

User and Installation Manual



ODTC

On deck thermal cycler: ODT 96, ODT 384, ODT 96 XL, ODT 384 XL
Part No.: 81000XX

INHECO Industrial Heating and Cooling GmbH reserves the right to modify their products for quality improvement. Please note that such modifications may not be documented in this manual.

This manual and the information herein have been assembled with due diligence.

INHECO GmbH does not assume liability for any misprints or cases of damage resulting from misprints in this manual. If there are any uncertainties, please feel free to contact sales@inheco.com. → How to contact INHECO, page 6.

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1 IMPORTANT NOTES

1.1. General Information

Read the user instructions completely. The manual explains how to handle all types of ODTC® 96 and 384 (Part#: 8100xxx). For the operation of the ODTC® a third party SiLA capable PMS is necessary → Communication with ODTC®, chapter 5

Example of Sets- Part# 8100100 consists of:

ODTC® Power & Control Unit (#8900035) and the ODTC® 96 Left (#8100000)

We offer ODTC® Left-, ODTC® Back-, ODTC® Right-, ODTC® Down -Versions which all differ in their ventilation.

In addition we have the ODTC® 96 XL and ODTC® 384 XL available which differs in the space for the gripper and the ODTC® 96 XL additional offer to use another type of PCR plates which can be used on top. The ODTC® 96 XL allows to handle low profile and also high profile ODTC® 96 XL plates for PCR volumes of up to 100µl.

In the following ODTC® is used for all ODTC® configurations (incl. Power & Control Unit). Only when necessary the exact type of ODTC® or Power & Control Unit will be stated.



In case the instructions contained in this manual are not followed, injury or product damage cannot be excluded.

Missing or insufficient knowledge of the manual leads to loss of liability against INHECO GmbH.

This manual is part of the ODTC® and must be retained until the device is disposed of and must be passed on with the ODTC® when the device is taken over by a new user.

Manual instructions must be followed in order to limit the safety risk during operation of the ODTC®.

Security-related warnings in this manual are classified into three hazard levels:

- The signal word WARNING indicates hazards which – without precautionary measures – can result in death or serious injuries.
- The signal word CAUTION indicates hazards which – without precautionary measures – can result in minor to moderate injuries.
- The signal word NOTE stands for the general precautionary measures that have to be taken to avoid damaging the device.
- The signal word NOTICE stands for the general measures that help using the device.

Contact INHECO in case there are any uncertainties of how to operate or how to handle the ODTC® 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, → How to contact INHECO, page 6.

1.2. Explanation of Symbols

Symbol	Explanation
	Potential danger of injury or death. → signal words WARNING and CAUTION indicate the severity
	Warning: Potential danger of hot surface.
	Caution: Potential danger to crush fingers or hand.
	Note: Potential danger to damage the device.
·	Bullet points indicate steps of instructions.
-	Hyphens are used for enumerations.
→	Arrows indicate: “refer to” and are mostly an active link
blue writing	indicate a software button

1.3. Abbreviations and Glossary

The document uses the following terms	
ODTC®	On Deck Thermal Cycler
PCU	ODTC® Power & Control Unit
°C	Degree Celsius
Hz	Hertz [1/s]
Iac	Alternating Current
I_{dc}	Direct Current
K	Kelvin
kg	Kilogram
rhu	relative humidity
TEC	Thermo Electric Cooler (Thermoelectric Module, Peltier Element)
Uac	Alternating Voltage
U_{dc}	Direct Voltage
W	Watt
IVD	In Vitro Diagnostic
FDA	Food and Drug Administration
SiLA	Standardization in Laboratory Automation
PMS	Process Management Software (control software of automated system)
PCR	Polymerase Chain Reaction
NGS	Next Generation Sequencing
VCM®	Vapor Chamber Mount (three dimensional heat pipe)
Gbit/s	Gigabit per second
Slope	Heating and Cooling Rate of ODTC®
Verification	Proof that the ODTC® is working within the specifications → Technical Data
Method	Defines all temperature steps for one single run
Temperature initialization step	Is mandatory to set the ODTC® mount and lid to a defined start temperature.
Method Set	Comprises all edited temperature initialization steps and methods.
XL	Extra Large

1.4. Warranty

The warranty period starts on the date of shipment. Any damage caused by operating the ODTC® devices outside the specifications and guidelines leads to the loss of warranty.

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. → Cleaning and Decontamination, page 37.

Devices exposed to Biosafety level 3 and 4 Environments or radioactive materials are not accepted by INHECO for return.

1.5. How to contact Tek-Matic

Authorized Distributor



www.tekmatic.com 815.282.1775 insidesales@tekmatic.com

2 PRODUCT DESCRIPTION

2.1. Intended Use

The ODTC® is designed for use as an integrated Thermal Cycler in automated liquid handling workstations, to heat and cool labware with biological or chemical samples, e.g. for NGS or PCR. The ODTC® is not intended to be used as a stand-alone unit.

The ODTC® devices are delivered with CE- and UL- certification.

The ODTC® is designed specifically for use in Life Science and In Vitro Diagnostics. The ODTC® devices are prepared for easy integration into IVD applications, but the final IVD validation has to be performed by the first marketer (IVD application).

When using the ODTC® 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 devices according to this Biosafety Manual.

The ODTC® needs to be installed by a skilled technical integrator, assisted by a system administrator for network settings. The device is made for use in a private local area network without any connection to the global network. In case of an existing connection to the global network, the PC (OS+SW) should implement CyberSecurity measures to ensure that the private instrument network cannot be accessed / attacked (one option might be using different network cards or a password).

The ODTC® 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 manual.

2.2. Components - 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 without delay. Transportation damages must be reported to INHECO within 7 days of delivery. The following components should be included in each shipment:

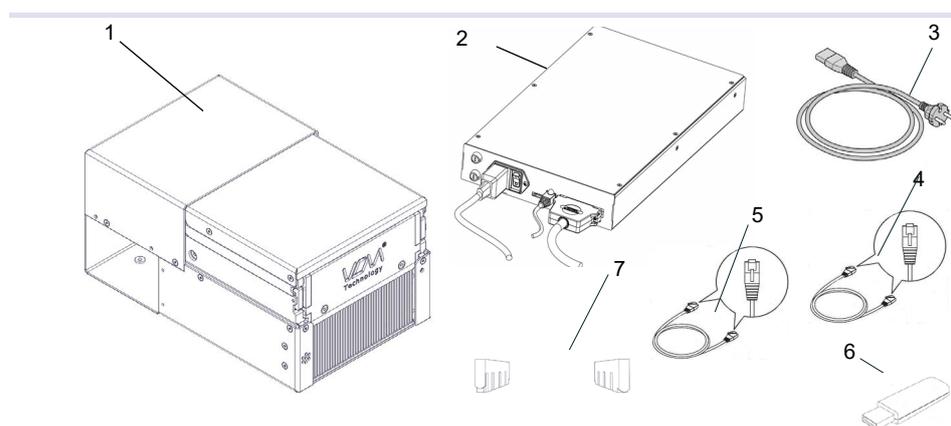


Fig.1: Components

(1) ODTC® incl. hardwired connector cable (shown ODTC type is 1 of various ODTC types available)

(2) ODTC® Power & Control Unit (PCU)

(3) Power cable

(4) Yellow Ethernet cable (RJ45)

(5) Red Ethernet cross-over cable (RJ45)

(6) USB flash drive (contains: this manual and Script Editor Manual, Firmware Command Set, ODTC device finder, ODTC Script Editor (software to create ODTC usable protocols/scripts) → Communication with ODTC, chapter 5).

(7) only for ODTC® 96 XL ejection bars to use high profile plates

2.3. Functional Elements

The ODTC® set primarily consist of the Thermal Cycler (ODTC®) and a Power & Control Unit (PCU). ODTC® and Power & Control Unit are connected by a maximum 3m cable which is hard-wired to the ODTC®.

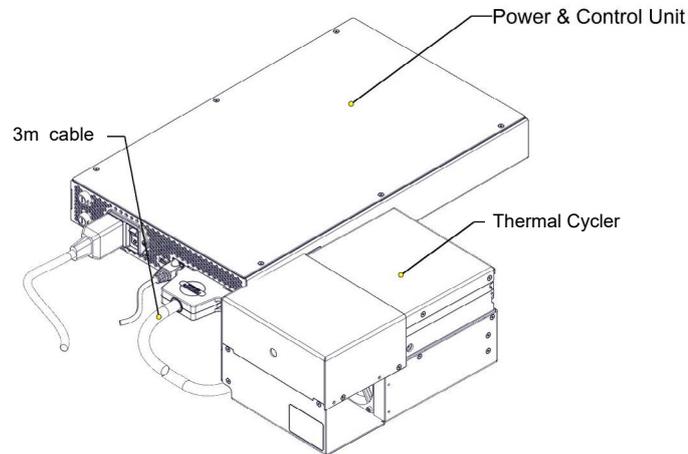


Fig.2: ODTC® set (Power and Control Unit 8900035 + Thermal Cycler 8100000) from the back showing the connection of both devices

2.3.1. Functional Elements of the ODTC®

- ODTC® front:

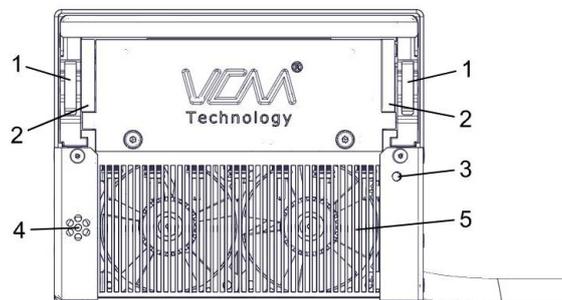


Fig.3: Functional elements of ODTC® at the front (for ODTC® with ventilation at the back or on the right the ambient temperature sensor (4) and Status LED (3) are mirrored)

- (1) Latches for locking the lid. How to open the ODTC® Lid manually → chapter 6.2.2, page 29.
- (2) Removable blocks for better gripper access and cable inlet for verification tool → chapter 4.3.1, page 23.
- (3) Status LED → table below with the description.

LED color	Status LED	Description of status
no color (off)	off	device is off
green	steady light	device is ready for operation
green	flashing	initialization, self-test, device ok but not ready yet
red	steady light	malfunction
red	flashing	malfunction of controlling mini PC located on the mainboard of the ODTC® Power & Control Unit

- (4) Ambient temperature sensor, to ensure that the ODTC® runs within its specified operation temperature → Ventilation, chapter 6.1, page 26 and Failures, chapter 8.3, page 40.
- (5) Ventilation inlet

- ODTC[®] ventilation

The ODTC[®] ventilation with free air supply is necessary to ensure sufficient cooling for the device. For optimal ventilation and integration in various workstation layouts INHECO offers 4 ventilation directions for the ODTC[®] versions (for the ODTC 96, ODTC 384, ODTC[®] 96 XL and ODTC[®] 384 XL):

ODTC[®] (e.g. #8100000, 8100010): Ventilation outlet on the left

ODTC[®] (e.g. #8100001, 8100011, 8100031): Ventilation outlet at the back

ODTC[®] (e.g. #8100002, 8100012): Ventilation outlet on the right

ODTC[®] (e.g. #8100003, 8100013): Ventilation outlet below the device

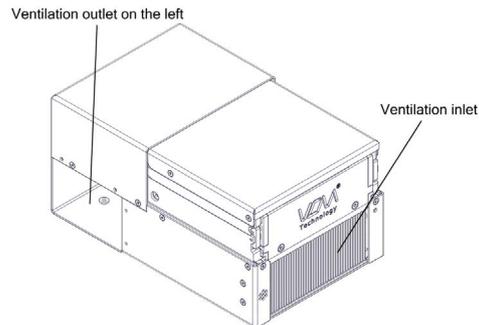


Fig.4: ODTC[®] ventilation version with ventilation outlet on the left

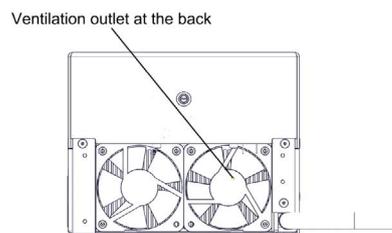


Fig.5: ODTC[®] ventilation version with ventilation outlet at the back

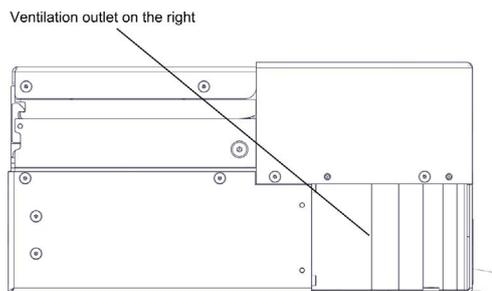


Fig.6: ODTC[®] ventilation version with ventilation outlet on the right

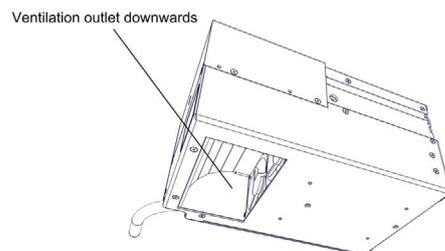


Fig.7: ODTC[®] ventilation version with ventilation outlet at the bottom

- ODTC® Lid

The horizontally moving ODTC® Lid includes a heating and sealing function to avoid evaporation, condensation and possible cross contamination.

