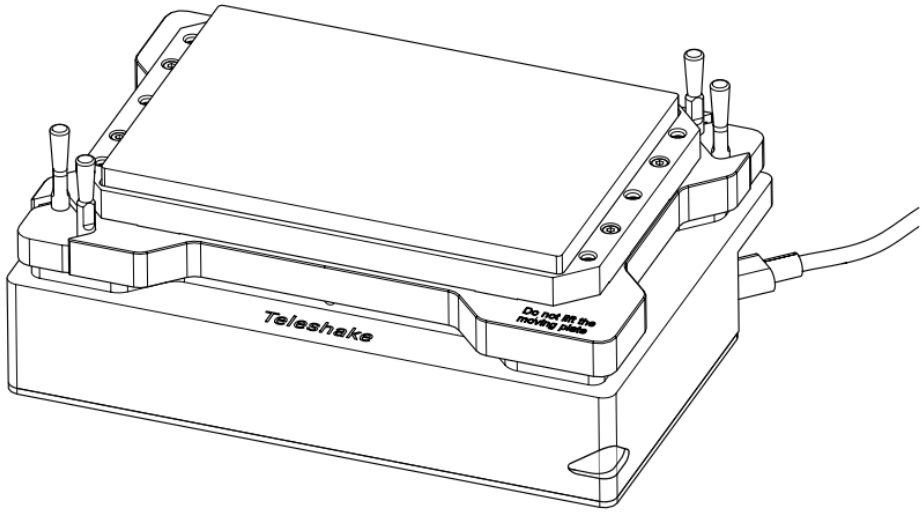
User and Installation Manual



Teleshake (95) AC USB Devices

Part No.: 7100180 | 7100181 | 7100182 | 7100183

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Company information

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Technical Support & Trouble Shooting Instructions:	www.inheco.com/tech-support.html

Table of Contents

1 About this manual

1.1 General information

- Read the manual completely.
- If the instructions in this manual are not followed, injury or product damage cannot be ruled out.
- Missing or insufficient knowledge of the manual leads to loss of liability against INHECO GmbH.
- This manual is part of the device and must be retained until the device is disposed of or must be passed on with the device to new users.
- Contact INHECO if there are any uncertainty in operation or handling of the device.

The devices with automated clamping meet the acknowledged rules of technology and comply with today's standards.

Manual instructions must be followed in order to ensure safe handling of the device.

Your opinion about this manual provides us with valuable insights on how we can improve this document. Please do not hesitate to direct your comments to **sales@inheco.com**, → **Contact information, page 5.**

1.2 Contact information

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Technical Support & Trouble Shooting Instructions:

https://www.inheco.com/tech-support.html

1.3 Abbreviations and glossary

The following acronyms and items are used in this document	
°C	Degree Celsius
°F	Degree Fahrenheit
AC	Auto Clamping
Calibration	Calibration is the validation of specific measurement techniques and equipment. At the simplest level, calibration is a comparison between measurements - one of known magnitude or correctness - made or set with one device and another measurement made in as similar a way as possible with a second device.
CE	Conformité Européenne (European conformity)
dB(A)	Decibel
FDA	Food and Drug Administration
Hz	Hertz [1/s]
in	Inch
IVD	In Vitro Diagnostic
K	Kelvin
kg	Kilogram
lbs	Pounds
mm	Millimeter
Offset	The difference between the set temperature and actual value once the temperature is stable
PE	Protective Earth
RH	Relative humidity
rpm	Revolutions per minute
TEC	Thermo Electric Cooler (Thermoelectric Module)
UL	Underwriter Laboratories certification
Vdc	Voltage direct current
W	Watt

1.4 Warranty

The warranty period starts on the date of shipment. Any damage caused by operating the device outside the specifications and guidelines leads to the loss of warranty. Broken seals on INHECO devices lead to the loss of warranty as well.

INHECO will only accept parts / devices for return that do not pose a threat to the health of our staff. In particular, the devices may not have been used in Biosafety Level 3 and 4 environments or have been exposed to radioactive or radiation materials.

Devices exposed to Biosafety Level 3 and 4 Environments are not accepted by INHECO for return.

2 Safety instructions

2.1 Product-specific risks

WARNING

WARNING

Follow the safety instructions given below in order to avoid danger to the user.

General

- The device needs maintenance on a regular basis → Maintenance, page 28.
- The device must be placed in an upright position. On non-observance, it will eventually overheat, causing the temperature fuse to blow.
- Do not exceed minimum or maximum ambient temperature and humidity conditions during operation or storage of the device → **Technical data, page 18**.
- The device must not be used in environments with risk of explosion.
- The device is for indoor use only.

WARNING

Burning hazard

Devices can burn your skin. Even after switching off the Device, its surface can still be hot and could seriously burn your skin as the material´s temperature can reach up to +125 °C [+257 °F]!

- Let the device cool down before touching it. This might take a while.

WARNING

Pinching of finger

While the clamp mechanism is closing you might pinch your finger or your glove. Closing or opening takes about 2-5 sec.

NOTICE

Biosafety laboratory environment

When using the device in a biosafety laboratory environment, the user is responsible for labeling it according to the WHO Laboratory Biosafety Manual (ISBN 92 4154650 6) and for operating the devices in accordance with the Biosafety Level Regulations of the WHO Laboratory Biosafety Manual.

NOTICE

Electromagnetic field

The device is not designed for use in residential areas. Thus, there is no guarantee of adequate protection of radio reception in this area.

