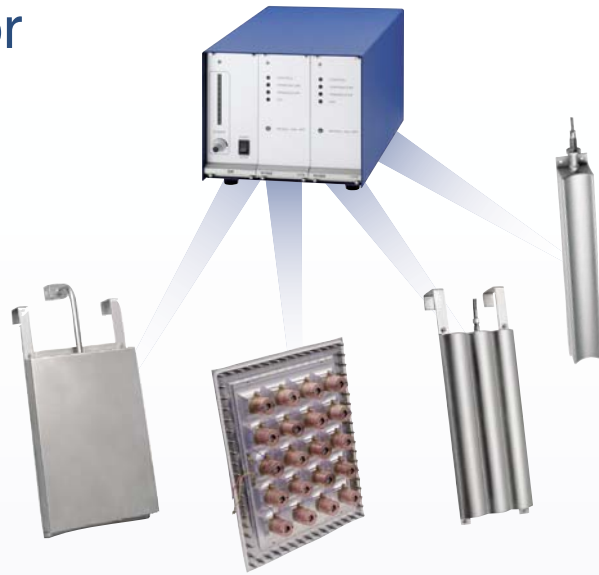


SONOREX TECHNIK

High-power ultrasound

Intensive cleaning for

- industry
- service
- maintenance



BANDELIN

55 years of experience in
ultrasound technology

Ultrasonic Cleaning

Four advantages of ultrasonic cleaning

economical

- using ultrasonic cleaning regularly saves money
- the material to be cleaned will last longer due to the more gentle effect of ultrasound, thus reducing the need for spare parts
- faster cleaning processes reduce standstill periods between productions

environmentally friendly

- biologically degradable cleaning agents are used instead of ecologically harmful solvents
- oil separators and bath filtration extend amount of time that the cleaning agent can be used, thus, the consumption of chemicals and waste water is reduced

efficient

- ultrasonic cleaning processes are effective
- a very high quality of cleanness is achieved
- brushing and wiping is unnecessary
- the material to be cleaned, including its surfaces, are not damaged
- even unusually shaped parts can be cleaned

easy to use

Ultrasonic cleaning devices :

- are easy to install
- are easy to operate
- are maintenance free
- do not require special training

Four reasons of why ultrasonic cleaning is the better choice

Ultrasound

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

Temperature

Many cleaning agents become fully effective only at high bath temperatures. The cleaning solution can be heated through the cleaning device's heating system.

Chemistry

The cleaning agent supports the cavitation process, reduces the water's surface tension, separates and binds dirt particles.

Depending on the type of dirt accumulation, different cleaning agents can be 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.



Range of Application

- Surface technology
- Automobile industry
- Machine and plant construction
- Printing industry
- Semiconductor industry
- Plating (Galvanic) industry
- Beverage industry
- Aviation
- Television industry
- Plastics industry
- Textile industry
- Laboratories

Cleaning and degreasing

- Engine blocks, radiators
- Ball bearings, carburetors
- Valves, nozzles
- Forming tools for plastics
- Electrostatic filters, hydraulic filters
- Respirator masks
- Printing rollers
- Wood working tools
- Electronic components
- Mechanical measuring and testing devices
- Analysis sieves
- Technical glassware
- Watches, jewellery, glasses

Typical industrial applications

Automobile industry

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

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 prostheses, implants and artificial joints

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

Pneumatic tools

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

Industrial safety and fire protection

Cleaning of respirator masks and sooty parts

Thin-layer technology

Cleaning of sensor parts

Service

Cleaning of computer parts

Transport technology

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

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

Plastics Industry

Cleaning of plastics and plastics shaping tools

Three product lines, each offering different applications for industry, trade 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.

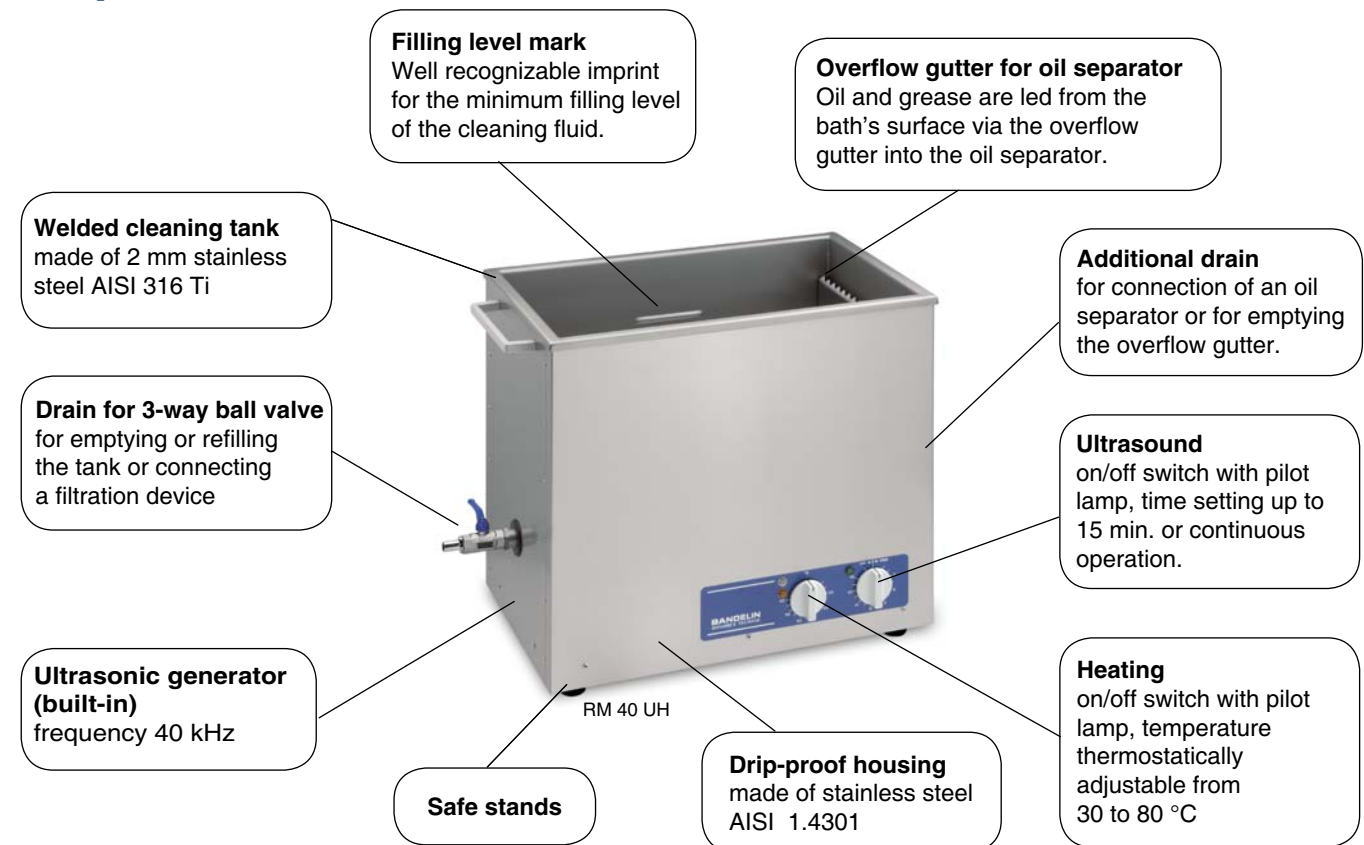
The following summary gives an overview of the range of products and is thought to help in pre-selecting suitable products.