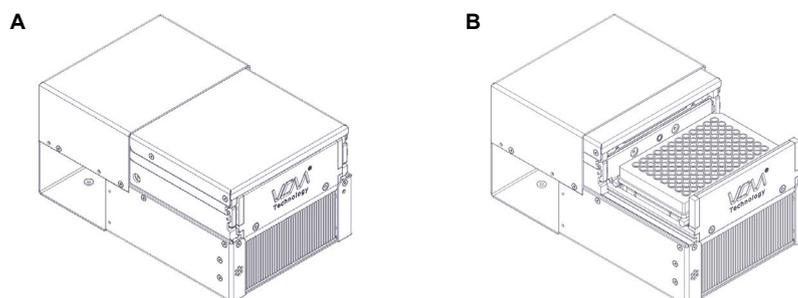


Fig.8: ODTC® Lid (A = closed position, B = open position)

NOTICE

Even with an open ODTC® Lid the Thermal Cycler can be operated (temperature profiles can be run). Operating the ODTC® with open ODTC® Lid may cause evaporation, condensation, and cross contamination. In this case it is the user's responsibility to avoid this with other measures.

- ODTC® Sealing Cover

The ODTC® Lid has a pre-installed Sealing Cover (removable). The Sealing Cover is used to ensure correct heat transfer from the top and to seal the plates (pre-sealed plate strongly recommended). The combination of Sealing Cover (or as alternative a suitable automated Sealing lid) **and** pre-sealed plate provides the best sealing to avoid evaporation, condensation and possible cross contamination.

The Sealing Cover is manually accessible for exchange/maintenance/service & cleaning → chapter 6.2.2, page 29.

The Sealing Cover can be replaced by a suitable automation friendly Sealing Lid → chapter 6.3.3, page 33..

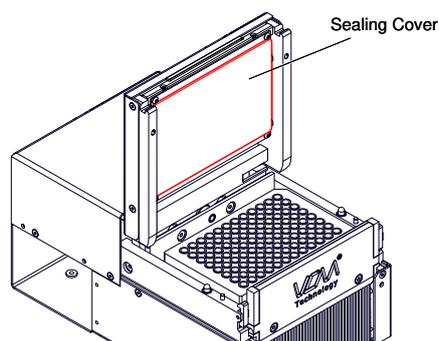


Fig.9: ODTC® Lid with integrated Sealing Cover

NOTICE

Either the ODTC® Sealing Cover **OR** a suitable automation friendly Sealing Lid has to be used to ensure correct heat transfer and to seal the plate properly. It is the user's responsibility to find and prove the best sealing option for his process.

- **ODTC® VCM® (Vapor Chamber Mount)**

The VCM® is the interface between the 96 and 384 well PCR plate and the thermal motor of the ODTC®. The VCM® allows an optimized heat transfer into the plate.

The VCM® or three dimensional 3D „Vapor Chamber Mount“ technology (patent pending) is based on heat pipe technology and is as such a further development of a standard 1D heat pipe (often used in laptop computers) and a flat 2D vapor chamber. → detailed information on www.inheco.com within the technology section.

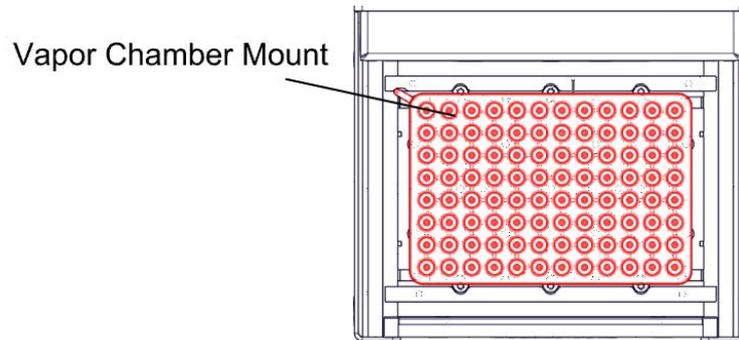


Fig.10: Functional element inside the ODTC® 96: VCM® (Vapor Chamber Mount)

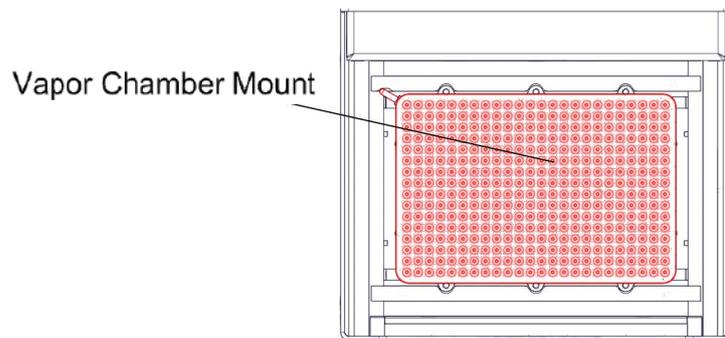


Fig.11: Functional element inside the ODTC® 384: VCM® (Vapor Chamber Mount)

NOTICE

For ODTC® 96 XL: The maximum volume for PCR applications in high profile plates should not exceed 100µl/well. Liquid levels above 100µl will exceed the height of the enclosed wells in the mount.

- ODTC® plate ejection mechanism

Due to the applied pressure and high temperatures (depending on executed temperature profiles), the inserted disposable might get stuck to the VCM®. Therefore, the ODTC® has a built-in plate ejection mechanism to loosen the PCR plate after the finished process. The plate ejection mechanism is automatically activated when the ODTC® lid is opened. The plate ejection mechanism is optimized for specific PCR plates → chapter 8, page 40.

Please contact INHECO if you plan not to use the recommended PCR plates. INHECO will help to determine whether the existing ejection bars (fig. 12 below) are suited or whether custom designed ejection bars are needed. The scope of supply includes ejection bars for full skirted PCR plates. Contact INHECO if ejection bars for semi skirted or non-skirted PCR plates are required.

The ejection bars are loose parts and can be taken off by hand. Ensure that they are in place at first installation and daily usage of the ODTC®.

NOTE

The thermal block (VCM®) and plate ejection mechanism are optimized for specific PCR plates → chapter 8, page 40.

Do not use other PCR plates without approval from INHECO. The use of other plates might reduce the thermal performance or might not work at all, if:

- plate does not fit perfectly into the VCM® => insufficient heat transfer
- plate ejection mechanism does not work properly
- ODTC® Lid does not to close properly

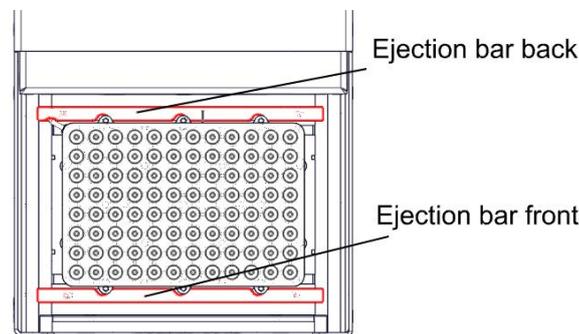


Fig.12: Functional element inside the ODTC®: plate ejection mechanism

NOTICE

For ODTC® XL 96/384: The ejection bars for the use with high profile plates differ from the standard ejection bars. The standard ejection bars for low profile plates are delivered within the ODTC XL 96/384 and the ejection bars are delivered as accessories → chapter 2, page 07



Fig.13: Ejection bars (A = for ODTC® low profile plates; B = ODTC® 96 XL high profile plates)

2.3.2. ODT[®] Power & Control Unit

The ODT[®] device has to be controlled via the ODT[®] Power & Control Unit. It can be positioned horizontally or vertically and is connected to the ODT[®] via a 3m cable with the ODT[®] connector (number 6 in fig.13)

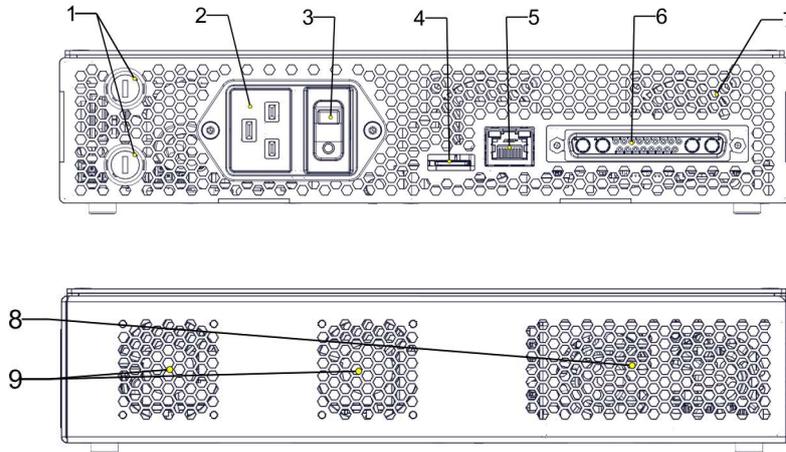


Fig.14: Functional elements of the ODT[®] Power & Control Unit

- (1) Fuses
- (2) Power connector
- (3) Power switch
- (4) Micro-SD card slot, which contains a Micro-SD card. This SD card is used for storing log files.
- (5) Ethernet connector with 2 Status LEDs → table below for color explanation
- (6) ODT[®] connector
- (7) Ventilation outlet
- (8) Ventilation inlets of the power supply
- (9) Ventilation inlets of the controller board

LED color	left/right	Status LED	Description of status
orange	left	steady/flashing light	Ethernet connection ok
orange	left	off	Ethernet connection failed, device not on
green	right	steady light	Device is ready for operation
green	right	off	Device is in status off or device is re-booting or a SiLA error occurred during boot period

NOTE

The ODT[®] Power & Control unit contains a Micro-SD card. This SD card is used for storing log and trace files. Do not use the PCU while the SD-card is not inserted as it is necessary for proper operation (respectively for proper support) of the device. The Micro-SD card can be removed when the PCU is powered off to copy the log and trace files.

2.4. 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 back or side of the ODTC® and on the side of the ODTC® Power & Control Unit. 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.

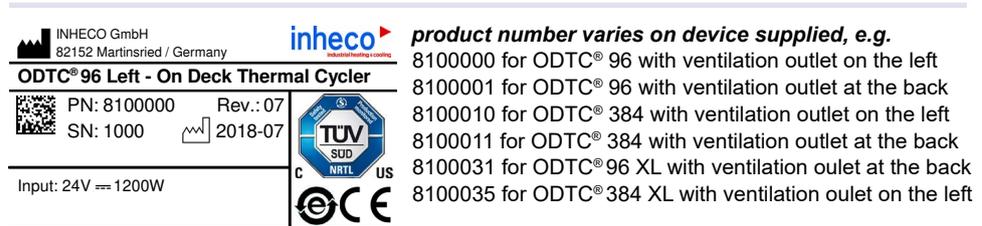


Fig.15: Example product label on the ODTC®

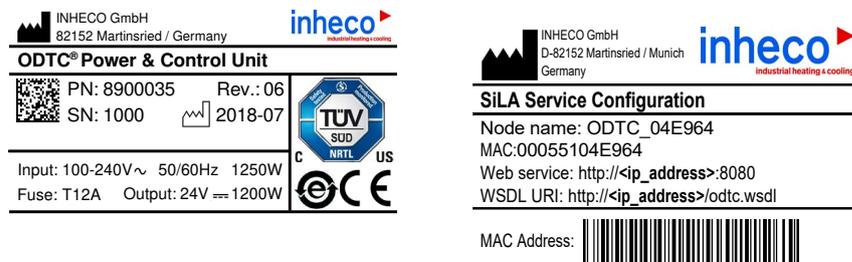


Fig.16: Product label on the ODTC® Power & Control Unit

NOTICE

The node name shown on the label for the SiLA Service Configuration can be used to ping the device, e.g. "ping ODTC_04E964".

