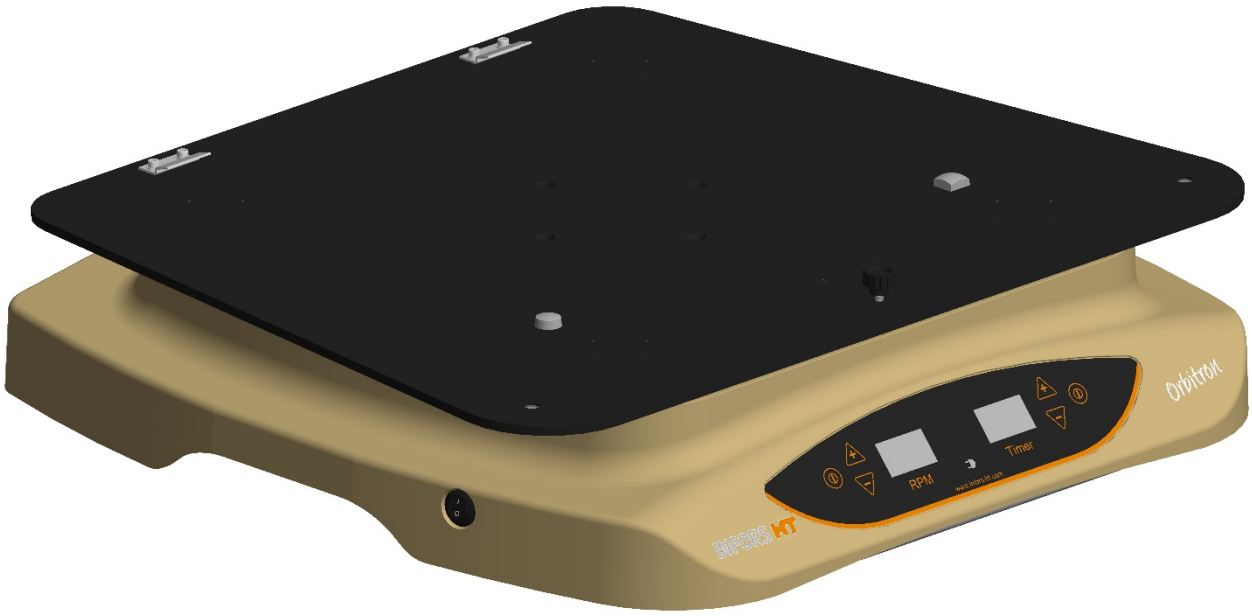
Operating Manual

Orbitron

Bench-top Shaker



Dok-ID: 79334 / V.03.01 - Original

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1 General Information

1.1 About this Manual

This manual enables the safe and efficient handling of the device.

All the information and instructions in this operating manual comply with the current standards, legal regulations, the latest technological and scientific developments and the knowledge gained from the manufacturer's many years of experience in this field.



This operating manual is a component part of the device. It must be kept near to the device and must be accessible to the operators at all times.
The users must read the operating manual thoroughly and fully understand its contents before beginning any work.
Adhering to all the safety and operating instructions in this manual is essential to ensure that work is carried out safely.

The scope of delivery may differ from the explanations, descriptions and figures in this operating manual due to special designs, additional options specified on ordering and the latest technical/mechanical modifications.

This manual contains illustrations to aid general understanding. These may differ from the actual device as supplied.

1.2 Explanation of Special Notices

1.2.1 Warning Notices

Warning notices in this manual are indicated by a coloured bar and begin with a signal word that signifies the degree of the hazard.

DANGER

The signal word “DANGER” indicates a dangerous situation that will lead to severe or even fatal injuries if not avoided.

WARNING

The signal word “WARNING” indicates a potentially dangerous situation that may result in severe or even fatal injuries if not avoided.

CAUTION

The signal word “CAUTION” indicates a potentially dangerous situation that may result in minor injuries if not avoided.

1.2.2 Other Notices

ATTENTION

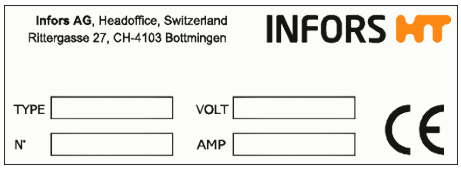
The word “ATTENTION” on a blue bar indicates a situation that may result in significant damage to property if not avoided.

INFORMATION

Texts located below a grey bar bearing the notice “INFORMATION” provide useful tips and recommendations for ensuring efficient, fault-free operation of the device.

1.3 Device Identification (Standard Identification Plate)

The identification plate is designed to allow clear identification of the device. It contains the following information:



- Manufacturer name and address
- TYPE = Device type (name)
- N° = Serial number
- VOLT = Nominal voltage
- AMP = Current consumption
- CE marking

1.4 Declaration of Conformity

The device is in compliance with the essential requirements of the following Directives:

- Machinery Directive 2006/42/EC
- EMC Directive 2014/30/EU

The Declaration of Conformity according to EC Machinery Directive 2006/42/EC, annex II 1 A is attached to the operating manual (see chapter 12 "EC-Declaration of Conformity", page 56).

1.5 Customer Service and Services

Our Customer Service is at your disposal for technical advice and specialist enquiries. For contact information, see page 2.

Due to their familiarity with the potential applications of the device, the Customer Service team is able to provide information on whether the device can be used for a specific application or modified to handle the planned process.

Furthermore, our colleagues are always interested in new information and experiences resulting from user's applications for the device that may be valuable for the continued development of our products.

2 Safety and Responsibility

This section describes general considerations relating to user safety that must be taken into account when working with the device.

In the remaining sections, warning notices are used only to highlight particular hazards directly arising from the actions being described in the section in question.



It is essential to read the operating manual carefully – especially this section and the warning notices in the text – and to follow the instructions therein.

This section also refers to areas that are the responsibility of the provider due to certain risks arising from particular applications for which the device is used deliberately and with full awareness of the associated risks.

2.1 Intended Use, Incorrect Use and Misuse

The device is designed to be used as a shaker for cultivating microorganisms or cell cultures in a laboratory environment.

The device is designed and constructed exclusively for the intended use described above.

Intended use also includes following all the instructions in this manual, especially those relating to:

- The installation site
- Use of suitable cultivation vessels
- User qualifications
- Correct operation and maintenance

Any failure to observe the requirements specified in this manual shall be deemed incorrect use, in particular, use of inappropriate cultivation vessels and/or unsuitable holders at speeds that are too high.

Any use of the device outside the scope of the intended use as described above shall be deemed misuse. This also applies to applications for which the device is not designed, especially the following:

- The device is not protected against explosions. Use and manufacture of explosive gases as well as operating the device in the Ex area are therefore not permitted.
- Any use of the device outside of a biotechnology laboratory, i.e. in any environment in which the conditions required for the safety of users cannot be met or cannot be met to their full extent, shall also be deemed misuse.

To use the device for special applications not covered by conventional, intended use, the device must be modified and certified accordingly by the manufacturer.

2.2 Cultivation Vessels to Be Used

Significant forces are applied to cultivation vessels, in particular in case of large vessels and high speeds. Hence, the cultivation vessels used are particularly significant in relation to user safety.

ATTENTION

Use of unsuitable or defective cultivation vessels can lead to glass breakage and therefore damage to property.

Approved cultivation vessels

The device has been designed for use with the following vessels using the holders designed specifically for them:

- Erlenmeyer flasks up to 5,000 mL made of borosilicate glass (e.g. Schott Duran®) or high-grade plastic, such as polycarbonate (z. B. Corning®) etc.
- Fernbach flasks up to 3,000 mL made of borosilicate glass (e.g. Schott Duran®) or high-grade plastic, such as polycarbonate (z. B. Corning®) etc.
- Other vessels with the holders designed for them:
  - Test tubes
  - Centrifuge tubes
  - Microtitre plates
  - Deep well plates

To avoid the vessels coming out of the clamps at very high speeds, they might have to be secured using cable ties underneath the springs or some other suitable measure.

Trays with Sticky Stuff

INFORMATION

For trays with Sticky Stuff, special provisions apply in relation to maximum permitted speeds. These must be observed to prevent cultivation vessels from detaching.

For detailed information see chapter 4.1.3 "Tray with Sticky Stuff", page 24.

2.3 Qualified Personnel

Due to the complexity of the device and the potential risks arising from its operation, the device may only be used by qualified, specialist personnel.

2.3.1 Provider

The term “provider” applies to all persons who are responsible for making the device and the necessary infrastructure available. These persons may also be included in the group of people known as “users”, though this is not always the case.

Irrespective of whether a provider is a member of the company’s board of management or a supervisor, they bear a special level of responsibility with regard to the processes and the qualification and safety of the users.

2.3.2 User

General

The term “user” applies to all persons who come into contact with the device in any way and perform work on or with it. This primarily applies to the following activities, which can be performed by the manufacturer’s own specialists or a variety of other persons (it is not always possible to distinguish clearly between the different types of person):

- Assembly, installation and commissioning
- Definition and preparation of the process
- Operation
- Troubleshooting and remedying of faults
- Maintenance and cleaning (autoclaving, if necessary)
- Service work and repairs
- Disassembly, disposal and recycling

Qualified personnel

On account of their specific education, training and – in many cases – experience, the qualified personnel required for this work are able to recognise risks and respond accordingly to potential hazards.

The qualified personnel (either internal or external) who cannot be categorised under the separate “operators” group are made up of the following groups of persons:

- Electricians (electrical engineers)
- Decontamination specialists
- Repair specialists
- Specialists in disassembly and (environmentally friendly) disposal
- Recycling specialists

2.3.3 Operator

The “operators” are a specific sub-group of users distinguished by the fact that they work with the device. They are the true target audience for this operating manual.

Qualified technicians

Only technicians who have been trained for working in a biotechnology laboratory can be considered for the role of operator. These include:

- Process technicians in the fields of biotechnology and chemistry
- Biotechnologists (biotechnicians)
- Chemists with a specialisation in biochemistry; chemists in the field of organic chemistry or biochemistry
- Life scientists (biologists) with special education in cytology, bacteriology, molecular biology, genetics, etc.
- Lab assistants (lab technicians) from various fields

In order to be classed as a “sufficiently qualified technician” for the operation of the device, the persons in question must have received thorough training and have read and understood the operating manual.

The operator must be informed in a training session provided by the provider of the tasks delegated to the operator and the potential risks of improper conduct. Tasks that go beyond the scope of operation under normal conditions may only be performed by the

operator if this is specified in the manual and the provider has explicitly entrusted said tasks to the operator.

Technicians in training

Persons in this group who are undergoing training or apprenticeships are only permitted to use the device under supervision and in accordance with the instructions of a trained and qualified technician.