Characteristics	RM 16 to RM 210	RM 112 to RM 212	ZM 112 to ZM 212
Tank filling volume	13 to 235 litres	125 to 250 litres	125 to 250 litres
Tank version	right-angled tank corners	round tank corners	round tank corners
Tank bottom	flat	inclined toward tank drain	inclined toward tank drain
Ultrasonic transducers	on the bottom	on the bottom	on the bottom and at the 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 mixed
Operating elements	at bottom, right side	at upper right side	at upper right side
Accessories	compatible	compatible	compatible
Peripheral devices	compatible	compatible	compatible

* off RM 110

SONOREX TECHNIK Industrial units RM

One-piece ultrasonic devices from 13 to 235 litres tank volume



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

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

RM...UH Unit with ultrasonic transducers and heating - for cleaning with heating for better efficiency of cleaning agents

RM...U Unit with ultrasonic transducers - for cleaning or rinsing with ultrasound support

RM...H Unit with heating - for rinsing without ultrasound

RM... Unit without ultrasonic transducers and without heating - for operation in cascade rinsing in several tanks combined in series

Model	Internal tank dimensions (l x w x d) mm	Minimum filling volume litres	External dimensions (l x w x h) mm	Ultrasonic peak output* W	HF-Output W_{eff}	Heating power W	Current consumption A**	Drain ball valve	Weight net kg
RM 16 UH RM 16 U RM 16 H RM 16	325 x 275 x 200	13,0	365 x 340 x 390	1200 1200 — —	1 x 300 1 x 300 — —	800 — 800 —	4,8 1,4 3,5 —	G ½	16,0 15,5 15,0 14,0
RM 40 UH RM 40 U RM 40 H RM 40	480 x 300 x 300	35,0	540 x 340 x 500	2000 2000 — —	1 x 500 1 x 500 — —	1250 — 1250 —	7,7 2,2 5,5 —	G ¾	26,0 25,0 23,0 22,0
RM 75 UH RM 75 U RM 75 H RM 75	580 x 500 x 300	70,0	640 x 540 x 530	4000 4000 — —	1 x 1000 1 x 1000 — —	1950 — 1950 —	12,9 4,4 8,5 —	G ¾	42,0 41,0 31,0 29,5
RM 110 UH RM 110 U RM 110 H RM 110	600 x 450 x 450	115,0	780 x 550 x 800	4000 4000 — —	1 x 1000 1 x 1000 — —	4800 — 4800 —	10,5 4,4 10,5 —	G 1	72,0 67,0 60,0 55,0
RM 180 UH RM 180 U RM 180 H RM 180	1000 x 500 x 400	180,0	1180 x 600 x 800	4000 4000 — —	2 x 1000 2 x 1000 — —	7200 — 7200 —	14,8 4,4 10,5 —	G 1	135,0 127,0 115,0 107,0
RM 210 UH RM 210 U RM 210 H RM 210	750 x 650 x 500	235,0	930 x 750 x 800	4000 4000 — —	2 x 1000 2 x 1000 — —	7200 — 7200 —	14,8 4,4 10,5 —	G 1	110,0 102,0 90,0 82,0

*To achieve an improved efficiency, the ultrasound is modulated whereby four times the values of the HF- output are achieved as ultrasonic peak output.

**starting with RM 110, per phase

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

Ultrasonic industrial units starting with RM 110 are equipped with spraying pipe, filling level indicator switch for dry run protection, ultrasonic generator supplying 40 kHz, optionally 25 kHz, and height-adjustable feet.

SONOREX TECHNIK Industrial units RM

One-piece ultrasonic devices from 125 to 250 litres tank volume

Spraying pipe
This particular part generates a movement on the liquid's surface that leads floating oil and grease from the bath surface into the overflow gutter.

Liquid level switch
as dry run protection for the heating device and the ultrasonic transducers

Ultrasonic generator (built-in)
for frequency of 40 kHz, optional frequency of 25 kHz on request

Safe stand by
height-adjustable feet

Functional Design

- Round tank corners**
at the bottom and at all sides facilitate the cleaning of the tank. Caking of residues is avoided.
- Operating elements**
positioned at the upper tank side 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 contaminated particles and residual fluid on the tank bottom are considerably reduced.

Basic equipment (identical for RM 110-210)

- overflow gutter for oil separator
- filling level mark
- heating device
- ultrasound
- drain for 3-way ball valve
- additional outlet
- welded cleaning tank made of 2 mm stainless steel AISI 316 Ti
- drip-proof housing made of stainless steel AISI 1.4301

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

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

RM...UH Unit with ultrasonic transducers and heating - for cleaning with heating for better efficiency of cleaning agents

RM...U Unit with ultrasonic transducers - for cleaning or rinsing with ultrasound support

RM...H Unit with heating - for rinsing without ultrasound

RM... Unit without ultrasonic transducers and without heating - for operation with cascade rinsing in several tanks combined in series

Model	Internal tank dimensions (l x w x d) mm	Minimum filling volume litres	External dimensions (l x w x h) mm	Ultrasonic peak output* W	HF-Output W _{eff}	Heating power W	Current consumption A**	Drain ball valve	Weight net kg
RM 112 UH	600 × 450 × 450/470*	125,0	780 × 610 × 800	4000	1 × 1000	4800	10,5	G 1	74,0
RM 112 U				4000	1 × 1000	—	4,4		69,0
RM 112 H				—	—	4800	10,5		62,0
RM 112				—	—	—	—		57,0
RM 182 UH	1000 × 500 × 400/420*	190,0	1180 × 660 × 800	4000	2 × 1000	7200	14,8	G 1	138,0
RM 182 U				4000	2 × 1000	—	4,4		130,0
RM 182 H				—	—	7200	10,5		118,0
RM 182				—	—	—	—		110,0
RM 212 UH	750 × 650 × 500/520*	250,0	930 × 810 × 800	4000	2 × 1000	7200	14,8	G 1	112,0
RM 212 U				4000	2 × 1000	—	4,4		104,0
RM 212 H				—	—	7200	10,5		92,0
RM 212				—	—	—	—		84,0

*inclined tank bottom

**To achieve an improved efficiency, the ultrasound is modulated whereby four times the values of the HF- output are achieved as ultrasonic peak output.

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

SONOREX TECHNIK Industrial units ZM

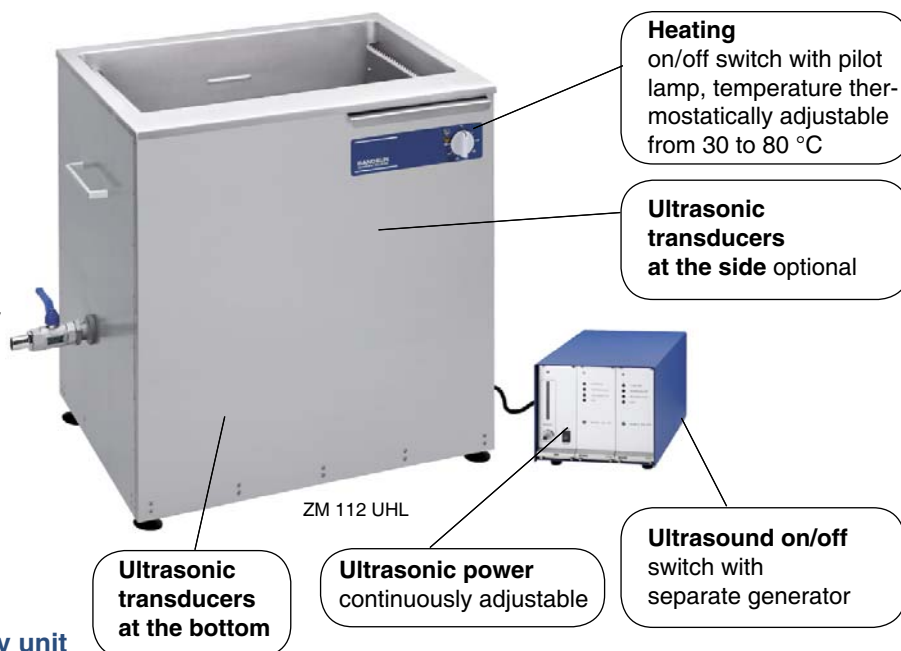
Two-part industrial ultrasonic cleaning units from 125 to 250 litres tank volume also available in TwinSonic®-versions as multi-frequency units with additional ultrasonic transducers at the bottom and at the side.