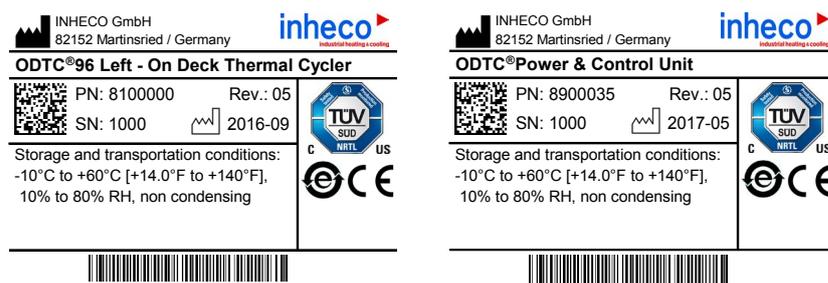


Fig.17: Example shipment labels on the package (part number varies on device ordered)



Warning Hot



Crushing Hazard



Warranty label

Fig.18: Other labels clearly visible on the housing of the product

2.5. Technical Data

General Specifications -	ODTC® 96 and 384	ODTC® 96 XL and 384 XL
Dimensions (WxDxH)	156.5 mm x 248 mm x 124.3 mm	156.5 mm x 285.2 mm x 129.3 mm
Weight	approx. 7.5 kg	
Plate ejection	automated plate ejection mechanism with exchangeable ejection bars	
ODTC® device DC Input ¹⁾	24 Vdc / 1200W	
Protection Class	III (according DIN EN 61140)	
EMV device class	Group 1 / class A (industrial requirements)	
PCR plates	96 and 384 well VCM optimized for specific PCR plates → chapter 9, page 43. (other PCR plate formats only on request)	
Maximum Volume during PCR	100µl/well for 96 well version 50µl/well for 384 well version	
ODTC® Lid	opens and closes by horizontal move and is heated to avoid condensation running temperature profiles with open ODTC® Lid possible	
Lid Pressure	automated adjustment of lid pressure for different disposable and sealing options	

¹⁾ ODTC® device shall only be powered by the ODTC® Power & Control Unit.

Thermal Specifications - ODTC®	ODTC® 96 / ODTC® 96XL	ODTC® 384 / ODTC® 384XL
Temperature range	+4°C to +99°C [+39°F to +210°F] ²⁾	
Temperature accuracy	±0.30 K at +55°C [+131°F]	
Temperature uniformity	±0.20 K at +55°C [+131°F] ±0.20 K at +72°C [+162°F] ±0.20 K at +95°C [+203°F]	
Heating rate average (slope)	max. 4.4 K/sec	max 5.0 K/sec
Cooling rate average (slope)	max. 2.2 K/sec	
Adjustable heating & cooling rate	from 0.1 K to 4.4 K/sec	from 0.1 K to 5.0 K/sec
ODTC® Lid temperature	adjustable between ambient temperature + 5.0 K to +115°C [+5.0 K to +239°F]	
ODTC® Lid default temperature	+110°C [+230°F]	+115°C [+239°F]

²⁾ Operation of ODTC® below ambient temperature: The operation of the ODTC® below ambient temperature has to be limited to 1-2 hours per application. Depending on the humidity in the atmosphere, condensation will be generated when operating the ODTC® below ambient temperature. The condensation might have an effect on the thermal performance and lifetime of the ODTC®. Condensate can prevent the ODTC® from operating properly and can damage the ODTC®. After each use of the ODTC® below ambient temperature a drying step needs to be performed. It can be part of a following method or should follow directly after the cooling period. The drying step needs to be clearly above ambient temperature. The length of the drying step depends on the amount of condensate and should be ended when no condensation is visible on the Mount or its surrounding.

Specifications - ODTC® Power & Control Unit	
Dimensions (WxDxH horizontally placed)	256.5 mm x 414.5 mm x 58 mm ³⁾
Interface	SiLA, Ethernet (RJ45 connector)
Weight	approx. 5.5 kg
AC Input	100-240 V / 50/60 Hz (1250W)
DC Output	24 Vdc / 1200W
Protection Class	I (according DIN EN 61140)
Fuses	2 x T12A / 250V

³⁾ Note: The ODTC® Power & Control Unit can be positioned vertically or horizontally.

Environmental Conditions - ODTC® and ODTC® Power & Control Unit		
Tolerable relative humidity	Operation	30-80% , non condensing ⁴⁾
	Transportation and storage	30-80% , non condensing ⁴⁾
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 ⁶⁾

⁴⁾ Condensate can prevent the ODTC® from operating properly and can damage the ODTC®.

3 SAFETY INSTRUCTIONS

3.1. Product-specific Risks



WARNING

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

General

- The main power switch of the ODTC® Power & Control Unit must always be accessible to shut down the system in case of emergency.
- The ODTC® needs no maintenance on a regular basis. → Maintenance, page 36ff .
- The ODTC® has to be placed in an upright position.
- Free air supply for the ODTC® and its Power & Control Unit must be ensured to prevent malfunction caused by insufficient cooling. Do not cover the ventilation inlet and outlet at the front / rear panel / side panel at any time and keep the ventilation inlet clean. In case of doubt, please contact INHECO for further analysis.
- Ensure that there is no other device installed next to the ODTC® increasing the inlet air temperature for the ODTC® above the specified temperatures. In case of doubt, please contact INHECO for further analysis.
- Do not insert any parts into the ventilation inlet or outlet.
- Do not exceed minimum or maximum ambient temperature and humidity conditions during operation or storage of the ODTC® → Technical Data, page 15
- The ODTC® must not be used in environments with risk of explosion or with explosive liquid samples.
- The ODTC® is for indoor use only.
- Operation of the ODTC® below ambient temperature:
The operation of the ODTC® below ambient temperature has to be limited to 1-2 hours per application. Condensation will be generated when operating the ODTC® below ambient temperature. The condensation might have an effect on the thermal performance and lifetime of the ODTC®. Condensate can prevent the ODTC® from operating properly and can damage the ODTC®.



Crushing Hazard:

- While the lid of the ODTC® is closing, there is a high danger of crushing your fingers, therefore a crushing hazard protection is implemented. Nevertheless, never reach into the "disposable area" while the lid is opening or closing.
- Never put your hand into the ventilation outlet of the Thermal Cycler while the ODTC® Power & Control Unit is connected to power.



Burning Hazard:

- Hot surfaces, primarily the VCM® and the ODTC® Lid can burn your skin. Even after switching off the ODTC® Power & Control Unit or after a heating process has ended, the ODTC® can still be hot and can seriously burn your skin as the mount temperature can reach up to +99°C [+210°F] and the ODTC® Lid temperature up to +115°C [+239°F]! It takes a while to cool down after the device has been used. Please note that the ODTC® Lid has no active cooling.



Electrical Shock:

- The ODTC® must not be used if the ODTC® or the Power & Control Unit or the connecting cables show visible signs of damage.
- You can suffer an electric shock and injuries, if the ODTC® and the ODTC® Power & Control Unit are not connected properly to the wall power outlet or between each other.
- *Opening of ODTC® Housing:*
Never open the ODTC® housing when it is still connected to the ODTC® Power & Control unit, as you can suffer an electric shock and injuries. Disconnect the ODTC® from the ODTC® Power & Control unit before opening the ODTC® housing.
- *Opening of ODTC® Power & Control Unit Housing:*
Never open the ODTC® Power & Control housing when it is still connected to the wall power outlet, as you can suffer an electric shock and injuries. Disconnect the ODTC® Power & Control Unit from the power outlet before opening the ODTC® Power & Control Unit Housing.
- Never connect or remove the power plug with wet hands.
- Make sure that the ODTC® does not get in contact with liquids while the device is connected to the power outlet.
- Original power cable provided by INHECO has to be used to guarantee safe and proper operation.
- The ODTC® is designed in accordance with Protection Class I (IEC).
- The housing of the ODTC® is connected to protection earth (PE) by means of a cord.
- For protection against electrical shock hazards, the ODTC® must be directly connected to an approved power source such as a three-wire grounded receptacle for the 230 V/110V/90V line.
- Where an ungrounded receptacle is encountered, a qualified electrician must replace it with a properly (PE) grounded receptacle in accordance with the local electrical code. Do not use the device when the delivered power cable cannot be used with your power socket (receptacle) without being correctly grounded.
- Make sure that the electrical specification on the identification label on the device meets your local situation. → Labels, page 14.

Biosafety Laboratory Environment

- When using the ODTC® 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.

Electromagnetic field

- The ODTC® is not designed for use in residential areas. Thus there is no guarantee for adequate protection of the radio reception in this area.

3.2. Technical Alterations

- Do not alter the product. Any modification or change which is not approved by INHECO leads to the loss of warranty and INHECO's liability → Warranty, page 6
- Use only original parts provided by INHECO. Parts provided by other suppliers can impair the functionality of the unit.
- Damages due to the use of non-original parts are excluded from INHECO's liability.

3.3. 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 36.

4 HARDWARE INSTALLATION

The Installation should only be performed by technically trained personnel.



WARNING

The main power switch of the ODTC® Power & Control Unit must always be accessible to shut down the system in case of emergency.

4.1. Scope of Supply

Before initial operation, make sure that the shipment of your unit is complete and neither packaging nor parts are damaged → Components, chapter 2.2, page 7. Keep original packaging for future shipments.



WARNING

As the ODTC® weighs 7.5 kg and the ODTC® Power & Control unit weighs 5.5 kg you could get hurt when the devices are dropped down.

4.2. Initial Operation

4.2.1. How to connect the device to the ODTC® Power & Control Unit

- Plug in the connector (→ fig. 19) of the ODTC® to the ODTC® Power & Control Unit and screw the connector tightly to the ODTC® Power & Control Unit.

NOTICE

Never unplug the connector of the ODTC® from the ODTC® Power & Control Unit while the Power & Control Unit is switched on. This could destroy the device.

- Connect the yellow Ethernet cable (RJ45) (→ fig. 19) to the ODTC® Power & Control Unit and to the Ethernet socket of your PC or robotic system.
- Connect the power cord (→ fig. 19) to the ODTC® Power & Control Unit and the wall power outlet.



WARNING

Make sure that the device is correctly connected to a grounded wall power outlet. If you are unsure, please contact techhotline@inheco.com.

- Switch on the power of the ODTC® Power & Control Unit (→ fig 19).
- The ODTC® Power & Control Unit will be initialized and the lid will open.

NOTICE

Output of wall power outlet has to be at least 1250W and must have ground earth connection.

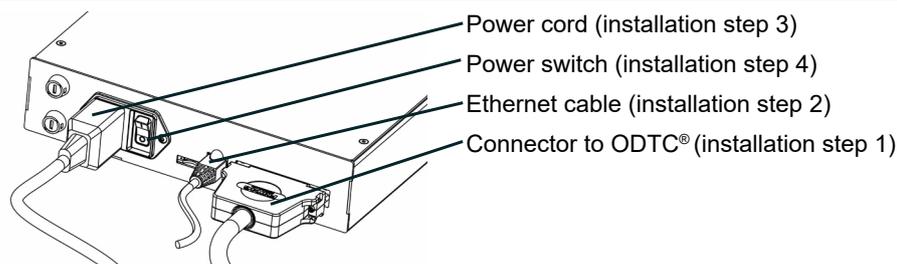


Fig.19: Connecting the ODTC® Power & Control Unit with PC and ODTC®

4.2.2. Remove protection insert

The ODTC® is delivered with a protection insert to ensure that the ejection bars stay in the correct position during transportation. This insert must be removed before operation.

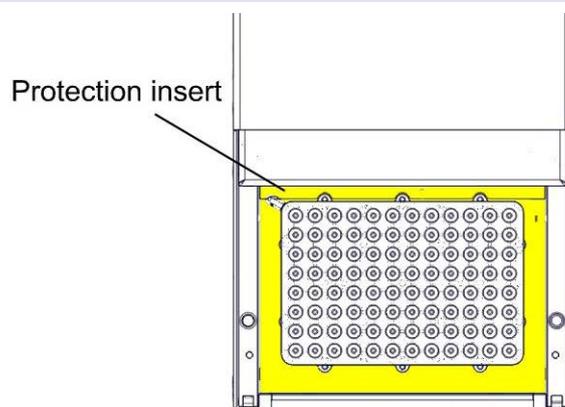


Fig.20: Protection insert inside the ODTC®

NOTE

Keep the protection insert for future shipments as it is part of the original packaging.

4.2.3. Remove pre-installed ODTC® Sealing Cover when a suitable automation friendly Sealing Lid will be used instead

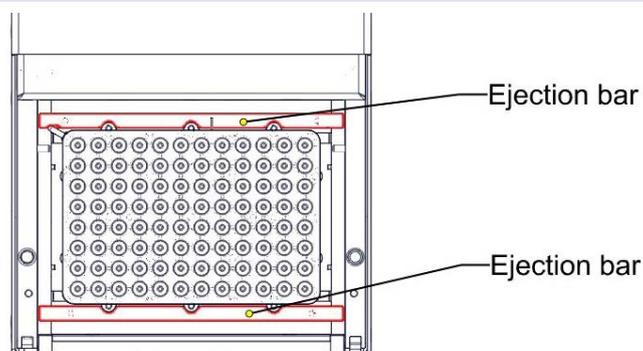
Automation friendly Sealing Lids (→ chapter 9.5, page 44) can only be used after removal of the pre-installed ODTC® Sealing Cover → chapter 6.3.3., page 33.

