User and Installation Manual

OVT Verification Thermal Cycling

Part No.:
790200X

Doc ID: 900905-000 December 2021

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 the ODTC® Verification Tool (abbreviated: OVT) with Part#: 790200x.

Part# 7902000-set consists of:
Data Logger connected with the OVT Measurement Head 96 well and Software

Part# 7902001-set consists of:
Data Logger connected with the OVT Measurement Head 384 well and Software

In the following OVT is used for the complete set.

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 OVT and must be retained until the device is disposed of and must be passed on with the OVT 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 OVT.

Security-related warnings in this manual are classified into 4 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 OVT 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.
	Warning: crushing your finger
·	Bullet points indicate steps of instructions.
-	Hyphens are used for enumerations.
→	Arrows indicate: “refer to” and are mostly an active link
blue writing	indicates a software button

1.3. Abbreviations and Glossary

The document uses the following terms	
ODTC®	On Deck Thermal Cycler
OVT	ODTC® Verification Tool
PCU	ODTC® Power & Control Unit
OVT Data Logger	ODTC Verification Tool Data Logger
°C	Degree Celsius
Hz	Hertz [1/s]
Iac	Alternating Current
Idc	Direct Current
K	Kelvin
kg	Kilogram
RH	relative humidity
TEC	Thermo Electric Cooler (Thermoelectric Module, Peltier Element)
Uac	Alternating Voltage
Udc	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 its specifications → Technical Data of ODTC® Manual

1.4. Warranty

The warranty period starts on the date of shipment. Any damage caused by operating the OVT 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 24-25.

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

1.5. How to contact INHECO

INHECO GmbH	
Address	Fraunhoferstr. 11 82152 Martinsried Germany
Telephone - Sales	+49 89 899593 120
Telephone - Techhotline	+49 89 899593 121
Fax	+49 89 899593 149
E-Mail - Sales	sales@inheco.com
E-Mail - Technical - Hotline	techhotline@inheco.com
Website	www.inheco.com

Technical Support & Trouble Shooting Instructions:

http://www.inheco.com/service/technical-support.html

2 PRODUCT DESCRIPTION

2.1. Intended Use

The OVT is designed for use as a verification tool to verify the temperature specifications of fully functional ODTC®. Mechanical / Hardware and Firmware defects / problems cannot be detected by the OVT. The OVT is not intended to be used to verify other Thermal Cycler systems.

The OVT devices are delivered with CE- and UL- certification.

The OVT is designed specifically for use in Life Science and In Vitro Diagnostics. The provided OVT software operates the OVT/ODTC® and evaluates the measurement data of the OVT system and generates an official verification certificate

When using the OVT 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 OVT must be used exclusively by service technicians and user of workstation system who are familiar with the instructions of this manual and the ODTC® 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:

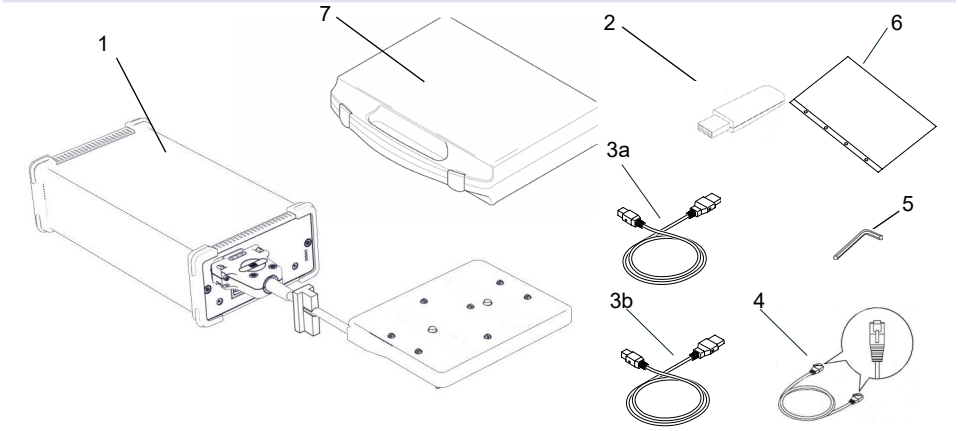


Fig.1: Components (measurement scale not correct)

(1) OVT measuring Head and OVT Data Logger tightly connected with a cable (cable longer than shown in the image)

(2) USB flash drive with OVT Control Software and Data Logger driver

(3 a) USB cable (1.5m length) (3 b) USB cable (3.0m length)

(4) RJ45 Ethernet cable

(5) Socket wrench (1.5 mm)

(6) Certificate

(7) Transport case

2.3. Functional Elements

The OVT set primarily consist of the Measurement Head and the Data Logger. Measurement Head and Data Logger are connected by a 1.5m cable.

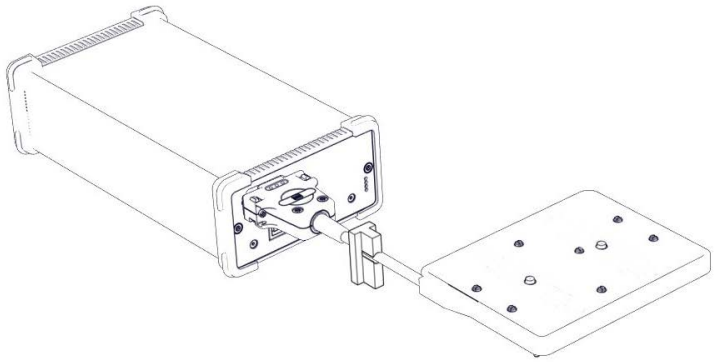


Fig.2: OVT set (Measurement Head and Data Logger) showing the connection of both devices

NOTE
Never unplug the connector of the Measurement Head from the OVT Data Logger. It is secured with a calibration void label. INHECO will not take any liability for quality of the measurement performed with the OVT if the Measurement Head was disconnected before.

2.3.1. Functional Elements of the OVT

- **OVT Measurement Head Sensing Elements**

The OVT Measurement Head has 5 sensing elements located at the bottom of the Measurement Head to verify the temperature of the ODTC® Mount and 2 sensing elements located at the top of the Measurement Head to verify the temperature of the ODTC® Lid.

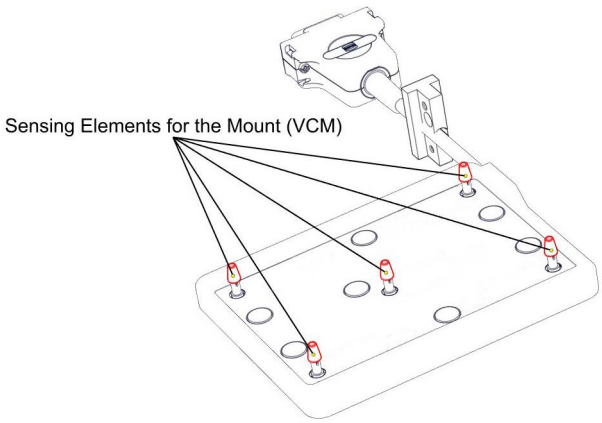


Fig.3: Sensing elements at the bottom of the Measurement Head

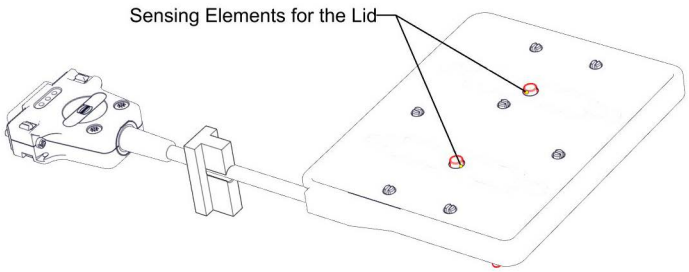


Fig.4: Sensing Elements at the top of the Measurement Head

- **OVT Measurement Head Gap Closure**

The Measurement Head includes a plastic part (Gap Closure) which is fixed to the cable. The Gap Closure has to be manually positioned to the front of the ODTC® (same position as right removable block) to guide the cable out of the ODTC® and close the gap.