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
- continuous spectrum of power control

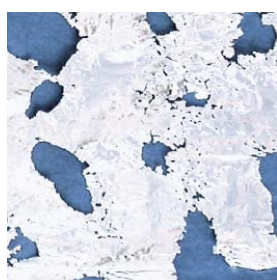
Equipment identical to RM 112... to 212 ... - see page 5

TwinSonic® version as multi-frequency unit
Registered utility model DE 20 2004 006 380.8

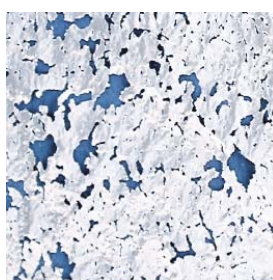


Multi-frequency units in the TwinSonic® version work with ultrasonic systems of different frequencies at the bottom and at the side.

Advantage of the said construction is a more uniform distribution of ultrasound and power, thus improving the cleaning efficiency and reducing the time needed for cleaning



Single irradiation with 25 kHz



TwinSonic® irradiation with 25 kHz and 40 kHz

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

3 standard sizes in 4 versions each equipped with ultrasonic transducers at the bottom and at the side are available for cleaning and rinsing with the optional choice of continuously adjustable power control.

ZM...UH Unit with ultrasonic transducers at the bottom and heating - for cleaning with heating for better efficiency of cleaning agents

ZM...U Unit with ultrasonic transducers at the bottom - for cleaning or rinsing with ultrasound support

ZM...UHL Unit with ultrasonic transducers at the bottom and at side and heating - increased ultrasound efficiency for cleaning heavily soiled parts

ZM...UL Unit with ultrasonic transducers at the bottom and at side, without heating - for cleaning and rinsing with increased ultrasound support

Model	Internal tank dimensions (l x w x d) mm	Min. filling volume litres	External dimensions (l x w x h) mm	Ultrasonic peak output* W	HF-Output W_{eff}	Heating power W	Current consumption A**	Drain ball valve	Weight net kg
ZM 112 UH ZM 112 U	600 x 450 x 450/470 [Ⓢ]	125,0	780 x 610 x 800	4000	1 x 1000	4800 —	4,3	G 1	78,0 73,0
ZM 112 UHL ZM 112 UL				4000	2 x 1000	4800 —	8,6	G 1	88,0 83,0
ZM 182 UH ZM 182 U	1000 x 500 x 400/420 [Ⓢ]	190,0	1180 x 660 x 800	4000	2 x 1000	7200 —	8,6	G 1	143,0 135,0
ZM 182 UHL ZM 182 UL				6000	2 x 1500	7200 —	13,0	G 1	151,0 143,0
ZM 212 UH ZM 212 U	750 x 650 x 500/520 [Ⓢ]	250,0	930 x 810 x 800	4000	2 x 1000	7200 —	8,6	G 1	117,0 109,0
ZM 212 UHL ZM 212 UL				6000	2 x 1500	7200 —	13,0	G 1	125,0 117,0

Remote control FS 15 L with time switch from 1 to 15 min and continuous operation, cable with plug, length 7 m

[Ⓢ]inclined tank bottom

[Ⓢ]tank + generator

*To achieve an improved efficiency, the ultrasound is modulated whereby four times the values of the HF- output are received as ultrasonic peak output.

**per phase

SONOREX TECHNIK RM / ZM

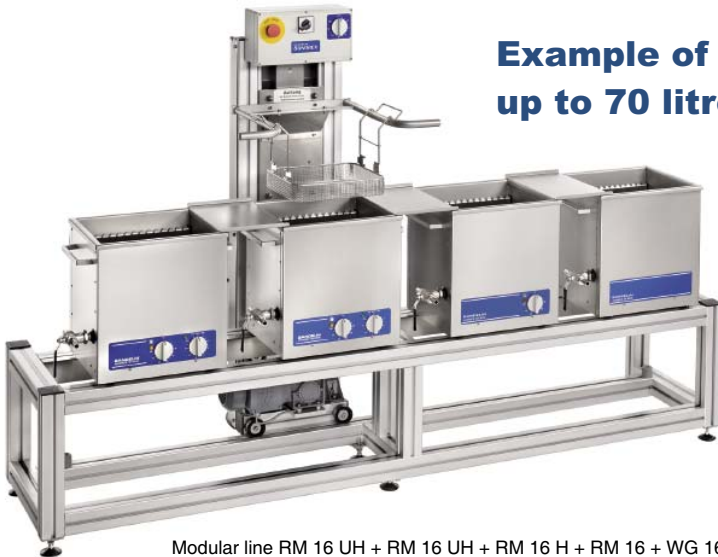
Variable set-up: modules are rearrangeable for different requirements

Example of a modular set-up of RM 16 with oscillation



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

Example of a modular set-up of devices with up to 70 litres tank volume



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

Example of a modular set-up of devices with up to 115 litres tank volume



Modular line RM 212 UH and RM 212 H with WG 210-2 and MB 210 B

Oscillation MO

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

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



MO 16

	RM 16	RM 40
Oscillation	MO 16	MO 40
Tank rack for 1 unit	WO 16-1	-
Tank rack for 2 units	WO 16-2	-
Tank rack for 3 units	WO 16-3	-
Tank rack for 4 units	WO 16-4	-

Tank rack WO

The tank racks are designed for 1 to 4 units of the production line RM 16... , in connection with MO 16.



WO 16

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.

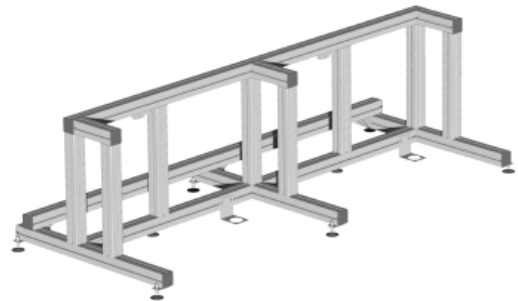
In connection with a tank rack, the basket can be transported from one unit to the other.

The oscillating movement of the parts to be cleaned reinforces the cleaning efficiency of the ultrasonic irradiation and removes dirt particles more efficiently.



Tank rack WG

The tank racks are designed for 2 to 4 units and can be combined with the electrically driven lifting device MB.



WG

	RM 16	RM 40	RM 75	RM 112 ZM 112 RM 110	RM 182 ZM 182 RM 180	RM 212 ZM 212 RM 210
Lifting device with oscillation, fixed, for 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
Tank rack for 3 units	WG 16-3	WG 40-3	WG 75-2	WG 110-3	WG 180-3	WG 210-3
Tank rack for 4 units	WG 16-4	WG 40-4	WG 75-4	WG 110-4	WG 180-4	WG 210-4



Filtration PF

To be connected to the ultrasonic cleaning tank. Particles that are removed during cleaning are extracted by filter. This prolongs the use of the liquid-filled bath while its cleaning capacity remains unchanged.



Oil separator OX

To be connected to the ultrasonic cleaning tank if parts soiled with oily or greasy contaminants are to be cleaned. Dirt accumulations floating on the bath's surface are led via the overflow gutter into the oil separator and are separated by means of 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.

	RM 16	RM 40	RM 75	RM 112 ZM 112 RM 110	RM 182 ZM 182 RM 180	RM 212 ZM 212 RM 210
Filtration	PF 16	PF 40	PF 75	PF 110	PF 180	PF 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

SONOREX TECHNIK Accessories



Lid MD
made of stainless steel,
to protect from
contamination.



Insertable baskets MK
made of stainless steel, the parts
to be cleaned must not be placed
on the tank bottom.

	RM 16	RM 40	RM 75	RM 112 ZM 112 RM 110	RM 182 ZM 182 RM 180	RM 212 ZM 212 RM 210
Insertable basket, also applicable for lifting device	MK 16 B	MK 40 B	MK 75 B	-	-	-
Insertable basket	-	-	-	MK 110	MK 180	MK 210
Insertable basket load up to 40 kg	-	MK 40 S	MK 75 S	MK 110 S	MK 180 S	MK 210 S
Insertable basket for lifting device	-	-	-	MK 110 B	MK 180 B	MK 210 B
Insertable basket for lifting device, load up to 40 kg	-	MK 40 BS	MK 75 BS	MK 110 BS	MK 180 BS	MK 210 BS
Insertable basket for 15 respirators	-	-	-	-	MK 180 A	-
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

SONOREX TECHNIK Special units

SONOREX TECHNIK W 65 and W 300 with specially deep tanks

Technical specification

- tank with high freeboard made of 2 mm stainless steel AISI 316 Ti
- W 65, frequency 35 kHz
W 300 frequency 40 kHz, on request 25 kHz
- W 65, mains connection 230 V~ 50/60 Hz alternatively 115 V~ 50/60 Hz
W 300, mains connection 400 V 3N~ 50/60 Hz on request with additionally built-in one-coil transformer for connecting to the existing voltage on board
- built-in heating, thermostatically adjustable from 30 to 80 °C

Applications

Cleaning of
oil filters • armatures • cylinder heads
especially for the shipping industry. The extra high tank freeboards avoid overflow of the cleaning liquid during cruising.