NOTICE

In case a suitable automation friendly Sealing Lid is used while the ODTC® Sealing Cover is still installed the thermal performance of the ODTC® Lid is impacted.

4.2.4. Ejection bars in correct position

- Ensure that the ejection bars are in the correct position, also refer to → Exchange of ejection bars, chapter 8.6, page 41ff.



NOTE

If the ejection bars are not in the correct position, they may get jammed between the VCM® and ODTC® Lid during movement of the lid, causing severe damage.

Fig.21: Correct position of plate ejection bars

4.3. Mechanical Integration

The ODTC[®] is primarily designed for the use / integration on liquid handling workstations. The ODTC[®] needs to be fixed by using 4x M4 screws (4.5 mm holes with thread → red circles in fig. 20 for the position) to the deck of the workstation in order to guarantee proper operation. For exact positioning use 2x Ø4m6 pins for the fittings in the bottom of the ODTC[®] → green circles.

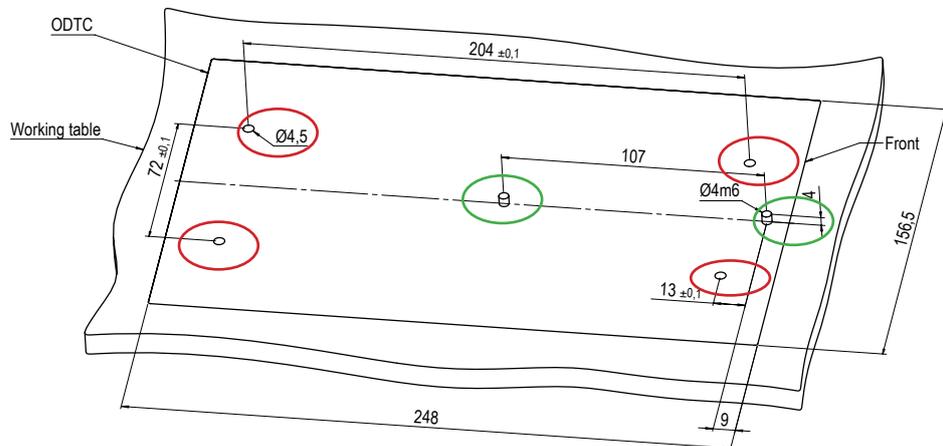


Fig.22: Drilling scheme for standard ODTC[®] fixation (distance to front of device: 9mm)

The drilling scheme of the ODTC[®] XL is the same as for the standard ODTC[®], but due to the larger footprint (285.2 mm more in depth), the distance to the front of the ODTC[®] differs between the standard ODTC[®] and ODTC[®] XL.

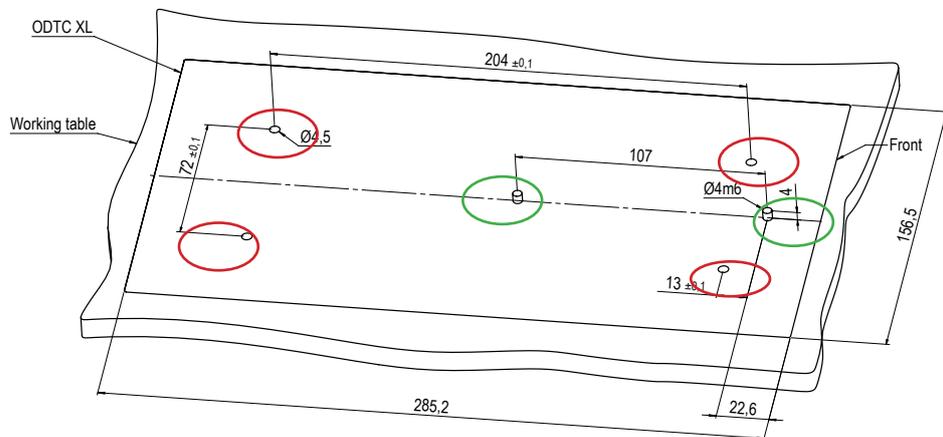


Fig.23: Drilling scheme for ODTC[®] XL fixation (distance to front of the device: 22.6mm)

Orientation to each other

- Make sure that a free air flow into and out of the ODTC[®] is guaranteed and avoid that the ODTC[®] takes in preheated air. Please find below an example.

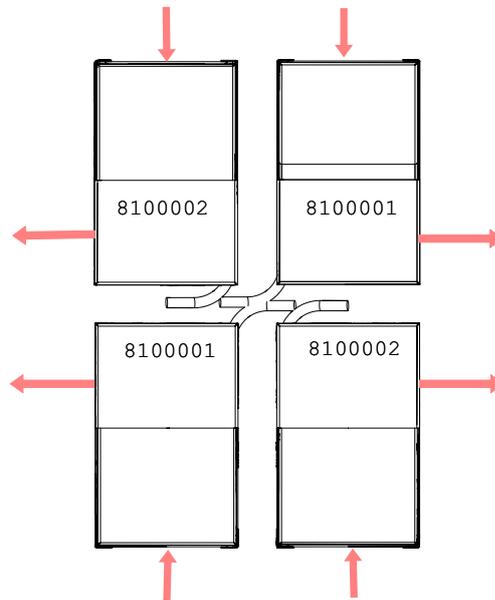


Fig.24: Orientation example on workstation deck to ensure correct airflow (red arrows)

- Make sure that the waste heat generated by the ODTC[®] device is properly dissipated, e.g. using exhaust pipes to move the waste heat off deck.

Free air supply (minimum 50mm to adjacent wall or device) for the ventilation inlet of ODTC[®] and its Power & Control Unit must be ensured to prevent malfunction caused by insufficient cooling. Do not cover the ventilation inlet at the front at any time. In case of doubt, please contact INHECO for further analysis.

Cable position

The position of the hard-wired connector cable outlet varies depending on ventilation position of the different ODTC[®] version.

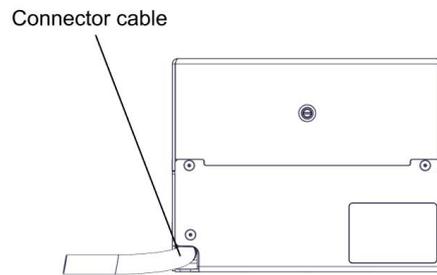


Fig.25: Connector cable position for left ventilation versions (side view)

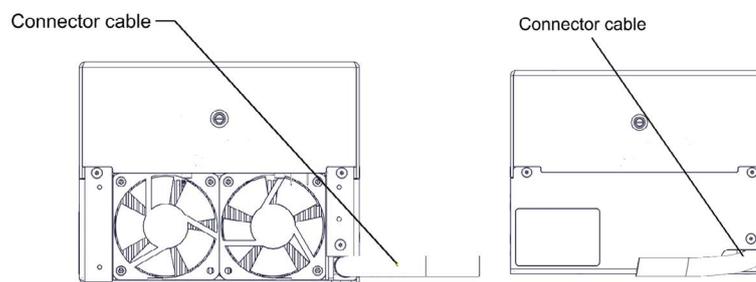


Fig.26: Connector cable position for left and back ventilation version (back view)

4.3.1. Removable blocks for better gripper access

For gripper access from the front, the blocks at the front are removable. The blocks may also be removed for the cable of a temperature verification tool.

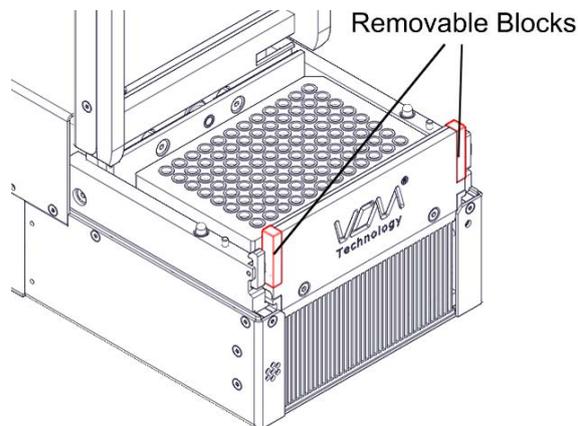


Fig.27: Removable Blocks for ODTc 96 and ODTc 384

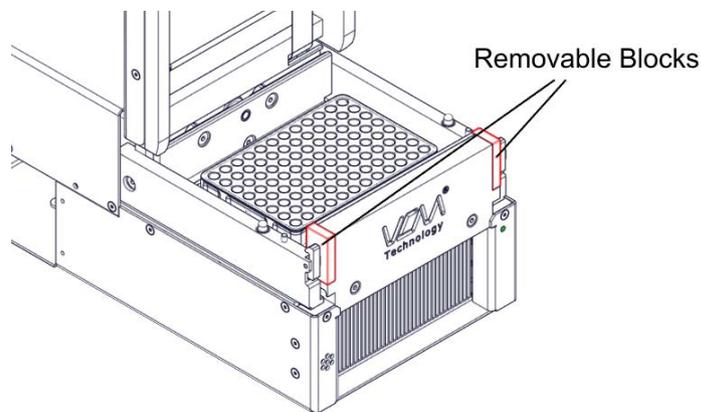


Fig.28: Removable Blocks for ODTc 96 XL and ODTc 384 XL

- Take the left block with your fingers and pull it out to the left and take the right block and pull it out to the right. If you need access only on one side, you may remove only one block.

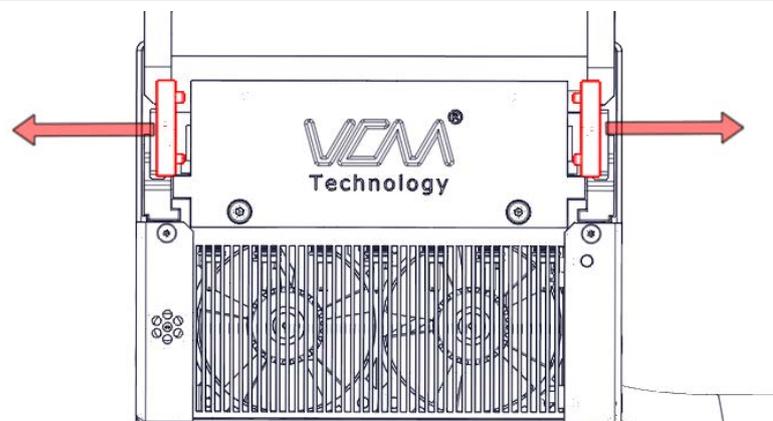


Fig.29: Block removal

4.4. Removable Blocks

The removable blocks are magnetic. They should be well stored after removal, e.g. during OVT Verification.

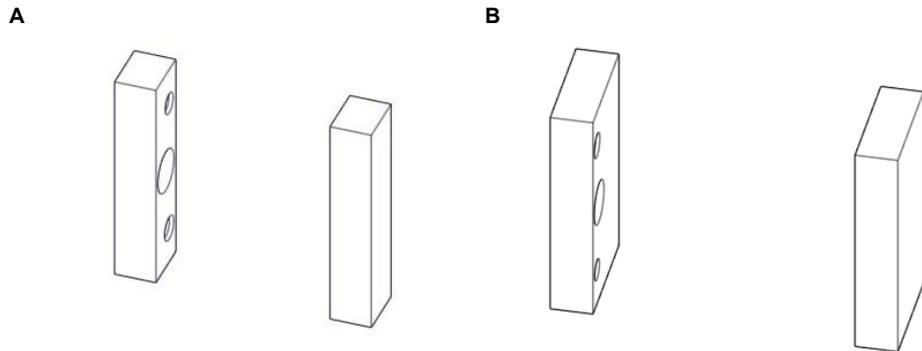


Fig.30: Removed blocks (A: for ODTC 96 and 384 ; B for ODTC 96 XL and 384 XL)

4.5. ODTC® Power & Control Unit (PCU)

The ODTC® Power & Control Unit (PCU) is recommended to be used in a horizontal position. In this case no fixation is needed. Installation of the PCU in upright position requires fixation or protection against tilting over.

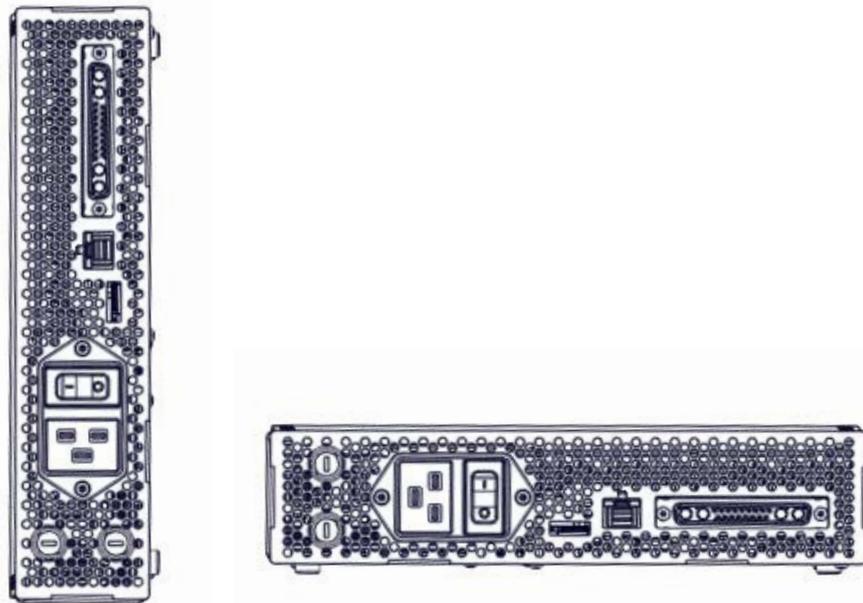


Fig.31: ODTC® Power & Control unit (PCU) upright and horizontal

5 COMMUNICATION WITH ODTC®

A system administrator has to install and integrate the ODTC® control software.