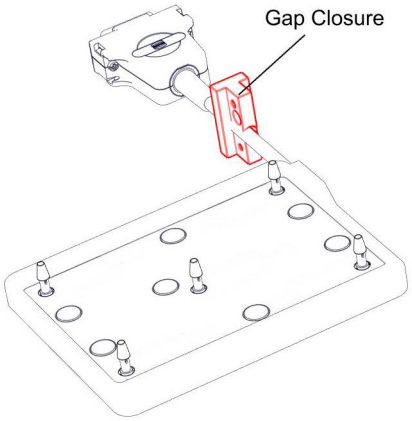


Fig.5: Gap Closure

2.3.2. OVT Data Logger

The OVT Data Logger contains the metrology and the data processing of the measurement data. The Data Logger is connected to the Measurement Head by a 1,5m cable.

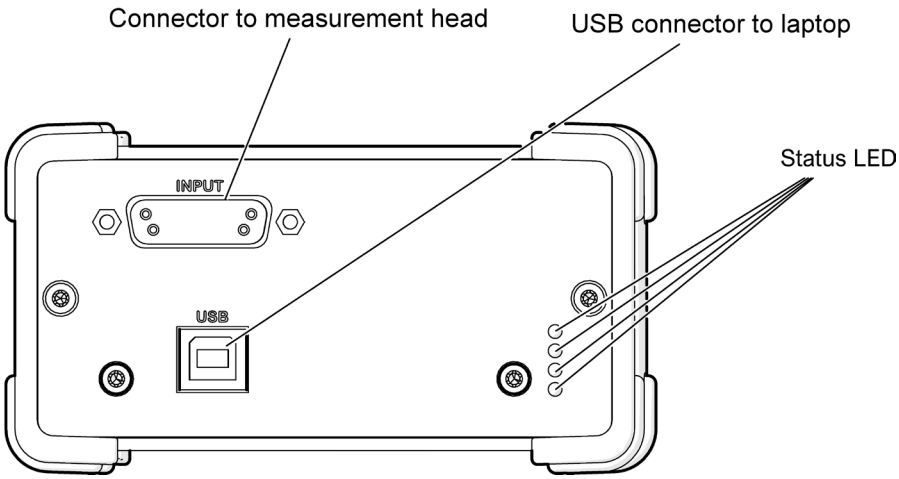


Fig.6: Functional elements of the OVT® Data Logger

(1) Connector to Measurement Head (do not separate)
(2) USB connector to PC
(3) Status LED

LED state from top to down

Status LED	Description of status
LED0	shows the state "on"
LED1	shows data transmission and is lightened only during data transmission
LED 2 and 3	only for INHECO use

NOTE
Never unplug the connector of the Measurement Head from the OVT Data Logger. It is secured with a calibration void label. INHECO will not take any liability for quality of the measurement performed with the OVT if the Measurement Head was disconnected before.

2.4. Labels

The identification label with part number and serial number also contains important technical information. The label is placed on the bottom of the OVT Data Logger. 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 label can be ordered from INHECO.

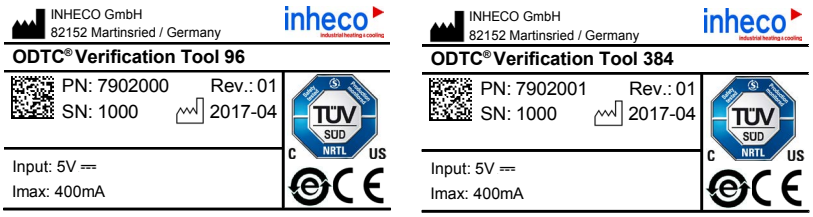


Fig.7: Product label on the ODTC® Verification Tool 96 and ODTC® Verification Tool 384

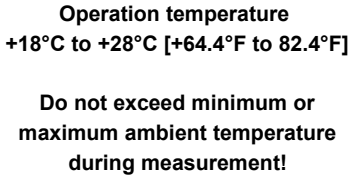


Fig.8: Operating temperature label (on the back of the Data Logger)

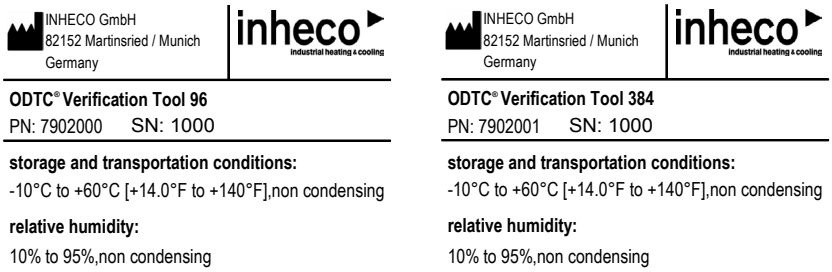
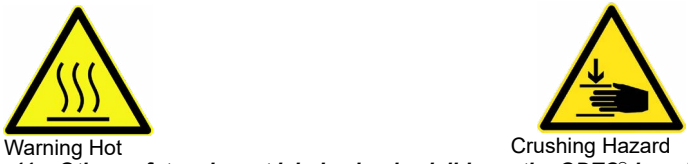


Fig.9: Shipment labels on the package

Warranty label

Calibration void label on connector

Fig.10: Other labels on the product, e.g. label to protect connection between Measurement Head and Data Logger placed on the connector



Warning Hot

Crushing Hazard

Fig.11: Other safety relevant labels clearly visible on the ODTC® housing

2.5. Technical Data

General Specifications - OVT Measurement Head [1]	
Dimensions (WxDxH)	96 mm x 126 mm x 9.4 mm (with sensor pins H: 20.5 mm (96) and 14.7 mm (384))
Weight	100 g
Protection Class	IP 20[2]
Verfication of	ODTC® 96 and ODTC® 384
Number of Sensing Elements	Mount verification 5 Sensing Elements Lid verification 2 Sensing Elements

[1] OVT Measurement Head shall only be connected to the OVT Data Logger.

