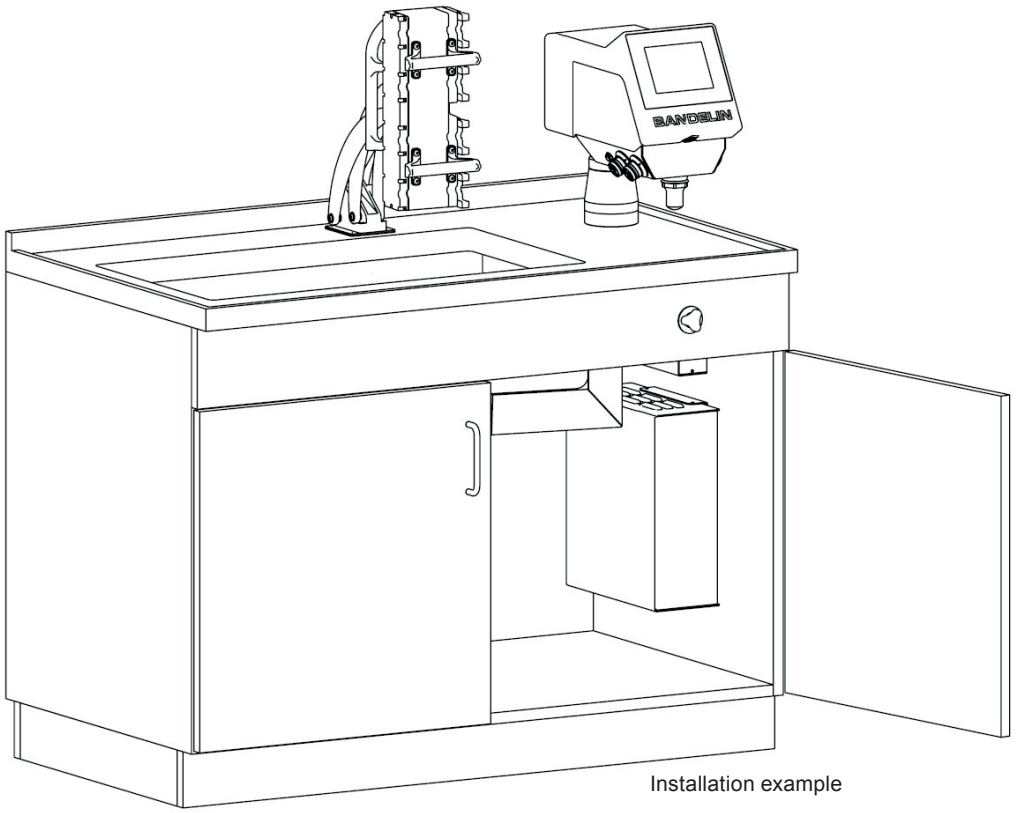
Project planning instructions
Installation instructions

BANDELIN
Ultraschall seit 1955

TRISON ultrasonic baths

for installation



Installation example

valid for:

TRISON 3000 L /R

TRISON 4000 Si/Xi L /R

61279e GB/2018-03

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General

The equipment, the accessories and the preparations are to be used in accordance with the Instructions for Use and/or the product information.

The instructions are part of the scope of delivery and are to be stored in the vicinity of the device for later reference. This also applies if possession of the device is transferred elsewhere.

Before the device is put into operation, these Instructions for Use should be read carefully and completely in order for the user to become familiarised with all functions.

The warnings and safety precautions (chapter 1) must always be heeded during use.

The manufacturer will not assume any responsibility for the device's safety or functional ability in the event of improper handling or usage contrary to the intended purpose. In the event of unauthorised alterations/modifications, both the warranty claim and the CE conformity will become void.

If service is required, please contact the specialist dealer in charge or the manufacturer.

Symbols used:

Symbol	Significance	Explanation
	Danger	Identifies information that could signify a risk to life and limb, especially through electric shock, if not observed.
	Caution	Identifies information that is to be observed and adhered to without fail in order to prevent damage to the device or the user. When device parts are labelled with this symbol, reference must be made to the documentation.
	Important	Identifies information that is important for execution.
	Note	Identifies information provided for explanatory purposes.
	Do not reach into the device	For health reasons, touching the oscillating fluid is prohibited.
	Wear hearing protection	For health reasons, remaining for long periods of time in the vicinity of the device without hearing protection is prohibited.

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Content

1 Warning and safety precautions 6

2 Scope of delivery 7

3 Project planning instructions 8

4 Mounting of the tank 10

4.1 Creating the cut-out 10

4.2 Fixing the sealing tape 11

4.3 Fixing the tank 12

4.4 Sealing the tank 12

4.5 Mounting the drain set 13

5 HF generator 13

5.1 Suspending the HF generator (recommended) 13

5.2 Positioning the HF generator 13

6 Control unit 13

6.1 Mains supply switch 15

6.1.1 Positioning the mains supply switch 15

6.1.2 Suspending the mains supply switch 15

7 Pivot mounted arm TRISON Lift (only at TRISON 4000) 16

8 Connection of the ultrasonic bath 18

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9 Functional check following mounting 19

9.1 Foil test 19

10 Technical data 19

10.1 Ultrasonic oscillating tank TE 3000 20

10.2 HF generator GT 3000 M-C 20

10.3 Control unit TRISON Base 21

10.4 Pivot mounted arm TRISON Lift (only at TRISON 4000) 21

Enclosures

Enc. 1 TE 3000 Oscillating Tank

Enc. 2 Complete assembly (example: Trison 4000 Xi R)

Enc. 3 Dimensioning - Hole pattern

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1 Warning and safety precautions

- Installation to be conducted **only** by authorised skilled personnel!
- TRISON ultrasonic baths must be installed in accordance with these installation instructions.
  If you have any questions, please contact the manufacturer.
- Do not weld the stainless steel ultrasonic oscillating tank to the work surface!
- Inspect all the individual parts for possible transportation damage after removing them from the packaging!
  If transportation damage is found, do not connect the TRISON ultrasonic bath to the mains. Instead, report the damage immediately and in writing to the delivering shipping agent and the supplier! Keep the original packaging!
- **Only** plug in the ultrasonic bath to an outlet with a **grounded socket**!

- Control units (TB ..., ST ...), HF generators and mains supply switches may only be opened by authorised skilled personnel.
- Defective parts may only be replaced with original parts!

- Never operate the ultrasonic oscillating tank without the cover on the transducers!
- Keep the HF generator and operating elements **clean and dry**!

- Only operate the mains supply switch from the ST ... with a cover plate or plugged-in conductor!
- Do **not** operate the ultrasonic oscillating tank without fluids!

- Follow the instructions for use!

- Cavitation noises are emitted during ultrasonic operation.
  When working continuously within a radius of 2 m from the ultrasonic oscillating tank, wear hearing protection to protect against injury!
- Do **not** place anything directly on the bottom of the tank; place the goods to be treated in the appropriate accessories (TRISON Twist, TRISON Rack)
- Position/suspend the HF generator and mains supply switch on a dry and firm surface.

- Please note that the ultrasonic oscillating tank will be delivered with short-circuited oscillation systems.
  Before starting up the short-circuit bridge at the ultrasonic oscillating tank or at the HF connection has to be removed.
- Only turn on the HF generator if the ultrasonic oscillating tank is connected (HF cable) – never run the HF generator without a load.
- Do not operate the ultrasonic bath while unattended.
- Do **not** fill the ultrasonic oscillating tank with **hot** water.
  The filling temperature may not be higher than 50°C.
- All live conductors must be protected from liquids – chapter 8.