The ODTC® has a SiLA communication interface. Ideally the ODTC® should be addressed by a SiLA PMS (Standardization in Laboratory Automation Process Management System) for operation.

For non SiLA based workstations an additional driver has to be written which translates the workstation protocol into a SiLA based protocol. The ODTC® command set and the SiLA communication standard are stored on an USB flash drive which is part of the scope of delivery. Please contact your workstation provider for the integration.

For communication with the ODTC® the IP address of the ODTC® has to be determined. The delivered tool "Device Finder" helps you to get the IP address, assigned by the network DHCP server. The "Device Finder" is stored on the USB flash drive. (→ chapter 2.2 , Scope of Supply, page 7)

- Please open the file DeviceFinder.exe with a double click and follow the instructions:

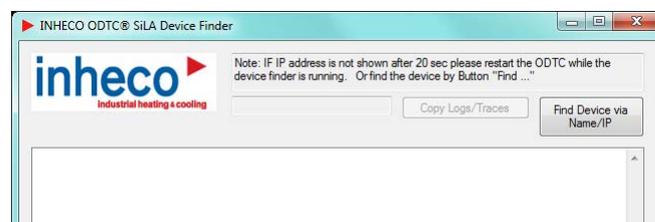


Fig.32: Screenshot of Device Finder before ODTC® is located

As soon as the ODTC® is initialized (green light at right Ethernet connector → page 13) the IP address is shown:

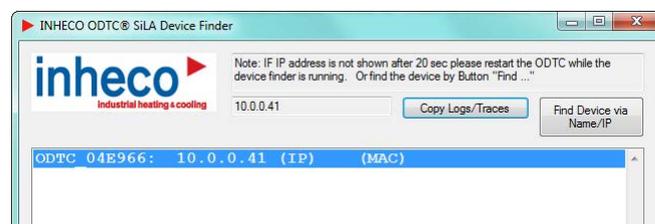


Fig.33: Screenshot of Device Finder after ODTC® is located

- Use the shown IP address (here 10.0.0.41) to communicate with the ODTC®.

NOTICE

The Device Finder shows all ODTC® units which are connected to the network or to the PC you are using. To distinguish several ODTC® devices shown in this Device Finder use the Node Name (here: ODTC_04E966) → page 14.

Depending on the network (DHCP server) the IP address might change after a restart of the ODTC®. Please contact your system administrator for further assistance.

The temperature profiles have to be programmed in xml format and then transferred / loaded to the ODTC® via the Ethernet connector. The xml files must be created by using the ODTC® Script Editor as the ODTC® Script Editor automatically compiles an xml file with the correct control parameters for the ODTC®. The ODTC® Script Editor allows an easy editing of temperature profiles and the translation into ODTC® compatible xml files. After editing the desired temperature profiles, the xml files must be transferred to the PMS of the liquid handling workstation. → Script Editor Manual on www.inheco.com

6 OPERATION

The ODTC[®] is designed for the use/integration with robotic platforms and can only be operated through the PMS of the liquid handling workstation. The ODTC[®] 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.

NOTE

The thermal block (VCM[®]) and plate ejection mechanism are optimized for specific PCR plates → chapter 9, page 43.

Do not use other PCR plates without approval from INHECO. The use of other plates might reduce the thermal performance or might not work at all, if:

- plate does not fit perfectly into the VCM[®] => insufficient heat transfer
- plate ejection mechanism does not work properly
- ODTC[®] Lid is not able to close properly

6.1. Safety Instructions for Operation

6.1.1. Ventilation

For optimal ventilation and integration in various workstation layouts INHECO offers 4 ventilation directions with different ODTC[®] versions for the 96 well & 384 well ODTC[®], i.e. in total there are 6 ODTC[®] types:

ODTC[®] (e.g. #8100000, 8100010): Ventilation outlet on the left side

ODTC[®] (e.g. #8100001, 8100011): Ventilation outlet at the back side

ODTC[®] (e.g. #8100002, 8100012): Ventilation outlet on the right side

ODTC[®] (e.g. #8100003, 8100013): Ventilation outlet downwards

ODTC[®] XL (e.g. #8100031): Ventilation at the back side (also available with other vents)

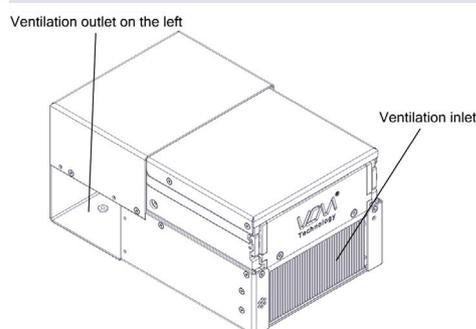


Fig.34: Example: Showing ODTC[®] #8100000: Ventilation outlet on the left hand side



WARNING

- Keep your hands away from the ventilation outlet as the moving fan could lead to injuries to your skin.
- Keep your hands away from the heated VCM[®] and from the opened heated ODTC[®] Lid while the unit is connected to power as the temperature of the mount and ODTC[®] Lid might be extremely hot (up to 115°C [239°F]) which could lead to severe burns.
- Do not insert anything into the ventilation outlet or inlet.

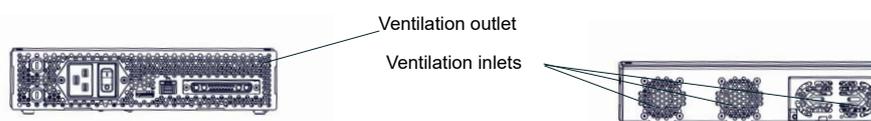


Fig.35: Ventilation openings of ODTC[®] Power & Control Unit

6.1.2. Protection of the small tube of the VCM®

The VCM® has a small tube at the upper left corner (as shown in fig. 36), needed for the production of the VCM®. Ensure not to damage or break off the tube, as this will lead to complete loss of the VCM® performance.

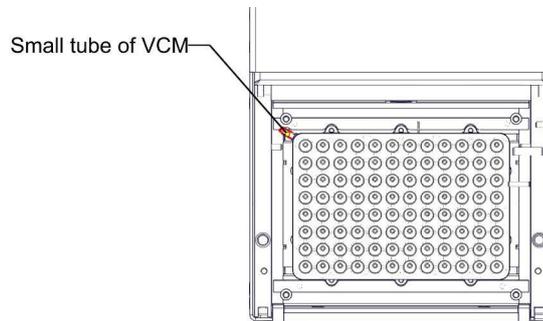
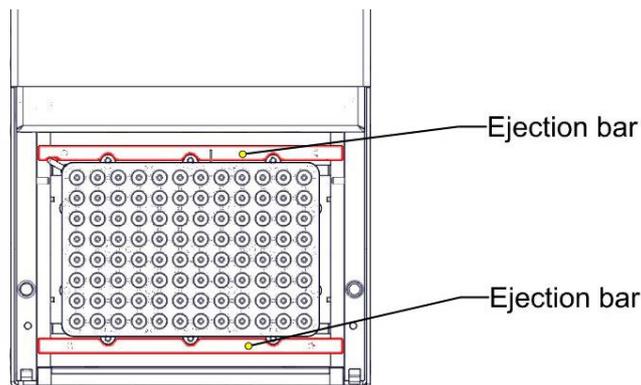


Fig.36: VCM® small tube at the corner

6.1.3. Ejection bars in correct position

- Ensure that the ejection bars are in the correct position, also refer to Exchange of ejection bars, chapter 8.6, page 41ff.



NOTE

If the ejection bars are not in the correct position, they may get jammed between the VCM® and ODT® Lid during movement of the lid, causing severe damage.

Fig.37: Correct position of plate ejection bars

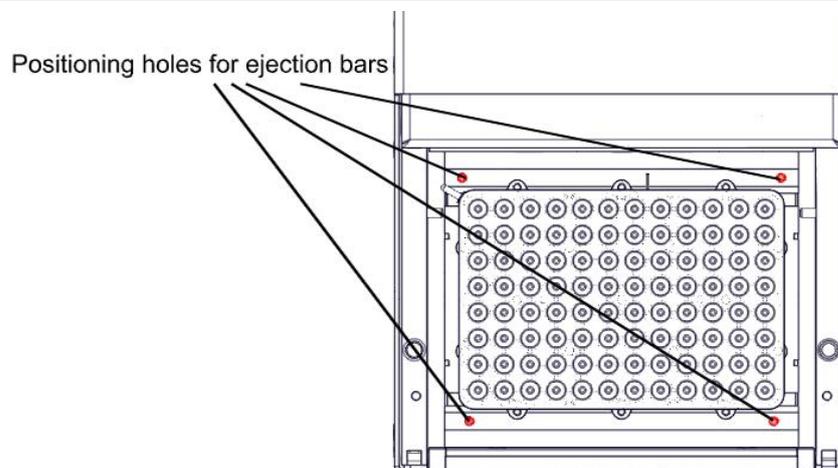


Fig.38: Positioning holes for the plate ejection bars (red)

6.2. How to use the ODTC®

6.2.1. Automated operation of ODTC® Lid

The ODTC® has to be controlled by a PMS which contains the SiLA and ODTC® specific command set.

The automated horizontal movement of the ODTC® Lid is controlled by the PMS commands for opening and closing the lid.

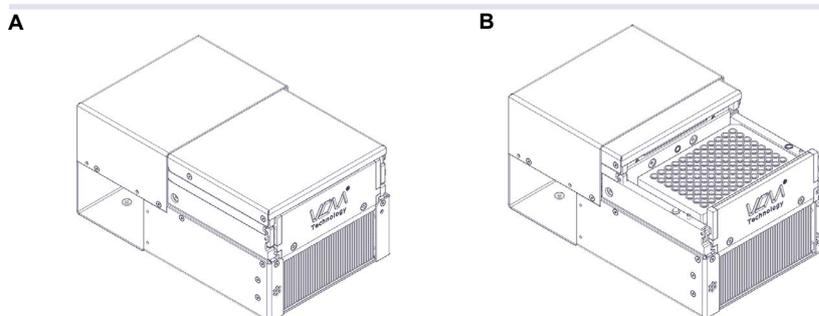


Fig.39: ODTC® Lid (A = closed position, B = opened position)

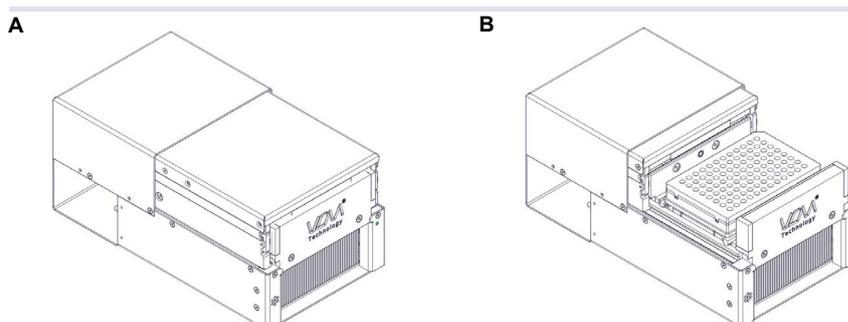


Fig.40: ODTC® XL Lid (A = closed position, B = opened position)

NOTICE

If the lid does not open, please check whether the latches are locked correctly → fig. 39, page 28.

The exact position of the ODTC® Lid is tracked by the ODTC®.



CAUTION

While the lid is closing, there is a high danger of crushing your fingers. Never reach into the "disposable area" while the lid is opening or closing.

NOTICE

Even with an open ODTC® Lid the Thermal Cycler can be operated (temperature profiles can be run). In this case it is the user's responsibility to avoid evaporation, condensation and possible cross contamination with other measures.

6.2.2. Manual opening of the ODTC® Lid (90° position)

The ODTC® Lid can be opened manually for maintenance/service & cleaning or in case of a malfunction. The ODTC® Lid may not be opened manually during operation.

Before the lid can be opened manually, it has to be fully closed at the end position. The lid can be moved into the end position by sending the command "CloseDoor" via the PMS. In case the ODTC® Lid cannot be closed electrically, the lid can be moved manually by turning the shaft at the back of the ODTC® with an appropriate screwdriver.