NOTICE

Risk of damaging the device

Operating the device with a different power supply than listed in → **Accessoires, page 32** may cause damage to the device.

– When using a different 24V DC power supply the power supply to the device must be fused with 8A.

2.2 Technical alterations

– Do not alter the product. Any modification or change not approved by INHECO leads to the loss of warranty and INHECO´s liability.

– Use only original parts provided by INHECO. Parts provided by other suppliers can impair the functionality of the unit.

– Damage due to the use of non-original parts are excluded from INHECO´s liability.

2.3 Malfunctions

– In case of a malfunction, switch off and disconnect the device immediately. Make sure to inform the authorized person in charge.

– Make sure that the malfunctioning unit is not accidentally re-installed and used before the malfunction is effectively eliminated. → **Trouble Shooting and Support, page 31**.

2.4 Danger signs

Illustration 1: General danger sign

The general danger sign is used to indicate the danger of personal injury.

Danger sign	Description
	**GENERAL DANGER SIGN** Failure to observe the warning notices can result in death, severe physical injury or damage to health, as well as severe property damage.
	**BURNING HAZARD** Failure to observe the required warning notices could result in serious injury or damage to products if contact is made with a hot surface.
	**CRUSHING HAZARD** If the required warning notices are not observed, physical injuries can occur from closing mechanical parts of a machine.

Table 1: Danger Signs

2.5 Information symbols

The information symbols listed here may appear in this document.

General Information Symbols

Information symbol	Description
	**IMPORTANT NOTE** This information symbol indicates important instructions that should be observed in order to avoid problems with the product.
	**INFORMATION** This information symbol indicates useful notes that should be observed in order to work optimally with the product.

Table 2: Information Symbols

3 Product description

3.1 Intended use

Combined heater / coolers and shakers add efficiency and precision to liquid handling decks for many life science research applications in molecular biology, biochemistry and clinical chemistry. They give labs more control of the process, and that helps achieve more accurate and repeatable results.

Active clamping (automated labware clamping), using customized clamping rods for different labware, lets you use different format plates without adjustment. That also enables you to shake plates with clamped lids and allows piercing through sealing foils while keeping the plate firmly clamped.

The Teleshake 95 AC USB is offering heating and shaking control up to 125 °C [+257 °F] without cooling. The Teleshake AC USB is offering the shaking without temperature control. The devices are offering a shaking amplitude of 2 mm oder 3 mm. All AC devices have compact size.

The Teleshake 95 AC USB can be placed on the deck of liquid handling systems with the lowest possible usage of space. The devices offer excellent control of temperature and fluid mixing according to their temperature needs. Shaking curve is orbital. Due to the stronger motor the device allows higher shaking rpm than with the standard Thermoshake.

The device operates independent and can be managed by a software component. The units are heating / cooling devices with CE and UL certification. They are mainly used on robotic platforms and systems in LabAutomation.

The device is designed specifically for use in Life Science. The Device is prepared for easy integration into IVD applications, but the final IVD validation must be performed by the first marketer (IVD application).

When using the Device in a Biosafety Laboratory Environment, the user is responsible for labeling the devices according to the WHO Laboratory Biosafety Manual (ISBN 92 4154650 6) and for operating the device according to this Biosafety Manual.

The Device must be used exclusively by laboratory professionals trained in laboratory techniques with LabAutomation systems and having studied the instructions for use of this instrument as well as the instructions of the workstation the device is used in.

3.2 Scope of supply

Before initial operation, make sure that the shipment of your unit and its scope of supply is complete, and no parts are damaged.

In case of parcel or product damages, take photos of the damaged boxes and products and email them to techhotline@inheco.com immediately. Transportation damages must be reported to INHECO within 7 days of delivery. The following components should be included in each shipment:

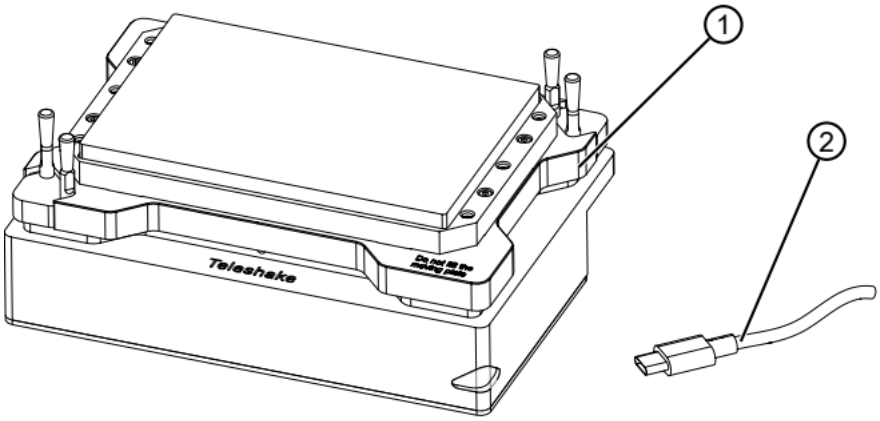


Illustration 2: Scope of Supply

1	Teleshake (95) AC USB	2	USB C cable

Additionally required power supply and power supply cable not included. For information about the required power supply, see → **Cable connection, page 23**. A power supply can be obtained at INHECO, see → **Accessoires, page 32**.

Info

Communication with USB connection only

For communication purposes only a USB connection to a USB host is necessary.

To operate the device the +24V DC supply is necessary.