[2] not protected against water

Thermal Specifications - OVT Measurement Head	
Temperature range (absolute)	Mount +4°C to +99°C [+39.2°F to +210°F] Lid +30°C to +120°C [+86F to +248°F]
Temperature accuracy (absolute)	Mount steady state: ±0.10 K at +50°C and +90°C [+122°F and +194°F] Lid steady state: ±0.20 K at +50°C and +90°C [+122°F and +194°F]
Temperature uniformity (relative)	Mount steady state: ±0.05 K at +50°C and +90°C [+122°F and +194°F]

Specifications - OVT Data Logger	
Dimensions (WxDxH)	116 mm x 216 mm x 64 mm
Interface to PC	USB 2.0 compatible
noise level	No noise
Weight	700 g
DC Input	5V
Protection Class	IP30

Environmental Conditions - OVT Data Logger		
Tolerable relative humidity	Operation	RH 30% to 80% (non condensing) [3]
	Transportation and storage	RH 10% to 95% (non condensing) [3]
Temperature	Operation	+18°C to + 28°C [+64.4°F and +82.4°F] altitude 0-2,000m
	Transportation and storage	-10°C to +60°C [+14°F and +140°F] altitude 0-11,000m

[3] Condensate can prevent the OVT® from operating properly and can damage the OVT®.

3 SAFETY INSTRUCTIONS

3.1. Product-specific Risks

WARNING
Follow the safety instructions given below in order to avoid danger for the user. Also follow the safety instructions of the ODTC Manual.

General

- The OVT needs no maintenance on a regular basis but calibration → Maintenance, page 24ff.
- The OVT Data Logger has to be placed on its bottom (marking of functional elements orientated according fig. 6 → page 10) .
- Do not exceed minimum or maximum ambient temperature and humidity conditions during operation or storage of the OVT → Technical Data, page 12. Ensure that there is no other device installed next to the OVT housing increasing temperature for the OVT above the specified temperatures. In case of doubt, please contact INHECO for further analysis.
- The OVT must not be used in environments with risk of explosion or with explosive liquid samples.
- The OVT is for indoor use only.

Crushing Hazard (When inserting the Measurement Head into the ODTC®):

- 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® is connected to power.

Burning Hazard (When inserting the Measurement Head into the ODTC®):

- Hot surfaces, primarily the Sensing Elements, 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® and Measurement Head 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 +120°C [+248°F]! It takes a while to cool down after the device has been used. Please note that the ODTC® Lid and OVT have no active cooling.

Electrical Shock:

- The OVT must not be used if the OVT or the Data Logger or the connecting cables show visible signs of damage.
- Disconnect Data Logger from the power outlet before opening the OVT Data Logger housing .
- Original cable provided by INHECO has to be used to guarantee safe and proper operation.
- The OVT is designed in accordance with Protection Class I (IEC).

Biosafety Laboratory Environment

- When using the OVT in a Biosafety Laboratory Environment, the user is responsible for labeling it according to the WHO Laboratory Biosafety Manual (ISBN9241546506) and for operating the devices in accordance with the Biosafety Level Regulations of the WHO Laboratory Biosafety Manual.

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 → Maintenance, page 24.

4 COMMUNICATION WITH THE OVT

NOTICE
The OVT Data Logger should only be operated with the INHECO OVT Software.

4.1. Installation OVT control software

The OVT control software is delivered on a USB flash drive together with the device.

Install the software following the installation routine after double click of the application OVT 1.x.x Setup.exe on the USB Flash drive.

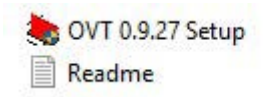


Fig.12: OVT installer file on USB flash drive

4.2. Installation of Data Logger driver

Additionally, a driver for the Data Logger (OVT Comm) needs to be installed by using the install-drivers.exe. Install the software following the installation routine after double click of the application on the USB Flash drive.

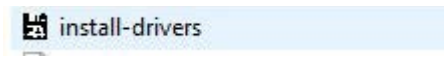


Fig.13: OVT Comm installer file on USB flash drive

4.3. Network configuration

To run the OVT successfully the correct network configuration of ODTC® and your PC is essential. Installation of the OVT should be performed by a network administrator or someone with good knowledge on network configuration and company network settings.

Please make sure to follow the below mentioned steps otherwise a support is not possible.

- Installation of OVT control software is supported on Windows 10 operating system.
- OVT and ODTC® need to be directly connected to a LAN connector of the PC. Do NOT use a hub, a USB to LAN Adapter or something similar.
- The IP address type (dynamic/static) of ODTC® and PC need to match.

  The OVT works either with ODTCs that have a dynamic (default) or static IP setting. In case the ODTC® uses dynamic IP setting please make sure that the TCP/IPv4 configuration of the PC is set to IP address automatically.
  If the ODTC® is set to static IP the PC has to be in the same Subnet as the ODTC®. The IP address and Subnet of the PC can be adjusted in the Internet Protocol Version 4 Properties. How to get to this Properties → Trouble Shooting section, page 26.

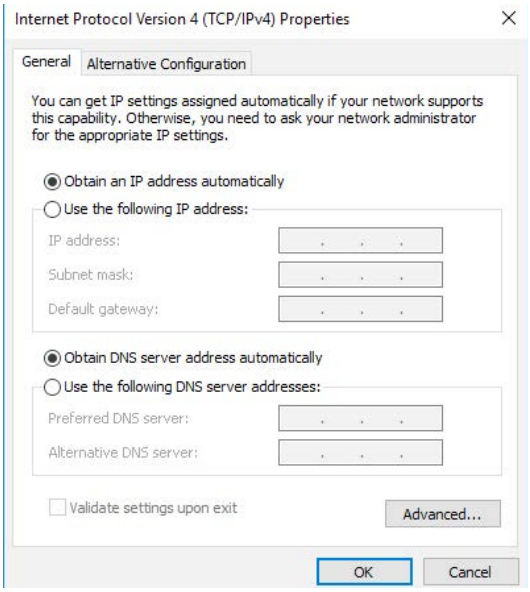


Fig.14: TCP/IPv4 Settings

NOTICE
In case the ODTC® and PC are not corresponding in IP address type (static or dynamic) the OVT control software cannot connect to the ODTC® → Trouble Shooting, page 26.

4.4. Energy saving settings of connected PC

For proper functionality of OVT Control Software the energy saving settings and lock screen settings of the connected PC need to be set to at least 30 min.

5 HARDWARE INSTALLATION / OPERATION

The OVT is designed for the temperature verification of the ODTC® devices only. The OVT must be used exclusively by laboratory professionals or technical support personnel who are familiar with the instructions of this manual as well as the ODTC® manual.

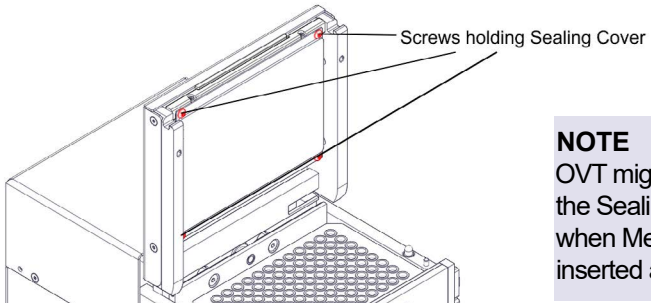
5.1. Scope of Supply

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.

5.2. Initial Operation

5.2.1. Remove the pre-installed Sealing Cover:

- Bring the ODTC® Lid in maintenance/service & cleaning position → ODTC® Manual, chapter 6.2.2, page 27. If ODTC is open then please use your software to close the ODTC®.
- Remove the four screws of the Sealing Cover.