W 65



W 300

Accessories for W 65

Basket **WK 65**
Lid **WD 65**

Accessories for W 300

Basket **WK 300** up to a load of 20 kg
Basket **WK 300 S** up to a load of 40 kg
Lid **MD 180**

Model	Inner tank dimensions (l x w x d) mm	Working volume litres	External dimensions (l x w x h) mm	Ultrasonic peak output* W	HF-output W_{eff}	Heating power W	Current consumption A^{**}	Drain ball valve	Weight net kg
W 65	500 × 300 × 450	30,0	560 × 360 × 650	1200	1 × 300	1450	7,0	G ½	30,0
W 300	1000 × 500 × 600	185,0	1180 × 600 × 1000	4000	2 × 1000	7200	14,8	G 1	170,0

SONOREX TECHNIK Special Units

Saw blade holder SA 16 and SA 40 for cleaning of saw blades and cutting tools



RM 16 UH with SA 16

Features:

- simple placement on existing ultrasonic units SONOREX TECHNIK RM 16 and RM 40
- removal of stubborn dirt, for example resin residues
- rapid and simultaneous cleaning of several saw blades and cutting/milling tools without second cleaning
- axis for different bore diameters

Equipment:

- adaptable axis for different bore diameters: \varnothing 20 – 50 mm are possible
- maximum load 8,0 kg
- driving roll rotates with approx. 1 rpm
- timer 1 to 15 minutes and motor inside the ABS-housing
- mains connection 230 V~ 50/60 Hz

SONOREX TECHNIK RL 70 UH with long tank



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

Accessories

- Basket insertable **RE 70 L**
- Basket holder **KT 70 L**
- Lid **MD 70**
- Saw blade holder **SE 70 L**
(Basket holder necessary)

Model	Inner tank dimensions (l x w x d) mm	Working volume litres	External dimensions (l x w x h) mm	Ultrasonic peak output* W	HF-output W_{eff}	Heating power W	Current consumption A**	Drain ball valve	Weight net kg
RL 70 UH	1700 x 250 x 250	70,0	1750 x 300 x 450	4000	1 x 1000	2000	13,1	G ½	55,0

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 baskets and for oscillating movement of parts in the cleaning or rinsing chamber.

Applications

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

SONOREX TECHNIK L 220

- stainless steel twin chamber
- 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

- stainless steel twin chamber
- separate HF-generator LG 4004 F
- frequency 40 kHz
- mains connection 400 V 3N~ 50/60 Hz
- optional lifting device LB 320 with basket

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

Model	Inner tank dimensions (l x w x d) mm	Working volume litres	External dimensions (l x w x h) mm	Ultrasonic peak output* W	HF-output W_{eff}	Current consumption A**	Drain ball valve per chamber	Weight net kg
L 220	2200 x 300 x 300/370 ^o	200	2320 x 750 x 850	4000	2 x 1000	8,6	G 1	260,0
L 320	3200 x 300 x 300/370 ^o	300	3320 x 750 x 850	4000	4 x 1000	8,6	G 1	383,0

* To achieve an improved efficiency, the ultrasound is modulated whereby four times the values of the HF- output are received as ultrasonic peak output.

** per phase ^oultrasound/rinsing chamber

SONOREX TECHNIK REACTORS

Applications

- Disinfection of organic substances
- Dispersion of nano-scaled particles
- Conditioning of surface
- Degassing of solutions
- Intensifying tanning and colouring processes
- Dis-agglomeration
- Emulsifying of substances
- Disintegration of sludge
- Production of suspensions

Features

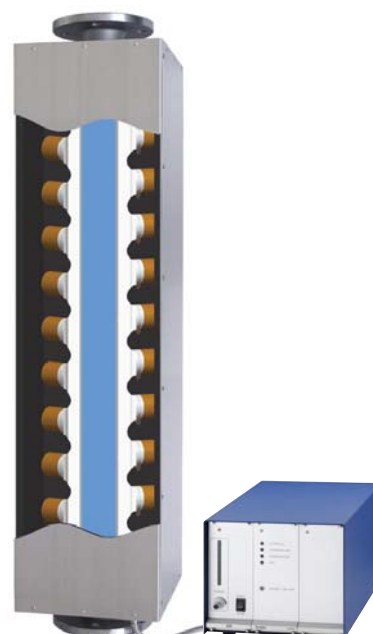
- Maximum flow rate 50 l/min
- High power density up to 520 W/l
- Constant power $\pm 2\%$ deviation
- Reliable power control through modern microprocessor technology, control via PC is also possible
- Scale-up e.g. by connecting several reactors



patent DE 197 24 189



patent DE 197 24 189



patent DE 196 49 975

SONOREX TECHNIK SONOREACTOR SR 4-1040

Complete set consists of:

Cylindrical immersible transducer
RT 4-1040

Reactor housing RG 4-000

HF generator LG 1001 T, 1000 W

Code-No. 8067

SONOREX TECHNIK SONOREACTOR SR 6-2040

Complete set consists of:

Cylindrical immersible transducer
RT 6-2040

Reactor housing RG 6-0000

HF generator LG 2002 T, 2000 W

Code-No. 8090

SONOREX TECHNIK SONOBLOC® SB 7-1025

Complete set consists of:

Rector block RB 7-1025

HF generator LG 1001 T,
1000 W

Code-No.8096

Technical data	SR 4-1040	SR 6-2040	SB 7-1025
Filling volume	3,9 l	11,3 l	2,24 l
Irradiation volume	2,8 l	8,0 l	1,9 l
Flow rate	1 - 50 l/min	5 - 100 l/min	1 - 50 l/min
Reaction crevice	15 mm	22,4 mm	24 mm
Power density	350 W/l	250 W/l	approx. 520 W/l
Power	1000 W _{eff}	2000 W _{eff}	1000 W _{eff}
Frequency	40 kHz	40 kHz	25 kHz
Dimensions (l×w×h) incl. flange and cover	dia. 220 × 716 mm	285 × 338 × 827 mm	250 × 235 × 1010 mm
Pipe material, stainless steel	AISI 316 Ti (V4A), 2 mm	AISI 316 Ti (V4A), 3 mm	AISI 316 Ti (V4A), 3 mm
Connection, flanges	ND 16, DN 50 (DIN 2633)	ND 16, DN 50 (DIN 2633)	2 × pre-welded flange ND 16, DN 50 (DIN 2633)
Connection cable, EMC-protected	5 m	5 m	5 m
Pressure resistance	max. 10 bar	max. 10 bar	max. 10 bar
Weight	22,5 kg	24 kg	37 kg
Protection class	IP 65	IP 65	IP 30

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.

Detailed consultation with regard to the adequate dimensioning is essential.

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 output with a frequency of 40 kHz or optionally 25 kHz.

The connection to the HF generator is made via an HF- cable with AMP- plug or the proven Quick-connect-technology.