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2 Scope of delivery

1 ultrasonic oscillating tank including sealing tape and pre-mounted drain set

1 HF generator with mounting bracket, pre-mounted

1 TRISON Base control unit including flat seal, ethernet connector and coupling socket for compressed air connection NW 7.2, for hose connection Ø 9 mm

1 mains supply switch

1 pivot mounted arm TRISON Lift (optional, only at TRISON 4000) including base plate, seal, shim and distance piece

1 moving device TRISON Twist (optional)

1 set of safety adhesives ("Hearing protection", "Do not reach into the device")

1 foil test wire frame

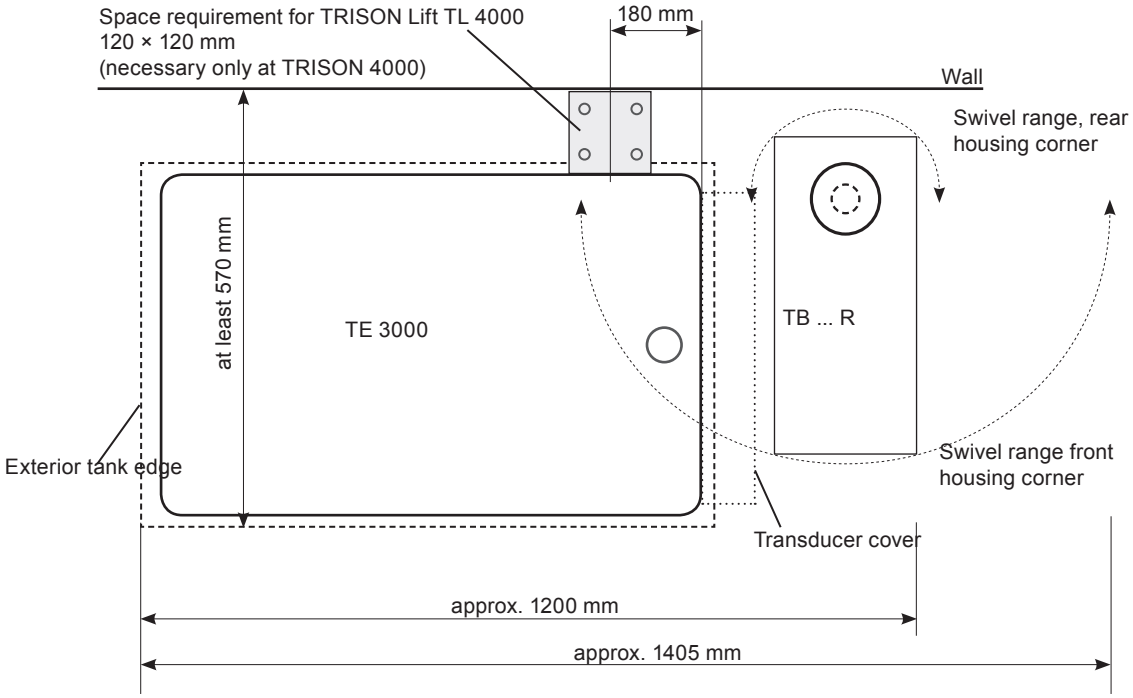
Note on fastening and mounting materials:

- Ultrasonic oscillating tank
  Fastening materials are not included in the scope of supply.

- TRISON Base control unit:
  Fastening materials are not included in the scope of supply.
  The following mounting material is included:
  2 threaded rods M6 × 80 mm

3 Project planning instructions

- The edge design of the TRISON ultrasonic oscillating tank TE 3000 only allows for bottom-mount installation. Detailed dimensions see drawings in the appendix.
- The TRISON Base control unit is mounted on the work surface next to the ultrasonic oscillating tank on the left (TB .... L) or right (TB .... R), and can be swivelled. See diagram for the space requirements for all components. In general, a modular dimension of 1200 mm is recommended for the intended bottom-mount cabinet.



Notes on operating ergonomics:

Assuming that operation is right-handed, the "right-handed version = TB ....R" is recommended for the use of a TRISON Twist for robotic instruments.
If a TRISON Rack for MIS instruments is predominantly used, use of the "left-handed version = TB ....L" is recommended.

- The outlet of the ultrasonic oscillating tank **must** face the control unit!
- Installation must be conducted in the vicinity of the following connections:
  - Compressed air connection with a minimum of 5 bar, maximum of 9 bar. In order to protect the components operated by compressed air, it is recommended that a suitable filter be installed upstream.
  - Power supply: Grounded socket outlet 230 V~ (± 10%) 50/60 Hz
  - Suitable filling fitting (spray, spigot, dosing unit)
  - Outlet for emptying the ultrasonic oscillating tank
  - Ethernet interface for documentation/ record-keeping (recommended). Alternatively, a USB connector is available on the control unit.

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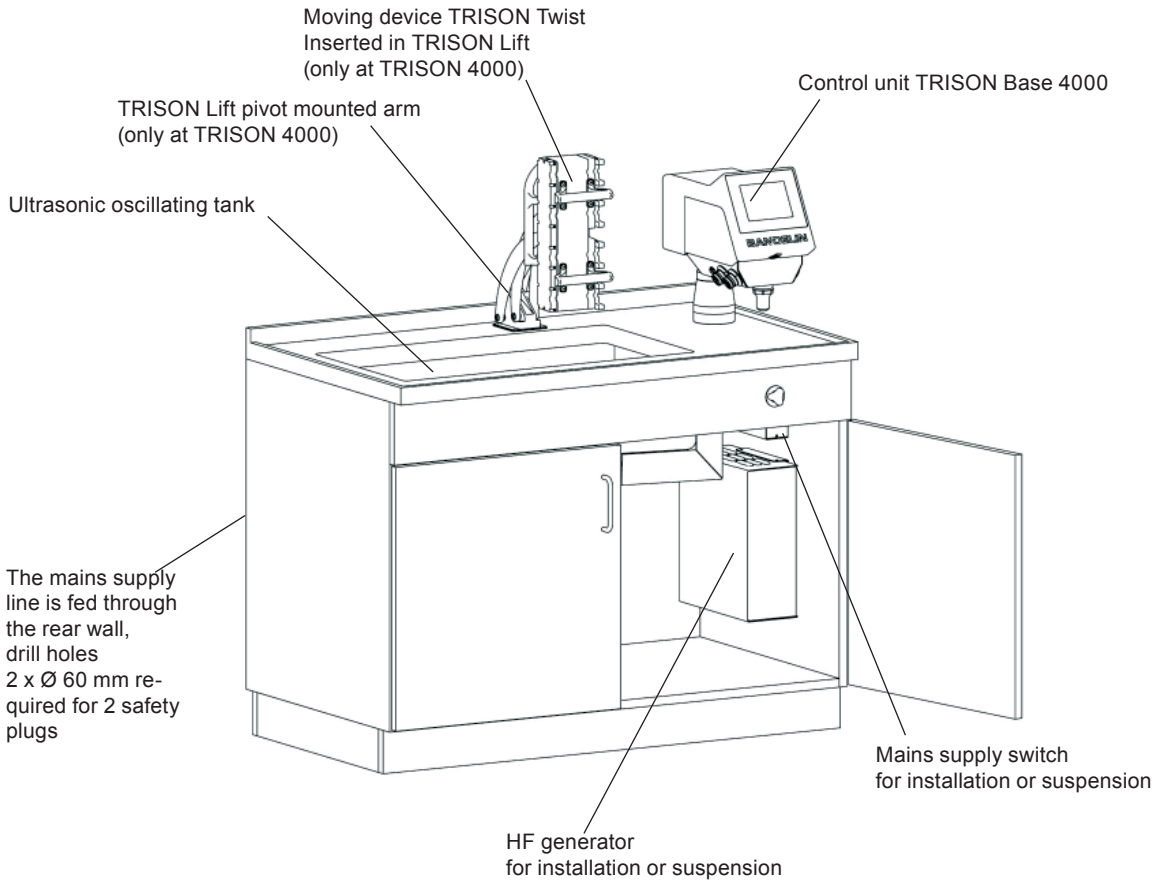
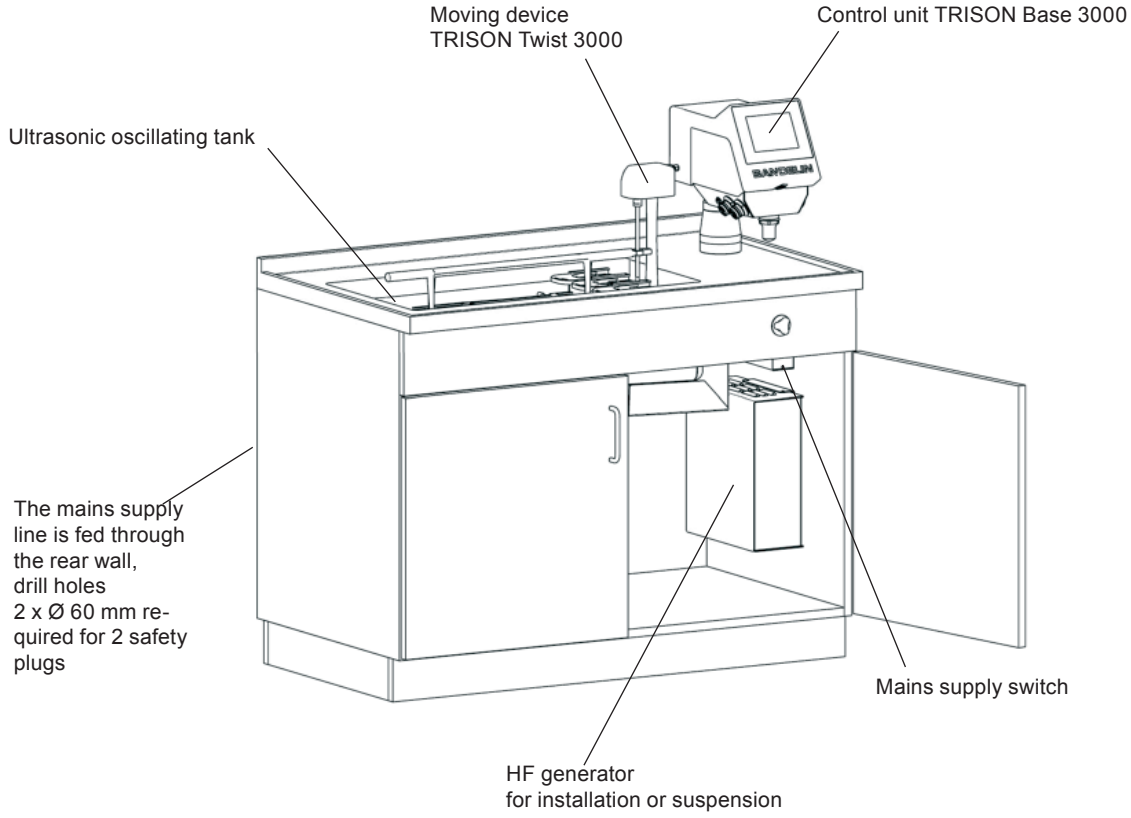
Installation example TRISON 4000:



Installation example TRISON 3000:



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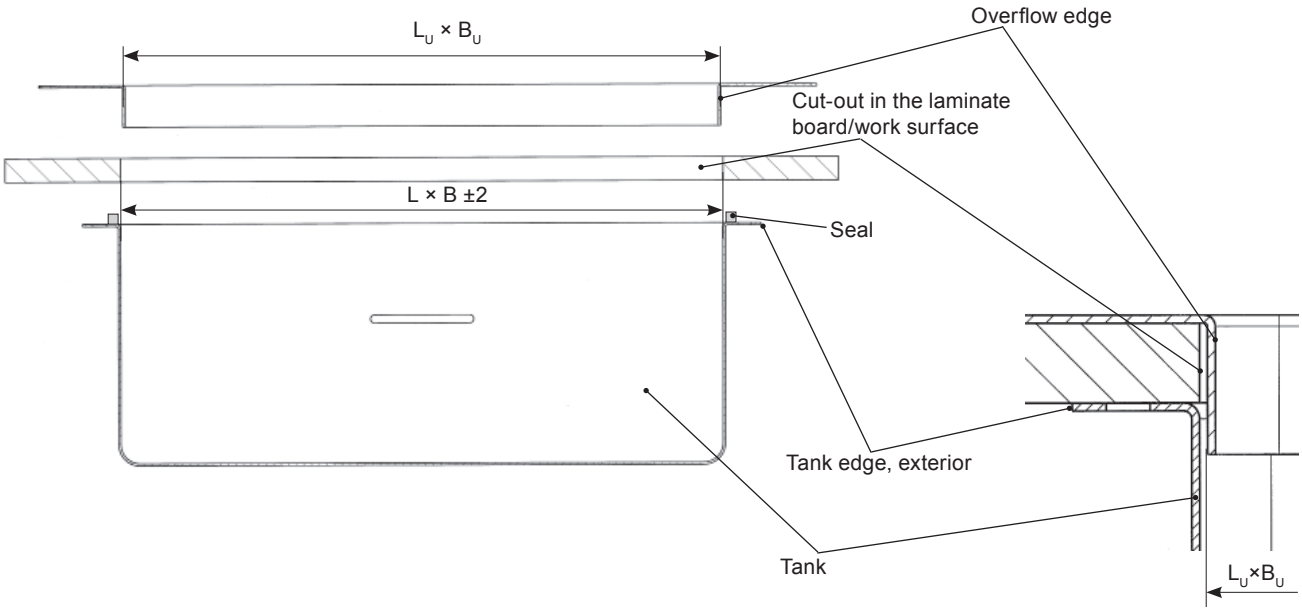
4 Mounting of the tank

When choosing a suitable fixation to fasten the tanks to the work surface, it is important to take into account the weight during cleaning (weight of tank when empty + filling volume + basket with goods to be cleaned).
The fastening of the tank to the work surface must be designed to accommodate the following weight as a minimum:

TE 3000 ⇒ 84 kg

4.1 Creating the cut-out

For the tank, overflow edges with the following dimensions must be produced through appropriate cut-outs in the work surface:



CAUTION – note the tank's corner radius "R"!

Type		Interior dimensions / tank		Overflow edge (exterior) External dimensions	
	R	L	B	L_U	B_U
TE 3000	20	770	420	766	416

All measurements given in mm

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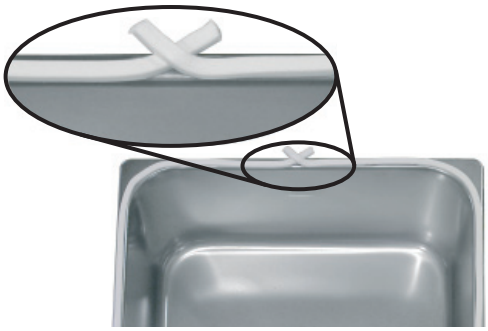
Notes:

- The height of the overflow edge depends on the lining of the work surface (see layout samples in chapter 4.3).
- The overflow edge may protrude a maximum of 2 mm wide and a maximum of 10 mm deep into the tank, so that the basket mounts for the accessories are not covered. Before installation, verify the table specifications since there may be production-related deviations/tolerances. (If necessary refer to the diagram in chapter 6.)
- The HF cable on the side cover may not be kinked - additional distance: 10 cm. See enclosed drawing.
- For the tank cut-out, take into account the position of the TRISON control unit and, if needed, the space requirement for the pivot mounted arm TRISON TL 4000, see chapters 3, 6 and 8.
- Thanks to the inclined tank bottom, the tank is able to empty out almost completely.

4.2 Fixing the sealing tape

Apply the self-adhesive sealing tape that is included in the scope of supply to the tank edge, this facilitates subsequent servicing.
Degrease the tank edge **thoroughly** and then apply the sealing tape as shown in the image, allowing the two ends to overlap.



Note:

Always set down the ultrasonic oscillating tank carefully on the oscillator cover.

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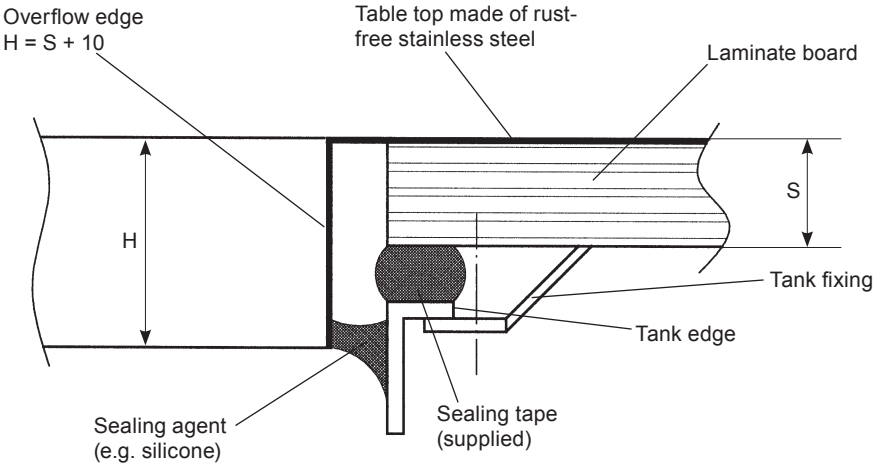
4.3 Fixing the tank

Mount the tank below the work surface, see layout samples 1 and 2. Do not weld onto the stainless steel work surface
⇒ results in undesired sound propagation and renders subsequent servicing more difficult.

Layout example 1

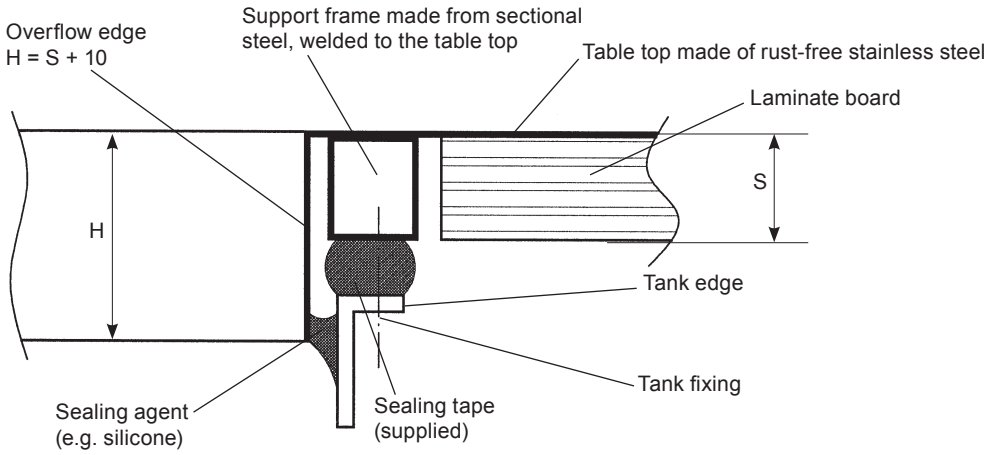
Fixing the tank onto the laminate board using screws and fastening claws.