NOTE
OVT might get damaged when the Sealing Cover is still installed when Measurement Head is inserted and ODTC® Lid is closed.

Fig.15: 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.

5.3. Start Verification

Open the OVT control software by double click on the desktop icon.

Fig.16: OVT software icon on desktop (image may vary depending on monitor resolution)

The OVT Control software scans automatically all physical and all virtual LAN ports. In case the OVT finds several physical LAN ports a window will open to select the port the ODTC® is connected to:

Fig.17: Select LAN port

- Select the correct LAN Port

Please follow the instruction prompted by the software:

5.3.1. Connect the OVT Data Logger to the PC

- Connect the Data Logger to the PC. Please use only the USB cable which is included in the shipment.

NOTE
Never unplug the connector of the Measurement Head from the OVT Data Logger. It is secured with a calibration void label. INHECO will not take any liability for quality of the measurement performed with the OVT if the Measurement Head was disconnected before.

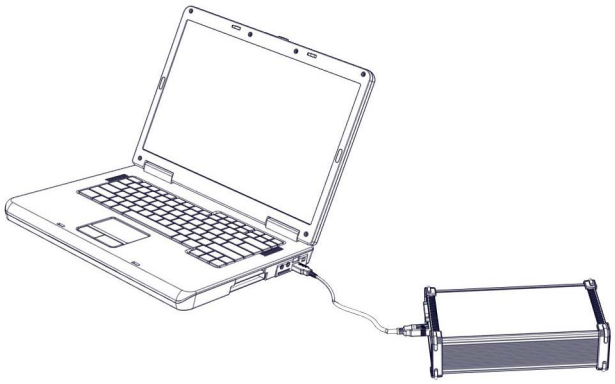


Fig.18: Connecting the OVT® Data Logger with PC (connected Measurement Head not shown in this image).

5.3.2. Connect the ODTC® with the PC

Follow the instructions of the ODTC® Manual and the instructions prompted in the OVT control software.

Connect the ODTC® to the PCU and connect PCU with the PC

- 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.

NOTE
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 Ethernet cable (RJ45 cable) (→ fig. 19) to the ODTC® Power & Control Unit and to the Ethernet socket of your PC or computer of robotic system.

NOTICE
The Ethernet cable delivered with OVT has to be used otherwise there might be connection problems.

- Connect the power cord (→ fig. 19) to the ODTC® Power & Control Unit and the wall power outlet.

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

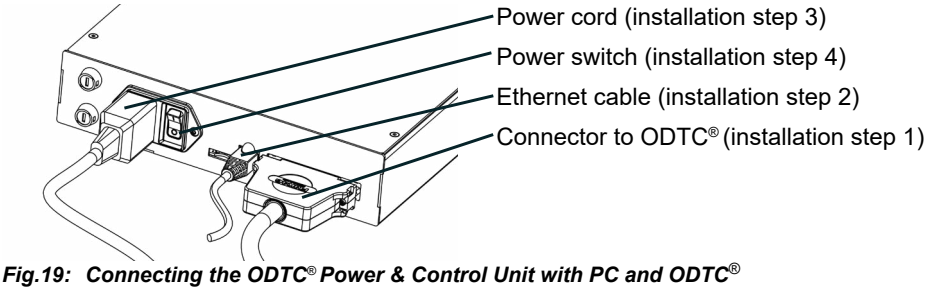


Fig.19: Connecting the ODTC® Power & Control Unit with PC and ODTC®

- Switch on the power of the ODTC® Power & Control Unit .

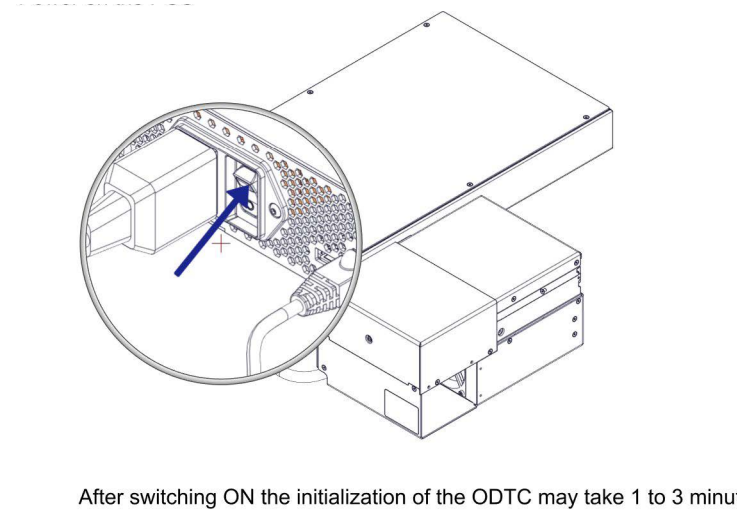


Fig.20: Power on ODTC®

- The ODTC® Power & Control Unit will boot and the lid of the ODTC® will open. The OVT software will start automatically connecting to the ODTC® as soon as the PCU is powered on. This will be shown at the bottom of the software window:

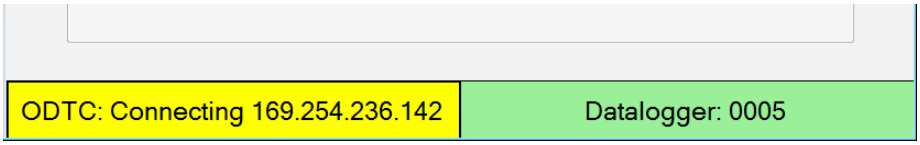


Fig.21: Connection establishment of OVT with ODTC®

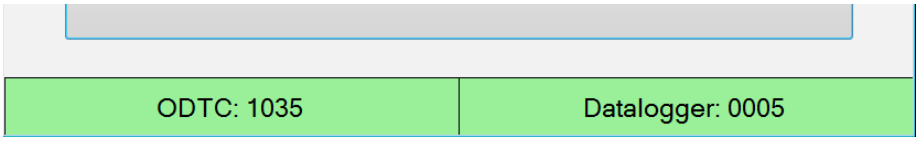


Fig.22: Connection established (this might take several minutes)

NOTICE
In case the ODTC® does not connect after several minutes please restart OVT control software and ODTC® (power off and on). If this does not help please check whether network configuration are set correctly → Network configuration, page 16.

Place the Measurement Head in the ODTC®

As soon as the ODTC® is opened and cooled down to ambient temperature you can insert the Measurement Head into the ODTC®.

The software will ask to confirm that the Sealing Cover is removed. If you select no, the ODTC will close and you can go on as described in → chapter 5.2.1, page 17. Afterwards you have to restart software and ODTC.

