | 45,0 | DT 1028 CH | 540 x 340 x 500 | 1200 | 300 | 1450 | 7,7 |
| 600 x 500 x 300 | 90,0 | DT 1050 CH | 640 x 540 x 530 | 2400 | 600 | 1950 | 11,1 |

*Ultrasonic peak power is 4 or 8 times higher than HF power caused by modulation of ultrasound – SweepTec®

Accessories

| Accessories | Unit | RK 102 H DT 102 H | RK 156 BH DT 156 BH | RK 170 H | RK 255 H DT 255 H | RK 510 H DT 510 H |
|---------------|------|----------------------|------------------------|----------|----------------------|----------------------|
| Insert basket | | K 3 C | K 6 BL | K 7 | K 5 C | K 10 |

Insert baskets made of stainless steel.



K 14

| Accessories | Unit | RK 514 H DT 514 H | RK 514 BH DT 514 BH | RK 1028 H DT 1028 H | RK 1028 CH DT 1028 CH | RK 1050 CH DT 1050 CH |
|---------------|------|----------------------|------------------------|------------------------|--------------------------|--------------------------|
| Insert basket | | K 14 | K 14 B | K 28 | K 28 C | K 50 C |

Further accessories on request

Besides ultrasonic power, temperature and relevant processing time, specially balanced cleaning agents are also necessary to achieve optimum cleaning results.

With TICKOPUR cleaning concentrates, BANDELIN offers a wide range of adequate cleaning agents. All of the TICKOPUR cleaning agents were specially developed for ultrasonic applications. With their cavitation-aiding properties, the cleaning concentrates support the cleaning process and are gentle to the material at the same time. Depending on the cleaning tasks, either alkaline, neutral or acidic cleaning agents are recommended. They are biologically degradable and easy to dispose of.