(fastening claws, screws and sealing agent are not included in the scope of supply)

Layout example 2

Fixing the tank by using the pre-fabricated holes in the tank edge. To achieve stable fixation, a support frame made from sectional steel can be welded to the stainless steel table top, for example.



(screws, discs and sealing agent are not included in the scope of supply)

4.4 Sealing the tank

Ensure a good seal between the tank and work surface so that

- no liquid can access the transducers or the bottom-mount cabinet ⇒ can cause a short circuit in the HF generator
- there is no undesired sound propagation outside of the tank.

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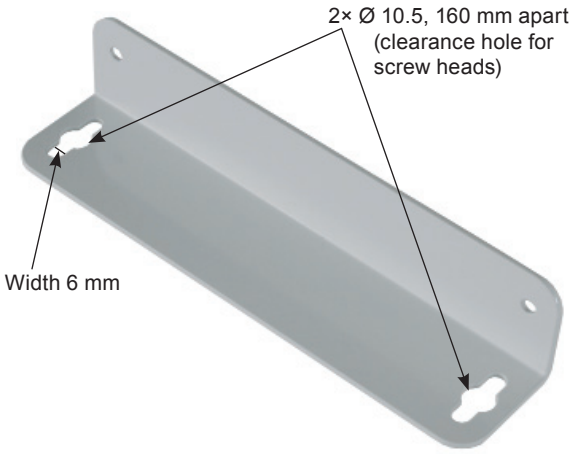
4.5 Mounting the drain set

The drain set is already pre-mounted on the tank.
Piping with an odour trap must be properly installed in order to connect the drain set to a nearby drainage system.

5 HF generator

5.1 Suspending the HF generator (recommended)

The HF generator is to be suspended next to the ultrasonic oscillating tank dust-free and dry. A minimum distance of 10 cm in all directions is required for sufficient cooling
⇒ installation in an enclosed structure is not permitted.



1. Drill holes for the screws (e.g. M5) leaving 160 mm of distance between them and ensuring that there is sufficient height.
2. Attach the HF generator.

The HF generator can be suspended on either the right- or left-hand side (supplied from the factory as a right-hand version).

5.2 Positioning the HF generator

Position the HF generator dust-free and dry on a firm base near the ultrasonic oscillating tank. A minimum distance of 10 cm in all directions is required for sufficient cooling.
⇒ Installation in an enclosed structure is not permitted.

6 Control unit

Depending on the version, the TRISON Base control unit must be mounted on either the right- or left-hand side of the work surface, next to the ultrasonic oscillating tank (tank outlet must point to the control unit!). The information and diagrams in chapter 3 must be regarded.

The following must be taken into consideration prior to assembly and drilling of the holes.

- The unit can be swivelled on its base by up to 180° in increments of 15° (12 stops)

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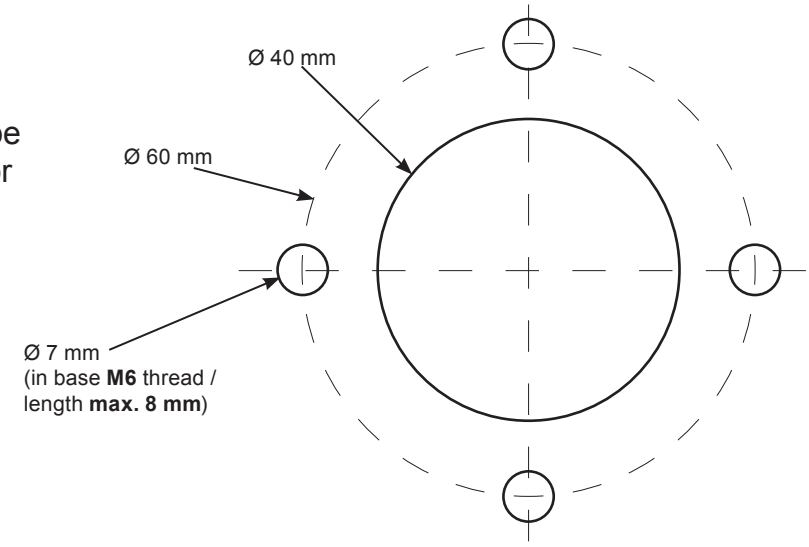
- From a production perspective, the layout of the fixation holes cannot be specified beforehand. Therefore
  - Place the control unit on its side and turn the base through 6 lock-in positions (clicks), starting from the left or right limit position (= midpoint of the subsequent swivel range).
  - Mark the drill holes on the outer edge of the base (can be wiped off).
  - Position the control unit on its future fixation spot in accordance with the position diagram on the next page, and turn it toward the user.
  - Then, transfer the marked drill holes on the base to the work surface.
- Use and position the flat seal as a template, drill and deburr the drill holes.
- Align the flat seal toward the work surface, in accordance with the drill holes.
- Screw in the threaded rods as mounting aids in the base.
- Guide both connectors through the work surface.
- Align the control unit while inserting the threaded rods through the corresponding drill holes.
- Now secure the base from the bottom onto the remaining holes using screws. Remove the threaded rods and replace them with 2 screws.
- Set up the compressed air connection under the table top. To do so, use the coupling socket supplied. See chapter 8.
- If desired, connect the Ethernet cable to the corresponding interface of the control unit.
  IMPORTANT:
  The specified degree of protection for the control unit is only preserved by using the supplied Ethernet connector.
  To do this, mount the plug to an existing, conventional Ethernet cable.

Assembly diagrams

The following drill holes must be provided in the work surface for assembly purposes.



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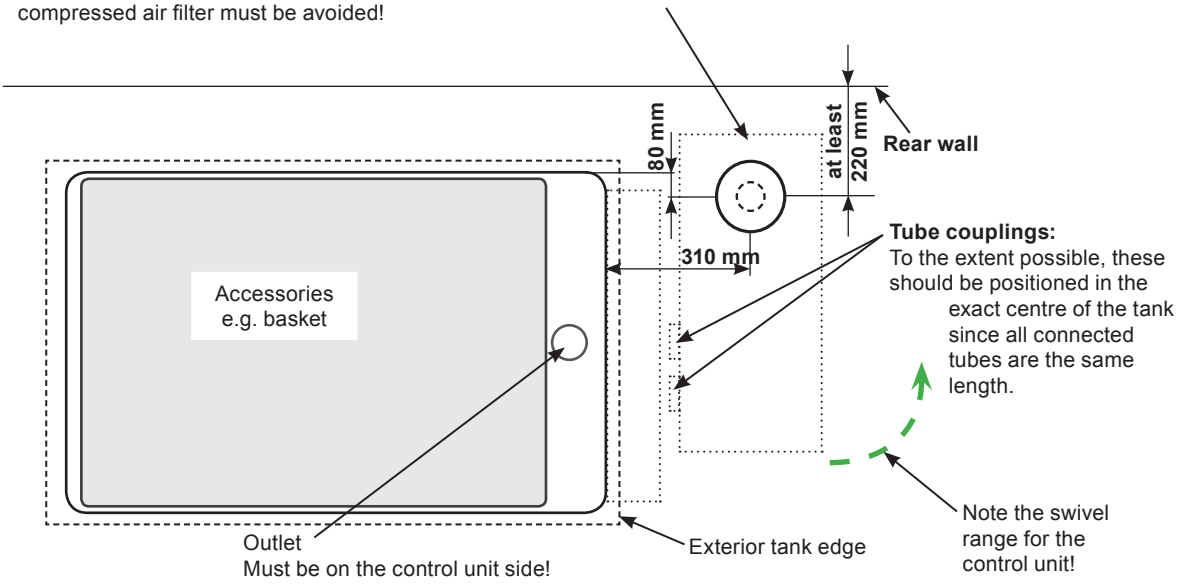
Position diagram

Control unit:
Position of a TB ... R (the data given must be mirrored for the TB ... L).
The control unit can be swivelled.
The customer may have to install an upstream compressed air filter behind the unit.
In addition, the distance to the rear wall must also be taken into account – any impact with the housing or compressed air filter must be avoided!