2.4 Unauthorised Persons

The term “unauthorised persons” applies to all persons who can access the work area but are not qualified to use the device in accordance with the aforementioned requirements.

Unauthorised persons are not permitted to operate the device or use it in any other way.

2.5 Responsibility of the Provider

The device is used for industrial and scientific purposes. As such, the provider of the device is individually liable with regard to the legal requirements relating to occupational health and safety in a biotechnology laboratory. In particular:

- The provider is responsible for ensuring that the work and environmental regulations applicable in a biotechnology laboratory are observed.
- The provider must ensure that the device remains in safe and proper working condition throughout its entire term of use.
- The provider must ensure that all safety equipment is fully functional and is not disabled.
- The provider must ensure that the device is only worked on by qualified users, and that said users receive sufficient training.
- The provider must ensure that the protective equipment required for working with the device is provided and worn.
- The provider must ensure that this operating manual remains in the immediate vicinity of the device throughout its entire term of use.

2.6 General Hazards

This section covers general hazards and residual risks that are always present when using the device in accordance with normal, intended use.

The following notices are general in nature. As such, with a few exceptions they are not repeated in the remaining sections.

2.6.1 Electrical Current



The device runs on electrical power. There is an immediate risk of fatal injury if contact is made with live parts. The following points must be observed in order to avoid the risk of fatal injury:

- In case of damage to insulation, disconnect the device from the power supply immediately and arrange for it to be repaired.
- Always use qualified electricians for any work on the electrical components of the device.
- Disconnect the device from the mains before beginning any maintenance, cleaning or repair work.
- Keep moisture away from live parts. It could cause a short circuit.
- Never remove the covers from the casing when the power supply is switched on.
- Only use the power unit provided or one with the same specifications.

2.6.2 Danger due to Moving Parts



If you are not careful, the orbital movement of the table can result in parts of your body getting pinched or scratched or sustain other injuries. To avoid injuries, observe the following:

- Only load or unload the device when the table has come to a complete standstill. Never touch the moving parts of the device.
- Ensure that hair and lose clothing cannot come into contact with the rotating parts of the device.

2.6.3 Unauthorised Spare Parts and Accessories



Incorrect or imitated spare parts and accessories as well as spare parts or accessories that have not been authorised by the manufacturer represent a significant safety risk. As such, we recommend procuring all spare parts and accessories from an authorised dealer or directly from the manufacturer. For the contact details of the manufacturer's representatives, see page 2.

2.7 Particular Hazards

This section covers particular hazards and residual risks that may arise when using the device for special applications in accordance with normal, intended use.

Since the use of the device for such applications is deliberate, it is the responsibility of the operators and the provider to ensure that all personnel are protected from potential damage to health. The provider is responsible for ensuring that the appropriate protective equipment for such applications is provided, and that the necessary infrastructure is in place.

2.7.1 Flammable or Explosive Substances



The use or production of flammable or explosive substances is not covered under "intended use" of the device, as the device is not explosion-proof.

If the provider intends to use the device for such purposes, he must check its suitability for the planned application with the responsible local authorities.

2.7.2 Corrosive or Toxic Substances



The use or production of corrosive or toxic substances entails a significant health risk. As such, special measures must be taken to protect the users for such applications.

Since the device is used deliberately for such applications, it is the responsibility of the users to ensure that they have sufficient protection.

2.7.3 Bioactive Substances or Pathogenic Organisms



The use or production of bioactive substances, pathogenic organisms or genetically modified cultures entails a significant health risk. As such, special measures must be taken to protect the users for such applications.

Since the device is used deliberately for such applications, it is the responsibility of the users to ensure that they have sufficient protection.

2.8 Declaration of Decontamination

When returning the device for repair, disassembly or disposal, it is required for the safety of all parties involved and because of legal provisions that a lawful declaration of decontamination is present.

The following must be observed if this is the case:

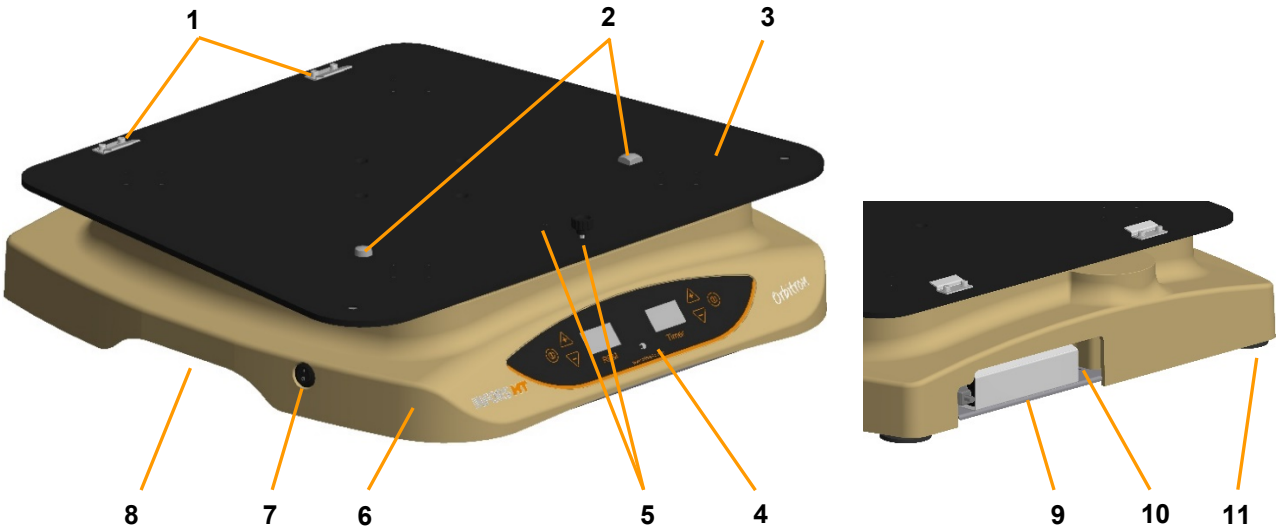
- The device, the component part or accessory must be entirely decontaminated before sending to the manufacturer
- The provider is therefore required to completely and truthfully fill out a declaration of decontamination, and have it signed by the person responsible.
- **The declaration of decontamination must be affixed on the outer packaging in which the device is sent back.**
- These forms can be obtained from the licensed dealer or the manufacturer. See address on page 2.

Important notice

If the return shipment is not accompanied by a signed and complete declaration of decontamination or it is not affixed to the outer packaging, the shipment will be returned unopened to the sender at their expense (see also T&C).

3 Setup and Function

3.1 Basic Unit



1	Fixing clips	7	Power switch
2	Tray centring wedges (in back position)	8	Grip recesses (on both sides)
3	Table	9	Power unit compartment with power unit
4	Operating panel	10	Power unit connection socket
5	Drill holes for fixing screw	11	Non-slip feet (4x)
6	Casing with shaker drive		

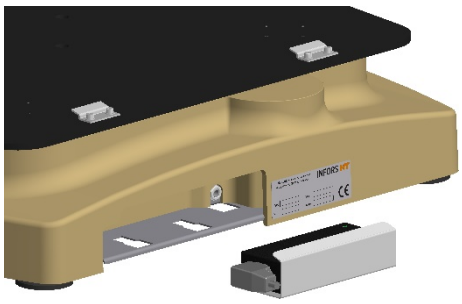
Brief description

Orbitron is a small shaker that has been designed specifically for use on a bench or in an incubator. The table moves in circles at speeds of 20 to 550 min^{-1}.

To affix the cultivation vessels, various trays of sizes N and M are available. These can be mounted on the table and equipped with various holders or Sticky Stuff adhesive matting. A fixing screw and two holder clips screwed onto the back of the table ensure that the trays are affixed securely.

To ensure the device's stability, the device stands on four non-slip feet. For transporting the device, there are grip recesses on both sides of the device. The device can be operated locally via the operating panel on the front.

Power supply

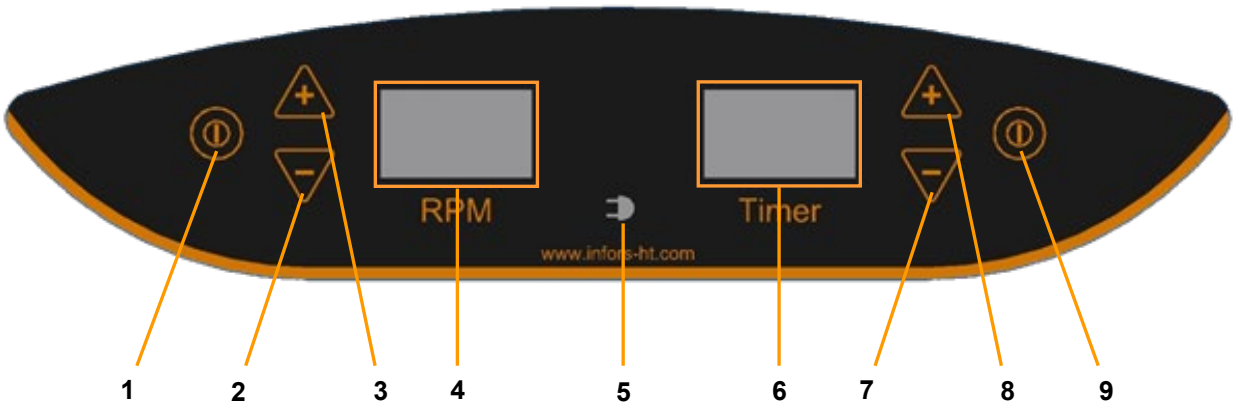


Power is supplied using a power unit that is located in a separate compartment at the back of the device. The power unit is moveable and can be removed from the device if necessary. This is recommendable, in particular, if the device is operated in an incubator. This avoids potential dangers to the user, e.g. pinching or damaging the 230 V power cable.

The power supply is activated and deactivated using a flip switch on the left side of the device. During normal operation, the device can remain switched on continuously, even when it is not in use. In this stand-by state, the device uses approx. 6 watts. If the device is not used for several days, it is recommended to switch off the power switch.

3.2 Operating Panel

All device functions can be controlled directly via the operating panel on the front of the device. The operating panel features the following elements:



1 **Shaker drive control On/Off** button
2 **Decrease rotation speed** button
3 **Increase rotation speed** button
4 Display for the “Rotation speed” parameter (actual values, setpoints, alarm and error messages)
5 *Power supply on/off* function symbol
6 Display for the “Timer” parameter (actual values, setpoints, alarm and error messages)
7 **Decrease Time** button
8 **Increase Time** button
9 **Timer On/Off** button

INFORMATION

The power switch is located on the left side of the device. In addition to normal switching on and off, it also works as an emergency switch, if the device has to be switched off in an emergency.