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



PVDF tank for sonication of aggressive media



Foulard sink for sonication of dye baths



Probe flange of a refractometer



Polarimeter tube for analysis

Selection of ultrasonic oscillating systems

PZT - oscillating system	Designation	HF-output 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 of special assemblies

TG generators
HF output up to 500 W
Ultrasonic frequency 40 kHz



TG 50



LG 1510 T

LG generators (page 18/19)
HF output starting at 500 W
Ultrasonic frequency 40 kHz or 25 kHz

Maximum HF output effective W	Generator without timer	Generator with timer*	Dimensions
50	TG 50	TG 50 Z	235 × 160 × 100 mm
100	TG 100	TG 100 Z	235 × 160 × 100 mm
200	TG 200	TG 200 Z	305 × 310 × 142 mm
300	TG 300	TG 300 Z	305 × 310 × 142 mm
500	TG 500	TG 500 Z	305 × 310 × 142 mm

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

Mains connection: 230 V~ 50/60 Hz, mains plug

*1 to 15 minutes and continuous operation

High-power ultrasonic transducers – applications

SONOREX TECHNIK ultrasonic immersible transducers and flat transducer plates are used for ultrasonic cleaning and degreasing as well as for supporting or accelerating chemical or physical processing. They can be installed onto new or already existing tanks or sinks.

SONOREX immersible transducers and flat transducer plates are manufactured of titanium stabilized stainless steel resulting in a high durability and long life span.

Depending on the required processing, the transducers are made with different connections for various installations. Oscillating systems are fed with energy from high-performance ultrasound generators.

Typical applications

Surface technology

Cleaning and degreasing as a preparation stage for coating, varnishing; ultrasound supported preparation in electroplating in order to yield perfect coating

Automobile industry

Degreasing and cleaning of engine parts

Mechanical and plant engineering

Cleaning of parts after turning, milling, drilling, lapping, and intermediate cleaning prior to further processing; cleaning of stainless steel chains

Printing industry

Cleaning of printing rollers

Semiconductor industry

Cleaning of circuit plates, insulating ceramics and wafers

Beverage industry

Controlled degassing after filling and leakage test of bottles containing carbon dioxide

Wire industry

Removing of drawing lubricant and oxidant residues

TV industry

Cleaning of television tubes

Plastics technology

Removing of separating agent residues from moulds

Textile industry

Intensive colouring of textile ribbons and fabric lengths, and cleaning of healds

Aviation

Cleaning of coolers

Advantages of high-power ultrasonic transducers

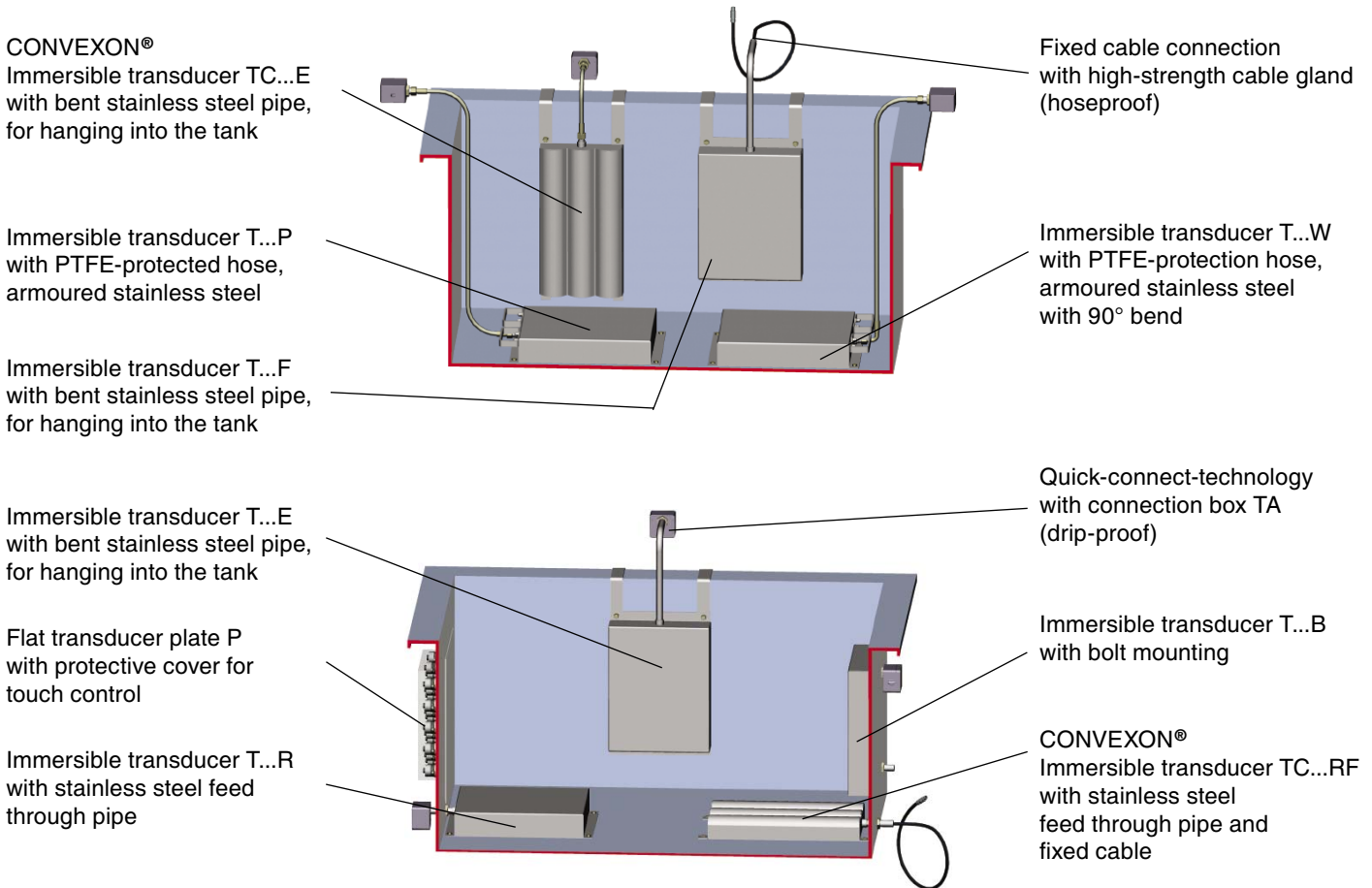
- Easy to install afterwards on existing equipment e.g. as used in galvanic processes
- Requiring only little space for installation at the tank's sides or on the tank's bottom
- Individual arrangement of transducers in cleaning and rinsing tanks
- Cost-saving alternative due to alternating insertion of transducers into different tanks in case of successive cleaning processes
- Directed irradiation of unusually shaped parts
- Through using with LG-generators, an individual power adjustment can be selected for either gentle or very strong cleaning
- Multi-frequency irradiation in case a very uniform power distribution is required

The following criteria must be considered when selecting adequate ultrasonic transducers

Output:	Tank volume in litres x 5 = minimum of required ultrasonic power in Watts
Frequency:	40 kHz for delicate objects such as circuit boards, wafers, optical devices etc. 25 kHz for the cleaning of very dirty machine and engine parts etc.
Dimensions:	Subject to the space available inside the tank or sink
Mounting:	Installation of oscillating systems at the bottom and/or at the side
Installation type:	Temporary or permanent installation of ultrasonic transducers
Connections:	Dry or damp conditions in surrounding area

High-power ultrasound transducers – installation

Examples for mounting of ultrasonic transducers



Options for the installation of immersible transducers - Quick-connect-technology

Constructional characteristics	with plug-in HF cable connection IP 51	with fixed HF cable connection IP 65
E – for hanging into the tank with tightly-welded bent stainless steel pipe and suspension hooks. This type is easily displaceable and applicable in a number of different tanks.	E	EF
B – with liquid-proof bolt mounting through tank bottom or side walls resulting in a working area being free of disturbing cables. The cable routing to the generator is arranged outside the tank.	B	BF
R – with liquid-proof feed through pipe through the tank wall	R	RF
P – with flexible PTFE – protection hose of 2 m length with armoured stainless steel (AISI 304 Ti), to be placed directly on the tank bottom	P	PF
W – with stainless steel bend 90 ° (AISI 304 Ti) and flexible PTFE-protection hose of 2 m length with armoured stainless steel (AISI 304 Ti), to be placed directly on the tank bottom in situation with only few spaces for mounting	W	WF
Directions on 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 to order a fixed cable connection F with high strength cable glands (hoseproof). Flat transducer plates are equipped with HF-sockets only, without connection boxes.		