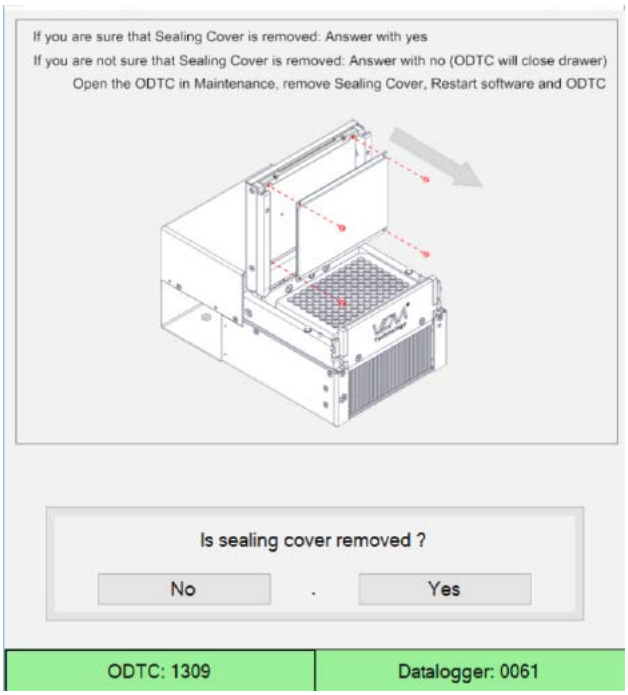


Fig.23: Confirm whether the Sealing Cover is removed

Crushing Hazard
(When inserting/removing the Measurement Head into/ out of the ODTC®):
- 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.

Burning Hazard
(When inserting/removing the Measurement Head into/ out of the ODTC®):
- 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 +120°C [+248°F]! It takes a while to cool down after the device has been used. Please note that the ODTC® Lid has no active cooling.

- Remove the magnetic block on the right side of the ODTC®.

Notice
When you also remove the left magnetic block the OVT test will fail due to not uniform temperatures.

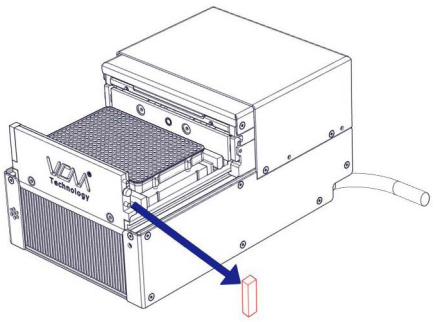


Fig.24: Block removal

- Insert the Measurement Head with both hands (the sensing elements at the corner of the Measurement Head need to be inserted into the corner wells of the ODTC® mount).

NOTICE
The left magnetic block needs to be installed during the measurement. Only remove and replace the right magnetic block otherwise the OVT test will fail in uniformity when the left block is not installed.

- Attach Gap Closure of Measurement Head instead of removable block at the right side of the front of the ODTC®.

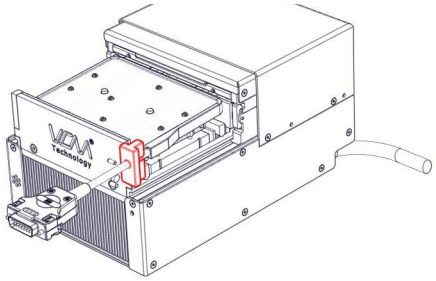


Fig.25: Inserted OVT Measurement Head within the opened ODTC®

- After the Measurement Head is inserted and the Gap Closure is attached, the insertion needs to be confirmed in the software to start verification. The "Confirm Measurement Head and start verification" button will be activated after the connection is established.
- Confirm within the software that the Measurement Head is inserted to start verification

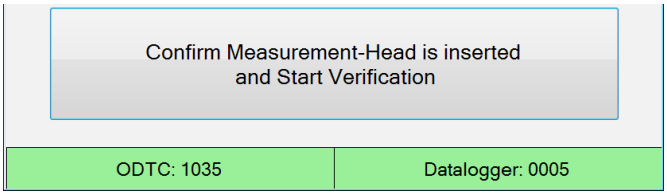


Fig.26: Confirm the Measurement Head is inserted and to start verfication by using the software button

- ODTC® lid will be closed.

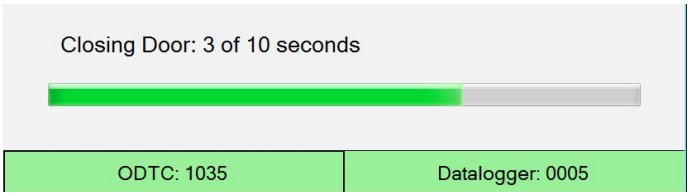


Fig.27: Closing door procedure

- Measurement will start and a progress bar is displayed showing the remaining time of the verification process. Verification time is about 23 minutes (time might vary depending on device type ODTC® 384 or ODTC® 96).

NOTICE
During the measurement do NOT disconnect any cable as this will eventually lead to a system crash without specific error message.

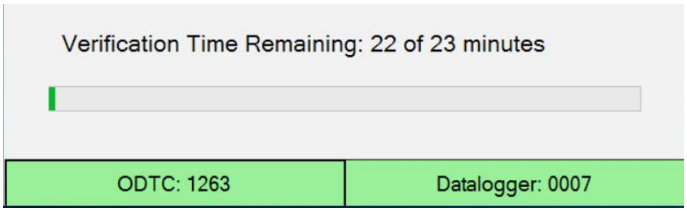


Fig.28: Status information about verification runtime

- During the verification, the following temperature profile will be run on the ODTC®

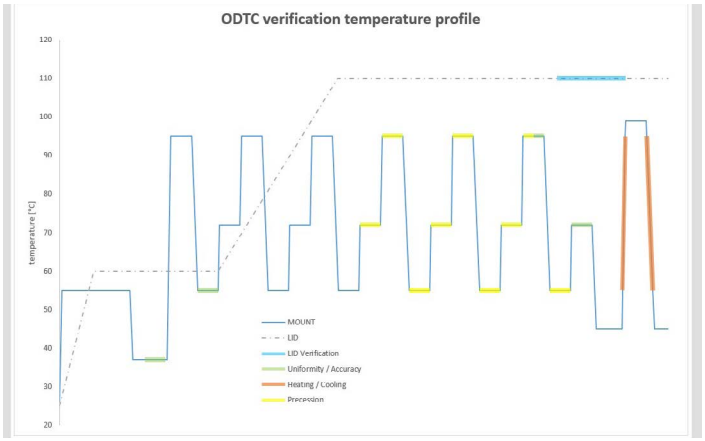


Fig.29: Temperature profile during verification

- The software automatically opens the ODTC® after the measurement is finished.

NOTICE
In case the lid does not open please power cycle the PCU. Measurement results should still be saved in the default folder.

- The Measurement Head can be removed after the cool down time of at least 2 minutes.

Fig.30: Information to remove the Measurement Head and reinstall the removed parts (e.g. Sealing Cover and Removable Block)

NOTE
Remove the Measurement Head with both hands in vertical direction, as otherwise the Sensing Elements might get damaged.