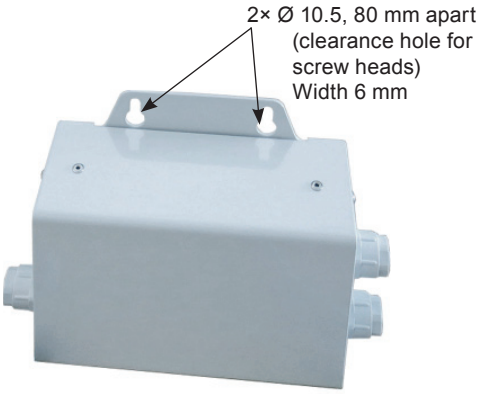


6.1 Mains supply switch

6.1.1 Positioning the mains supply switch

Position the mains supply switch dust-free and dry on a firm base near the HF generator and the TRISON control unit.

6.1.2 Suspending the mains supply switch

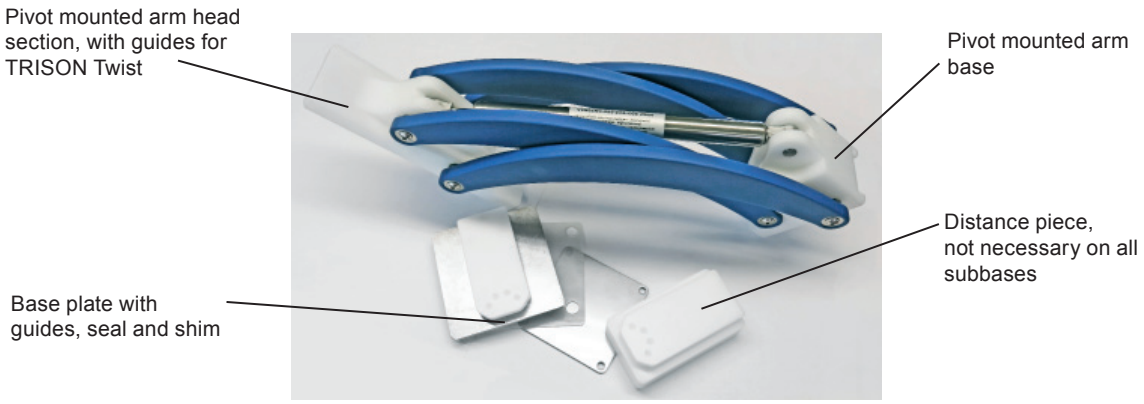


Suspend the mains supply switch dust-free and dry on a firm base near the HF generator and control unit TB.

1. Drill holes for the screws (e.g. M5) leaving 80 mm of distance between them and ensuring that there is sufficient height.
2. Suspend the mains supply switch.

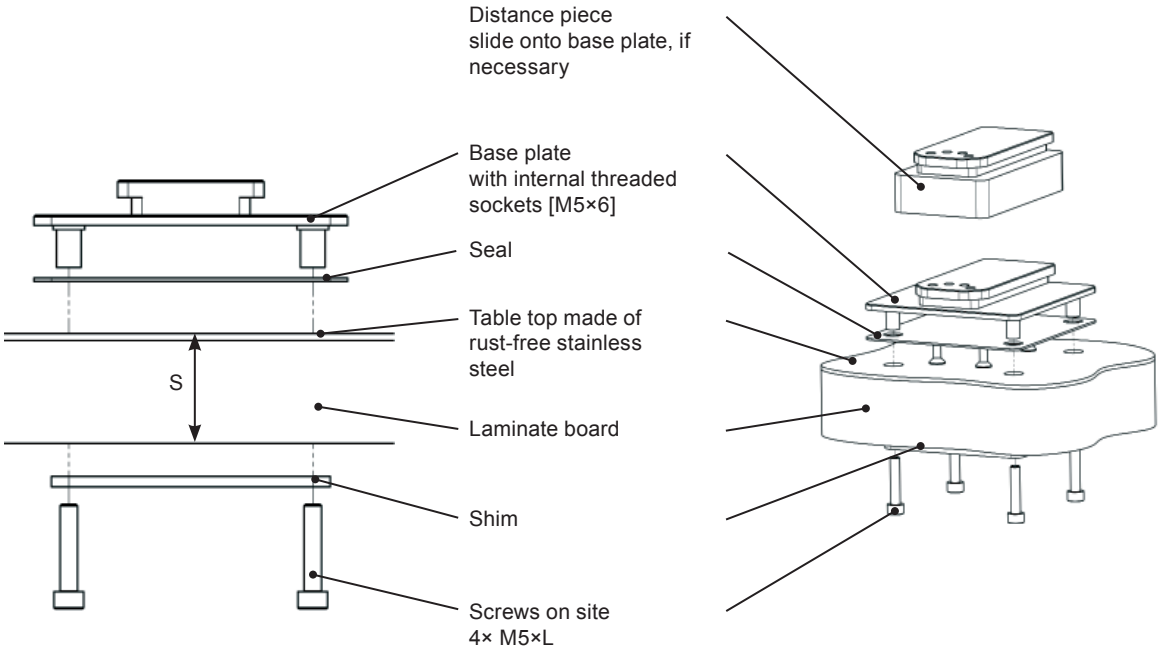
7 Pivot mounted arm TRISON Lift (only at TRISON 4000)

The pivot mounted arm TRISON Lift TL 4000 is mounted on the work surface, on the left (by the left-sided control unit TB ... L) or on the right (by the right-sided control unit TB ... R), behind the ultrasonic oscillating tank. See enclosed drawing for exact position specification and hole sizes.



- Use and position the seal as a template, drill (4× Ø 10 mm), and then deburr the drill holes.
- Align the seal toward the work surface, in accordance with the drill holes.
- Insert the pivot mounted arm's base plate in the drill holes and affix from below using suitable screws and the shim.
- Slide the distance piece onto the base plate, if neccessary, like the TRISON lift. This is only than useful if the laminate board ist thinner than 20 mm!

Assembly diagram:



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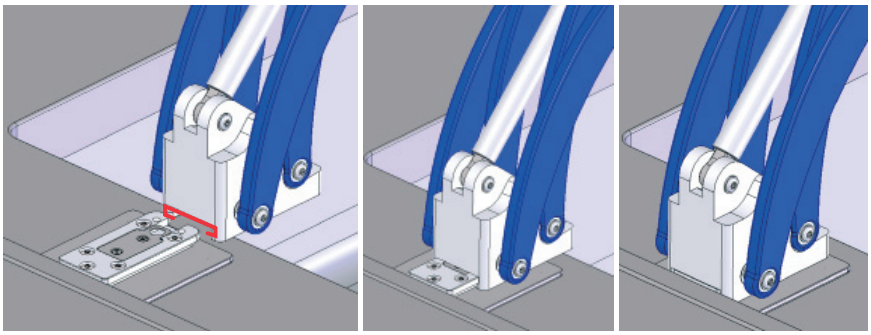
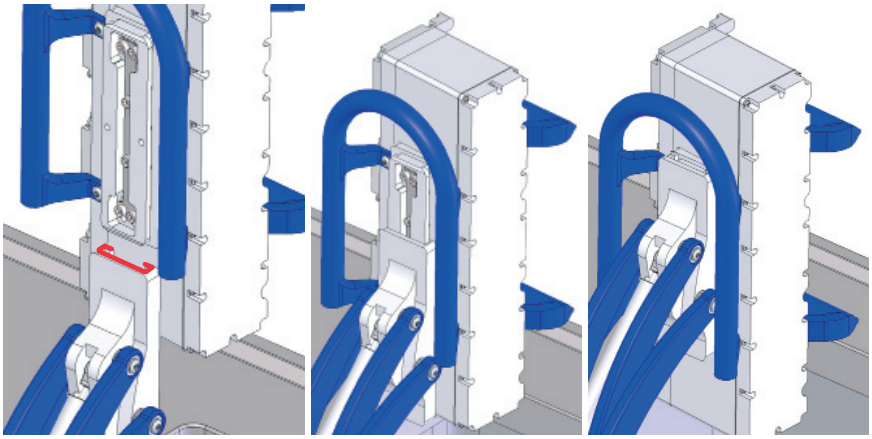
- Hold the TRISON Lift from the base and slide it from its guide onto the base plate, until the dead stop is reached (it clicks into place).

View:
As seen from the back



- Attach the TRISON Twist moving device in accordance with the TRISON instructions for use (no special mounting required – simple suspension).