High-power ultrasonic transducers

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



Immersible transducer T – for quick installation

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

Features

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



Flat transducer plate P – for space-saving installation – Registered utility model DE 298 07 581

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

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

HF-output W_{eff}	Radiating surface* (l x w) mm	Immersible transducer			Flat transducer plates		
		External dimensions** (l x w) mm	25 kHz h = 100 mm	40 kHz h = 80 mm	External dimensions (l x w) mm	25 kHz	40 kHz
200	170 x 160	230 x 160	T 25 04 1...	T 40 04 1...	255 x 230	P 25 04 1	P 40 04 1
300	325 x 235	385 x 235	T 25 06 3...	T 40 06 3...	380 x 305	P 25 06 3	P 40 06 3
400	325 x 160	385 x 160	T 25 08 3...	T 40 08 3...	380 x 230	P 25 08 3	P 40 08 3
400	595 x 80	655 x 80	T 25 08 5...	T 40 08 5...	680 x 155	P 25 08 5	P 40 08 5
500	325 x 235	385 x 235	T 25 10 3...	T 40 10 3...	380 x 305	P 25 10 3	P 40 10 3
500	415 x 325	475 x 325	T 25 12 4...	T 40 12 4...	480 x 380	P 25 12 4	P 40 12 4
500	415 x 265	475 x 265	T 25 14 4...	T 40 14 4...	480 x 330	P 25 14 4	P 40 14 4
500	595 x 235	655 x 235	T 25 14 5...	T 40 14 5...	680 x 305	P 25 14 5	P 40 14 5
1000	415 x 325	475 x 325	T 25 20 4...	T 40 20 4...	480 x 380	P 25 20 4	P 40 20 4
1000	475 x 325	535 x 325	T 25 22 4...	T 40 22 4...	555 x 380	P 25 22 4	P 40 22 4
1000	565 x 355	625 x 355	T 25 24 5...	T 40 24 5...	630 x 430	P 25 24 5	P 40 24 5
1000	595 x 235	655 x 235	T 25 22 5...	T 40 22 5...	680 x 305	P 25 22 5	P 40 22 5
1000	595 x 415	655 x 415	T 25 26 5...	T 40 26 5...	680 x 480	P 25 26 5	P 40 26 5
1000	775 x 205	835 x 205	T 25 22 7...	T 40 22 7...	855 x 280	P 25 22 7	P 40 22 7
1500	595 x 355	655 x 355	T 25 30 5...	T 40 30 5...	680 x 430	P 25 30 5	P 40 30 5
1500	595 x 415	655 x 415	T 25 32 5...	T 40 32 5...	680 x 480	P 25 32 5	P 40 32 5
1500	775 x 415	835 x 415	T 25 38 7...	T 40 38 7...	855 x 480	P 25 38 7	P 40 38 7
2000	565 x 355	625 x 355	T 25 40 5...	T 40 40 5...	630 x 430	P 25 40 5	P 40 40 5
2000	595 x 415	655 x 415	T 25 44 5...	T 40 44 5...	680 x 480	P 25 44 5	P 40 44 5
2000	775 x 355	835 x 355	T 25 46 7...	T 40 46 7...	855 x 430	P 25 46 7	P 40 46 7
2000	895 x 445	955 x 445	T 25 48 8...	T 40 48 8...	955 x 530	P 25 48 8	P 40 48 8

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 delicate parts
- Near field irradiation in process technology

HF – output W_{eff}	Radiating surface* mm	Immersible transducers TC	
		External dimensions** mm	40 kHz
300	634 x 90 (L x B)	694 x 90 x 68 (L x B x H)	TC 40 10 6...
600	634 x 172 (L x B)	694 x 172 x 68 (L x B x H)	TC 40 20 6...
1000	634 x 260 (L x B)	694 x 260 x 68 (L x B x H)	TC 40 30 6...

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

High-power ultrasonic transducers

Explosion plated compound ultrasound with long lifespan



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 lifespan caused by low erosion
- Stainless steel plating: 3 mm, AISI 316 Ti
- Stability at high temperatures up to 180 °C max.
- Suitable for pressure and vacuum strain
- New radiating characteristics
- Equal power output along the entire surface
- Increased mechanical stability due to rugged design
- High reliability due to nonbonded transducers
- Ultrasonic frequencies: 25 kHz alternatively 40 kHz
- Unchanged connection and generator technology
- Immersible transducers TQ and flat transducers plates PQ are available with this technology

Compound ultrasound	25 kHz - Immersible transducer TQ and flat transducer plate PQ				40 kHz - immersible transducer TQ and flat transducer plate PQ			
	HF – output	Radiating surface * (l x w) mm	TQ External dimensions ** (l x w) mm	PQ External dimensions (l x w) mm	Type TQ... or PQ...	Radiating surface * (l x w) mm	TQ External dimensions ** (l x w) mm	PQ External dimensions (l x w) mm
500	558 x 198	618 x 198	605 x 255	...25135	384 x 134	444 x 134	430 x 205	...40133
500	414 x 270	474 x 270	455 x 330	...25144	284 x 184	344 x 184	330 x 255	...40142
500	342 x 342	402 x 342	405 x 380	...25154	234 x 233	294 x 234	305 x 280	...40152
750	414 x 342	474 x 342	455 x 405	...25194	284 x 234	344 x 234	330 x 305	...40192
750	486 x 342	342 x 546	530 x 405	...25234	334 x 234	394 x 234	355 x 305	...40233
750	630 x 270	690 x 270	655 x 330	...25236	434 x 184	494 x 184	480 x 255	...40234
1000	558 x 342	618 x 342	605 x 405	...25275	384 x 234	444 x 234	430 x 305	...40273
1000	630 x 342	690 x 342	655 x 405	...25316	434 x 234	494 x 234	480 x 305	...40314
1000	486 x 414	546 x 414	530 x 480	...25294	334 x 284	394 x 284	380 x 355	...40293
1500	558 x 486	618 x 486	605 x 555	...25415	384 x 334	444 x 334	430 x 405	...40413
1500	702 x 414	762 x 414	730 x 480	...25447	484 x 284	544 x 284	530 x 355	...40444
1500	774 x 414	834 x 414	805 x 480	...25497	634 x 234	694 x 234	680 x 305	...40476

CONCAVON® Immersible transducer TN

patent DE 100 13 120



TN 40 10 6 RF

Features

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

Applications

- Focussed intensive cleaning of longish or filamentous parts
- Especially suitable for wire cleaning

Cylindrical immersible transducer RT

patent DE 197 24 189



RT 4-1040

Features

- Radial irradiation characteristics
- Circumpolar distribution of ultrasound along the axis
- Little surface erosion
- Extended life span
- Stainless steel of 2 mm material, AISI 316 Ti, TIG-welded
- Ultrasonic frequency 40 kHz

Applications

- Irradiation of media in reactors, fermenters etc.
- Inside cleaning of casings

HF – output	Radiating surface* mm	Immersible transducers TN, RT	
		external dimensions** mm	40 kHz
300	634 x 90 (L x B)	694 x 90 x 84 (L x B x H)	TN 40 10 6...
1000	104 x 500 (Ø x l)	220 x 760 (Ø x L)	RT 4-1040
2000	168 x 500 (Ø x l)	285 x 820 (Ø x L)	RT 6-2040

The following information does not concern type RT: * Radiating surface = external dimensions of installation type B, **external dimensions of installation types E, P, R and W.

SONOREX TECHNIK

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

Modular structure

All modules for the LG-generator can be easily inserted or exchanged from the front. The generator is set up through the operating modules SM or PRO. Power output is controlled through power modules M.