- A window is popping up that allows to edit general information that will be imported into the certification document.
- General information can be fully adapted according to the needs. But mutated vowels are not allowed. The inserted content of the general information will be automatically displayed in the next verification process.
- In case you want to view the certificate after saving please check "Try to open the Certificate with attached pdf-Viewer after exit the program"

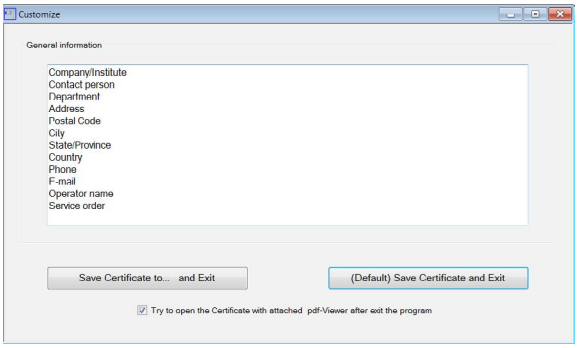


Fig.31: Image of software

- Remove Gap Closure
- Remove Measurement Head

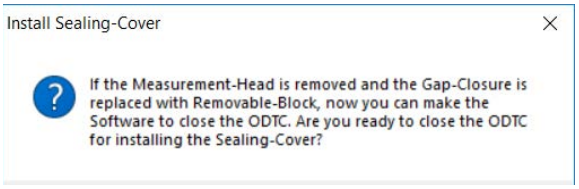


Fig.32: Image of software

- Reinstall Sealing Cover (if necessary)

- The certificate is automatically saved into the default directory (last used folder) using the Save Certificate and Exit. Alternatively, the directory can be user defined using the Save Certificate to... and Exit.

Certificate of Temperature Verification

Testing equipment				
ODTC Verification Tool SN	Software Version	Calibration date	Calibration due date	Analysis Rules Version
0001 (FW 2.0.7)	1.0.33.0	2017-06-02	2018-06-02	M323_1.1

OVT sensor legend
Sensor position (top view)

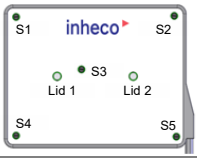


Fig.33: Certificate

The layout of the certificate is shown in Appendix A → page 29.

The certificate will show the overall performance summary as result: PASS on the first page.

ODTC overall performance summary
Result
PASSED

As long as each result of page 2 is set to PASS the overall performance summary on page 1 will show the PASS result also.

In case of a FAILED result please clean the wells and the Sensing Elements for contaminations (→ Cleaning, page 25) and repeat the measurement.

NOTICE
Please make sure that you only start the measurement when the ODTC® and OVT are on ambient conditions.

In case the FAILED result is showing up again please contact **techhotline@inheco.com.**

6 MAINTENANCE

The OVT must be used exclusively by laboratory professionals and technical service personnel who are familiar with the instructions of this manual as well as the ODTC® manual.

6.1. Software Updates

For updates of the OVT control software, please contact **sales@inheco.com** → How to contact INHECO, page 6.

6.2. 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 OVT (shown on device label)
- INHECO part number of OVT (shown on device label)
- INHECO serial number of OVT (shown on device label)

6.3. 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 24.

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 be returned in the original packaging.

6.4. Transportation and Storage

It is recommended to keep the original OVT® packaging. The OVT® should be shipped and stored in its original packaging. Adhere to required environmental conditions for transportation and storage →Technical Data, page 12.

6.5. Cleaning

The contact surface should be cleaned regularly to ensure optimum measurement. 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. Make sure that no liquid enters the inside of the Data Logger or the Measurement Head.

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

Contact INHECO in case you prefer other cleaning liquids or methods which may be

harmful for the material of the devices.

NOTE
Be careful when cleaning the Sensing Elements do not twist or bend them because the wires might break.

6.6. 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 OVT can be decontaminated by disinfection with formaldehyde or ethylene oxide gas.

NOTE
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.

6.7. Thermal Verification

The OVT is delivered DAkkS/Nist calibrated and adjusted.

To proof that the OVT is working within the specifications the calibration must be renewed every year. The calibration date and calibration due date are shown in the certificate in the "Testing equipment" section. After expiration of the certification the OVT will issue a certificate that states that the overall verification has failed although all temperature specifications might have been met during the verification process.

Testing equipment				
ODTC Verification Tool SN	Software Version	Calibration date	Calibration due date	Analysis Rules Version
0001 (FW 2.0.7)	1.0.33.0	2017-06-02	2018-06-02	M323_1.1

For futher information on the calibration certificate please refer to → Appendix B, page 31.

NOTE
Never unplug the connector of the Measurement Head from the OVT Data Logger. It is secured with a calibration void label. INHECO will not take any liability for quality of the measurement performed with the OVT if the Measurement Head was disconnected before.

6.8. 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.

7 TROUBLESHOOTING

7.1. OVT is not connecting to ODTC®

If you encounter problems with connecting to the ODTC® perform the following steps:

- Check the physical network connection.
- Restart the ODTC® and the OVT control software
- Test TCP/IP Network link for automatic IP configured hosts:
  - Open an MS-DOS/Command window (Command Prompt) and type:
    C:\> ping <ODTC NetBIOS Name>
  - The <ODTC NetBIOS Name> is a unique identifier printed on the INHECO ODTC® Power and Control Unit (PCU) label called 'Node name'.
    Example: ODTC_049B97. Replace <ODTC NetBIOS Name> with the node name of the connected PCU.
    The expected output from Ping looks like the following:

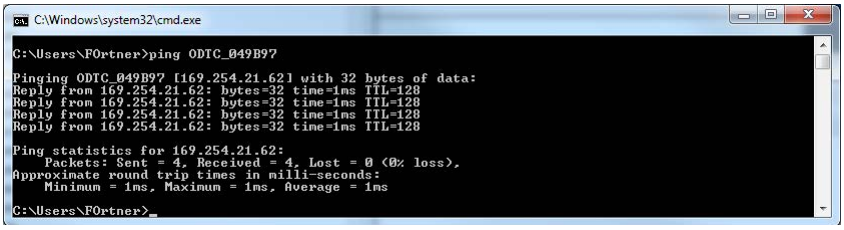


Fig.34: Successful conncetion

- Make sure ODTC® and OVT network configurations are matching.
  To change the network adapter settings
  - Press Win+R on keyboard to open the Run dialog
  - Type ncpa.cpl and click OK to open the Network Connections window.

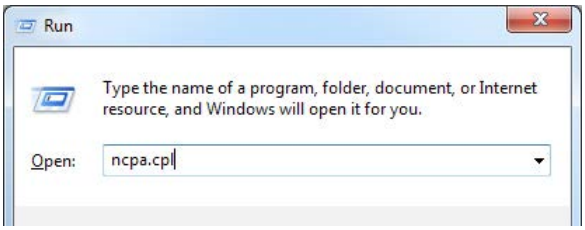


Fig.35: ncpa.cpl command

  - Choose the relevant LAN adapter from list and perform a right mouse click and choose Properties from menu.
  - Within the adapter properties window select Internet Protocol Version 4 (TCP/IPv4) and click Properties.

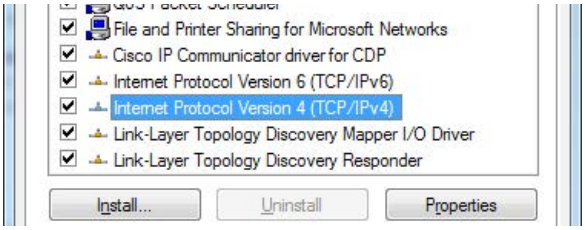


Fig.36: TCP/IPv4 selection

  - On General tab make sure "Obtain an IP address automatically" Radio button or the "use the following IP address" is selected (depending on ODTC® IP address type).