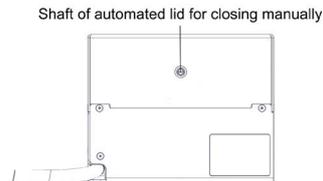


Fig.41: a) Shaft at the back of ODTC® 8100000

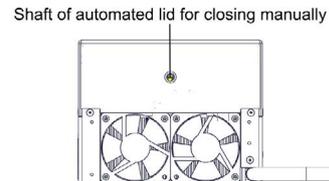


Fig 22: b) Shaft at the back of ODTC® 8100001

- Press the 2 latches simultaneously to unlock the lid.

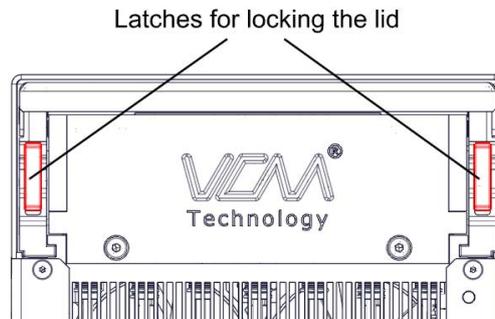


Fig.42: Chrome latches

- Now the lid can be opened to the maintenance/service & cleaning position (90°).

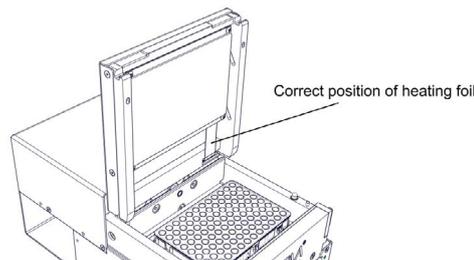


Fig.43: ODTC® opened for maintenance/service & cleaning in 90° position



WARNING

Hot surfaces, primarily the VCM® and the ODTC® Lid can burn your skin. Even after switching off the ODTC® Power & Control Unit or after stopping a heating process, the ODTC® can still be hot and could seriously burn your skin as the mount temperature can reach up to +99°C [+210°F] and the lid temperature up to +115°C [+239°F]! It takes a while to cool down after the device has been used. Please note that the ODTC® Lid has no active cooling.

6.2.3. Manual closing of ODTC® Lid after maintenance/service & cleaning

- Before closing the Lid please make sure that the ribbon cable of the heated lid is in correct position”



NOTE

The ribbon cable will be damaged if it is not in correct position (fig. 44) when closing the lid.

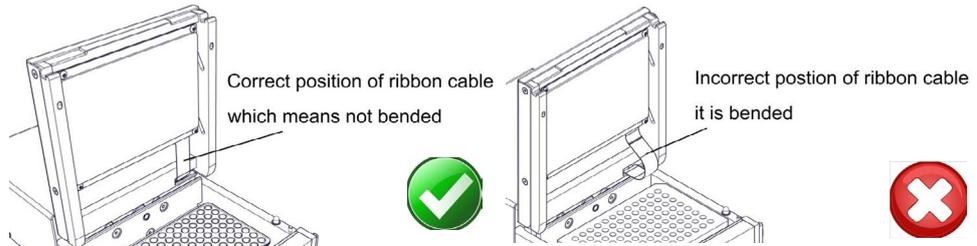


Fig.44: Correct position vs incorrect position (a bending is not allowed)

- Close the lid until it is nearly seated on the front.



NOTE

Do not push back the bar with attached Sealing Cover while it is still in 90° position as the ribbon cable might get caught behind the Sealing Cover and will be bended which will eventually lead to a heating foil failure.



CAUTION

The lid is locked in the 90° position to avoid that the lid falls back. There is no locking mechanism during manual lid closing. Close the lid carefully and make sure to hold it with your hands until it is in complete horizontal position, otherwise you could pinch your fingers.

- Push back the bar (shown in red) and hold it in this position (fig. 45).
- Push down the lid until the latches are locked (fig. 46).

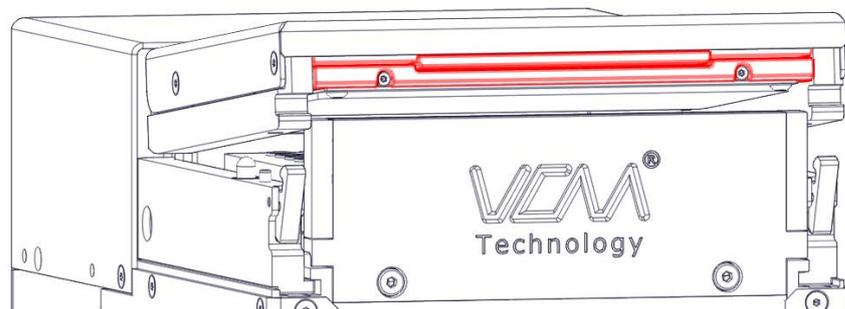


Fig.45: Closing procedure



CAUTION

The lid is locked in the 90° position to avoid that the lid falls back. There is no locking mechanism during manual lid closing. Close the lid carefully and make sure to hold it with your hands until it is in complete horizontal position, otherwise you could pinch your fingers.

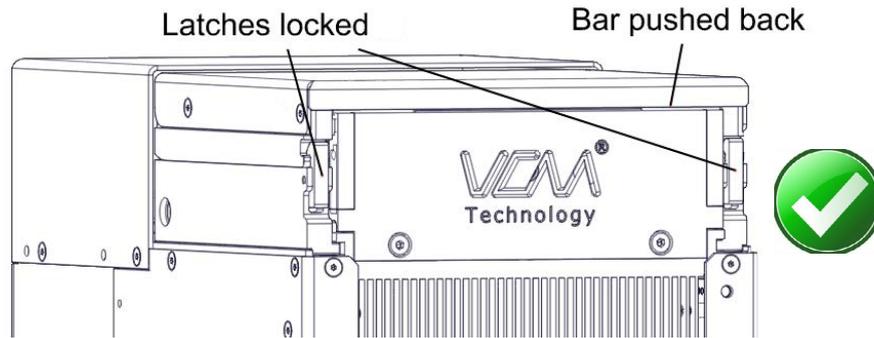


Fig.46: Correctly closed lid

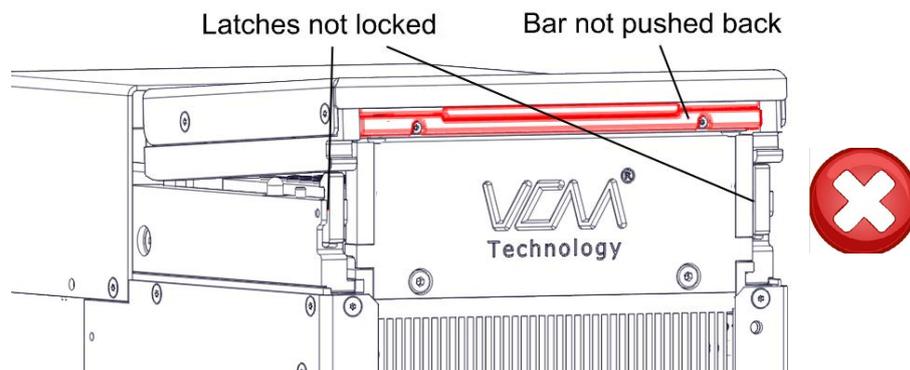


Fig.47: Incorrectly closed lid (bar is placed on top of front and latches are not locked)

NOTE

Even when the lid is not closed correctly after maintenance / service the ODTC® will function in heating and cooling mode, but not properly. Evaporation and condensation may not be prevented, and the thermal performance might be impacted. The ODTC® will be damaged during horizontal moving of the lid when the lid is not in horizontal position and when the latches are not locked.

Always check whether the lid is closed and locked correctly → fig. 46 above

6.3. Sealing with ODTC® Lid

The ODTC® offers 2 options to seal the plates:

- Use of pre-installed ODTC® Sealing Cover.
- Use of automation friendly Sealing Lid.

Both options are suited for pre-sealed disposables. Pre-sealing is strongly recommended to avoid cross contamination.

Each automation friendly Sealing Lid should only be used once, when used for plates without pre-sealing, otherwise cross contamination and evaporation cannot be ruled out.

The ODTC® Sealing Cover needs to be decontaminated each time the ODTC® Lid is opened, when used for plates without pre-sealing, otherwise cross contamination cannot be ruled out.

It is the user's responsibility to find and use the best sealing option for his process.

NOTICE

Either the ODTC® Sealing Cover **OR** the automation friendly Sealing Lid (resp. a suitable automation friendly lid) has to be used to apply sufficient pressure on the plate and to seal the plate properly. This also applies when a pre-sealed plate is used.

NOTICE

For unsealed plates there is a risk of evaporation and cross contamination when opening the heated ODTC® for loading a plate or pipetting. Therefore, we recommend to use pre-sealed plates or to set the temperature during opening and closing as close as possible to ambient temperature to minimize evaporation of the sample.

6.3.1. Use of pre-installed Sealing Cover

No adjustments of the ODTC® are necessary. The pre-installed ODTC® Sealing Cover is not ideal for use with unsealed plates as cross contamination and evaporation will very likely occur. May be reused up to 50 times.

6.3.2. Use of automation friendly Sealing Lids

Automation friendly Sealing Lids (→ chapter 9.5, page 44) can only be used after removal of the pre-installed ODTC® Sealing Cover → next chapter.

NOTICE

The design of the ODTC® is optimized for the use of automation friendly Lids (list of approved lid → chapter 9.5, page 44. Other automatable sealing lids might also work, but have not been tested by INHECO. It is the user's responsibility to find and use the best sealing option for his process.

NOTICE

For ODTC® 96 XL: The maximum volume for PCR applications in high profile plates should not exceed 100µl/well. Liquid levels above 100µl will exceed the height of the enclosed wells in the mount.

6.3.3. Removal of the pre-installed Sealing Cover

- Open the ODTC® Lid for maintenance/service & cleaning → chapter 6.2.2, page 29.

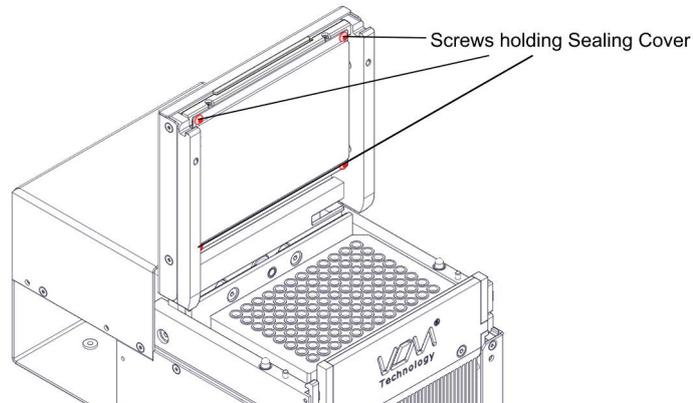


Fig.48: Lid with integrated Sealing Cover



CAUTION

The lid is locked in the 90° position to avoid that the lid falls back. There is no locking mechanism during manual lid closing. Close the lid carefully and make sure to hold it with your hands until it is in complete horizontal position, otherwise you could pinch your fingers.

- Remove the four screws of the Sealing Cover.

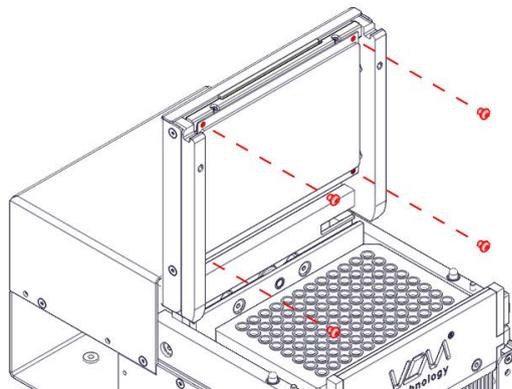


Fig.49: Four screws removed

- Remove the Sealing Cover

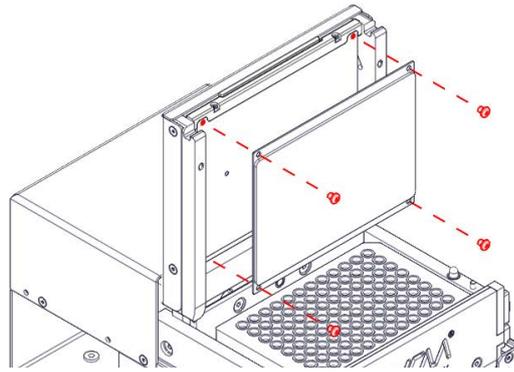


Fig.50: Sealing Cover removed

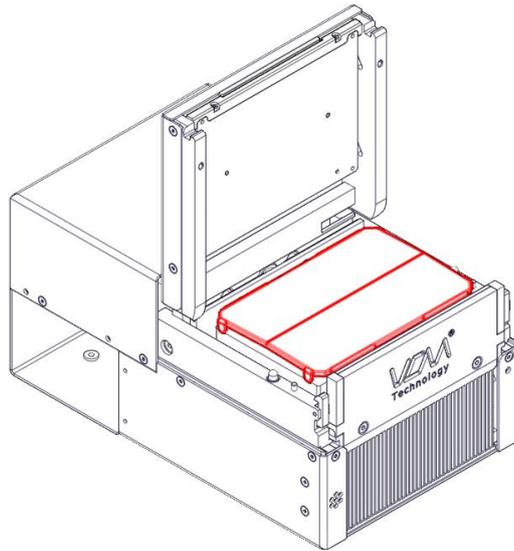


Fig.51: ODTC® with automation friendly Sealing Lid (red) on top of disposable, with INHECO Sealing Cover removed

6.3.4. Inserting ODTC® Sealing Cover in ODTC® Lid

- Open the lid for maintenance/service & cleaning by pressing the two chrome latches simultaneously while the ODTC® Lid is closed. For opening lid → chapter 6.2.2, page 29.
- Screw the Sealing Cover back to the lid.
- Close the lid correctly → chapter 6.2.3, page 30.