Flexibility

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

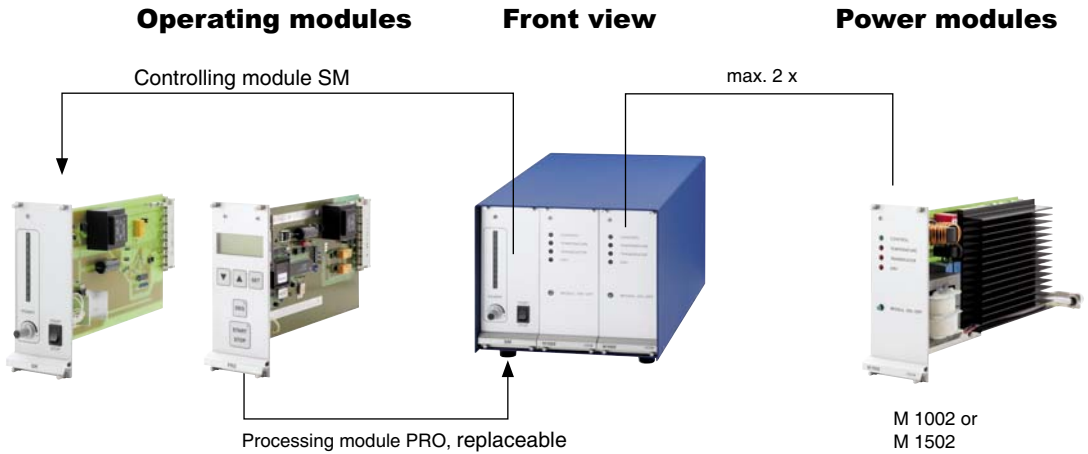
Generators

Patent DE 196 49 975

Desktop housing (T) up to 3 kW

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

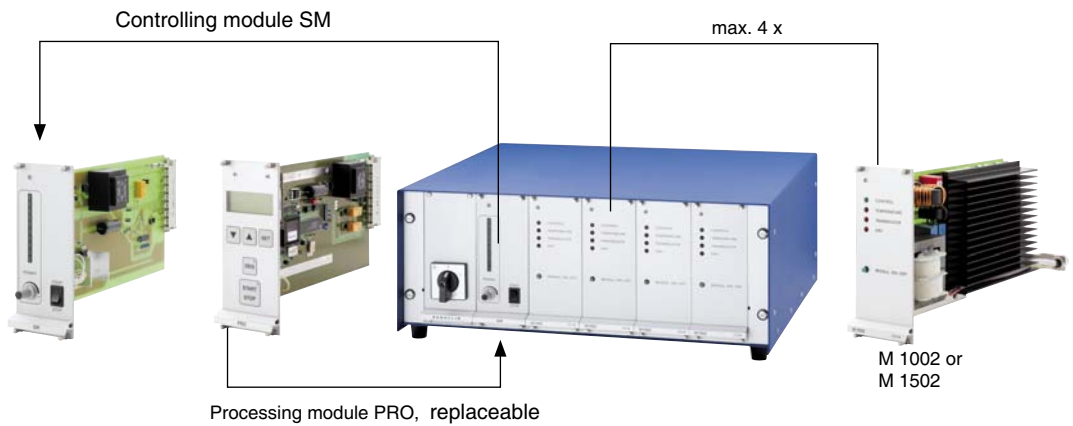
mains connection:
230 V~ 50/60 Hz



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 switch 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 switch cabinet

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



High power - ultrasonic generators LG

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

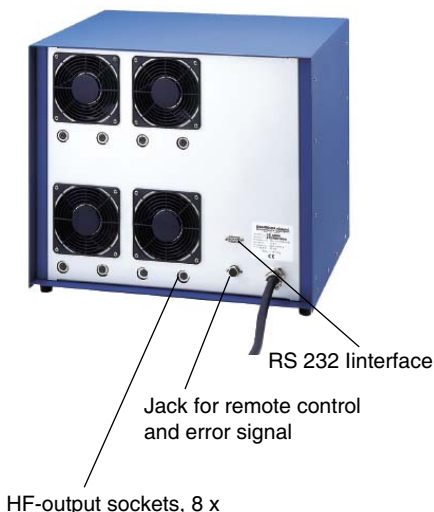
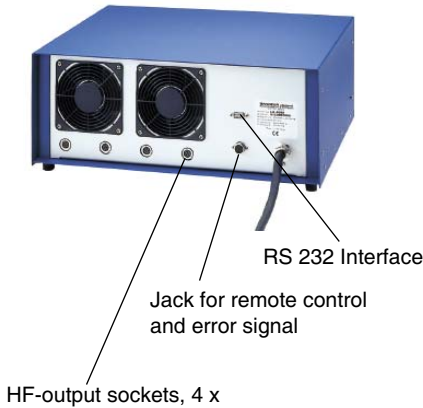
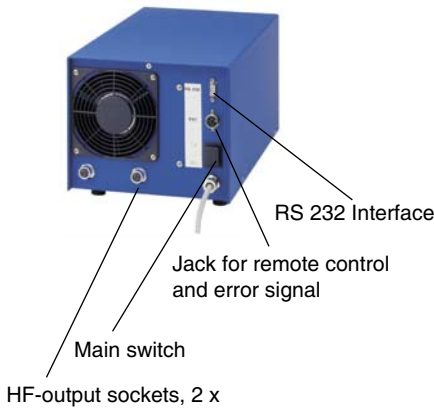
The connections for remote control and serial interface at the rear side allow the integration of the generators into higher ranking monitoring and controlling equipment (see page 21).

Selection

The selection of the generators and the installation of power and operating modules depend on the needed total output of the ultrasound transducers that are to be connected and on the desired way of controlling.

Detailed project information on request.

Rear view



Power modules

M 1002
max. 1000 W

M 1502
max. 1500 W

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

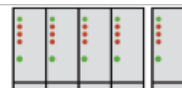


LG 3003 F
LG 3003 F PRO

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

Operating modules

Controlling module SM



A controlling module is built into all LG generators as a standard. The ultrasound output set with the adjustable rotary controller applies to all power modules of the generator. The power modules take over the controlling and monitoring of the generator functions as well as possible error indication.

The programming of the power modules may even be made through the RS 232-interface by means of a SPS equipment or by a PC using the software WINSONIC®-S. The controlling module may be replaced by the processor module PRO in all versions of generators.

- Continuous setting of the nominal output range from 10 % to 100 % via rotary controller
- Bar display indicates the nominal output in %
- On/Off switch for the power modules

Processing module PRO



The processing module PRO allows for an individual programming of the power modules. Consequently, the controlling of complex tasks, the computer-based connection to industrial processes as well as the design of various applications are possible. Power modules can be programmed directly at the processing module or via the RS 232-interface by SPS equipment or using the software WINSONIC® on a PC.

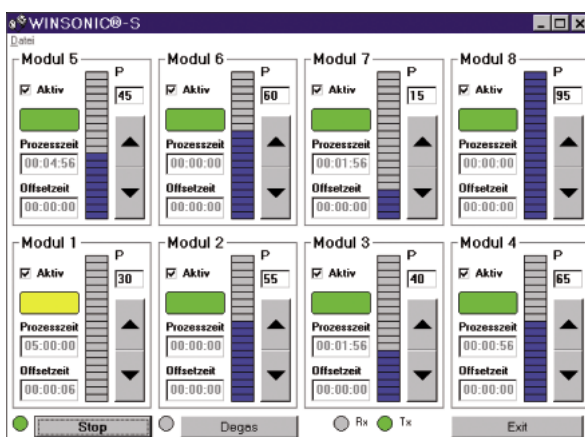
- LCD display to indicate the output and settings
- Setting of processing and offset times of separate modules
- Degassing function for quick degassing of the bath liquid
- Switching on/off of separate modules
- Elapsed time indicator
- Language selection: German/English
- Indication of external control by a PC or SPS
- Error indication with date and time

Communication

WINSONIC® PC-Software

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

Besides the individual setting of performance parameters, programming, saving and databasing of application related process data are possible as well. Operating status, nominal and actual output of the power modules as well as processing times are displayed clearly.



WINSONIC®: PC programme on CD, for generators with PRO-module, 5 m serial cable (SUB-D; 9-poles)

WINSONIC®-S: PC programme on CD, for generators with SM module, 5 m serial cable (SUB-D; 9-poles)

WINSONIC®-D: PC demo programme on CD free of charge

High-power ultrasonic generators

Power modules M 1002 and M 1502

High efficiency

The combination of microprocessor technology with modern and powerful semiconductors in the output stage allows for an efficient circuit technology of very high efficiency.