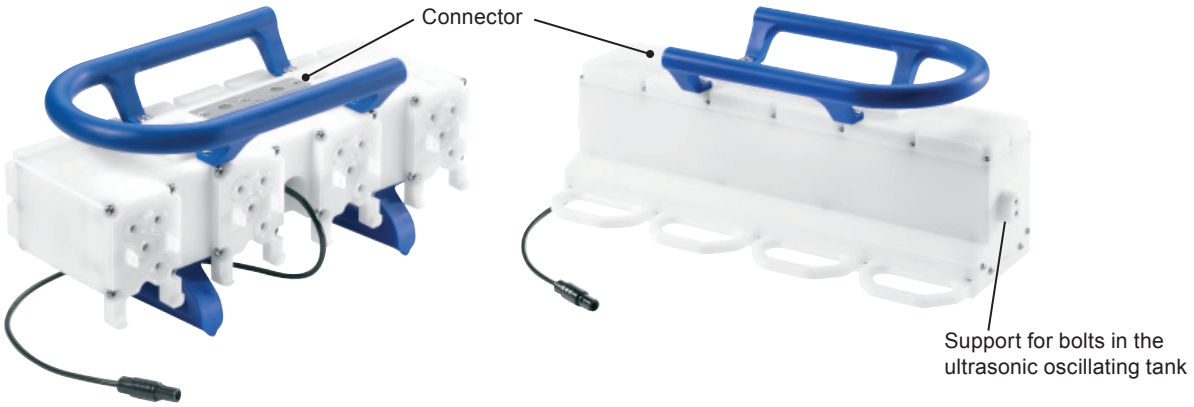
View:
As seen from the back



- Hold the Twist from the handle and lower into the ultrasonic oscillating tank. Check that it is not bumping or rubbing laterally against the oscillating tank. Exception: With its supports, the Twist 4000 Si may rest on the bolts in the oscillating tank.
  If it makes contact with the oscillating tank, swivel the Twist upwards and remove. Remove the screws on the Twists connector, reposition the connector slightly, then re-tighten. Conduct this adjustment as long as needed, until the Twist is centrally positioned in the ultrasonic oscillating tank and can be swivelled.

TRISON Twist 4000 Xi R

TRISON Twist 4000 Si R



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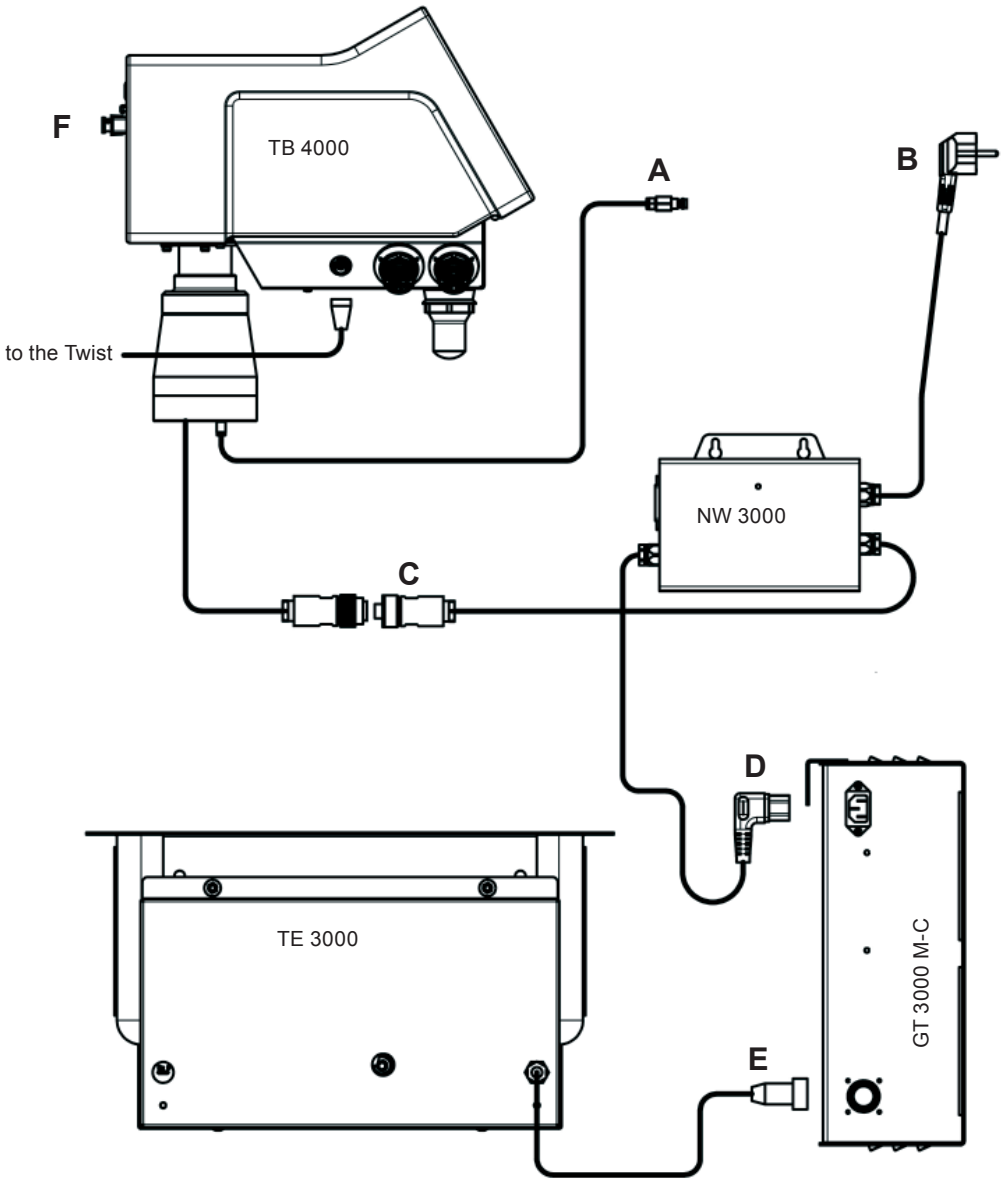
8 Connection of the ultrasonic bath



Set up the connections in the following sequence:

- Plug the compressed air connector (A) into an already-existing socket on site.
- Connect the power supply (C) for the TRISON Base to the mains supply switch and secure by screwing them together.
- Connect the HF plug (E) for the ultrasonic oscillating tank to the HF generator and secure by screwing them together. If necessarry remove short-circuit bridge from the HF plug.
- Connect the mains power supply (D) for the HF generator to the mains supply switch.
- Plug the main power supply (B) for the complete unit into the grounded socket outlet only when all this is done.
- For using the TRISON Ethernet interface (F), always use the supplied ethernet connector, the normally plug does not provide sufficient protection against possible water penetration. For this, cut off the existing plug of the network cable and fasten the supplied connector according to the enclosed instructions.

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9 Functional check following mounting

To perform this functional check, the tank outflow must be closed.

1. Fill the tank with water up to the filling level mark.
2. Turn on the ultrasonic bath from the TRISON Base's power switch, follow the instructions for use to do so.
3. If available connect the TRISON Twist to the control unit.
4. Select the "Robotic Instruments" program and press  until the channel selection appears. Select both couplings (A+B) and start. Skip soaking (soaking running) by pressing the  Button and allow program to run for approx. 5 min. No errors may be displayed. During this time, look for any leaks in the bottom-mount cabinet. Check for movements at the connected TRISON Twist.
5. Stop the process and turn off the ultrasonic bath once again.
6. Drain the water.

Once mounting is completed, affix the enclosed safety adhesives on clearly visible spots near the ultrasonic oscillating tank, e.g. on the front of the bottom-mount cabinet.

9.1 Foil test

After all execute a foil test according the enclosed information.

10 Technical data

TRISON ultrasonic baths are interference-free and CE - marked.
Safety: EN 61010-1
EMC: EN 61326-1

Ambient conditions according to EN 61 010-1

- Overvoltage category:	II
- Degree of contamination:	2
- Protection class:	I
- Permissible ambient temperature:	15 to 35 °C
- Permissible relative humidity up to 31°C:	80 %
- Permissible relative humidity up to 40 °C:	50 %
- Altitude:	up to 2000 m

- No condensation allowed.
- Only for indoor operation.

“Details on use as a medical device” and “Information on EMC” can be found in the Instructions for Use.

