



INHECO Heat, Shake & Cool

Thermoshake

Part No.: 7100144 / 7100146

► **Maintenance & Cooling Liquid Refill Instructions**

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.

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1 IMPORTANT NOTES

1.1. General Information

Read the user instructions completely. The manual explains how to operate and handle the Thermoshake devices: Thermoshake and Thermoshake RM. In case these manual instructions 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 Thermoshake devices and must be retained until the device is disposed of and must be passed on with the Thermoshake when the device is taken over by a new user.

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

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




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 serious injury or even death.
- The signal word **CAUTION** is given to indicate hazards which – without precautionary measures – can result in minor to moderate injuries or could impair the proper functioning of the device.
- The signal word **NOTE** stands for the general precautionary measures that have to be taken to avoid damaging the device when using it.

Contact INHECO in case there are any uncertainties of how to operate or how to handle the Thermoshake 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
	Warning: Potential danger of serious injury or death.
	Caution: Potential danger of hot surface.
	Note: Potential danger of material damage.
·	Bullet points indicate steps of instructions.
-	Hyphens refer to enumeration.
→	Arrows indicate: "refer to" and are mostly an active link

2 MAINTENANCE

2.1. Software Updates

For updates of the Demo Tool Software, contact: sales@inheco.com.

2.2. Trouble-Shooting & Support

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

Provide the following when contacting INHECO for support:

- INHECO product number of the device (shown on device label)
- INHECO product name of the device (shown on device label)
- INHECO serial number of the device (shown on device label or via software)
- Detailed error description
- Error code report (generated with software "MTC/STC Demo Tool")
- Information about setup of devices:
 - o integrated in workstation
 - o controlled by MTC or STC (incl. part number and serial number)
 - o controlled by workstation software or INHECO software

Serial numbers are shown on the device labels of the TEC Control Unit and connected devices, but you can also read them out by using INHECO's software "MTC/STC Demo Tool" (Demo Tool). The Demo Tool must also be used to generate the above mentioned report of error codes for the TEC Control Unit and all connected devices → Demo Tool Manual.

Based on the above information, INHECO's Techhotline decides about the requirement of a return. → Return for Repair only with RMA Number, page 13.

2.2.1. Installation of the Software "MTC/STC Demo Tool"

The Demo Tool is stored on the USB flash drive which comes with each control unit (MTC/STC). It can also be downloaded from INHECO's customer login area at our website where you will also find the Demo Tool Manual with detailed instructions of the software.

Download the MTC/STC Demo Tool and the DLL file into the same folder. Both files must be saved **into the same folder, otherwise it is impossible to run the Demo Tool.**

2.2.2. Serial Numbers via Demo Tool

Start the Demo Tool and click on the button “find MTC” (or “find STC”). The software scans all com ports and subsequently displays the connected MTC/STC as well as connected devices.

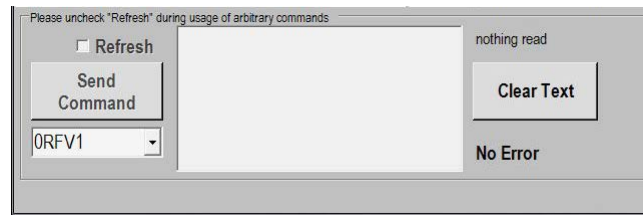


Fig.1: Command section of the User Interface

- Make sure the Refresh Box is unchecked (as in Fig. 1).
- Enter your command into the command field. (overwrite the last command shown in this field e.g. last command was 0RFV1).
- Select button “Send Command”.
- Enter following Commands:
 - for MTC/STC Mainboard serial number: 0RFV2
 - for Slot Module serial number: xRFV2 (x=slotID: 1-6)
 - for external connected device: RSNx (x=slotID: 1-6)

2.2.3. Error Code Report generated with “MTC/STC Demo Tool”

- Start the Demo Tool.
- Click on the button “find MTC” (or “find STC”).
The software scans all com ports and subsequently displays the connected MTC/STC as well as connected devices.
- Click on the button “report error codes”.
An additional window appears in which all error codes are displayed. Email a screenshot of this window along with all other required information to **techhotline@inheco.com**