Programmed safety

The microprocessor based status analysis guarantees a high operational reliability. LEDs on the front indicate the current operating status. The power modules are protected against short circuits, idle motion and overload.

Stable output

The maximum HF-output of the power modules is 1000 W for M 1002 and 1500 W for M 1502. The output is continuously adjustable from 10 % to 100 %. The output is constant with a minor ± 2 % deviation starting at 30 % of the nominal output.

Excess temperature and derating

The power modules are ventilated by fans placed at the rear side of the housing. If the temperature is increasing to unacceptable values, a temporary derating will start automatically. During this process, the power module is not switched off.

Transducer breakdown

Fast safety circuits protect the power module and the transducers connected to it. In case of a defect, the derating process will start automatically.

Dry run detection

The automatic dry run detection avoids damage to the ultrasound transducers. If the surface of the ultrasound transducer is no longer sufficiently covered with liquid, the derating process will start automatically. When the liquid level rises to the appropriate height again, power output is increased again.

Module switch

Used to switch individual modules on or off, i.e. when a partial load operation is required in a generator that is equipped with several power modules.

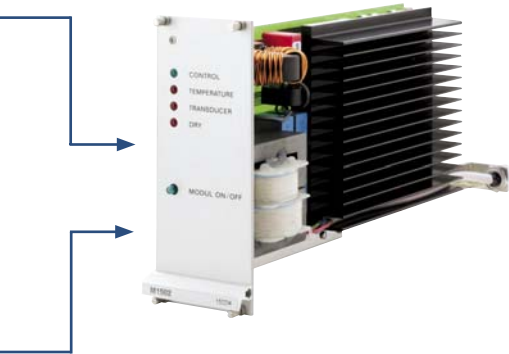
● CONTROL

● TEMPERATURE

● TRANSDUCER

● Dry

● MODUL ON/OFF



Sweep function

The programmable sweep function that can also be operated with the adapted processing module PRO leads to a better distribution of the ultrasonic waves in the bath, hence, resulting in a constant and gentle cleaning process.

Communication

Remote diagnosis of problems

Bandelin offers you a low-cost, fast, and on-site service by employing a remote control maintenance module FWM for LG generators. By using this module, Bandelin can check your settings on the LG generator in its active state and can then adjust these setting if necessary. The remote control maintenance module is available on loan on short notice.

Interface RS 232 for SPS 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 SPS equipment.



Remote control

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

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

SONOREX Ultrasonic baths

Applications in service, repair, maintenance and industry

SONOREX SUPER



Characteristics

- SONOREX SUPER - rust-free stainless steel tank
- SONOREX LONGLIFE units are characterized by a long lifespan due to welded V4A tanks of 2 mm titanium stabilized stainless steel (AISI 316 Ti)
- HF-Frequency 35 kHz - SweepTec®
- Timer for 1 - 15 minutes and continuous operation
- H/CH-types with heating, thermostatically adjustable from 30 bis 80 °C, (RK 31 H with heating device fixed at 65 °C)
- Drip-proof stainless steel housing
- SONOREX SUPER units starting from RK 102 H and SONOREX LONGLIFE units are equipped with ball valve drain
- Mains connection 230 V~ 50/60 Hz, on request 115 V~ 50/60 Hz

SONOREX LONGLIFE



SONOREX SUPER

Internal tank dimensions (l x w x d) mm	Capacity litres	Model	External dimensions (l x w x h) mm	Drain ball valve	Ultrasonic peak output * W	HF-output W _{eff}	Heating power W	Current consumption A	Weight net kg
190 x 85 x 60	0,9	RK 31 H	205 x 100 x 155	-	240	30	70	0,5	1,9
240 x 140 x 100	3,0	RK 100 H RK 102 H	260 x 160 x 250	- G ¼	320 480	80 120	140 140	1,0 1,2	3,6 4,3
Ø 245 x 130	5,6	RK 106	Ø 265 x 270	G ¼	480	120	-	0,6	5,5
500 x 140 x 150	9,0	RK 156 BH	530 x 165 x 300	G ¼	720	180	600	3,6	7,3
1000 x 200 x 200	39,0	RK 170 H	1050 x 250 x 385	G ½	1200	300	1600	8,3	26,5
300 x 150 x 150	5,5	RK 255 H	325 x 175 x 305	G ¼	640	160	280	2,0	5,3
300 x 240 x 150	9,7	RK 510 H	325 x 265 x 305	G ½	640	160	400	2,5	7,6
325 x 300 x 150	13,5	RK 514 H	355 x 325 x 305	G ½	860	215	600	3,6	8,8
325 x 300 x 200	18,7	RK 514 BH	355 x 325 x 385	G ½	860	215	600	3,6	9,8
500 x 300 x 200	28,0	RK 1028 H	535 x 325 x 400	G ½	1200	300	1300	6,8	14,7
500 x 300 x 300	45,0	RK 1028 C	540 x 340 x 500	G ½	2000	500	-	2,2	24,6

SONOREX LONGLIFE

140 x 135 x 100	1,9	RK 52 CH	180 x 175 x 250	-	240	60	100	0,7	4,0
220 x 135 x 100	3,0	RK 102 CH	260 x 175 x 275	G ¼	480	120	200	1,4	5,6
220 x 135 x 150	4,5	RK 103 CH	260 x 175 x 325	G ¼	640	160	200	1,6	6,4
280 x 150 x 150	6,3	RK 255 CH	320 x 190 x 325	G ¼	720	180	280	2,0	7,9
280 x 234 x 200	13,1	RK 512 CH	320 x 275 x 380	G ½	1200	300	560	3,5	13,6
280 x 234 x 300	19,7	RK 515 CH	320 x 275 x 485	G ½	1200	300	700	4,4	16,0
500 x 300 x 300	45,0	RK 1028 CH	540 x 340 x 500	G ½	1200	300	1450	7,7	23,7
600 x 500 x 300	90,0	RK 1050 CH	640 x 540 x 530	G ½	2400	600	1950	11,1	37,0

*To achieve an improved efficiency, the ultrasound is modulated whereby in combination with SweepTec® and according to the tank model four times or eight times the values of the HF- output are received as ultrasonic peak output.

Accessories



K 14

Insertable baskets

stainless steel, for gentle cleaning of delicate surfaces. Objects to be cleaned or vessels must not be placed on the tank bottom.

Further accessories on request

Unit	RK 31 H	RK 52 CH	RK 100 H RK 102 H RK 102 CH	RK 103 CH	RK 106	RK 156 BH	RK 170 H	RK 255 H RK 255 CH
Accessories								
Insertable baskets (l x w x h) mm	K 08 170x65x50	K 1 C 120x110x40	K 3 C 200x110x40	K 3 CL 200x110x40	K 6 Ø 215x50	K 6 BL 460x100x50	K 7 950x150x50	K 5 C 260x110x40

Unit	RK 510 H	RK 512 CH	RK 514 H	RK 514 BH	RK 515 CH	RK 1028 H	RK 1028 C RK 1028 CH	RK 1050 CH
Accessories								
Insertable baskets (l x w x h) mm	K 10 250x195x50	K 10 B 250x195x50	K 14 275x245x50	K 14 B 275x245x50	K 15 C 250x190x50	K 28 455x245x50	K 28 C 455x245x50	K 50 C 545x450x50

DR·H·STAMM Cleaning concentrates

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	Litres*
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
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
Non-ferrous and precious metals, steel, stainless steel, glass, ceramics, plastics, rubber, test sieves, printed circuit boards with service cleaning. Caution with light metals!	Resinous residues, soot, grease, oils, waxes, pigments, coloured fog, silicon oils, flux media, oxides at non-ferrous and precious metals	TICKOPUR RW 77 special cleaner with ammonia, without phosphate, gentle cleaning, mildly alkaline, pH 9.9 (1 %) dosage 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	Litres
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

Quality and precision combined with many years of experience in the engineering of mechanical and electronic apparatus is reflected in our wide range of products. Our products and their vast variety of applications underline the present importance of efficient ultrasonic technology.



The production site is located in Berlin. 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 CNC production leads to high-quality system production

Your advantages

- Free of charge test cleaning to clarify/test the process technology
- Short-term delivery from the present fabrication series