10.1 Ultrasonic oscillating tank TE 3000

- Oscillating tank HF connection: 2 m cable with AMP-CPC jack (drill hole with Ø 35 mm required)
- Degree of protection: IP 20 pursuant to DIN EN 60529 (for more details see chapter 10.2)

Type	Materials	Interior dimensions (LxWxH) mm	Operating volume l	Outlet	Exterior dimensions (L×W×H) mm	Weight kg
TE 3000	Stainless steel, soldered	770 × 420 × 165/190	35.0	Drain set G 1½	900 × 480 × 245/275	24

10.2 HF generator GT 3000 M-C

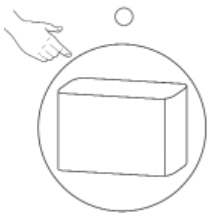
- Mains connection: 230 V~ (± 10 %) 50/60 Hz
- HF frequency: 38 kHz
- Degree of protection: IP 20 according to DIN EN 60529 (for more details see below)

Type	Ultrasonic peak power W*	HF power W_{eff}	Current consumption A	Circuit breaker	Exterior dimensions (L×W×H) mm	Weight kg
GT 3000 M-C	3040	760	3.3	4× F2A	360 × 310 × 142	4

* In order to improve the effect, the ultrasound is modulated, whereby a 4-fold HF power value is obtained as ultrasonic peak power in connection with SweepTec.

Degrees of protection:

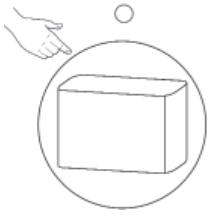
IP 20 according to DIN 60529



Protected against access by fingers to hazardous parts; protected against solid foreign bodies with a diameter of 12 mm or larger

Not protected against ingress of water

IP 22 according to DIN 60529



Protected against access by fingers to hazardous parts; protected against solid foreign bodies with a diameter of 12 mm or larger

Protected from dripping water up to 15° from its vertical axis

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10.3 Control unit TRISON Base

Control unit TB ... L / R

Required to operate the mains supply switch.

- Exterior dimensions (incl. rotary base): 370 × 190 × 380 mm (L×W×H)
- Current consumption: 0.2 A
- Power: 35 W
- Compressed air connection: Coupling plug: NW 7.2 (without connection hose)
  Input pressure: 5 ... 9 bar, ISO 8573-1:2010 [7:4:4]
- Fuses: 2× F3,15A
- Interfaces: USB (front side), ethernet RJ45 (on the back side)
- Degree of protection: IP 22 pursuant to DIN EN 60529
  (for more details see chapter 10.2)
- Weight: 9.1 kg

Mains supply switch NW 3000

- Dimensions: 220 × 60 × 145 mm (L×W×H)
  300 × 60 × 145 mm (L×W×H) - with cable
- Mains connection: 230 V~ (± 10 %) 50/60 Hz
- Current consumption: 0.005 A
- Power: 1 W
- Mains fuse: 10 A
- Connectors:
  - Approx. 1.2 m mains cable with safety plug for connection to the mains.
    (drill hole Ø 60 mm required)
  - Approx. 1.0 m data cable with mains connector to the HF generator.
  - Approx. 1.4 m mains cable with flange socket for connection to the control unit TB ...
- Degree of protection: IP 20 pursuant to DIN EN 60529
  (for more details see chapter 10.2)
- Weight: 1.1 kg

10.4 Pivot mounted arm TRISON Lift (only at TRISON 4000)

- Type: TL 4000
- Exterior dimensions: 240 × 95 × 350 mm (L×W×D)
- Material: Stainless steel, POM and PU (polyurethane)
- Weight: approx. 3 kg

If service is required, please contact your specialist dealer or write to us at the address provided.

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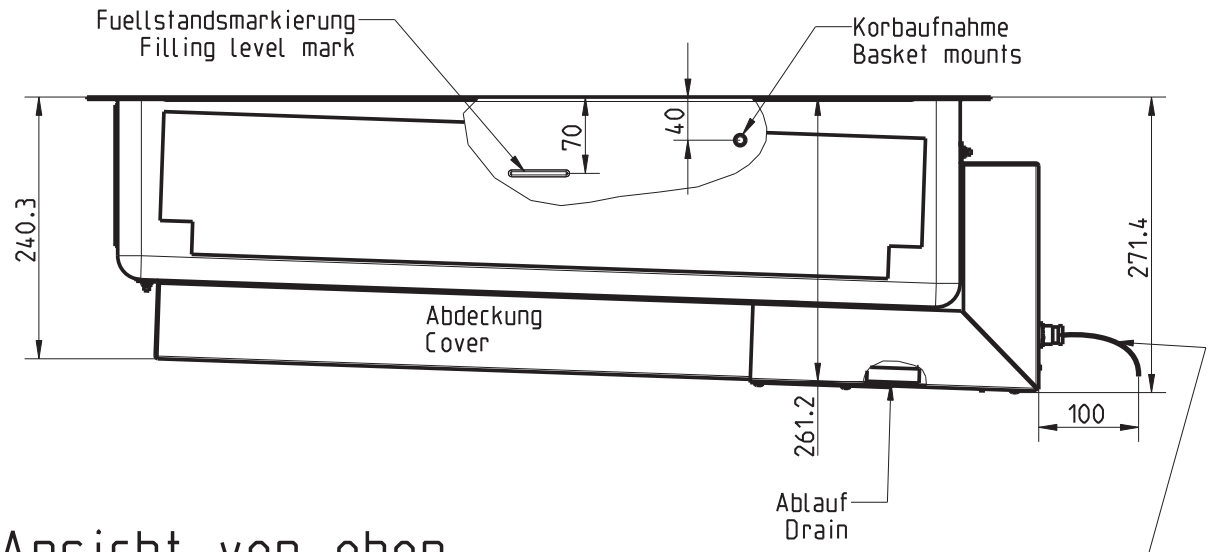
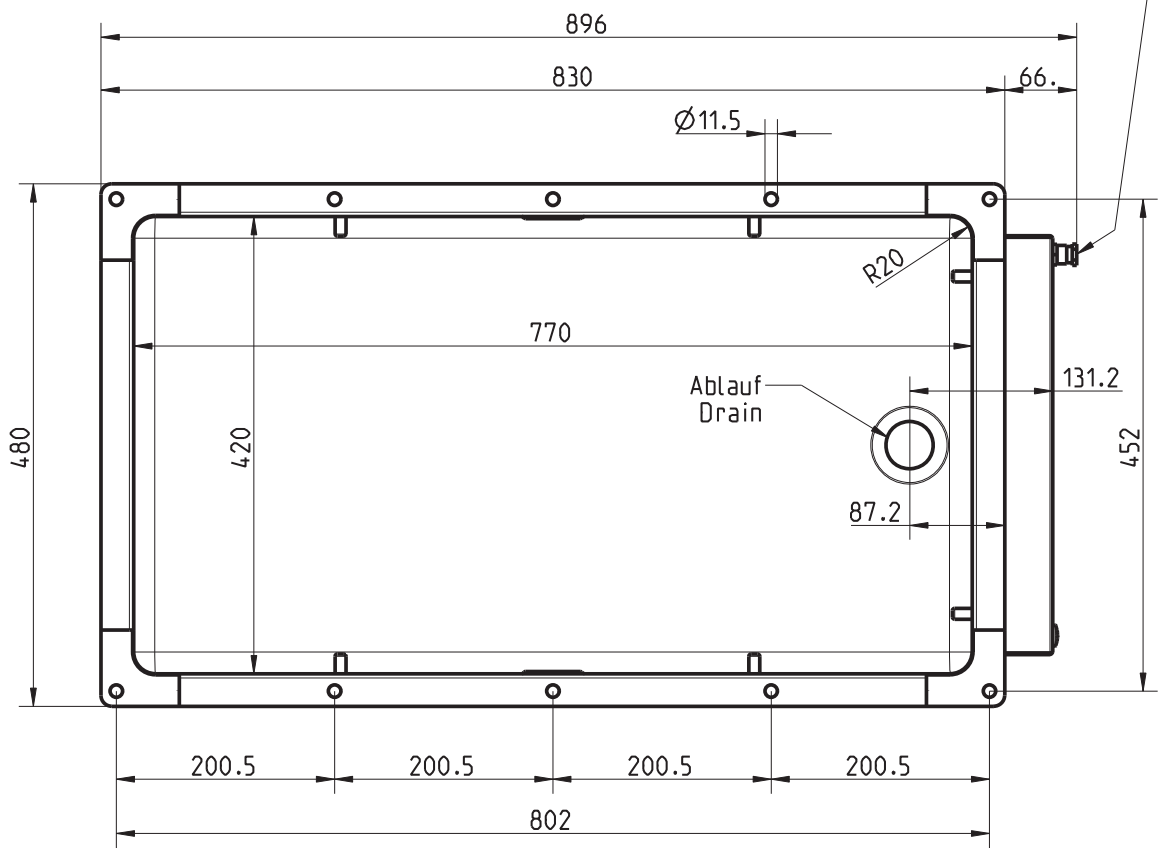
Zertifiziert nach
EN ISO 9001:2008
EN ISO 13485:2012