3.3 Functional elements

3.3.1 Clamping Mechanism

The automated clamping mechanism is suited for ANSI / SLAS standard plates and it will make sure that the plates will keep in position during shaking. After shaking is stopped the clamp mechanism will automatically open.

⚠WARNING

WARNING

In case the plate is not complying with standard ANSI / SLAS plates the clamping mechanism might not sufficiently fix the plate on the shaker table during shaking.

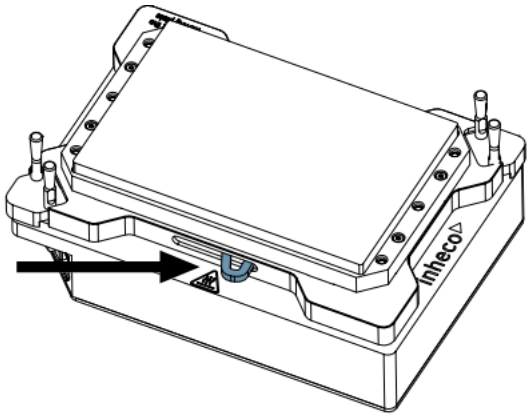


Illustration 3: Clamp mechanism "Open"

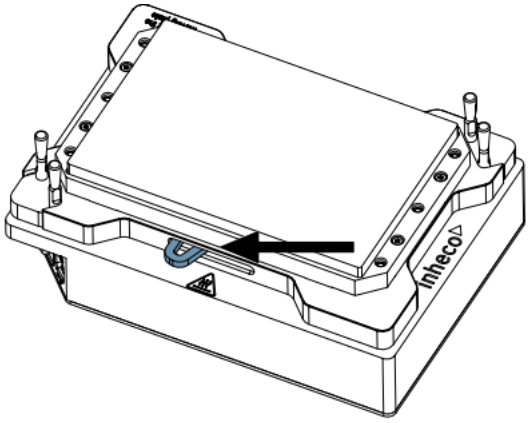


Illustration 4: Clamp mechanism "Closed"

⚠WARNING

Pinching of finger

While the clamp mechanism is closing you might pinch your finger or your glove. Closing or opening takes about 2-5 sec.

3.3.2 Fixation Pins

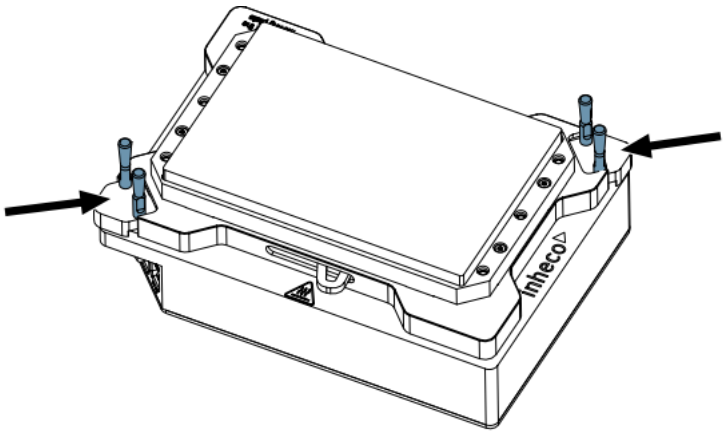


Illustration 5: Fixation Pins of Clamp Mechanism

WARNING

Pinching of finger

While the clamp mechanism is closing you might pinch your finger or your glove. Closing or opening takes about 2-5 sec.

3.3.3 Temperature controlled area

(Only for Teleshake 95 AC USB)

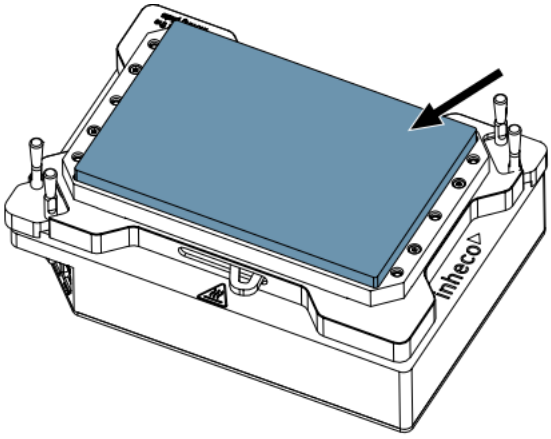


Illustration 6: Heated area of the device.

3.3.4 Recommended Shaking Frequency

NOTICE

Shaking Frequency

The Teleshake AC USB is a highly integrated, powerful shaker that can be operated beyond its recommended limits. This has an impact on the expected service life of the device. The maximum possible load and shaking frequency are dependent on many physical factors. Please contact the service department if you wish to exceed the recommended limits, as Inheco is able to find a customized solution. For example, the optimized setting of the internal shaker counterweight to reduce unwanted vibrations.

Shaking diameter 2 mm:

- At 1,000 RPM max. 1,000 g
- At 2,000 RPM max. 700 g
- At 3,000 RPM max. 200 g

Shaking diameter 3 mm:

- At 1,000 RPM max. 600 g
- At 2,000 RPM max. 400 g

3.4 Status LED

The device has a built-in status LED which indicates the device status.