2.3. Maintenance (Refilling of Cooling Liquid Reservoir)

The Thermoshake needs a well defined minimum level of cooling liquid to work properly and to avoid damages to the system. To ensure that the Thermoshake does not run dry INHECO implemented a sensor to check the liquid level of the cooling liquid. The sensor can be addressed with a command to report the cooling liquid level. This command can be integrated into your daily routine with different ways:

- integrated in workstation software (→ contact your workstation provider to receive information)
- integrated in start up routine of MTC/STC (error displayed on touch-screen → chapter 2.3.3)
- integrated in the error code report of INHECOs Demo Tool software (→ chapter 2.3.4)
- manually send via INHECOs Demo Tool software (→ RRS Command, chapter 2.3.4)

NOTE

In any case we recommend to refill the Thermoshake at least every 3 months.

2.3.1. Refill Tools delivered with Thermoshake

- 100ml cooling liquid (23% ethanol, 77% distilled water)
- syringe to fill the reservoir
- socket wrench (2mm) to open filling nozzle

2.3.2. Refill Procedure

- Switch off the power of the MTC/STC.
- Unplug the Thermoshake from the MTC/STC.
- Loose the screw plugs of the cooling fluid reservoir (→ fig. 2).
- Fill the reservoir with the injection syringe delivered with the Thermoshake until the liquid is visible in the filling nozzle.

NOTE

Use the original INHECO cooling fluid or a mixture of 23% ethanol and 77% distilled water to avoid damage to the unit.

- Insert the needle of the empty syringe as deeply as possible into the filling nozzle and extract as much of the fluid as possible.

NOTE

This method ensures that the reservoir contains cooling fluid at the maximum filling level.

- Close the reservoir with the screw plugs of the cooling fluid reservoir.

NOTE

Never leave the reservoir open.

- Connect the Thermoshake with the MTC/STC.
- The Thermoshake is now ready again for use.

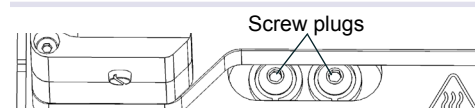


Fig.2: Screw plugs of the cooling fluid reservoir

2.3.3. Refill Check with MTC/STC Touch Screen Display

Error 7 displayed on the MTC/STC touch screen indicates the refill requirement. The touch screen of the MTC/STC controller box displays Error 7 only under the following conditions:

- The power of the control unit MTC/STC was switched on less than 10 minutes ago (Error 7 is only displayed for 10 minutes).
- No other errors occurred during the first 10 minutes of power supply (error messages overwrite previous error messages).
- MTC: Thermoshake and slot number are selected via the select buttons. Example: **Thermo 6** is displayed in the upper left corner if Thermoshake of slot 6 is selected.
- Activate heating/cooling by touching the button **Temp** which then appears black.



NOTE

Upper left corner indicates **Thermo 6** when the Thermoshake of slot 6 is selected. Use or to control select devices.

*Fig.3: Activate heating/cooling by touching the button **Temp** which then appears black*

Procedure to check cooling liquid with display of MTC

- Switch MTC power off.
- Switch MTC power on.
- Select Thermoshake and Slot via **Select** button. (Fig. 3 display: e.g. **Thermo 6**)
- Touch button **Temp**. (Temp. button must appear black)

Procedure to check cooling liquid with display of STC

- Switch STC power off.
- Switch STC power on.
- Touch button **Temp**. (Temp. button must appear black)

In case the touch screen displays Error 7, the liquid reservoir of the selected Thermoshake is below minimum filling level and requires a refill of cooling fluid. In case the touch screen does not display Error 7 after selection of the Thermoshake and Slot, the filling level may not be at maximum level, but the level is sufficient.

2.3.4. Refill Check with MTC/STC Demo Tool

The **MTC/STC Demo Tool** and the **Demo Tool Manual** are delivered on a USB flash drive with each MTC/STC. With a login and password these files can also be downloaded from www.inheco.com. Login/password can be requested from sales@inheco.com.