In case of an emergency shut down via the power switch, all parameter setpoints are stored and the device restarts immediately when it is switched back on via the power switch.

When the device is switched off using the power switch, the parameter setpoints are stored for approx. one month.

Displays

The current actual values, setpoints, alarm messages and error messages are displayed on one or both of the LED displays using three-letter abbreviations.

- During normal operation, the current actual value for the “Rotation speed” (RPM) parameter is displayed in the left display whenever this parameter is active. Otherwise, the display alternates between the entered setpoint and the *OFF* message.
- During normal operation, the remaining time on the timer is displayed in the right display if the timer is active. Otherwise, the display alternates between the entered setpoint and the *OFF* message.

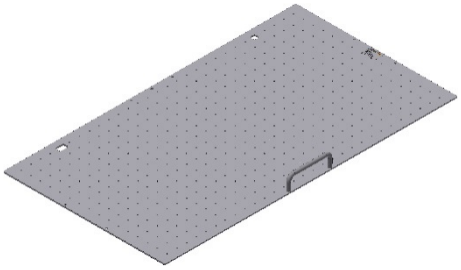
4 Accessories

In the following section, the available accessories for the device are described. For special applications, please contact our customer service for advice (for contact information, see page 2).

4.1 Trays

Different trays are available for the device; these can be purchased individually or ordered with the device. In addition to the universal table tray, which can be equipped as desired, various trays with fixed features are available for different purposes. Orbitron can be used with tray sizes N and M.

4.1.1 Universal Table Tray



The tray referred to as “universal table tray” features drill holes on a grid so that it can be fitted as desired. For fitting, various clamps and test tube holders are available, that can be combined as desired (see chapter 4.2 "Clamps and Other Holders", page 26).

The universal table tray is made of anodised aluminium and can be sterilised in autoclaves if required.

The separately available Sticky Stuff adhesive matting can also be stuck onto the universal table tray.

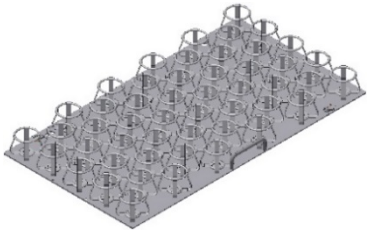
Technical data of the universal table tray		
Description	**Value**	
Material	Aluminium	
Size	N tray	480 x 420 mm
	M tray	850 x 470 mm
Threaded holes	M4	
Number of threaded holes	N tray	224
	M tray	462
Threaded hole grid	28.28 x 28.28 mm	
Sterilisation in autoclave	YES	

4.1.2 Pre-Fitted Trays

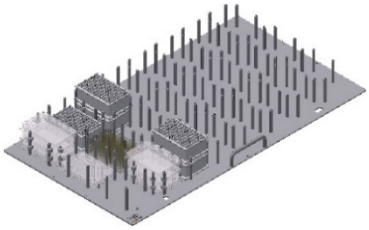
Pre-fitted trays are equipped with one clamp type each. They are used if only a single size of flask is to be used for certain tasks. Unlike the universal table tray, their holders cannot be changed.

Pre-fitted trays feature a capacity that is up to 20% higher than an individually equipped universal table tray. Since no drill holes have to be taken into account in the grid, the clamps can be installed closer together.

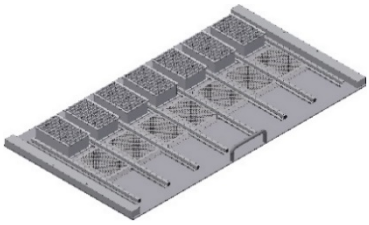
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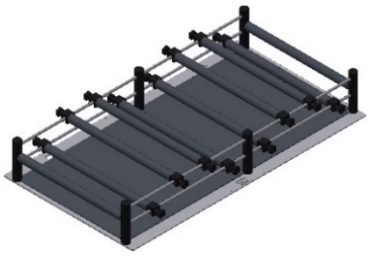
- Tray with steel clamps



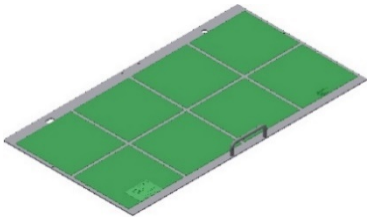
- Tray with pin holders for microtitre and deep-well plates



- Tray with clamps for microtitre and deep-well plates

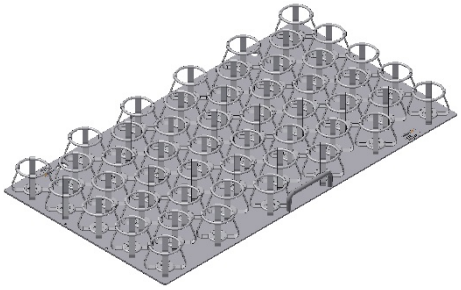


- Tray with sliding bars



- Tray with Sticky Stuff

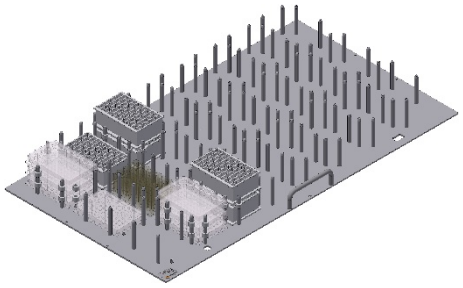
Accessories



Tray with steel clamps

Fitting identical clamps on the entire tray results in the following capacities:

Flask Size		Number of Flasks per Tray	
		N-Tray	M-Tray
25	ml	105	197
50	ml	69	131
100	ml	46	91
250	ml	25	48
300	ml	-	43
500	ml	15	31
1000	ml	10	19
2000	ml	6	13
3000	ml	-	9
4000	ml	-	8
5000	ml	-	6



Tray with pin holders

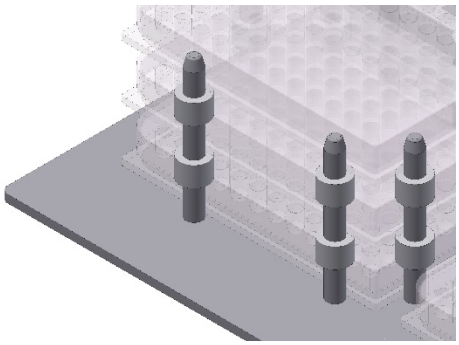
For applications in which large numbers of microtitre or deep-well plates need to be incubated, various trays with pin holders are available. These enable loading with several layers of microtitre and deep-well plates.

The plates can be stacked. This allows you to simultaneously incubate up to 72 deep-well plates and up to 144 microtitre plates on one M tray.

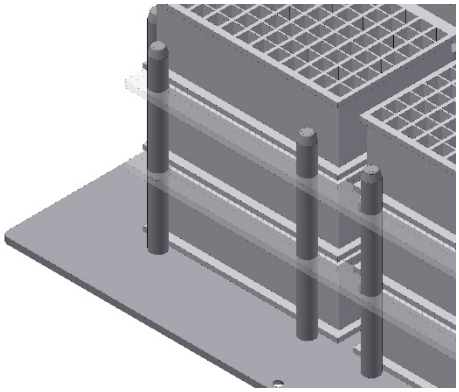
The trays are designed for plates with the dimensions 85.1 x 127 mm.

Accessories

To ensure the cultures receive the optimum oxygen supply, spacers can be placed between stacked plates. These are available in two variants:



- **Ring spacers** (10 mm high) are placed on the pins individually. Depending on the type of tray loading, this makes it possible to remove individual plates or stacks of plates.



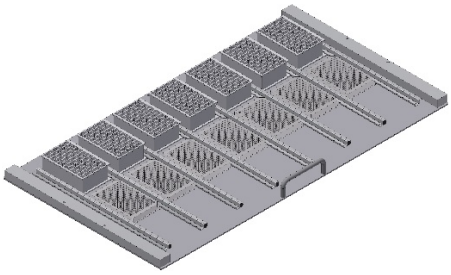
- **Quickload spacers** are long plastic strips (4 mm high) that span across several plates, thus allowing you to save time while loading.

ATTENTION

The spacers are made of plastic and therefore cannot be autoclaved.

Technical data for pin holders	
Description	**Value**
Material	Aluminium
Fastening screws	M5 x 12
Cleaning	Mild neutral cleaning agent
Disinfection	Commercially available disinfectant
Sterilisation in autoclaves	YES
External dimensions of the microtitre plates	85.1 x 127 mm
Height of the deep well plates	42 mm

Accessories

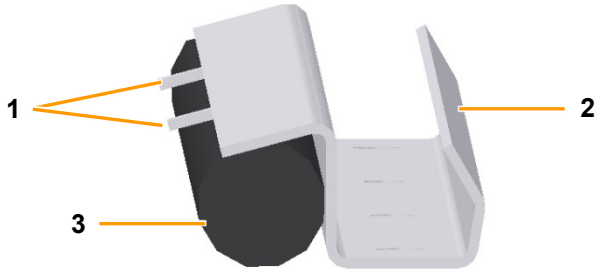


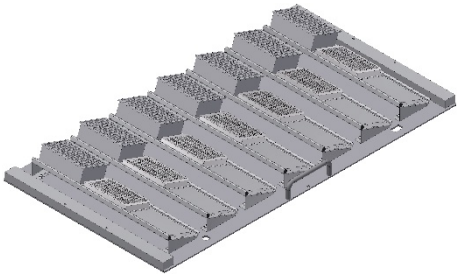
Tray with clamping assembly

There is a quick clamping assembly for affixing microtitre and deep-well plates. Two versions of this clamping assembly are available:

Tray with flat clamping assembly (horizontal incubation):

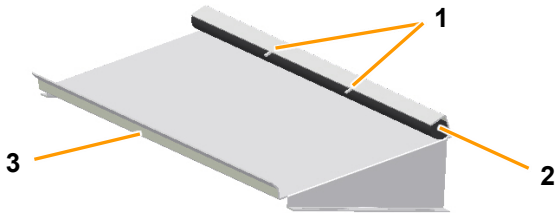
The flat clamping assembly is a profile made of sheet metal that is equipped with an angled strip (2). On the other side, there is an edge featuring a foam rubber strip (3). There are two spacers on the edge (1) for positioning microtitre plates or deep-well plates.