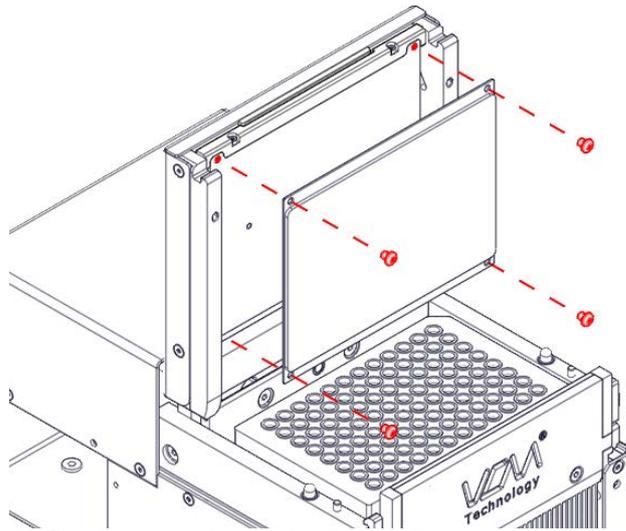


Fig.52: Screw position for the Sealing Cover

6.3.5. Removable "Blocks"

Two blocks can be removed from the front plate (with VCM® Logo) for gripper access and for the cable of a temperature verification tool.

→ chapter 4.3.1, page 23

7 MAINTENANCE

The ODTC® 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.

7.1. Software Updates

For updates of the Script Editor, please contact sales@inheco.com → How to contact INHECO, page 6.

7.2. Trouble-Shooting & Support

In case of an operation failure, follow the trouble-shooting instructions of this chapter.

Please provide the following information when contacting INHECO for support:

- INHECO product name of ODTC® **and** Power & Control Unit (shown on device label)
- INHECO part number of ODTC® **and** Power & Control Unit (shown on device label)
- INHECO serial number of ODTC® **and** Power & Control Unit (shown on device label)
- Detailed error description, LED Status, error description of workstation software
 - o send log and trace files extracted with the help of the Device Finder → chapter 7.2.1 below
- Information about setup of ODTC®
 - o ODTC® is installed on which workstation, name of manufacturer?

7.2.1. Copy Log and Trace files

To copy the log and trace files use the "Device Finder" which is stored on the USB flash drive (→ Scope of supply, page 7). These files contain status information and errors of the ODTC®.

- Please copy the file DeviceFinder.exe onto your PC.
- Open with a double click and follow the instructions:

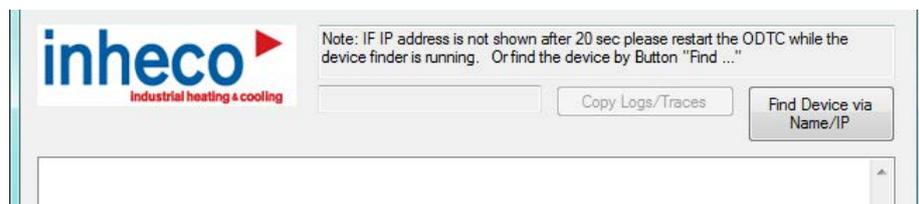


Fig.53: Screenshot of Device Finder showing no device

If the Device Finder finds an ODTC® the IP address is displayed as shown below:

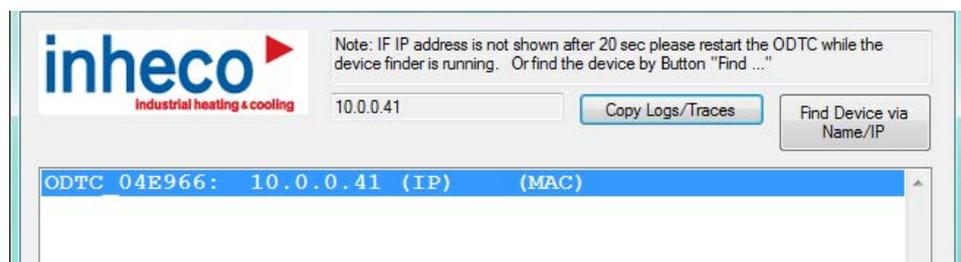


Fig.54: Screenshot of Device Finder with ODTC®

In case the ODTC® is not shown after initialization (green light at right Ethernet connector → page 13) restart the ODTC or use the button Find Device via Node Name /IP .

NOTICE

Node Name /IP can be found on the ODTc[®] label → page 14.

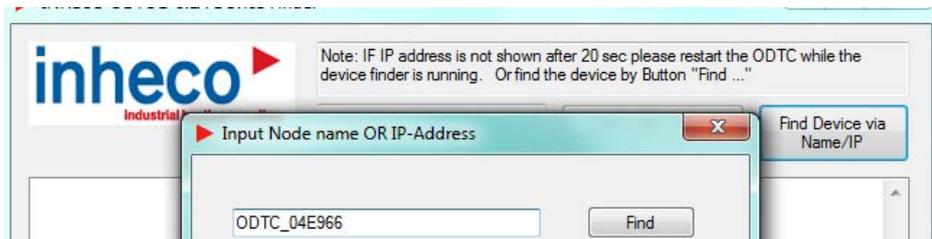


Fig.55: Input of device name (Node Name). In this case ODTc_04E966.

NOTICE

If the ODTc[®] is still not shown please deactivate all other network devices including WLAN and restart the ODTc[®] and Device Finder.

- Select the ODTc[®] (in this case the ODTc_04E966).
- [Copy Logs/Traces](#) is activated.
- Mouse click on [Copy Logs/Traces](#) → the following window will open.

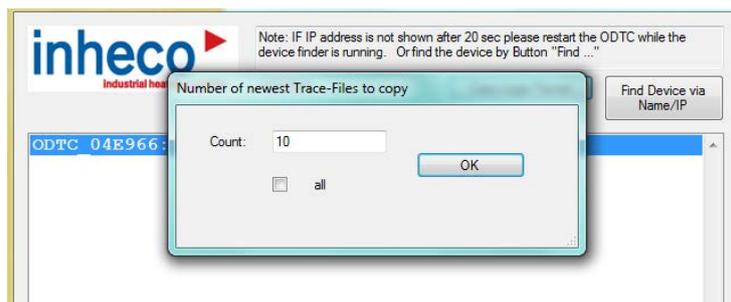


Fig.56: Screenshot of Copy Logs/Traces

- Select all and click on [OK](#).
- A dialog window (windows explorer) will appear, please create a [new folder](#) and save.

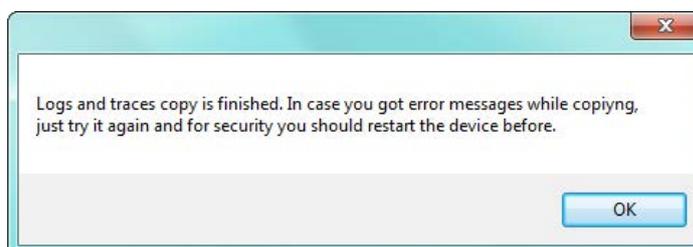


Fig.57: Copy of log and trace files successful

The first lines in a log or trace file shows information such as serial number of devices, firmware version and SiLA settings:

```
* ODTc Temperature trace = pre1 = 2015-07-30T15:28:06Z
* Firmware: BUILD:5689.24096,DEVICE:ODTC_214_BOOT_001_HWVS_002 / Serial: ArticleNo PCU: 860007, SerialNo PCU: 1234567, SerialNo PCU PC
.....
```

Fig.58: Device information row (serial numbers, firmware, etc.) within the trace file

7.2.2. Feasibility of .xml files

The INHECO Script Editor (→ Script Editor Manual) checks all programmed steps of a method (definition see below) and only allows steps which the ODTC® is capable of handling. However, in case you have issues with running a method on the ODTC® or if you need assistance with programming the xml files, please contact **techhotline@inheco.com**. Please send us your requirements and temperature profiles needed for testing your application on the ODTC® at INHECO. If this information should contain proprietary information, please send us a NDA to cover this. INHECO will check whether the ODTC® is capable of performing the desired or programmed temperature steps.

7.3. Return for Repair only with RMA Number

INHECO devices must be repaired by INHECO only. Parts must not be exchanged by the user. Opening of the unit and/or the exchange of parts will lead to the loss of warranty.

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. → Cleaning and Decontamination, page 37.

Devices exposed to Biosafety level 3 and 4 Environments or radioactive materials are not accepted by INHECO for return.

Please contact **techhotline@inheco.com** or visit **<http://www.inheco.com/service/returns-rma.html>** for the return procedure before returning the 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 including the protection insert. If not possible, ensure that devices are protected and cannot move within the package to avoid transportation damage. Consider the weight of the devices (ODTC® 7.5 kg and Power & Control Unit 5.8 kg) for sturdy packaging material and sufficient padding. If the protection insert is missing, please use a PCR plate instead. Never ship the ODTC® with open ODTC® Lid.

7.4. Transportation and Storage

It is recommended to keep the original ODTC® packaging, also the protection insert. The ODTC® should be shipped and stored in its original packaging. Adhere to required environmental conditions for transportation and storage → Technical Data, page 15.

7.5. Cleaning



WARNING

Before **cleaning** the ODTC®, disconnect the power and make sure that the temperature at the VCM® (disposable contact surface) and ODTC® Lid are at temperatures which do not burn your skin (below +50°C).

The disposable contact surface should be cleaned regularly to ensure optimum heat transfer to the disposable 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. The ventilation inlets should be checked for contamination and should be cleaned if necessary. Liquids must not enter into the unit.

Do not use aggressive cleaning fluids such as acetone, or abrasive cleaners. The nickel teflon coating of the VCM® and coatings of other components could be damaged.

Contact INHECO in case you prefer other cleaning liquids or methods which may be harmful for the material of the devices.

NOTE

Operation of ODTC® below ambient temperature: The operation of the ODTC® below ambient temperature has to be limited to 1-2 hours per application. Depending on the humidity in the atmosphere, condensation will be generated when operating the ODTC® below ambient temperature. Especially when using the option "keep temperature after method" the risk for excessive condensation is very high.

The condensation might have an effect on the thermal performance and lifetime of the ODTC®. Condensate can prevent the ODTC® from operating properly and can damage the ODTC®.

After each use of the ODTC® below ambient temperature a drying step needs to be performed. It can be part of a following method or should follow directly after the cooling period. The drying step needs to be clearly above ambient temperature. The length of the drying step depends on the amount of condensate and should be ended when no condensation is visible on the Mount or its surrounding.

7.6. 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, or chemical 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 for your health and skin when using toxic gases or fluids for decontamination.

NOTICE

Contact INHECO if you are not sure whether the used decontamination method or solution could damage the device or its surface material.

Handling and disposal of infectious material shall be performed according to local safety guidelines.

7.7. Thermal Verification

The ODTC® is delivered calibrated and adjusted.

To prove that the ODTC® is working within the specifications, INHECO recommends to perform a thermal verification at least once a year.

For this purpose INHECO has developed a verification tool for ODTC® customers to verify the thermal performance of their ODTC® on-site → www.inheco.com

7.8. Shut Down and Disposal

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

All INHECO devices are RoHS and WEEE compliant.

8 FAILURES

In case you receive a failure message without clear remedy instruction please contact the support of your workstation provider.

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

8.1. ODT[®] Lid Failure (in error codes: Drawer Failure)

In case you receive a failure message regarding a drawer failure (ODT[®] Lid) please check the following, whether:

- the pre-installed ODT[®] Sealing Cover is dismantled. It has to be removed before an automation friendly Sealing Lid is used.
- the PCR plate slides correctly into the VCM[®] and is not too high → Technical Data.
- the PCR plate is missing.
- there is anything blocking the ODT[®] Lid.
- correct ejection bars are installed for the inserted full/semi/non-skirted plates.
- when the ODT Sealing Cover is used how often it was in usage. We recommend changing the Cover every 50 run.