Ansicht von oben
View from above

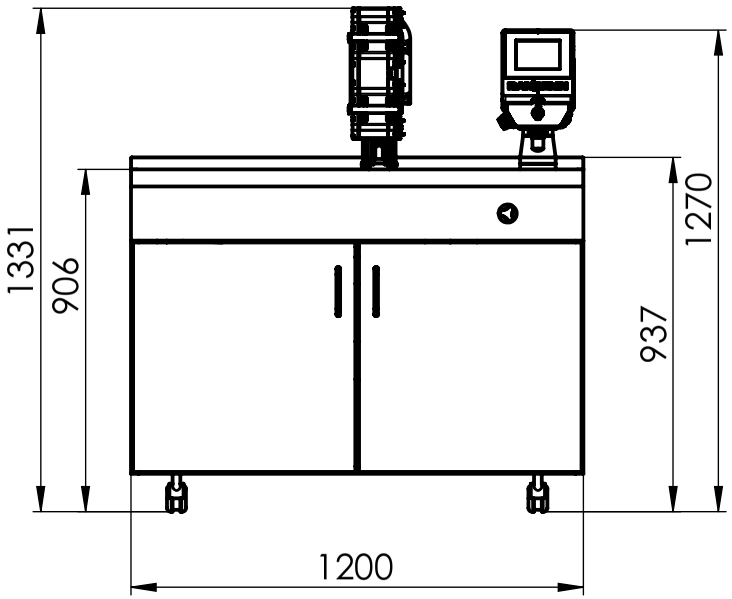


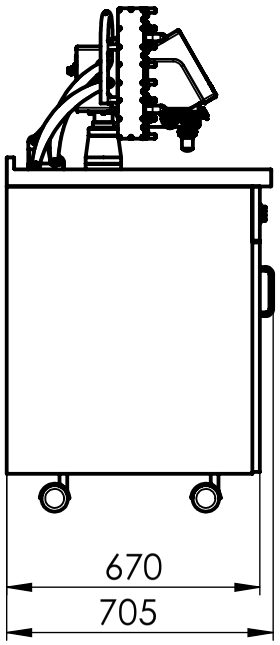
BANDELIN
electronic GmbH & Co. KG

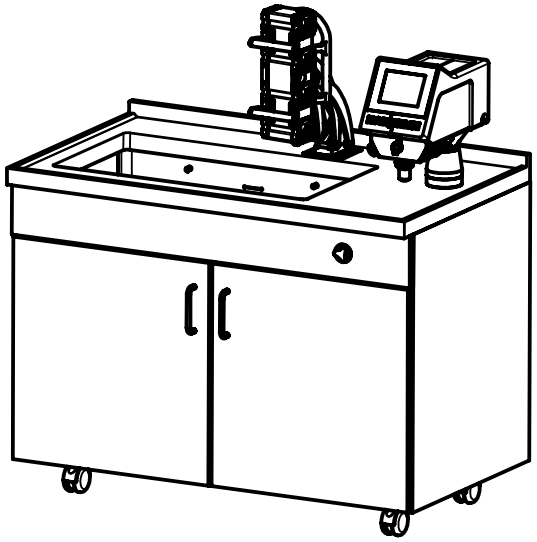
Benennung
Wanne TE 3000
komplett
Tank TE 3000
complete

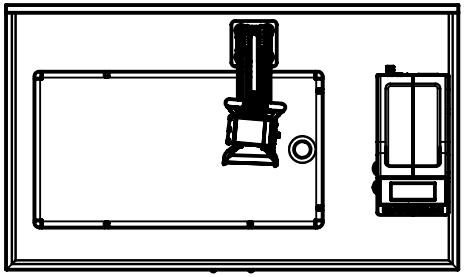
Zeichnung-Nr.
TT-3279
08.04.2014

Maßstab
3:20
A4



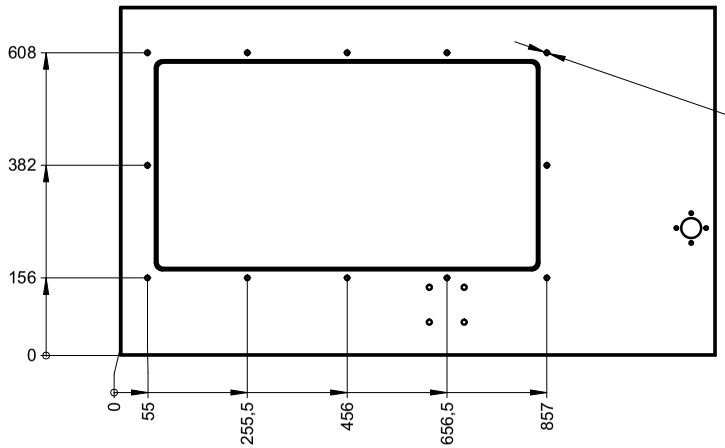




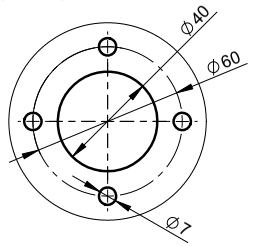


Masse [kg]	BANDELIN electronic GmbH & Co. KG
Maßstab 1:20	Benennung: TRISON - Gesamtaufbau - complete assembly - assemblage complet
A4	
	Zeichnungsnr. MT-5493-MA / Blatt 1 von 1
SW	Datum 17.11.2015

Ansicht von unten
View from below
Vue du dessous

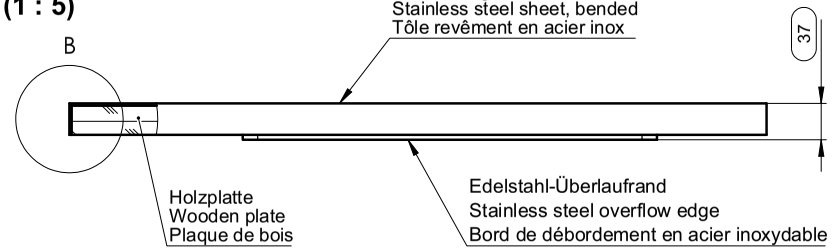


A (1 : 2)

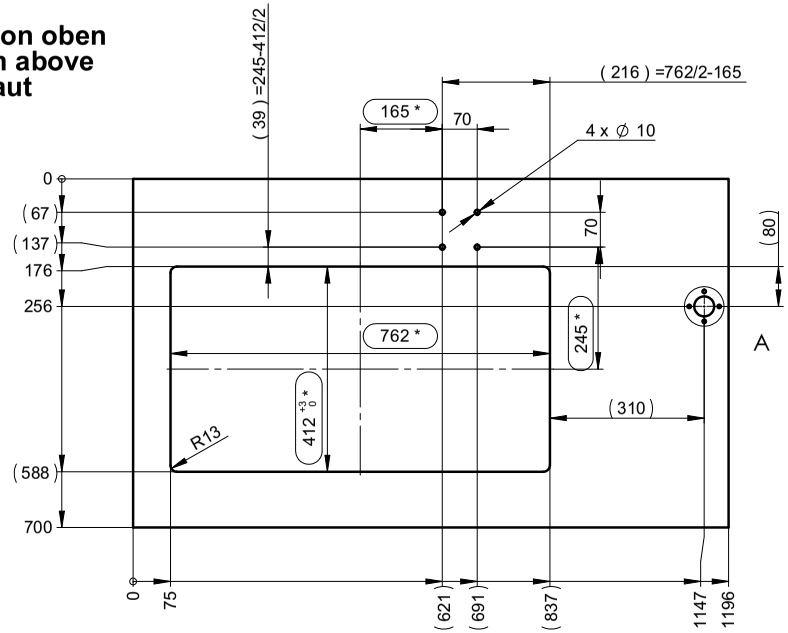


Vorderansicht
Front view
Vue de face

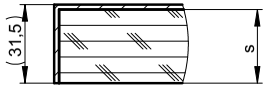
Seitenansicht
Side view
Vue de côté
(1 : 5)



Ansicht von oben
View from above
Vue de haut



B (1 : 2)



Empfohlen: s = 20 ... 40 mm
Wenn s = 0 ... 20 mm dann
Erhöhungsstück verwenden

Recommended: s = 20 ... 40 mm
If s = 0 ... 20 mm than
use distance piece

Recommandé: s = 20 ... 40 mm
Si s = 0 ... 20 mm alors
l'utilisation distance piecè

* **Innenmaße**
Wichtig für die Funktion (Zubehör)!

Internal dimensions
Important for the function (accessory)!

Dimensions intérieures
Importantes pour la fonction (accessoire)!

Masse [g]	BANDELIN electronic GmbH & Co. KG
Maßstab 1:10	Benennung: Lochbild - Trison rechts / Hole pattern - Trison right / Gabarit de trous - Trison droit
A3	
SW	Zeichnungsnr. MT-5549-MA
	Blatt 1 von 1
	Datum