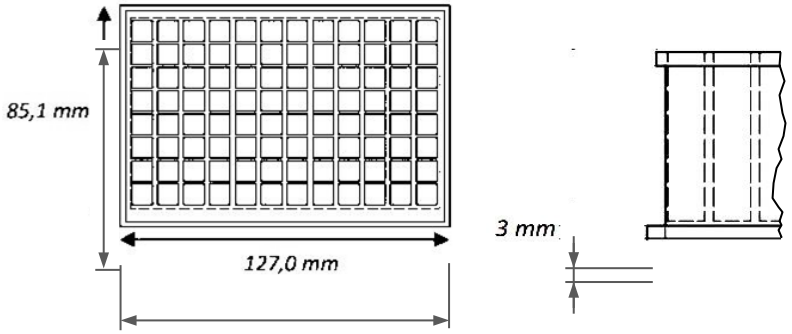
Tray with clamping assemblies tilted at an angle of 20° (angled incubation):

The tilted clamping assembly is a wedge-shaped metal sheet with two profiles. The lower profile is an angled bar (3). The upper profile is a U profile into which the cellular rubber string (2) is inserted. There are two spacers on the upper edge (1) for positioning the microtitre plates or deep-well plates.

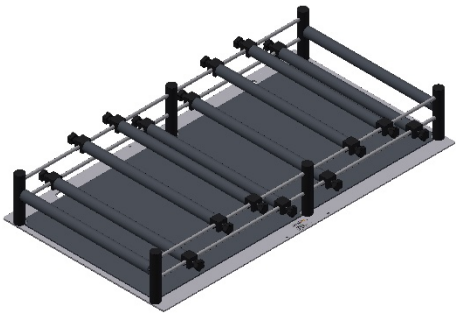


The trays with clamping assemblies are designed for microtitre and deep-well plates with dimensions 85.1 mm x 127 mm. To ensure sufficient clamping force can be achieved, plates with a web height of at least 3 mm must be used.

Accessories



Technical data for clamping assemblies	
Description	**Value**
Rail material	Aluminium
Foam rubber material	CR rubber
Temperature range	≤ 80°C
Cleaning	Mild neutral cleaning agent
Disinfection	Commercially available disinfectant
Sterilisation	NO
Size of microtitre and deep-well plates	85.1 x 127 mm



Tray with sliding bars

Trays with sliding bars allow you to fix vessels of any shape. The sliding bars can be affixed to any point on the support bars. This also allows you to affix bottles with vertical walls and a curved base. The bars are sheathed in a soft material and arranged on two different levels in order to securely hold bottles of different sizes.

The scope of delivery for the tray includes the fixed frame and 8 movable sliding bars.

Technical data for the sliding bars	
Description	**Value**
Material	Aluminium, plastic
Cellular rubber mat	EPDM cellular rubber
Cellular rubber cover	Armaflex
Cleaning	Mild neutral cleaning agent
Disinfection	Commercially available disinfectant
Max. operating temperature	65 °C
Sterilisation in autoclaves	NO

4.1.3 Tray with Sticky Stuff

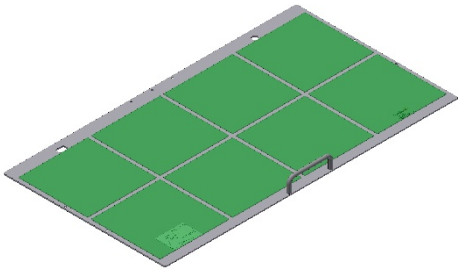
ATTENTION

If condensate forms on the tray or on the cultivation vessels, the adhesiveness of the Sticky Stuff is no longer guaranteed. As a result, cultivation vessels can become detached from the Sticky Stuff and break.

Hence, consider the following when using Sticky Stuff:

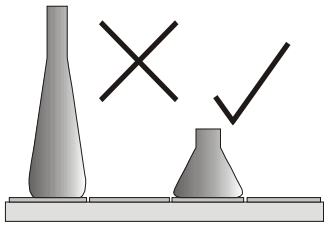
– Ensure that no condensate forms on the tray or on the cultivation vessels. This is especially necessary if cultivation is started at low temperatures and the temperature then is increased.

– Let cultivation vessels that were stored in the fridge warm up to ambient temperature first before placing them on the adhesive matting.

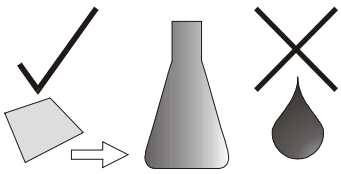


- If you are looking for a very flexible option for equipping the tray, Sticky Stuff offers an ideal alternative.
- However, you have to keep in mind that speeds are limited when using Sticky Stuff (for more information on this, refer to the table at the end of the chapter).

About using Sticky Stuff



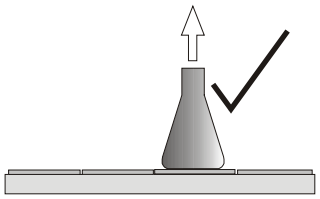
- Use only vessels with a broad flat base. Large Erlenmeyer flasks (e.g. 3000 mL) adhere more strongly than smaller ones (e.g. 500 mL).
- Ensure that the entire bases of the flasks are on the adhesive matting. They must not extend beyond the edge of the tray.



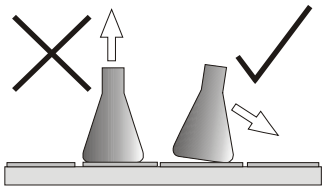
- Check vessels for damage prior to use and replace, if necessary.

  Never use damaged vessels!
- Prior to putting down any vessel, ensure that its base is dry, clean and grease-free.

Accessories

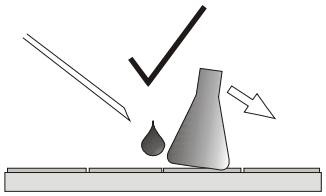


- Prior to the shaking process, gently pull on every vessel to ensure they are all stuck on firmly.
- If the humidity is too high or the temperatures are too low or if there are extreme jumps in temperature (e.g. when using the timer function), keep an eye on condensate. Condensate can result in vessels detaching from the adhesive matting.

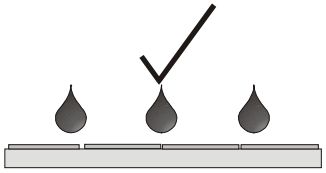


- To remove vessels, gently and evenly pull or push on the neck and wait a few seconds.

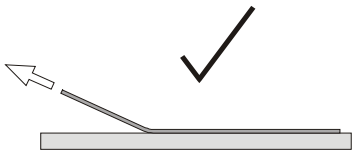
  Never use force!
- In case of large vessels, it can take 20 to 30 seconds until they detach from the adhesive matting.



- Vessels that are stuck can be removed from the adhesive matting by using a syringe to inject water under the flask.
- Due to their shape (wide base, short neck), Fernbach flasks in particular can be difficult to remove. If necessary, cover part of the adhesive matting with the protective foil provided.



- The adhesive power can deteriorate over time due to dust and dirt. To clean and restore full adhesive power, thoroughly wipe down the surfaces with a brush or a dish sponge and clear water with mild detergent (dishwashing liquid). Then let dry overnight.
- **Quaternary ammonium compounds are suitable for disinfection.**
- Consider application times and thoroughly rinse with water. If the adhesive matting is disinfected at regular intervals, it might need to be replaced sooner.



To replace the adhesive matting proceed as follows:

1. Thoroughly spray the tray with water
2. On one side, peel the adhesive matting off the tray and pull it up diagonally.
3. Use acetone to degrease the tray and apply new **wet** adhesive matting (according to separate installation instructions). Only peel off protective foil prior to use.

The removed adhesive matting can be reused and can be reapplied after regeneration in water.

Adhesive matting that is severely worn due to aging must be replaced. This also applies if a reduction in the adhesive force is detected.

INFORMATION

Due to limited resistance to disinfectants as well as the risk of unintentional detaching of flasks, Sticky Stuff is not suitable for cultivating pathogenic microorganisms.

Maximum agitation speeds with Sticky Stuff

To ensure that the flasks do not detach from the adhesive matting, the maximum permissible rotation speed is limited when using adhesive matting.

INFORMATION

The following guidelines only apply to undamaged, completely dry adhesive matting and flasks free of grease. If old or dirty adhesive matting is used, there is a risk that flasks detach even at lower speeds.

Schott Duran® glass Erlenmeyer flask	Filling	Maximum permissible rotation speed (25 mm throw)
25 to 750 mL	20 %	250 min^{-1}
1000 mL	20 %	300 min^{-1}
2000 mL	20 %	300 min^{-1}
3000 mL	20 %	350 min^{-1}
5000 mL	20 %	300 min^{-1}

Corning plastic Erlenmeyer flask	Filling	Maximum permissible rotation speed (25 mm throw)
125 to 3000 mL	20 %	300 min^{-1}

Corning plastic Fernbach flask	Filling	Maximum permissible rotation speed (25 mm throw)
3000 mL	20 %	300 min^{-1}

4.2 Clamps and Other Holders

For individual fitting of the universal table tray, various clamps and holders are available.

4.2.1 Clamps

Clamps in various sizes are available for equipping a universal table tray. These can be ordered individually and mounted on the universal table tray.

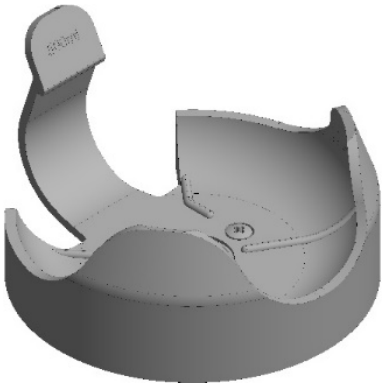


Stainless steel clamps

The following stainless steel clamps are available:

For flask type	Volume		
Erlenmeyer	25 mL	500 mL	4000 mL
	50 mL	1000 mL	5000 mL
	100 mL	2000 mL	
	250 mL	3000 mL	
Fernbach	1800 mL	2800 mL	

Technical data of the steel clamps	
Description	**Value**
Material	Stainless steel
Fastening screws	25 up to 50 ml: M4 x 6 100 up to 5000 ml: M4 x 8
Temperature range	95 °C
Cleaning	Mild neutral cleaning agent
Disinfection	Commercially available disinfectant
Sterilisation in autoclave	YES



Plastic clamps

The following plastic clamps are available:

For flask type	Volume		
Erlenmeyer	100 mL	250 mL	500 mL

Technical data of the plastic clamps	
Description	**Value**
Material	POM Co polymer
Fastening screws	M4 x 6
Temperature range	65 °C
Cleaning	Mild neutral cleaning agent
Disinfection	Commercially available disinfectant
Sterilisation in autoclave	NO

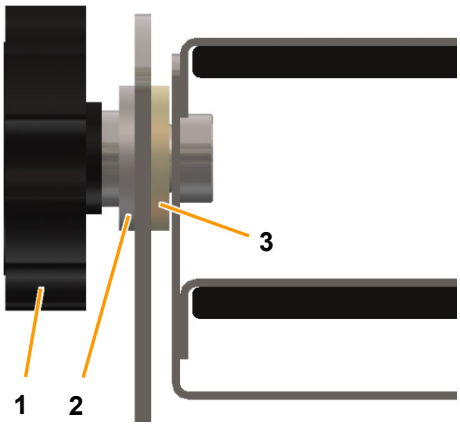
4.2.2 Test Tube Holders



Test tube holders are used to securely affix different sized test tubes. Test tube holders can be screwed onto a universal table tray or placed on Sticky Stuff adhesive matting.