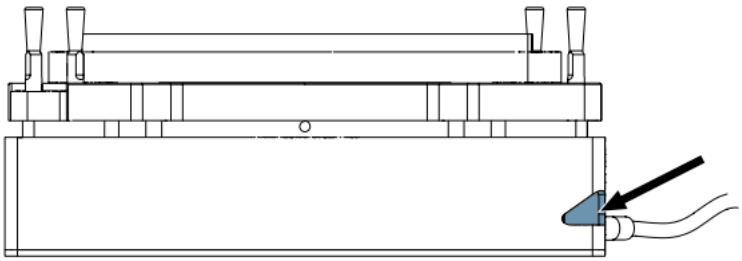


Illustration 7: Status LED

Color of LED	State	Description
Blue	Continous (longer than two Seconds)	Device is missing Firmware
Green	Blinking	Device is initializing
Green	Continous	Device is operating normal
Orange	Continous	Error in Firmware
Red	Continous	Hardware defect

In case of malfunction see → **Trouble Shooting and Support, page 31**.

3.5 Labels

The identification label with part number and serial number also contains important technical indications. The electrical specification on the label must meet your local situation. The label is placed on the side or the bottom of the device.

The identification label must not be removed. If it has become illegible or falls off, it has to be replaced by a new identification label. New labels can be ordered at INHECO. In case the label is missing and you do not know the part number and serial number, they can also be read out with the software (Device Manager) which can be downloaded from INHECO´s customer area on www.inheco.com. → **Trouble Shooting and Support, page 31**.

Illustration 8: Example for product label on the device (marking varies depending on the device)

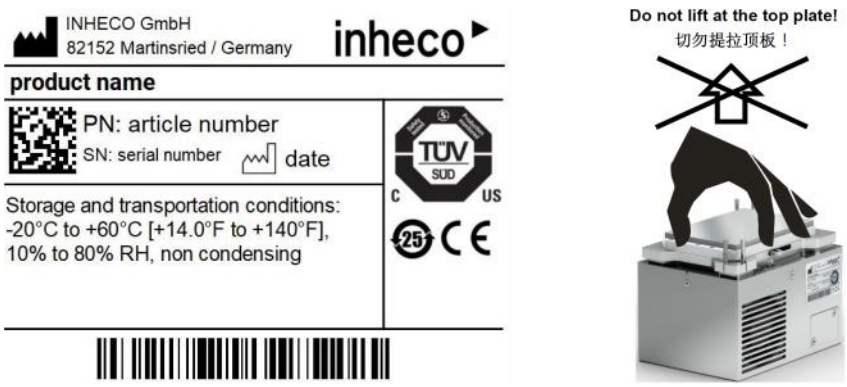


Illustration 9: Example for shipment labels on the package

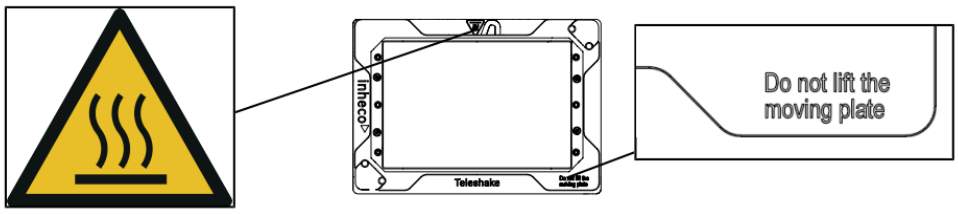


Illustration 10: Additional Labels on the product

3.6 Technical data

	Teleshake AC USB 2 mm	Teleshake AC USB 3 mm	Teleshake 95 AC USB 2 mm	Teleshake 95 AC USB 3 mm
Product number	7100180	7100181	7100182	7100183
Height (bottom to contact surface)	47.3 mm [1.862 in]			
Height with standard fixation pins	59.7 mm [2.35 in]			
Length x width	144 mm x 101 mm [5.669 in x 3.976 in]			
Temperature range	---		Ambient +5K up to +125°C [Ambient +5K up to +257°F]	
Operation Voltage	+24 Vdc			
Max. current	1.9 Amax		6.3 Amax	
Noise	Max. 42 dB(A)			
Protection category	IP 20			
Pollution degree	2 (laboratory equipment)			
Altitude	Max. 2500 m			
Weight including cables	2.2 kg [4.85 lbs]			
Maximum load	1 kg [2.2 lbs]			
Shaker frequency	up to 3000 rpm *1)	up to 2000 rpm *1)	up to 3000 rpm *1)	up to 2000 rpm *1)
Shaking amplitude	2 mm [0.089 in]	3 mm [0.118 in]	2 mm [0.089 in]	3 mm [0.118 in]
Shaking pattern	Orbital			

*1) Depending on the load. High frequency shaking with high load can lead to spills or clamping failure. We recommend testing the desired frequency with a microtiter plate and water beforehand.

Tolerable relative humidity	Operation	10-80% RH (non condensing)
	Transportation and storage	10-80% RH (non condensing)
Temperature	Operation	+15°C to +32°C [+59°F to 90°F]
	Transportation and storage	-10°C to + 60°C [+14°F to 140°F], non condensing

Table 3: Environmental Conditions

4 Installation

4.1 Hardware installation

4.1.1 Hardware inspection

Before initial operation, make sure that the shipment of your unit is complete and neither packaging nor parts are damaged → **Scope of supply, page 12**.

4.1.2 Fixation of microplates

A proper positioning of the microplate is essential to avoid uncontrolled motions of the plate, and to achieve the desired shaker frequency.

Info

Please test your requested shaking frequency with only a microplate first, then with the microplate filled with water to make sure that the frequency is not set too high for your set up.

Info

The Labware needs to be SBS size, if labware is too small or too big the clamping mechanism will not close correctly and might get damaged.