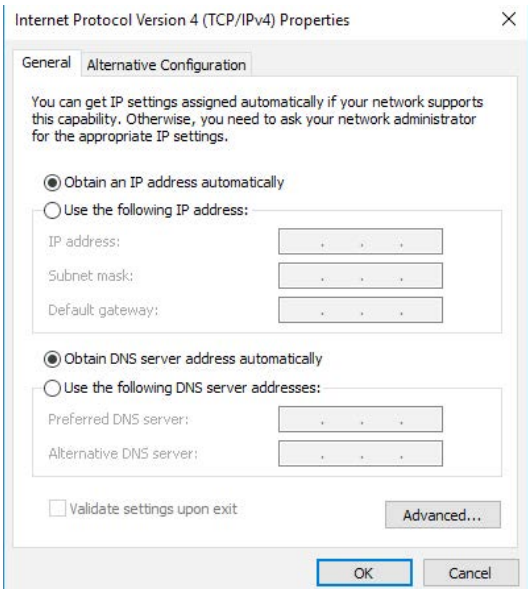


Fig.37: TCP/IPv4 Settings

- Click Advanced button to proceed to Advanced TCP/IP Settings dialog and choose WINS tab. Make sure under section NetBIOS setting Default radio button is selected.

8 ACCESSORIES

8.1. Miscellaneous

Product Name	Description	Part Number
Calibration	Yearly Recalibration for OVT	7902002
Notebook EU (optional)	dedicated Notebook only for the OVT with preinstalled OVT software with european power supply	1004504
Notebook US (optional)	dedicated Notebook only for the OVT with preinstalled OVT software with european power supply	1004505

9 APPENDIX

9.1. CE Declaration

inheco
industrialheating+cooling

Declaration of Conformity

in accordance with Directive 2014/35/EU, 2012/19/EU and 2011/65/EU

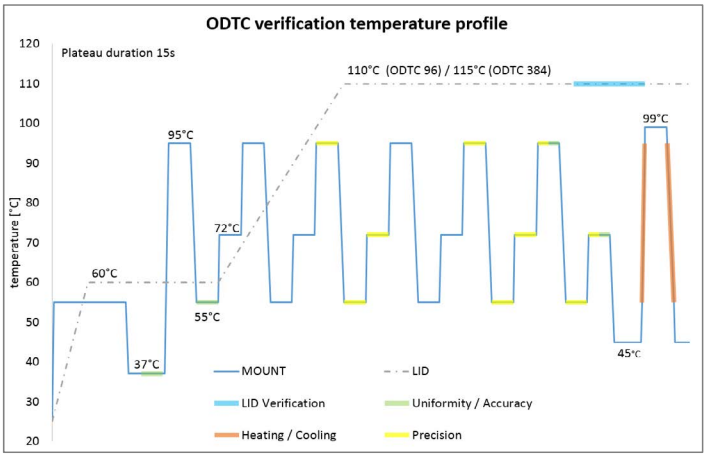
Product:	ODTC Verification Tool (OVT)
	ODTC Verification Tool 96 / ODTC Verification Tool 384
Part No:	7902000, 7902001
Standards (Safety):	EN 61010-1:2011-07
Standards (EMC):	EN 61326-1:2013-07
	EN 55011:2009 + A1:2010
	EN 61000-3-2:2006 +A1:2008 +A2
	EN 61000-3-3
	EN 61000-4-2:2009
	EN 61000-4-3:2006 + A1:2008 + A2:2010
	EN 61000-4-4:2004 +A1:2010
	EN 61000-4-5:2009
	EN 61000-4-8:2010
	EN 61000-4-11:2004

This product complies with the essential requirements of the Low Voltage Directive 2014/35/EU and EMC directive 2014/30/EU, when used for its intended use.

International Standards:	For international standards please see UL certificate U8 16 05 46515 024
	Download UL certificat: http://www.inheco.com/service/certificates.html
Manufacturer address:	INHECO Industrial Heating and Cooling GmbH Fraunhoferstr. 11 82152 Martinsried Germany

10 APPENDIX A

10.1. Certificate of Temperature Verification



ODTC accuracy [°C] accuracy for S1 to S5 (average temperature)				
Set point [°C]	Min limit	Max limit	Measured value	Result
37	36,2	37,8	37,21	PASSED
55	54,4	55,6	55,03	PASSED
72	71,2	72,8	72,04	PASSED
95	93,9	96,1	94,72	PASSED

ODTC uniformity [K] average uniformity of S1 to S5 (max. temperature – min. temperature)			
Set point [°C]	Limit	Measured value	Result
37	0,4	0,13	PASSED
55	0,4	0,18	PASSED
72	0,4	0,20	PASSED
95	0,4	0,23	PASSED

ODTC precision [K] precision of S1 to S5 (average temperature)			
Set point [°C]	Max limit	Measured value	Result
55	0,6	0,22	PASSED
72	1	0,18	PASSED
95	1,6	0,22	PASSED

ODTC cooling rate [K/s] cooling rate from 95°C – 55°C (ΔT_{S1-S5} / Δt)		
Min limit	Measured value	Result
2	2,15	PASSED

ODTC heating rate [K/s] heating rate from 55°C – 95°C (ΔT_{S1-S5} / Δt)		
Min limit	Measured value	Result
4,8	4,98	PASSED

ODTC accuracy heated lid [°C] accuracy of Lid 1 to Lid 2 sensor (average temperature)				
Set point [°C] (ODTC 96 / 384)	Min limit	Max limit	Measured value	Result
110 / 115	113	116	114,02	PASSED

ODTC uniformity heated lid [K] average uniformity of L1 to L2 (max. temperature – min. temperature)			
Set point [°C] (ODTC 96 / 384)	Max limit	Measured value	Result
110 / 115	2	0,19	PASSED

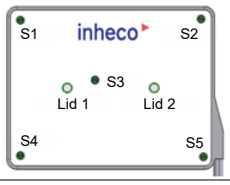
2017-06-26_TemplateVerificationCertificate.docx 2/2

Certificate of Temperature Verification

Testing equipment				
ODTC Verification Tool SN	Software Version	Calibration date	Calibration due date	Analysis Rules Version
0001 (FW 2.0.7)	1.0.33.0	2017-06-02	2018-06-02	M323_1.1

OVT sensor legend

Sensor position (top view)



Test object	
ODTC type	3840000
Part number	2726058
Power & Control Unit serial number	1213
ODTC serial number	1036
Firmware version microcontroller	225
Firmware version ePC (SiLA)	6046.20645
Raw data filename	201706131739OVT_1036_3840000
Date of measurement	2017-06-13

General information
Company/Institute
Contact person
Department
Address
Postal Code
City
State/Province
Country
Phone
E-mail

ODTC overall performance summary
Result
PASSED

Note:
The design of the OVT is optimized for the use with the latest version of ODTC beginning with the serial number:
ODTC 96: 2000
ODTC 384: 2000.
For ODTCs with lower serial number the acceptance criteria are adjusted to the limits valid at that time.