The following test tube holders are available (details and special types on request):

- For long test tubes, Ø 8 bis 30 mm
- For short test tubes, Ø 12 bis 18 mm
- For plastic tubes with ventilation lid, Ø 16 and 30 mm
- Special holders, e.g. for 600 ml cultivation vessel



If necessary, the inserts with the tubes can be tilted by loosening the black nuts (1). The tilt can be set freely. Then tighten the nuts again.

The entire inner part with the holders for the tubes can be removed by loosening the black nuts, whereby the u-shaped holder remains on the tray.

When inserting the inner parts, ensure that the feet of the holder (part on the tray) on both sides rest between the rubber ring (3) and the Teflon washer (2).

Test tube holders can also be used on a tray with Sticky Stuff. To do this, the pre-installed screw must be removed from the base plate.

ATTENTION

The test tube holders adhere extremely strongly to the Sticky Stuff, so that water has to be sprayed underneath the edge of the holder with a syringe in order to remove them. This is done to prevent damage to the holder or the tray.

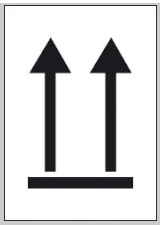
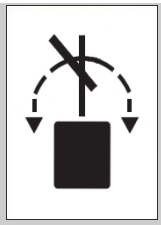
5 Transport and Storage

WARNING

Improper transport, use of incorrect auxiliary equipment and careless handling of the device may lead to injuries and significant damage to property.

– Never push the device as this could result in the feet being damaged or the base plate being dented.

5.1 Symbols on the Packaging

			
Fragile The content of the package is fragile. Do not drop the package and avoid impact.	**Top** Marks the top of the device. The package must be transported and stored in a way that ensures that the arrows always point up.	**Protect from humidity** Protect the package from humidity and keep it dry.	**Do not roll** The package must not be rolled.

5.2 Transport Inspection

When you receive the delivery, immediately inspect it for completeness and any potential damage sustained during transport.

If you can see damage from outside, proceed as follows:

- Do not accept the delivery or only under reserve.
- Make a note of the extent of the damage on the shipping documents or on the carrier's delivery note.
- Lodge a complaint.

INFORMATION

Lodge a complaint for each defect as soon as you detect it. Claims for compensation can only be asserted within the claim period in accordance with the general terms and conditions.

5.3 Transporting the Device

The device and accessories are packaged in a box. The packaging is intended to protect the device from transport and other damage until the device is commissioned. Therefore, do not destroy the packaging and remove it just before commissioning.

When transporting the device, observe the following:

- Always work in pairs and use suitable auxiliary equipment when transporting the unit (weight of the device: 26.5 kg).
- Hold the device on the two grip recesses.
- Only transport the device upright and set it down carefully.
- Observe the symbols on the packaging for correct transport.

5.4 Storing the Device

- Decontaminate, thoroughly clean and dry the device every time before placing it in storage.
- Store the device clean, dry and protected against dust, dirt and liquids.
- Protect the device from aggressive media, direct sunlight and vibrations.
- Store the device in a cool place with low humidity but protected from frost.
  - Storage temperature: 10 °C to 35 °C.
  - Relative humidity, non-condensing: 10 % to 60 %.

6 Installation

6.1 Requirements for the Installation Site

6.1.1 Operating Conditions

The following requirements must be met for the installation of the device:

Operating conditions		
Temperature range	Shaker: Power unit:	4 to 65 °C 0 to 40 °C
Humidity (non-condensing)	Shaker: Power unit:	10 to 85% 10 to 60 %
Restrictions	■ Do not expose to direct sunlight ■ Do not expose to dust ■ Do not expose to vibrations	
The device may only be set up indoors.		

- The installation site must be level, sufficiently stable and able to bear loads.
- There must not be any sources of electrical interference near the unit.
- The power switch (On/Off flip switch) must be easily accessible.

Operating the device in an incubator

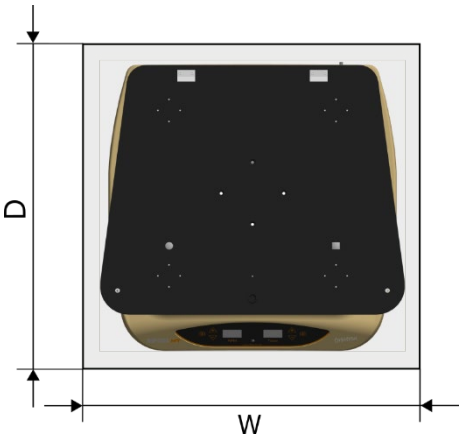
The device can be set up and operated in the interior of an incubator under the following conditions:

- Operation within in incubator is possible at temperatures up to 40 °C if the power unit is placed in the compartment in the casing. At working temperatures from 40 to 65 °C, the power unit must be removed from the casing and placed outside the incubator. We recommend always placing the power unit outside the incubator.
- The humidity in the incubator must not exceed 85 % and there must be no condensation. The power unit may be exposed to a maximum humidity of 60 %.

INFORMATION

Any other type of installation must first be checked with the manufacturer and requires the manufacturer's consent in writing.

6.1.2 Required Floor Space



The required floor space depends on the tray used and is calculated using the width of the tray plus 25 mm for shaking movements (W x D):

- Floor space with N tray: 660 x 600 mm
- Floor space with M tray: 875 x 600 mm

During operation, an additional minimum distance of 20mm must be maintained to all walls and other devices.

CAUTION

The M tray extends beyond the device. Hence make sure there is sufficient space at the installation site. Ensure that when the shaker drive is activated there is enough space between the tray and fixed parts (e.g. a wall). Otherwise there is a risk that the device could be damaged or parts of the body (in particular fingers) could be pinched.

6.2 Installing the Device

6.2.1 Establishing the Power Supply

The device is suitable for use with 115/230 Volt alternating current and a frequency of 50 to 60 Hertz. Prior to connecting the power supply, check whether the voltage value on the identification plate matches the local mains voltage. If the specified voltage values differ, do not connect the device under any circumstances but contact the manufacturer immediately.

ATTENTION

Any undischarged electrostatic charge can damage the (open-loop) control and drive of the device. Hence, use of an unsuitable power unit poses a risk of damage to property.

– Only use the original power unit for power supply.

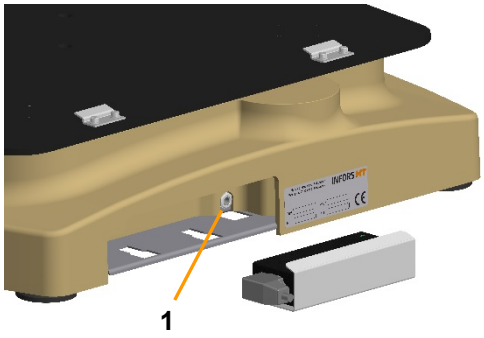
– The device may only be connected to a properly installed earthed socket.

ATTENTION

Failure to comply with the required ambient conditions for the power unit can result in damage to the power unit. If you are using the device in an incubator, we therefore recommend removing the power unit from the power unit compartment and placing it outside the incubator.

To establish the power supply to the device, proceed as follows:

Procedure



1. Ensure that the power switch of the device is in the *Off* position.
2. Connect the round plug of the power unit on the back of the device (1).
3. Connect the power unit to the building's power supply.
4. Ensure that the mains connection is freely accessible at all times.

INFORMATION

To place the power supply cable in an incubator, remove the power unit from the power unit compartment. Following that, place the power supply cable in the incubator and connect the power connection on the back of the device.

If the power supply cable is placed in an incubator, you must ensure that the cable is neither bent nor stretched nor at risk of being damaged in any other way. The cable must be kept clear of moving parts.

6.2.2 Checking the Stability

During commissioning, you must check the stability of the device.

ATTENTION

If the surface is not stable, the device can move uncontrollably. This can damage other device or objects nearby.

– Before commissioning at the site of operation and after each repositioning, check if the device runs smoothly.

To do so, proceed as follows:

Procedure

1. Set the shaking speed to 50 min^{-1}.
2. Start the shaker drive.
3. Check the device for vibrations or uneven operation. To do this, increase the shaking speed from slow to maximum speed and continue checking if the device runs smoothly.
4. If there are strong vibrations, move the device. If this does not make the device run smoothly, contact the manufacturer.

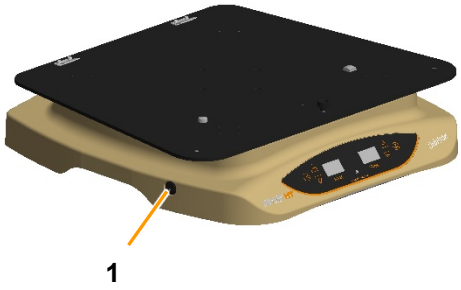
7 Operation

7.1 Switching on the Device

ATTENTION

If the shaker drive is switched on, the shaker automatically starts at the set speed when connected to the power supply and/or activated on the power switch. Uncontrolled movements of the shaker can cause material damage.

Procedure



1. Actuate the power switch (1) on the left side of the device.

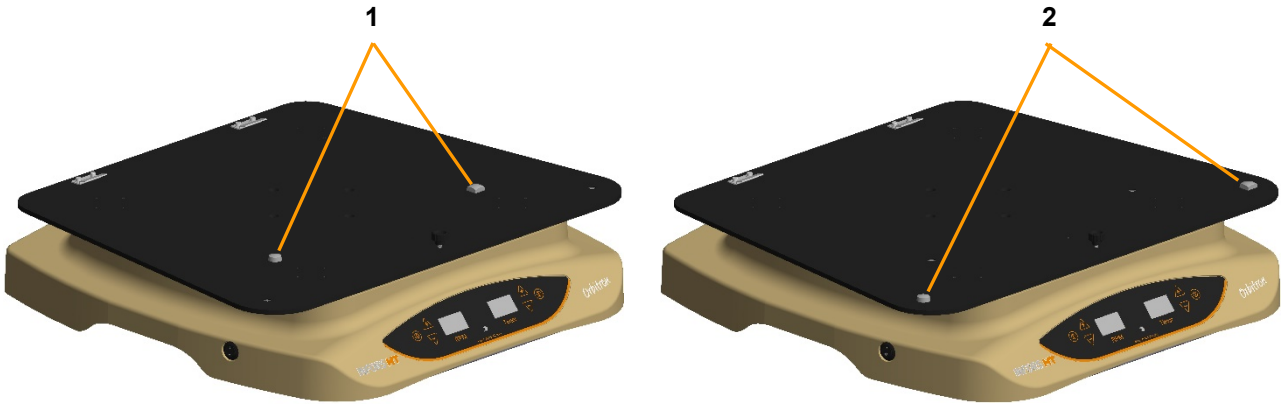
   If the device has been correctly connected to the power, the *Power supply on/off* function symbol lights up after switching on. Once it has been switched on, the device will automatically run a self-test and the installed firmware version is displayed briefly. Following that, the device is ready for operation.