| Objects to be cleaned | Contamination | Cleaning concentrate | Liter* |
|--|--|--|----------------------|
| Steel, stainless steel, non-ferrous, precious and light metals, glass, ceramics, plastics, rubber, windows, glasses, electrostatic filters, respirator masks | General contamination, drilling, grinding, polishing and lapping residues, oily and greasy residues, dust, soot, ink etc. | TICKOPUR R 33 universal cleaner anticorrosive, for service, industry, technology and laboratory, gentle cleaning, mildly alkaline, pH 9.9 (1 %) dosage 1 to 5 % | 5 l 25 l 200 l |
| Steel, stainless steel, non-ferrous, precious and light metals, glass, ceramics, plastics, rubber | Light drilling, grinding, polishing and lapping residues, dust | TICKOPUR R 30 neutral cleaner based on tensides, anticorrosive, gentle cleaning, emulsifying, neutral, pH 7 dosage 1 to 5 % | 5 l 25 l 200 l |
| Steel, stainless steel, precious metals, glass, ceramics, plastics, rubber. Not for tin, zinc, light and non-ferrous metals! | Heavy mineral residues (chalk, silicate, phosphate, cement etc.), rust, temper colours, metal oxides, grease and oil films | TICKOPUR R 27 special cleaner based on phosphoric acid, for decalcification and rust removal, anticorrosive, acid, pH 1.9 (1 %), dosage 5 % | 5 l 25 l 200 l |
| Steel, stainless steel, non-ferrous, precious and light metals, glass, ceramics, plastics, rubber | Mineral residues, drifting rust, grease, oils, waxes, pigments, drilling, grinding, polishing and lapping residues | TICKOPUR TR 3 special cleaner based on citric acid, gentle cleaning, without phosphate, anticorrosive, weakly acid, pH 3.0 (1 %), dosage 5 % | 5 l 25 l 200 l |
| Steel, stainless steel, non-ferrous, precious and light metals, glass, ceramics, plastics, rubber, soldering frames | Grease, oils, waxes, pigments, flux media, soldering pastes, drilling, grinding, polishing and lapping residues | TICKOPUR TR 7 universal cleaner , demulsifying, for rapid separation of oil and grease, without phosphate, mildly alkaline, pH 8.9 (1 %) dosage 0.1 to 5 % | 5 l 25 l 200 l |
| Steel, stainless steel, glass, ceramics, plastics, rubber Not for tin, zinc and light metals! Non-ferrous metals can be affected. | Coke residues, resinous residues, soot, grease, oils, waxes, pigments, coloured fog, drilling, grinding, polishing and lapping residues | TICKOPUR TR 13 intensive cleaner , demulsifying, for stubborn contamination, without phosphate and silicate, alkaline, pH 11.9 (1 %) dosage 0.1 to 10 % | 5 l 25 l 200 l |
| Metal, glass, ceramics, plastics, rubber assembled and non-assembled printed circuit boards, soldering frames, electronic components, boards | Resinous flux, soldering paste, ionic and non-ionic residues, drilling and grinding residues fingerprints, fat, oil | TICKOPUR TR 14 Flux-remover , with ammonia, tenside- and phosphate-free, non foaming, alkaline, pH 10.7 (1 %), dosage 10 % | 5 l 25 l 200 l |
| Steel, stainless steel, non-ferrous, precious and light metals, glass, optical glass, ceramics, plastics, rubber, venetian blinds, vertical and horizontal blades | General contamination, oil, grease and distillation residues, organic and inorganic residues | TICKOPUR R 36 special cleaner , tenside-free, for the analytical application and blade cleaning, non-foaming, gentle cleaning, mildly alkaline, pH 9.9 (1 %) dosage 0.25 to 5 % | 5 l 25 l 200 l |
| Steel, stainless steel, non-ferrous, precious and light metals, blackfinished metal, glass, ceramics, plastics, rubber etc. Especially for galvanic, laser and analytical application. | General contamination, oily-, greasy- and distillation residues, organic and inorganic residues | TICKOPUR R 32 special cleaner , non-chelating, anticorrosive, gentle cleaning, mildly alkaline, pH 11.1 (1 % in DI water) dosage 0.25 to 5 % Dilute with DI water. | 5 l 25 l 200 l |
| Steel, stainless steel, glass, ceramics, plastics, rubber Not for light metals! Caution with tin, zinc and non-ferrous metal! | Coke residues, resinous residues, soot, pigments, grease, oils, waxes, silicon oils, coloured fog, drilling, grinding, polishing and lapping residues etc. | TICKOPUR R 60 intensive cleaner , without phosphate, strongly alkaline, pH 12.8 (1 %) dosage 2 to 20 % | 5 l 25 l 200 l |

*All TICKOPUR agents are also suitable for dipping and wiping.

Separate leaflet with other sizes on request.

EC-Safety data sheets are available as PDF-data via internet at: www.bandelin.com.

Anticorrosive for ferrous metals

| Material | Characteristics | Concentrate | Liter |
|---|---|--|------------|
| Applicable for all ferrous metal such as cast iron, unprotected steels of different alloys. | Efficient anticorrosive after cleaning with TICKOPUR agents and consecutive aqueous rinsing. No formation of oil or grease films. | TICKOPUR KS 1 All-purpose anticorrosive for all ferrous metals , without solvents, neutral, pH 7.4 (1 %), dosage 0.5 to 2 % | 2 l 5 l |

Your partner for quality and reliability



The family-owned mid-sized company is specialized in manufacturing ultrasonic equipment, accessories and cleaning agents. It maintains a Quality Management System complying with the requirements of EN ISO 9001:2008, EN ISO 13485:2003 + AC:2007.

Quality and precision combined with 60 years experience in the precise and electronic apparatus engineering is reflected in the wide product range.

Our products for a vast variety of applications underline the present importance of efficient ultrasonic technology.

The production site is located in Berlin, the capital of Germany. Automated manufacturing lines ensure excellent quality and high productivity. Nevertheless, we have kept the flexibility and capability to manufacture customized equipment.



Modern laser technology in metal processing ensures precision.



Permanent control ensures high quality.



Fully-automated welding ensures a high quality standard.

Our strengths for your benefit

- Free of charge test cleaning to clarify the process technology
- Short-term delivery