Tubes, reservoirs, and plates without flat bottom require a thermal adapter (insert, nest), → **Installation of adapter plates, page 22**. A flat bottom plate can be placed directly onto the contact surface and is positioned by the holder at two corners of the device.

A custom-fit thermal adapter plate (insert, nest) for the temperature transfer into the tube or plate also ensures a proper positioning of the plate. The holder at the four corners can be taken off in case the standard holder is not suitable for your set up. → **Removal of fixation pins, page 20**. Visit www.inheco.com to find the custom-fit adapter for your microplate and contact sales@inheco.com in case you need a custom-fit holder.

4.1.3 Removal of fixation pins

Use an open-end wrench to unscrew the pins and replace them with the custom-fit pins provided by INHECO.

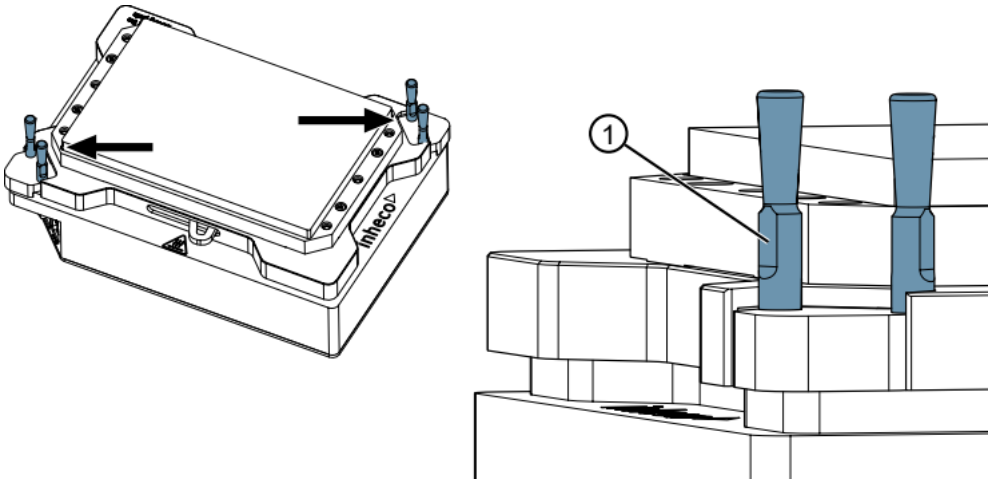


Illustration 11: Removal of Fixation Pins

1	Access for open-end wrench (3 mm)

Step 1: Use the open-end wrench to screw the new pins back in position.

Info

In case the standard fixation pins don't work with your plate please contact INHECO (sales@inheco.com) for customized fixation pins.

4.1.4 Installation of adapter plates

A thermal adapter is not needed for microplates with flat bottoms. Such plates can be placed directly onto the temperature contact surface of the device.

Custom-fit adapters are required for all tubes, reservoirs and plates without flat bottoms, to ensure temperature transfer into the microplate / assay. The adapter may facilitate accurate positioning for easy robotic handling plate.

Visit www.inheco.com to find the adapter which fits your tube, reservoir or plate. In case you do not find your microplate on the list of adapters, ask sales@inheco.com for a custom design.

There are two orientations possible for the installation of the adapter plates.

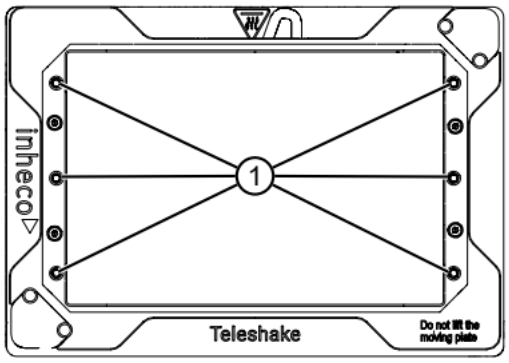


Illustration 12: Threaded holes to fix or unfix the adapter plates (1: M2.5 x10)

NOTICE

Tightening torque for adapter screws

– The recommended maximum tightening torque for the adapter screws is **10 Ncm**. Overtightening may cause damage to the shaker.

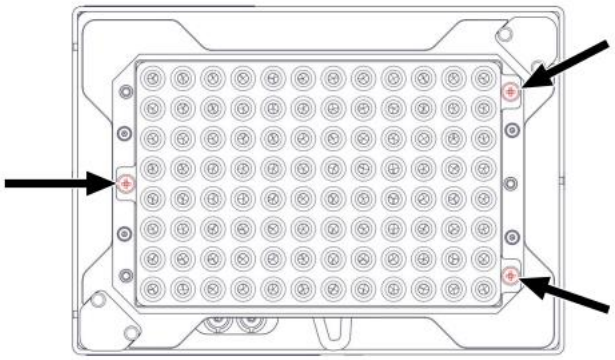


Illustration 13: Device with installed PCR adapter plate (3 screw holes used)

4.1.5 Cable connection

The device must be connected to a power source and a USB host.

The device needs a +24 V DC power supply. The cable must be AWG 18..16 or wire end sleeve 1mm^2..1,5mm^2.

NOTICE

Risk of damaging the device

Operating the device with a different power supply than listed in → **Accessoires, page 32** may cause damage to the device.

– When using a different 24V DC power supply the power supply to the device must be fused with 8A.

The USB connection requires a USB cable type C. A USB type C cable is included with the device.