7.2 Fitting the Tray

Both universal table trays for screwing in clamps and test tube holders as well as fixed trays of varying sizes can be fitted onto the table of the device.

Two centring wedges on the table are used for positioning the tray. Due to the different depths of the trays, there are two positions for the tray centring wedges:

- Back position (1) for N trays (depth 420 mm)
- Front position (2) for M trays (depth 470 mm)



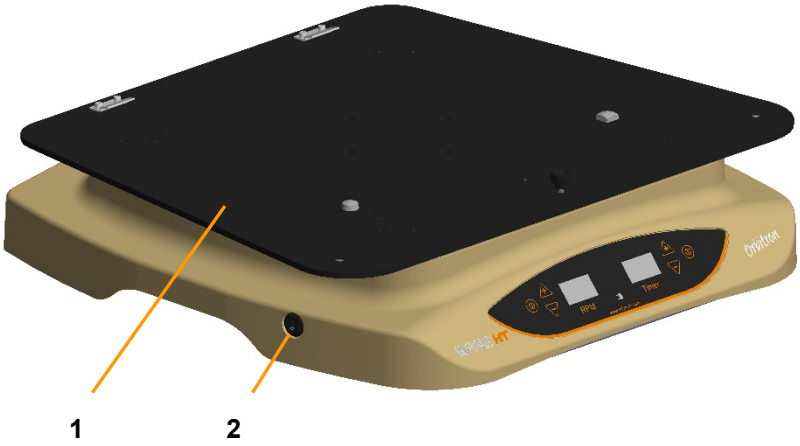
To switch between N trays and M trays, the table has to be dismantled and the centring wedges must be placed in the corresponding position.

⚠ CAUTION

To prevent unintentional starting of the shaker drive and associated injuries, the device must be switched off using the power switch prior to any manipulations on the table and tray.

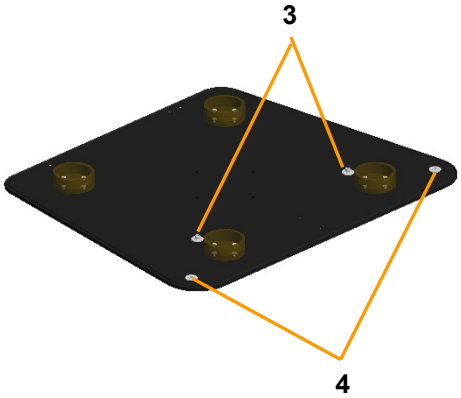
7.2.1 Moving the Tray Centring Wedges

Before a tray can be affixed to the table, the centring wedges must be placed in the right position. The following section describes the procedure for switching from N trays to M trays. To switch from M trays to N trays, proceed analogously and move the centring wedges from the front position to the back position.



Procedure

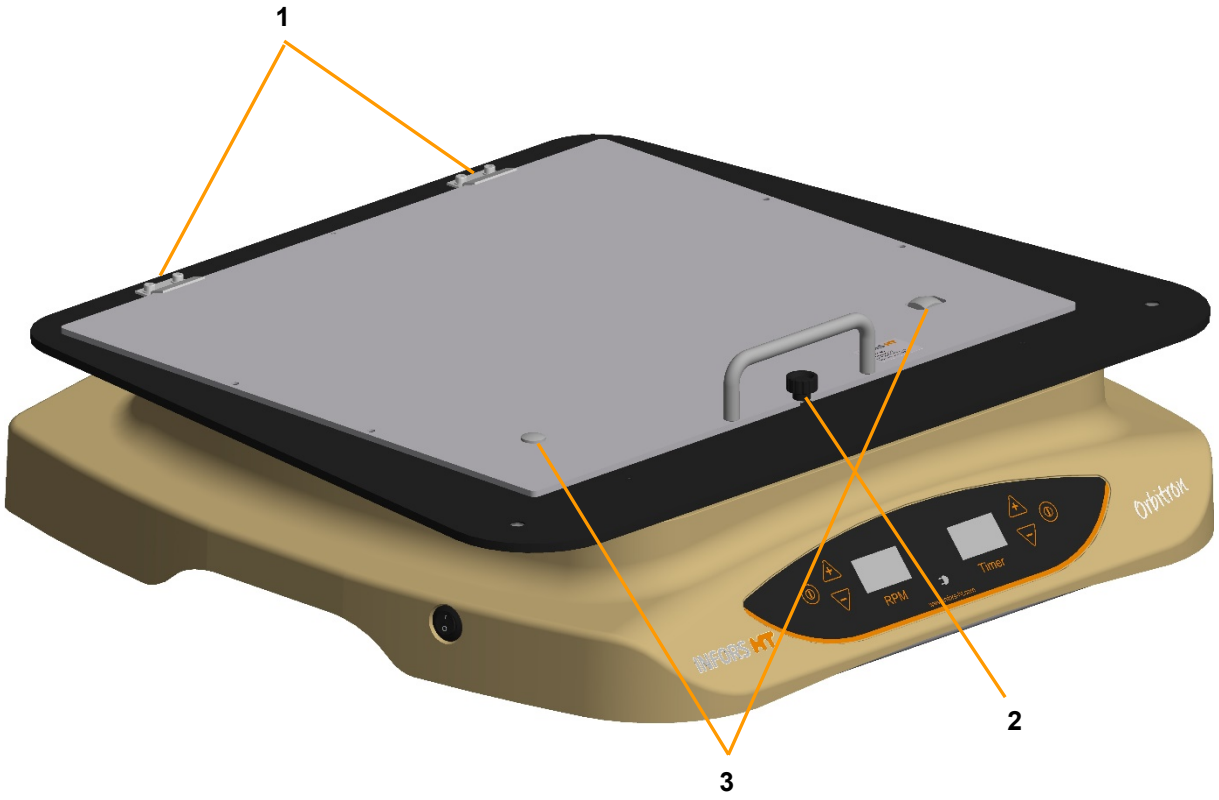
1. Turn off the power switch of the device (2) and pull out the plug.
2. Dismantle the table (1) by loosening the four hexagonal socket screws (M6x12) in the centre of the table.
3. Lift the table off the device and rotate it 180°.



4. Remove the centring wedges. To do so, loosen the screws of the centring wedges on the bottom of the table (3) using an Allen key.
5. Remove the two plugs (4) from the front position.
6. Push the centring wedges out of the back position of the table and place them in the front position.
7. Screw the centring wedges in tightly.
8. Insert the two plugs in the back position.
9. Place the table on top and screw it on.

7.2.2 Inserting the Tray

The insertion of the tray is identical for all sizes. To do so, proceed as follows:



Procedure

1. Ensure that the centring wedges (3) are in the correct position.
2. Insert the tray diagonally on the back edge of the table and push it under the fixing clips (1).
3. Lower the front of the tray. In doing to, align openings in the tray with the centring wedges on the table.
4. Affix the tray to the table using the supplied knurled screw (2).
5. Before you activate the shaker drive, check that the tray is firmly in place. Do not turn on the shaker drive under any circumstances, if the tray is not correctly affixed to the table.

7.3 Loading the Device

⚠ CAUTION

If the loading mass of the table is too high or too low or the load is distributed unevenly, high rotation speeds can cause vibrations. This can result in the device moving uncontrollably and potentially falling off the table. This can lead to property damage and injuries.

– Do not operate the device without tray and loading. Switch off the shaker drive when the device has been unloaded.

– In case of strong vibrations, reduce the rotation speed and check the loading weights or the distribution of the load.

7.3.1 Fitting the Holders

! ATTENTION

The threaded holes of the tray can be damaged if the fastening screws are not screwed straight into the thread:

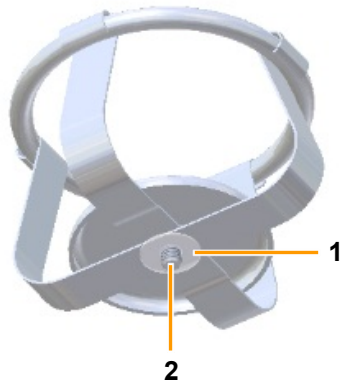
– Place the screws vertically on the drill holes.

– Ensure they can be tightened easily.

! ATTENTION

All holders are supplied with pre-fitted screws. If a test tube holder is placed on the Sticky Stuff adhesive matting, there is a risk that the adhesive matting is damaged by protruding screws.

– Remove the screws before you place test tube holders on the Sticky Stuff adhesive matting.



Fitting a holder

Clamps and test tubes are fixed to the tray using screws. The device is delivered with pre-fitted screws (2). The screws are each secured with one flat gasket at the bottom (1) so that they cannot fall out. Only use the screws provided or screws of the same size for assembly.

Operation

To fit a holder, proceed as follows:

Procedure

1. Loosen flat gaskets.
2. Position the holder on the tray.
3. Centre a screw on the threaded hole in the tray and screw it in loosely. It must still be possible to turn the holder.
4. Align the holder so that all screws are vertical above the respective threaded hole in the tray.
5. Insert screws loosely. Ensure that the screws are screwed in straight and do not tilt.
6. Evenly tighten all screws cross-wise.

Screw sizes

ATTENTION

If screws that are too long are used to affix the holders, these will stick out at the bottom of the tray. This has the effect that the tray can no longer be inserted and affixed correctly.

– If you have to replace lost fastening screws, you must use screws that comply with the specification below.