Operator _____ Date _____ Signature _____

Supervisor _____ Date _____ Signature _____

11 APPENDIX B

11.1. Certificate of Calibration

The certificate of calibration will be issued by our calibration laboratory ELMTEC. It will show the measurement results before and after the adjustment.

channel in the data logger before adjustment	indicated values of the sensors		*extended uncertainty of measurement*
	at 50,000 °C	*at 89,999 °C*	
2	49,932 °C	90,298 °C	0,05 K
3	50,062 °C	90,263 °C	0,05 K
4	49,674 °C	90,120 °C	0,05 K
5	50,138 °C	90,204 °C	0,05 K
6	49,790 °C	90,190 °C	0,05 K
7	49,752 °C	89,925 °C	0,05 K
8	49,872 °C	90,022 °C	0,05 K

configuration of the data logger	*gain before adjustment*	*offset before adjustment*	*gain after adjustment*	*offset after adjustment*
2	39,156	38,400	38,800	37,529
3	39,117	37,800	38,920	37,421
4	39,417	39,410	38,981	38,099
5	38,911	37,760	38,846	37,751
6	39,230	39,170	38,841	38,077
7	39,213	38,620	39,043	37,989
8	39,037	38,280	38,890	37,820

channel in the data logger after adjustment	indicated values of the sensors		*extended uncertainty of measurement*
	at 50,010 °C	*at 89,992 °C*	
2	50,028 °C	90,022 °C	0,05 K
3	50,018 °C	90,008 °C	0,05 K
4	50,010 °C	90,007 °C	0,05 K
5	50,013 °C	90,016 °C	0,05 K
6	50,020 °C	90,007 °C	0,05 K
7	50,013 °C	90,004 °C	0,05 K
8	50,011 °C	89,987 °C	0,05 K

channel in the data logger	*deviation to reference sensor before adjustment*		*deviation to reference sensor after adjustment*	
	at 50,000 °C	*at 89,999 °C*	*at 50,010 °C*	*at 89,992 °C*
2	-0,068 K	0,299 K	0,018 K	0,030 K
3	0,062 K	0,264 K	0,008 K	0,016 K
4	-0,326 K	0,121 K	0,000 K	0,015 K
5	0,138 K	0,205 K	0,003 K	0,024 K
6	-0,210 K	0,191 K	0,010 K	0,015 K
7	-0,248 K	-0,074 K	0,003 K	0,012 K
8	-0,128 K	0,023 K	0,001 K	-0,005 K

of measurement channel 2 to 6	*before adjustment*		*after adjustment*	
mean value	-0,081 K	0,216 K	0,008 K	0,020 K
maximum - minimum	0,464 K	0,178 K	0,018 K	0,015 K

ELMTEC Ingenieurgesellschaft mbH, Kattreppeln 28, 38154 Königslutter ☎ +495353/9545-0 , Fax: +495353/9545-45 http://www.elmtec.de

Which channel represents which Sensing Element of the Measurement Head is also shown on the certificate. → refer to page 33 to receive further information.

NOTE
Never unplug the connector of the Measurement Head from the OVT Data Logger. It is secured with a calibration void label. INHECO will not take any liability for quality of the measurement performed with the OVT if the Measurement Head was disconnected.

The following values are used to decide whether an adjustment is necessary or not:

- Calibration and adjustment of OVT if the deviation is:
  > ±0.050K
- Calibration of OVT if the deviation is:
  ≤ ±0.050K
  In this case the deviation of the referential sensing element is recorded in the certificate

Sensing Element should not differ more than 0.150 K to the reference sensor (value in the header of table):

channel in the data logger	*deviation to reference sensor before adjustment*		*deviation to reference sensor after adjustment*	
	at 50,000 °C	*at 89,999 °C*	*at 50,010 °C*	*at 89,992 °C*
2	-0,068 K	0,299 K	0,018 K	0,030 K
3	0,062 K	0,264 K	0,008 K	0,016 K
4	-0,326 K	0,121 K	0,000 K	0,015 K
5	0,138 K	0,205 K	0,003 K	0,024 K
6	-0,210 K	0,191 K	0,010 K	0,015 K
7	-0,248 K	-0,074 K	0,003 K	0,012 K
8	-0,128 K	0,023 K	0,001 K	-0,005 K

Fig.38: Red area shows the value which is used for adjustment decision

If the deviation is > ±0.150K the customer will be informed by INHECO.

The "mean value" and "maximum - minimum" values in the certificate are only for information.

Channels 2-8 refer to the sensing elements:

Messkanal im Datenlogger *Channel in the data logger*	Sensor *sensor*
2	S1
3	S2
4	S3
5	S4
6	S5
7	Lid 1
8	Lid 2

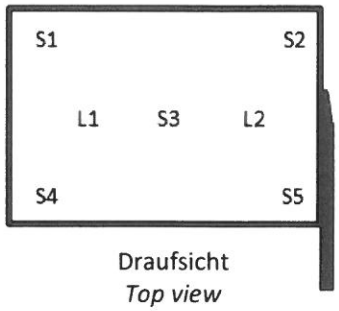


Fig.39: OVT Channel corresponding sensing elements as shown in certificate

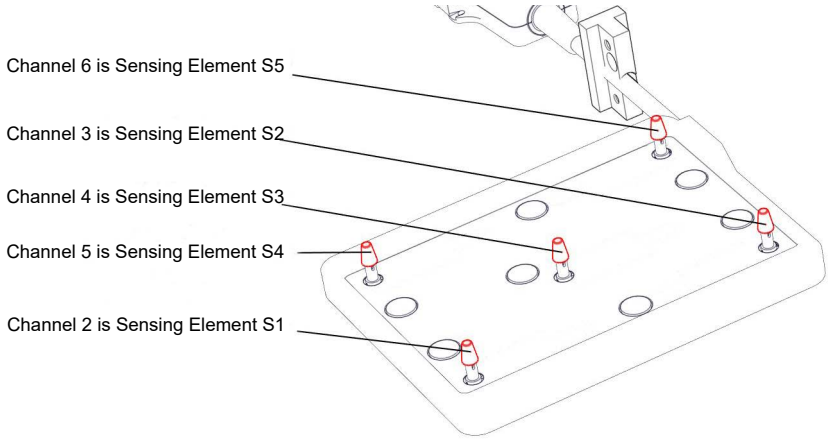


Fig.40: OVT Channel corresponding sensing elements for ODTC® Mount (VCM)

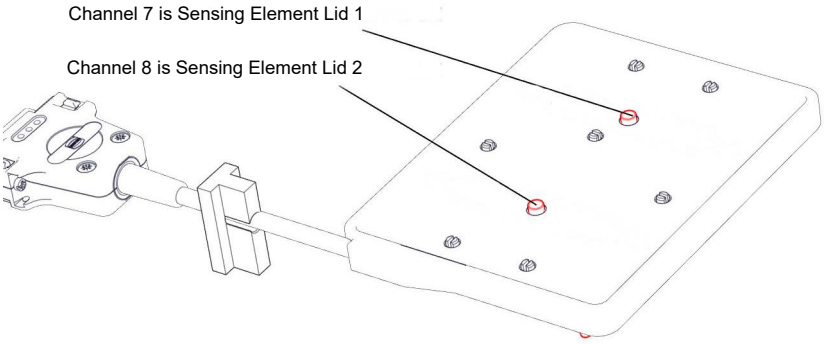


Fig.41: OVT Channel corresponding sensing elements for ODTC® Lid