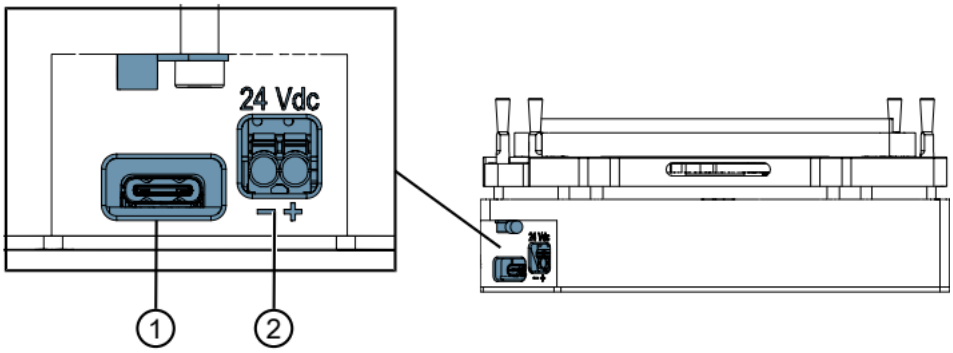


Illustration 14: Cable connections

1	USB C Port	2	+24 V DC Port

To connect the device:

Step 1: Connect the device to a applicable, not plugged in power supply, → **Technical data, page 18**, → **Accessoires, page 32**.

Step 2: Connect the power supply to a power source.

Step 3: Connect the device with the USB C cable to the USB host.

Info

Communication with USB connection only

For communication purposes only a USB connection to a USB host is necessary.

To operate the device the +24V DC supply is necessary.

4.1.6 Mechanical integration

The device is usually integrated into liquid handling workstations. The way of fixation depends on the hardware provided by the automation platform manufacturer. When the devices are placed on a bench top, they must be fixed to the ground with two M4 screws via the thread holes of the units. The ground must be firm and even.

NOTICE

Transporting the device

For transportation and installation of the device the shaker needs to be in closed position, Getting the device in closed position.

Drilling schematic for secure mounting of the device:

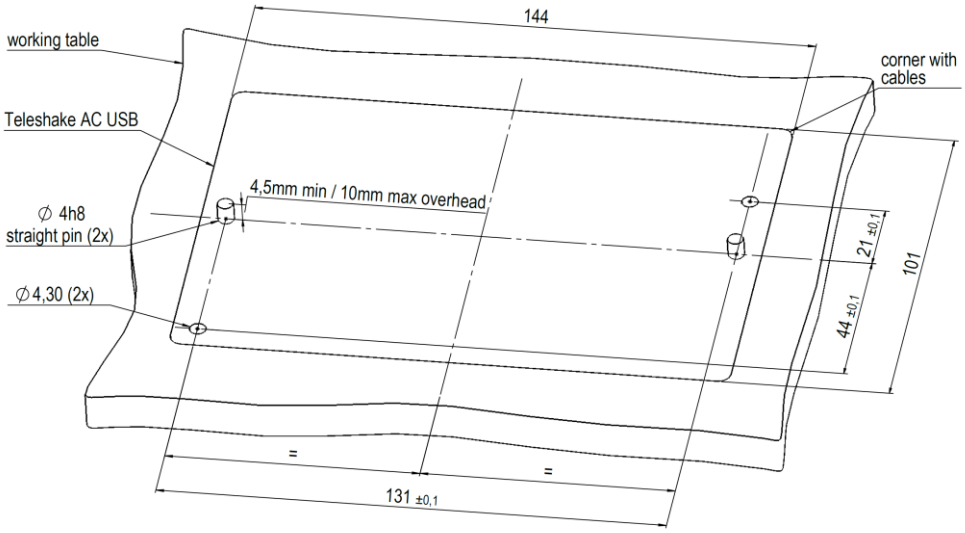


Illustration 15: Drilling Scheme Teleshake (95) AC USB

NOTICE

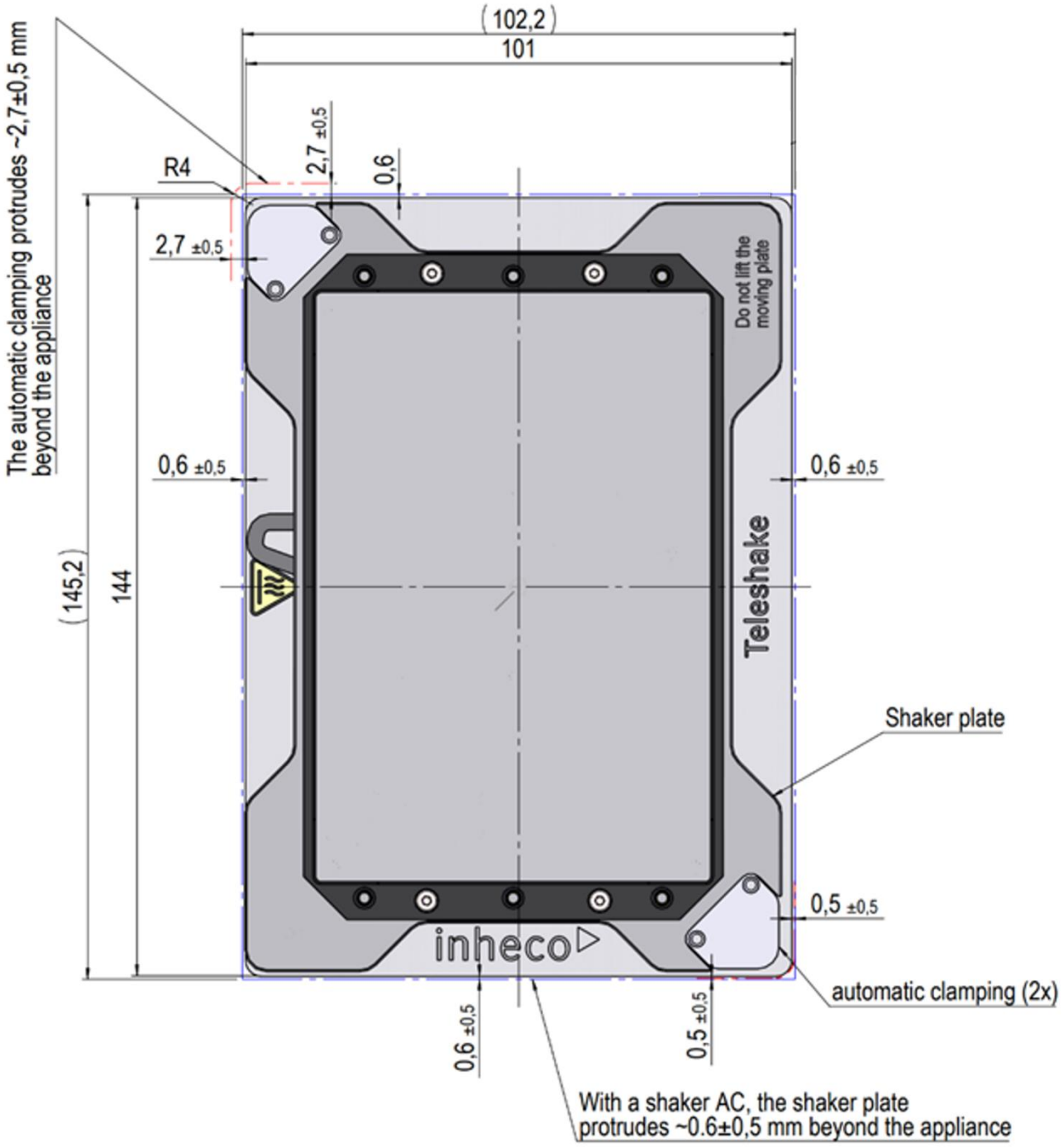
Fixed to ground

The Shaker always needs to be fixed to the ground for proper shaking performance.

NOTICE

Installation situation

The Shaker requires a minimum distance to the adjacent appliances, otherwise a collision may occur when using the shake function. Please note the installation tolerances of your carrier rack.



4.2 Device Communication

The device has a USB communication interface. Ideally, the device should be addressed by operating software of robotic system for synchronization.

There are several options to communicate with the device:

Device Manager

For communication with the Device Manager as a standalone system (not synchronized with the robotic system, e.g. for support cases) refer to the Device Manager Manual and Quick Installation Guide. These Documents can be downloaded from the customer area on www.inheco.com.

Integrated in robotic system software

For daily operation of the device, we recommend the integration either by

- Bootstrapping on the liquid Handling Platform or
- Bootstrapping in the adapter interface of the library

Refer to the Software Integration Guide, which can be downloaded from the customer area on www.inheco.com.

INHECO also offers files to help with integration such as jsonfiles etc. Please contact techhotline@inheco.com to receive a download link.

Info

Information for teaching your robotic system

The closed position of the clamps can be adjusted via firmware commands to ensure a proper clamping force. The open position is not adjustable, and the device will always fully open when prompted.

5 Operation

The device is designed for the use/integration with robotic platforms and can only be operated through the PMS of the liquid handling workstation. The device must be used exclusively by laboratory professionals who are familiar with the instructions of this manual as well as with the instructions of their workstation.

All software products as well as the documentation are provided online in the “Inheco Customer Area”. The device can be operated by software via two different solutions:

1. Device Manager

   The Device Manager Software is a standalone application (GUI). The Device Manager Manual leads users through the process of installing, operating, and maintaining the device efficiently.

2. Software Integration

   The Software Integration Guide describes the integration of the device supporting libraries into third party custom applications. Within the documentation code examples are also included.

5.1 Safety instructions for operation

NOTICE

Do not operate the device in an ambient temperature of more than 32°C [90°F]. Otherwise, the devices may not work properly or may even get damaged.

Free air supply of the ventilation opening must be ensured to avoid damage to the unit (only for Thermoshake AC).

⚠WARNING

Burning hazard

Devices can burn your skin. Even after switching off the Device, its surface can still be hot and could seriously burn your skin as the material´s temperature can reach up to +125 °C [+257 °F]!

– Let the device cool down before touching it. This might take a while.

⚠WARNING

Pinching of finger

While the clamp mechanism is closing you might pinch your finger or your glove. Closing or opening takes about 2-5 sec.

⚠WARNING

Warning

Not ANSI / SLAS complying standard plates or too high speeds can result in injuries due to hot spilling liquids.

– Test the desired load - speed configuration with a microtiter plate and water beforehand.

6 Maintenance

6.1 Software updates

For updates of the Device Manager contact sales@inheco.com.

6.2 Cleaning

⚠CAUTION

CAUTION

Before cleaning the device, disconnect power and make sure the temperature at the heated area is below +50°C.

The contact surface should be cleaned regularly to ensure optimum heat transfer into the microplate and assay. Always clean the contact surface after a spillage. Use a cloth with a 50:50 water / isopropanol solution and make sure that no deposits are left on the surface. Liquids must not enter into the unit.