Steel clamps		
Flask size	**Screw**	**Flat gasket**
25 – 50 mL	Flat head screw with Phillips head M4 x 6 A4	D = 3.2 x 12 x 0.5
100 – 5000 mL	Flat head screw with Phillips head M4 x 8 A4	D = 3.2 x 12 x 0.5

Plastic clamps		
Flask size	**Screw**	**Flat gasket**
100 – 500 mL	Flat head screw with Phillips head M4 x 6 A4	D = 3.2 x 12 x 0.5

Test tube holders		
Size	**Screw**	**Flat gasket**
Ø 8 – 30 mm	Oval head screw with Phillips head M4 x 6 A2	D = 3.2 x 12 x 0.5

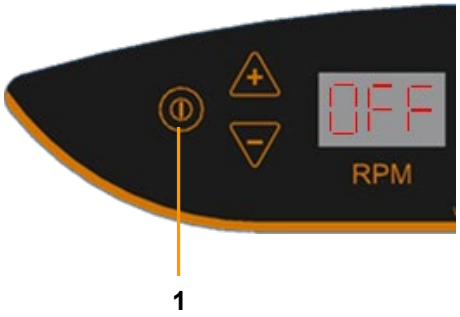
7.3.2 Loading and Unloading the Device

⚠ CAUTION

The table can cause injuries due to the considerable vibration moment. Furthermore, the is a risk of fingers getting trapped between the table and the casing.

– Before you load or unload the device, turn off the shaker drive and wait until the table has come to a complete standstill.

Procedure



1

1. If the shaker drive is active, use the left **On/Off** button to deactivate it.
2. Wait until the table has come to a standstill.
3. Load or unload the tray. Observe the notices in the next chapter.

7.3.3 Tips & Tricks for Loading the Tray

Observe the following notices when loading the tray:

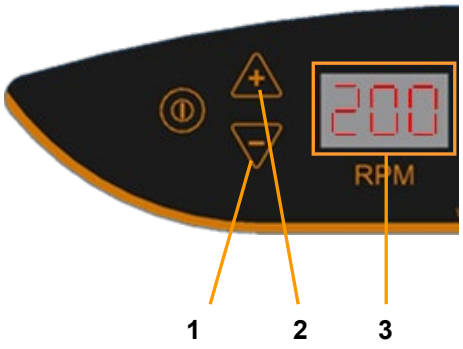
- Place the cultivation vessels symmetrically in the middle of the tray.
- If any of the vessels protrude over the edge of the tray, they could collide with the wall or objects and thus break or cause other damage. Therefore, always position cultivation vessels on the tray so that they do not protrude.
- If the table is only loaded lightly and is going to be run at high rotation speeds, place additional cultivation vessels filled with water on the tray. This will make the device run more smoothly. At shaker speeds of approx. 200 – 250 min^{-1}, the load distribution plays only a minor role.
- Both higher and lower loads can cause an imbalance, which can result in strong vibrations at higher rotation speeds and can lead to flasks breaking. When you change the load, you should therefore keep an eye on the device until the desired rotation speed is reached. In case of strong vibrations, reduce the rotation speed, remove vessels or reduce the fill volume.

7.4 Activating/Deactivating the Shaking Function

If Activating the shaking function

To activate the shaking function, proceed as follows:

Procedure

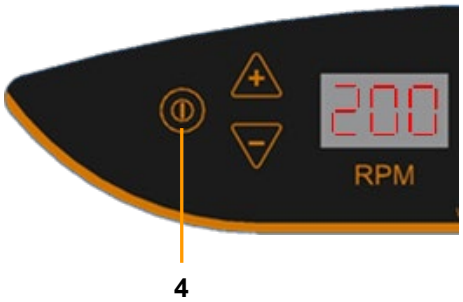


1. Press the left **Plus** or **Minus** button (1/2) to set the setpoint for the rotation speed.
   - Pressing the **Plus** or **Minus** button once increases or decreases the setpoint by one unit (10 min^{-1}).
   - Pressing or holding down the **Plus** or **Minus** button has the effect that the display runs up or down through the specified value range.

   The display (3) will show the set setpoint for the parameter. If you make no entry for more than 2 seconds, the display alternates between the set setpoint and the message *OFF* (if the parameter is deactivated) or the current actual value (if the parameter is activated).

INFORMATION

The entered value is saved automatically. A separate confirmation is not necessary. If the parameter is already activated, the changes take effect immediately.



2. Press the left **On/Off** button (4) to activate the shaking function.

   The shaker drive starts and accelerates to the set setpoint. The display briefly shows the message *On* and then the current actual value of the rotation speed.

   When starting up the shaker drive, use the time until the setpoint is reached to check whether the cultivation flasks are secured on the tray.

Deactivating the shaking function

The shaking function is deactivated in the same way as it is activated, by pressing the respective **On/Off** button. If the shaking function is deactivated, the view box alternates between the set setpoint and the message *OFF*.

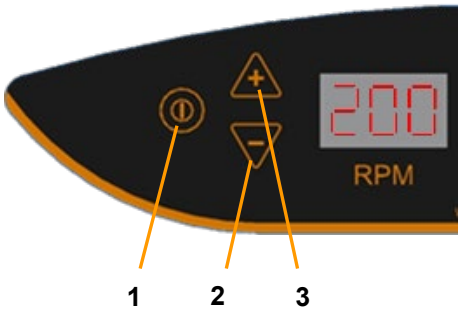
7.5 Operating the Timer

The timer has two operating modes: the time-delayed activation and the time-delayed deactivation of the shaking function:

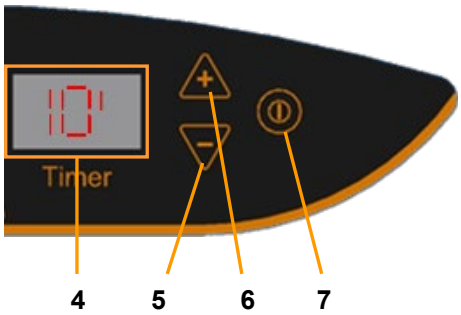
- If the timer is activated while the shaking function is active, the shaker drive is switched off after the entered time period.
- If the timer is activated while the shaking function is not active, the shaker drive is switched on after the entered time period.

To activate the timer, proceed as follows:

Procedure



1. If necessary, use the left **Plus** or **Minus** button (2/3) to set the setpoint for the rotation speed.
2. Press the left **On/Off** button (1) to activate the shaking function.



3. Press the **Plus** or **Minus** button (5/6) to set the required time period.
   - Pressing the **Plus** or **Minus** button once increases or decreases the setpoint by one unit (1 min).
   - Pressing or holding down the **Plus** or **Minus** button has the effect that the display runs up or down through the specified value range.
4. Press the right **On/Off** button (7) to activate the timer.

   As soon as the timer is active, the residual time is displayed in the display (4). Depending on whether or not the shaking function was active when you set the timer, the shaker drive is either activated or deactivate after the set time.

7.6 Switching off the Device

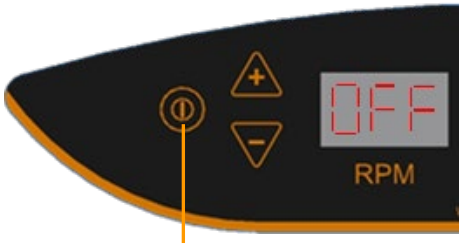
ATTENTION

If the shaker drive is not deactivated before the device is switched off, it is automatically activated when the device is switched back on. This can damage the device and the cultivation vessels.

– Deactivate the shaker drive before switching off the device.

To switch off the device, proceed as follows:

Procedure



1

1. Press the **On/Off** button to deactivate the shaker drive.
2. Use the power switch on the left-hand side of the device to switch the device off.
3. If the device is not going to be used for an extended period of time, unplug the power plug.

7.7 Behaviour in Case of Interrupted Power Supply

If the power supply to the device is interrupted during a cultivation process (e.g. by flicking the power switch or in case of a power failure), the setpoint for the rotation speed and the time remaining on the timer will be stored. If the power supply is restored, the device will automatically restart with the last stored setpoints.

8 Rectifying Faults

8.1 Fault Tables

The following tables describe possible reasons for faults and how to resolve them.

The troubleshooting work described here may be carried out by the operator if not indicated otherwise. If you encounter a fault that cannot be resolved by following the instructions below, please contact your nearest INFORS HT representative. See service addresses on page 2.

General faults

Fault		
The view box does not light up after activating the power switch (On/Off flip switch).		
Possible cause	**Measures**	**Personnel**
Power supply to the device interrupted.	■ Check if the plugs are plugged in correctly. ■ Check the mains connection. ■ Check the status display on the power unit. If the power unit is defective, replace it with a power unit of the same type.	Operator

Fault		
Unusual emissions (smoke, noises, smell)		
Possible cause	**Measures**	**Personnel**
The device is defective.	Immediately switch off the device, disconnect it from the power supply and contact your local INFORS HT representative.	INFORS HT service technician or licensed dealer

Rectifying Faults

Faults related to the shaker drive

Fault		
The table does not move.		
Possible cause	**Measures**	**Personnel**
The shaker drive is not switched on.	Switch on the shaker drive.	Operator
The table is blocked by foreign objects.	Dismantle table and remove foreign objects.	Operator
The load is too heavy, making the drive too weak or causing it to overheat.	If the drive has overheated, the process can be continued after it has cooled down.	Operator
The drive has heated up too much, and has been turned off automatically.	Let the device cool down.	Operator
The drive belt is torn.	Contact your local INFORS HT representative.	INFORS HT service technician or licensed dealer
The drive control system is defective.	Contact your local INFORS HT representative.	INFORS HT service technician or licensed dealer
The motor is defective.	Contact your local INFORS HT representative.	INFORS HT service technician or licensed dealer

Fault		
The setpoint is not reached.		
Possible cause	**Measures**	**Personnel**
The load is too heavy.	Reduce the load.	Operator

Fault		
The shaker drive accelerates too quickly or runs too fast.		
Possible cause	**Measures**	**Personnel**
Error when measuring the rotation speed.	Switch the device off and then on again.	Operator
The drive control system is defective.	Contact your local INFORS HT representative.	INFORS HT service technician or licensed dealer

Fault		
Strong vibrations occur.		
Possible cause	**Measures**	**Personnel**
The load is too heavy, so the device is no longer balanced.	Reduce the load to the prescribed value.	Operator
The load is too light, so the device is no longer balanced.	Increase the load to the prescribed value.	Operator
The load is distributed unevenly.	Load the tray in the centre. If possible, do not place any heavy weights in the corners of the tray.	Operator
The rotation speed is too high.	Reduce the rotation speed.	Operator
The device is not standing straight.	Place the device on a flat surface.	Operator
The substructure (bench) is too weak.	Place the device on a stable bench or the floor.	Operator
The liners of the table are worn.	Contact your local INFORS HT representative and replace the liners.	Operator

8.2 Returning for Repair

The provider must return the device or the faulty component part(s) to the manufacturer if, after consulting the service department of the local dealer or the manufacturer, on-site diagnosis and/or repair is not possible.