CAUTION

While the lid is closing there is a high danger of crushing your fingers. Never reach into the "disposable area" while the lid is opening or closing.

8.2. Open the ODT[®] Lid when Lid (drawer) is blocked by unknown causes

In case the ODT[®] Lid cannot be closed or opened electrically, the lid can be moved manually by turning the shaft at the back of the ODT[®] with an appropriate screwdriver.

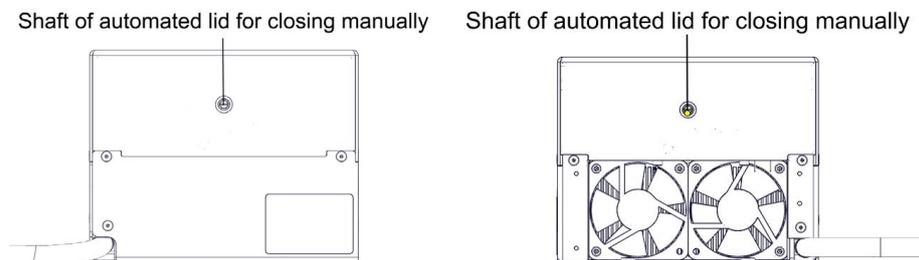


Fig.59: Shaft at the back of ODT[®] ventilation left Shaft at the back of ODT[®] ventilation back

8.3. Overheated System or Fan Issue

In case you receive a failure message regarding malfunctioning fans or an overheated system please check, whether:

- fans are running.
- anything is blocking the ventilation inlet or outlet.
- there is enough free space in front of ventilation.
- there is another device installed next to the ODT[®] increasing the temperature near the ODT[®].



WARNING

Keep your hands away from the ventilation outlet, from the VCM® mount and from the heated ODTC® Lid while the unit is connected to power to avoid injuries or severe burns. Do not insert anything into the ventilation outlet or inlet.

8.4. Evaporation of Sample

In case you observe significant evaporation of your sample during operation with closed lid, please contact techhotline@inheco.com.

8.5. Communication Issues

In case your workstation computer is not able to communicate with the ODTC®, check all cables for a correct and tight connection. Use the original cables provided with the device. Check whether device is powered on. If it is not possible to switch on the device, check whether the fuses need to be changed. In case the fuses are defective, exchange them with fuses corresponding the technical specification: 2 x T12A / 250V. Contact your workstation provider if devices are correctly connected and the communication issue remains.

If the device encounters a communication problem during operation the ODTC® goes into "in error state" (red LED). After a restart the ODTC® LED should show green again. If the communication problem is persistent please contact your workstation provider.

8.6. Plate Ejection Mechanism Fails

In case you observe:

- a broken or bended ejection bar => exchange ejection bars.
- a microplate got stuck in the VCM® => check whether incompatible plate is inserted and check whether correct ejection bars are installed for the inserted full/semi/non skirted plate. → chapter 9 (compatible plates), page 43 and chapter 8.6.1 (exchange of ejection bars) below

8.6.1. Exchange of ejection bars

- Take the plate ejection bar at both ends and pull it out.
- Insert the pins of the new ejection bar into the positioning holes.

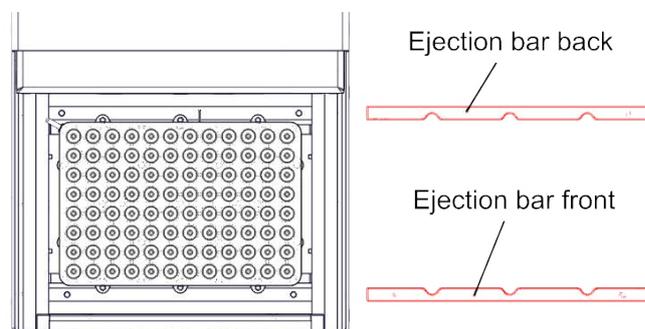


Fig.60: Ejection bars of ODTC® removed



WARNING

Hot surfaces, primarily the VCM® and the ODTC® Lid can burn your skin. Even after switching off the ODTC® Power & Control Unit or after stopping a heating process, the ODTC® can still be hot and could seriously burn your skin as the mount temperature can reach up to +99°C [+210°F] and the lid temperature up to +115°C [+239°F]! It takes a while to cool down after the device has been used.

NOTICE

The front and back ejection bars are slightly different. A mix-up of the front and back ejection bars is not possible due to unique positioning pins.

The ejection bars between the ODTC® 96, ODTC® 384 and ODTC® 96 XL for high profile plates differ. → chapter 9, page 43.

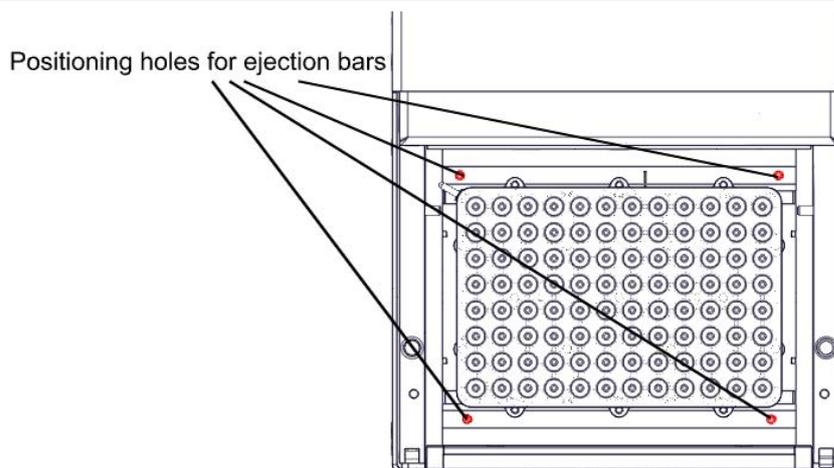


Fig.61: Positioning holes for the plate ejection bar (red)

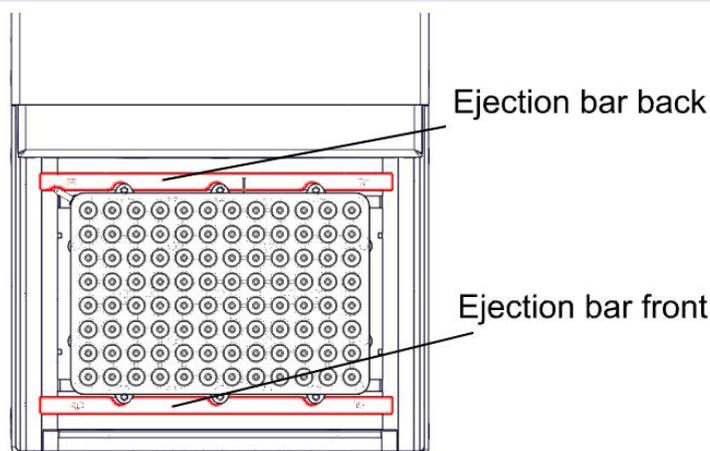


Fig.62: Correctly inserted ejection bars

NOTE

If the ejection bars are not in the correct position, they may get jammed between the VCM® and ODTC® Lid during movement of the lid, causing severe damage.

NOTE

The ejection bar from the standard ODTC® 96 can also be used for the ODTC® 96 XL in case low profile plates are used.

9 ACCESSORIES

9.1. Miscellaneous

Product Name	Description	Part Number
ODTC® Power & Control Unit	controls one ODTC®	8900035
Sealing Cover	one of the sealing options → chapter 6.3 for installation in ODTC® Lid → chapter 6.3.4	5000066
Ejection Bars	optimized for specific full skirted PCR plates → chapter 9.2 below (ejection bars for semi or non skirted PCR plates only on request)	for standard ODTC 96 and also for use with ODTC 96 and XL with low profile plates: 3200485 back bar 3200484 front bar ODTC 384 and 384 XL with low profile plates 3200528 back bar 3200527 front bar ODTC 96 XL only needed for high profile plates 3200643 back bar 3200642 front bar

For full or semi-skirted plates which are not compatible with the standard ejection bars, INHECO offers the design and manufacturing of customized ejection bars

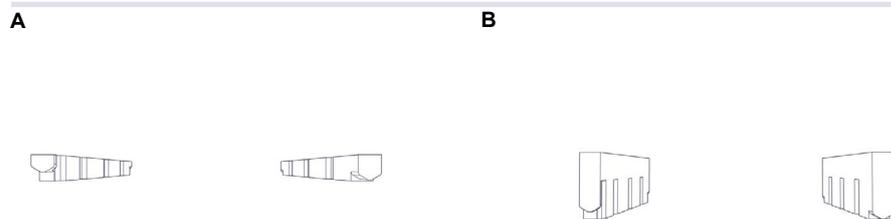


Fig.63: Ejection bars (A = for ODTC® low profile plates; B = ODTC® XL high profile plates)

9.2. List of approved PCR Plates for all ODT[®] 96

Description	Manufacturer's Part Number
BioRad Hard-Shell [®] Low-Profile Thin-Wall 96-Well Skirted PCR Plate (all frame & well colors)	HSP-9xxx; e.g. HSP-9601
4titude FrameStar 96 PCR Plate (clear frame & clear wells)	4ti-0960/C
Hamilton 96 PCR FramePlate	841302

9.3. List of approved PCR Plates for ODT[®] 96 XL optimized for high profile plates.

Description	Manufacturer's Part Number
MicroAmp [™] EnduraPlate [™] Optical 96-Well Clear	4483352
Eppendorf twin.tec [®] PCR Plates semi skirted	E0030128575
BioRad Hard-Shell high-profile 96 well Semi-skirted PCR Plates	HSS-9641 (HSS-9xxx)

NOTICE

For ODT[®] 96 XL: The maximum volume for PCR applications in high profile plates should not exceed 100µl/well. Liquid levels above 100µl will exceed the height of the enclosed wells in the mount.

9.4. List of approved PCR Plates for ODT[®] 384 and ODT[®] 384 XL

Description	Manufacturer's Part Number
BioRad Hard-Shell [®] Low-Profile Thin-Wall 384-Well Skirted PCR Plate (all frame & well colors)	HSP-3xxx; e.g. HSP-3801
4titude FrameStar 384 PCR Plate (all frame & all well colors)	4ti-0384 to 4ti-0387 (all color version)
Hamilton 384 PCR FramePlate	814305

9.5. List of approved automatable sealing lids

Description	Manufacturer's Part Number
BioRad Auto-Sealing Lid for PCR Plates	MSL2022 and MSL2023
Hamilton Comfort Lid	814300
4titude Auto-Sealing PCR Plate Lid	4ti-0291

APPENDIX

CE Declaration



EC - Declaration of Conformity

in accordance with Directive 2014/35/EU (LVD), 2014/30/EU (EMC), 2012/19/EU (WEEE) and 2011/65/EU (RoHS II)

Product	On Deck Thermal Cyclers (ODTC): ODTC® 96 Left; ODTC® 96 Back, ODTC® 96 Right, ODTC® 96 Down ODTC® 384 Left; ODTC® 384 Back, ODTC® 384 Right, ODTC® 384 Down ODTC® 96 Left XL, ODTC® 96 Back XL, ODTC® 96 Right XL, ODTC® 96 Down XL ODTC Power and Control Unit (P&CU): ODTC® Power & Control Unit	
Part No:	ODTC: 81000xx P&CU: 8900035, 8900037	
Standards (Safety):	EN 61010-1:2012/R:2016-04 EN 61010-2-010:2015 EN 61010-2-081:2015	
Standards (EMC):	EN 61326-1: 2013 EN 55011:2009 + A1:2010 EN 55016-1-1:2010 + A1:2010 EN 55016-1-2:2004 + A1:2005 + A1:2006 EN 55016-1-4:2007 + A1:2008 EN 55016-2-1:2004 EN 55016-2-1:2009 + A1:2011 EN 55016-2-3:2010 + A1:2010 EN 55016-2-4:2004 EN 55016-4-2:2004	EN 61000-3-2: 2006 + A1:2009 + A2:2009 EN 61000-3-3: 2008 EN 61000-4-1: 2007 EN 61000-4-2: 2009 EN 61000-4-3: 2006 + A1:2008 + A2:2010 EN 61000-4-4: 2004 + A1:2010 EN 61000-4-5: 2006 EN 61000-4-6: 2009 EN 61000-4-8: 2010 EN 61000-4-11: 2004

This product complies with the essential requirements of the Low Voltage Directive (LVD) and Electromagnetic Compatibility (EMC) directive, when used for its intended use.

International Standards For international standards please see UL certificate U8 046515 0032 Rev. 00
Download UL certificate: <http://www.inheco.com/service/certificates.html>

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Martinsried, May 2021

Place and date of issue

Günter Tenzler, Managing Director

Authorized Distributor