Do not use aggressive cleaning fluids such as acetone, or abrasive cleaners.

Contact INHECO in case you prefer other cleaning liquids or methods as they might be harmful for the material of the devices.

6.3 Decontamination

Decontamination is required before return of a device to INHECO in case it has been exposed to human or animal blood / fluid / tissue or has been exposed to biological, chemical, or radioactive materials.

The surface decontamination should include a wipe-down of the housing surface with a decontaminating solution. A solution of 70 % alcohol, bleach (5 %-12 %) or Microside SQ can be used where effective for the respective target material (organism). Otherwise, the appropriate decontamination method and solution to eliminate any risk must be applied. Fumigation (e.g., with toxic formaldehyde or ethylene oxide gas) might be required if decontamination of inaccessible areas is needed but ensure to take precautions when using toxic gases or fluids for decontamination.

Info

Contact INHECO if you are not sure whether the used decontamination method or solution could damage the device or its surface material. → **Contact information, page 5**

NOTICE

In case of decontamination with gas, make sure that no liquid enters inside the device.

6.4 Calibration / Verification

For proper performance of the device, it is recommended to verify the thermal and shaking performance at least once a year. Depending on the application, shorter verification intervals may be required. INHECO recommends to use the INHECO Measurement Plate (IMP) to perform the verification.

Contact techhotline@inheco.com in case of performance deviations from set values.

6.5 Return for Repair only with RMA Number

INHECO devices must be repaired by INHECO only. Parts must not be exchanged by the user. Exchange of parts or broken seals can lead to the loss of warranty. Spare Parts must be ordered from INHECO.

INHECO only accepts decontaminated devices for repair, firmware update, maintenance etc., in case the devices were exposed to blood, to other body fluids or tissues, to biological, chemical or radioactive materials.
→ **Cleaning, page 28** and → **Decontamination, page 28**.

Devices which were exposed to biosafety level 3 and 4 environments are not accepted by INHECO for return.

Ask techhotline@inheco.com or visit www.inheco.com/service/returns-rma.html for the return procedure before you return a device to INHECO. Do not return any devices without INHECO's RMA number. INHECO's RMA number must be shown on the outside of the return package.
Returns without RMA number are not being processed by INHECO.

Devices should ideally be returned in the original packaging. If not possible, make sure that devices are sufficiently protected and cannot move within the package to avoid transportation damage.

NOTICE

Do NOT return the device in open position as otherwise the shaker motor will get damaged. For information about how to close the device refer to the Device Manager Manual which can be downloaded at www.inheco.com.

6.6 Transportation and Storage

It is recommended to keep the original packaging. INHECO devices should be shipped and stored in their original packaging. Adhere to required environmental conditions for transportation and storage, → **Technical data, page 18**.

6.7 Shut Down and Disposal

The device must be disposed of in accordance with environmental and biosafety directives. You must arrange for correct electric waste disposal following current safety regulations of your country.

All INHECO devices are RoHS and WEEE compliant.

7 Failures

If you receive a failure message without clear remedy instructions, please contact the support of your workstation provider.

Ask a technical skilled user (e.g. service technician) to follow the instructions below.

7.1 Opening the device manually

The clamping mechanism can be opened manually by using the lever:

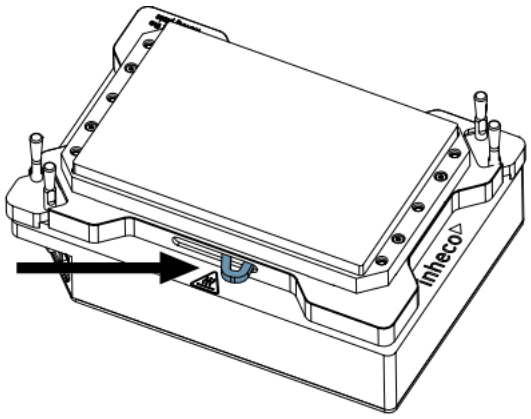


Illustration 16: Clamp mechanism "Open"

Step 1: Move the lever to the open position (arrow) to open the lid.

7.2 Restart device

If necessary to restart the device, follow these instructions:

Step 1: Unplug the USB connection.

Step 2: Disconnect the power.

Step 3: Reconnect the power.

Step 4: Plug in the USB connection.

⇨ The clamp mechanism is opened and in zero- position after a power restart.

8 Trouble Shooting and Support

In case of an operation failure follow the trouble-shooting instructions of this chapter. INHECO needs the below mentioned information to help you troubleshooting the operation failure.

Provide the following when contacting INHECO for support:

- INHECO product number of the device (shown on device label)
- INHECO product name of the device (shown on device label)
- INHECO serial number of the device (shown on device label or via software)
- Detailed error description
- Reported Errors
- Information about setup of devices:
  - integrated in workstation
  - controlled by workstation software or INHECO software

The serial number is shown on the device labels and can be read out with de Device Manager.

The Device Manager must also be used to generate the above-mentioned report of error codes for the connected devices.

Based on the above information, INHECO's TechHotline decides about the requirement of a return. → **Return for Repair only with RMA Number, page 29**.

Our Return process is explained here: https://www.inheco.com/rma-process.html

9 Accessories

Power supply

Product name	Description	Part number
TS USB	+24Vdc Power supply	2400260

Thermal Adapter

A list of adapters (inserts, nests) can be downloaded from INHECO´s webpage www.inheco.com or requested from sales@inheco.com.