INFORMATION

When returning the device, the component part or accessory for repair, it is required for the safety of all parties involved and because of legal provisions that a lawful declaration of decontamination is present. Refer to main chapter “Safety and Responsibility”, chapter “Declaration of Contamination” for details.

9 Maintenance and Cleaning

WARNING

To prevent life-threatening electric shocks, always switch off the device and disconnect it from the power supply before carrying out any maintenance or cleaning.

The device requires hardly any maintenance. This reduces the running costs to certain regular checks and cleaning.

Keep in mind that various media or gases will have more or less corrosive effects on the metal parts. When using particularly aggressive substances, more frequent checks are required in order to maintain smooth device operation.

9.1 Cleaning and Disinfection

If substances, in particular hazardous substances, are spilled in or on the device, the device has to be cleaned and disinfected thoroughly. Furthermore, the device should be cleaned and disinfected on a regular basis to ensure proper operation.

If there are doubts concerning the compatibility of cleaning and disinfection agents, contact your local INFORS HT representative (see service contact details on page 2).

ATTENTION

Insufficient cleaning and disinfection can lead to damage to cultures due to contamination.

9.1.1 Cleaning

Detergent

Mild detergents, e.g. dishwashing liquid or neutral cleaning agents, are suitable for all surfaces:

- Exterior surfaces of the casing
- Operating panel
- Table
- Trays (incl. clamps and other holders)

ATTENTION

Aggressive detergents, solvents and abrasive cleaning utensils (hard sponges, brushes) can scratch surfaces, damage the device and impair its function.

Notices on cleaning

To clean the surfaces, use a soft cloth, ideally lint-free. This applies in particular to the operating panel. Disinfect using commercially available disinfectant if necessary. Only use permitted auxiliary materials for cleaning and disinfection. After cleaning, use a cloth to dry the device.

9.1.2 Disinfection

Only use quaternary ammonium compounds for wipe-down disinfection. As a tried as tested disinfectant, we recommend Fermacidal D2.

ATTENTION

Heat (temperatures above 60 °C), aggressive disinfectants such as chlorine bleach and UVC radiation can damage the device and significantly limit the function and useful life of the machine.

We recommend against using UV lamps for disinfection of the device because the UV rays can massively damage the plastic casing in case of multiple applications.

10 Disassembly and Disposal

The device must be disassembled and disposed of in an environmentally friendly manner if it is no longer in use.

INFORMATION

When returning the device for disassembly or disposal, it is required for the safety of all parties involved and because of legal provisions that a lawful declaration of decontamination is present. Refer to main chapter “Safety and Responsibility”, chapter “Declaration of Contamination” for details.

10.1 Disassembly

Prior to disassembly:

- Switch off the device and lock any isolation switch in the ‘off’ position.
- Physically disconnect the main energy supply from the device and wait for components to fully discharge.
- Remove and dispose of all additional consumable items, auxiliary components and/or spent processing material in an environmentally acceptable manner.

Clean and disassemble component parts professionally with regard to any local regulations concerning employment and environmental protection. If possible, separate materials.

10.2 Disposal

Recycle disassembled components if no agreement is made concerning reclaim or disposal.

- Send metals for scrap.
- Send plastic components for recycling.
- Sort and dispose of the remaining components according their material composition.

⚠ WARNING

Electronic waste, electronic components, lubricants or other auxiliary materials/supplies are subject to hazardous waste regulations and may only be disposed of by registered specialist disposal firms.

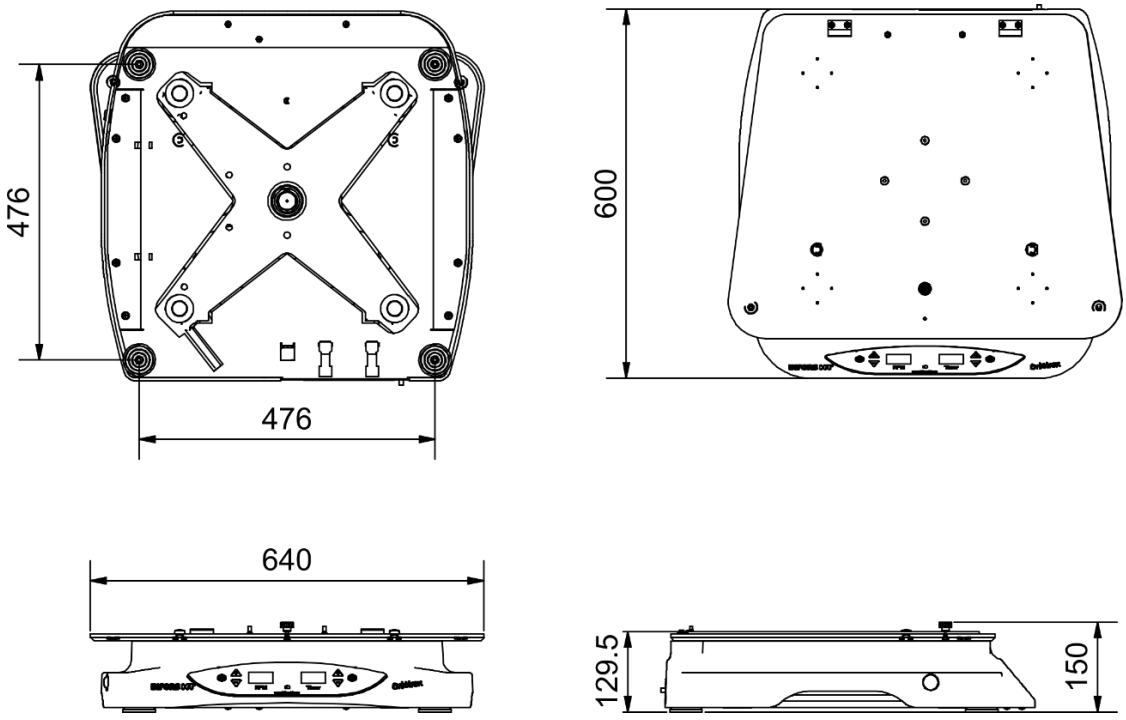
For disposal, the system units are to be disassembled and dismantled into individual material groups. These materials are to be disposed of according to the applicable national and local legislation.

Local authorities or specialist disposal firms can provide information regarding environmentally acceptable disposal.

If no special arrangements have been made for return, INFORS HT units with the required declaration of decontamination can be sent back to the manufacturer for disposal.

11 Technical Data and Specifications

11.1 Dimension Drawings



All dimensions in mm

11.2 Weight and Dimensions

Mass			
Description		**Value**	**Unit**
Base unit (without tray)		26.5	kg

Exterior dimensions			
Description		**Value**	**Unit**
Base unit	Width	640	mm
	Height	150	mm
	Depth	600	mm
Table	Width	635	mm
	Depth	522	mm
N-tray		420 x 475	mm
M-tray		470 x 850	mm

11.3 Shaker Drive

Description	Value	Unit
Drive	Brushless direct current motor	
Direction of rotation	Clockwise	
Rotation speed range [1]	20 to 550	min^{-1}
Increment	10	min^{-1}
Control precision at maximum rotation speed	± 1	%
Throw	25	mm

1 The actual rotation speed that can be achieved depends on a variety of factors, such as loading, vessel type (e.g. flasks with baffles) and the fixtures used (e.g. clamps or Sticky Stuff adhesive matting)

11.4 Electrical Connection and Power Values

Electrical connection values		
Description	**Value**	**Unit**
Voltage	115/230	V AC
Frequency range	50 to 60	Hz
Operating voltage	24	V DC

Electrical power values		
Description	**Value**	**Unit**
Max. power input	70	W
Max. power consumption	0.5	A
Consumption in stand-by	6	W

11.5 Limits

description	Value	Unit
Shaking speeds	20 to 550	min^{-1}
Maximum load incl. tray	31	kg

INFORMATION

The specified shaking speeds only apply to loading standard Erlenmeyer flasks with a maximum filling of 1/3 of the total volume of the flask.

When using differently shaped flasks or other filling volumes, it might not be possible to reach the maximum shaking speeds.

11.6 Protection Type

Description	Value
Casing	IP43 (as per DIN EN 60529)

11.7 Materials

Component	Material
Casing	PUR – IHS, Zinkor
Table	Aluminium, powder-coated
Universal table tray	X5CrNi18-10 (1.4301, AISI 304)
Sticky Stuff tray	Aluminium, anodised

11.8 Operating Conditions

Base unit		
Description	**Value**	**Unit**
Temperature range	4 to 65	°C
Relative humidity, non-condensing	10 to 85	%

Power supply		
Description	**Value**	**Unit**
Temperature range	0 to 40	°C
Relative humidity, non-condensing	10 to 60	%

11.9 Emissions

Description	Value	Unit
Sound pressure	< 70	dB(C)

11.10 Operating and Auxiliary Materials

ATTENTION

Using the wrong auxiliary materials can result in significant damage to property.

– Only use the auxiliary materials in accordance with the table below.

Description	Permitted Products
Detergent for casing	Mild neutral cleaning agent
Detergent for adhesive matting	Mild neutral cleaning agent Dishwashing detergent
Disinfectant	Quaternäre Ammonium-Verbindungen

EG-Konformitätserklärung

EC-Declaration of conformity

Déclaration CE de conformité

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Gemäss der EG-Maschinen-Richtlinie 2006/42/EG, Anhang II 1 A

In accordance with directive on machinery 2006/42/EC, appendix II 1 A

D´après la directive relative aux machines 2006/42/CE 2006, annexe II 1 A

Hersteller *Manufacturer* *Fabricant*	Infors AG Rittergasse 27 CH-4103 Bottmingen
Bezeichnung *Designation* *Désignation*	Tischschüttler Bench-top shaker Agitateur de table
Typ *Type* *Type*	Orbitron
Ab Release *From release* *A partir du version*	alle Releases all releases toutes les versions
Ab Seriennummer *From serial number* *A partir du numéro de série*	S-000127197

Dieses Gerät entspricht den grundlegenden Anforderungen der Richtlinien

This device is in compliance with the essential requirements of directives

Cet appareil est conforme aux exigences essentielles des directives

Maschinenrichtlinie 2006/42/EG	*Directive on machinery 2006/42/EC*	*Directive relative aux machines 2006/42/CE*
EMV-Richtlinie 2014/30/EU	*EMC directive 2014/30/EU*	*Directive CEM 2014/30/UE*

Aussteller
Issuer
Editeur

Bevollmächtigter für die technische Dokumentation
Person authorised to compile the technical file
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Representative for conformity
Responsable de la conformité



Bottmingen, 16. Nov. 2021

M. Heuschkel
Chief Technology Officer

Ort, Datum
Place, date
Lieu, date

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