The Demo Tool offers two options to check the refill requirement:

- check via Error Code Report (→ below)
- check with RRS command (→ page 10)

Check refill requirement via Error Code Report:

- Select button [Report Error Codes](#).
- Search in the displayed report for Details of Error: 07: **occurrences: 00X** → Fig. 4
- Make a note of the number of occurrences in case Error: 07 is listed in report.
- Filling level is fine in case Error: 07 is not shown (scroll down report).
- Restart MTC/STC in case Error: 07 is shown.
- Enter value of target temperature between 40 and 700 (+4°C and +70°C).
- Activate temperature by a mouse click on the [Set](#) button of the target temperature.
- Select button [Report Error Codes](#) again.
- Search again for the number of occurrences in the Details of Error: 07: **occurrences: 00X**.
- Compare number of occurrences of 2nd report with number of occurrences of 1st report.

In case number of occurrences has increased from one report to the next, a refill is required.

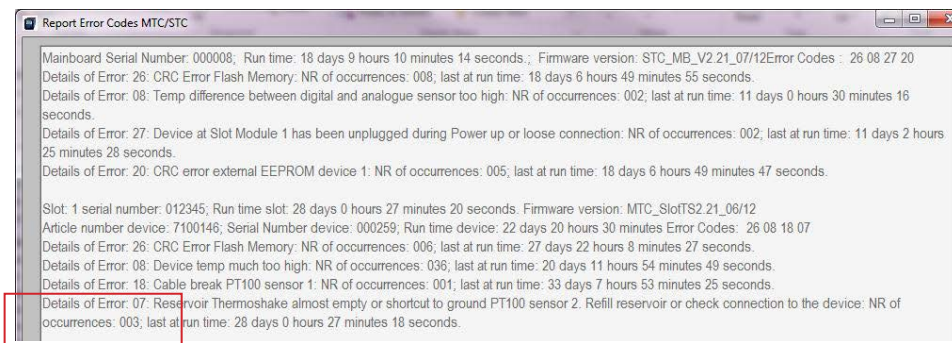


Fig.4: Example: Details of Error 07: no. of occurrences: 003, in case of an increase in 2nd report to 004 → refill is required

NOTE

Maximum number of occurrences is 255. If this number is reached the error memory of the slot module has to be erased.

- Make a screenshot of error code report.
- Send screenshot to techhotline@inheco.com along with request for command to set back the error codes.

Check refill requirement via RRS command:

- Enter value of target temperature between 40 and 700 (+4°C and +70°C).
- Activate temperature by a mouse click on the [Set](#) button of the target temperature.
- Uncheck the [REFRESH](#) checkbox.
- Enter in the command field the command xRRS (x = SlotID → table below).

Command for STC	Description
1RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to a Single TEC Control unit.

Commands for MTC	Description
1RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to slot module 1
2RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to slot module 2
3RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to slot module 3
4RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to slot module 4
5RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to slot module 5
6RRS	send this command to check the filling level of cooling liquid of a Thermoshake connected to slot module 6

NOTE

The command field shows either the default command 0RFV1 or the last command you have entered. Overwrite this last command.

- Select button [Send command](#).

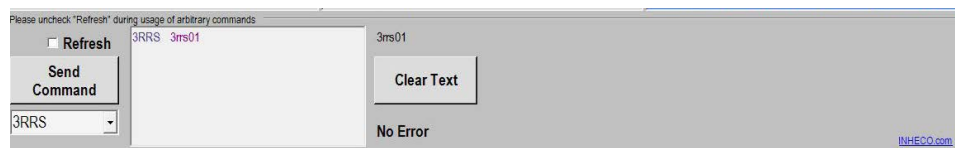


Fig.5: Command section after command was sent. Command and reply displayed in [reply message field](#).

- The command and answer are displayed in the [reply message field](#) (→ possible replies in table on page 11).

NOTE

The last number of the answer is relevant: 0 means empty and 1 means full.

Possible Answer (x = slotID)	Description of Reply Messages
xrrsY0 or xrrsY1	the fifth digit (here Y) is the reply message byte from the error code table and the sixth digit is 0 (zero) when the reservoir is empty or 1 (one) when the reservoir is full.
xrrs00	empty system
xrrs01	full system
xrrs60	empty system (6 indicates reset detected)
xrrs61	full system (6 indicates reset detected)
xrrsR0	empty system (R indicates cable break or shortcut PT100 detected)
xrrsR1	full system (R indicates cable break or shortcut PT100 detected)
xrrsA..._..._...	This is a reply without information on level status thus command has to be repeated: <ul style="list-style-type: none"> • Select button Refresh (in the upper left corner of user interface) • Uncheck refresh check box • Resend command.

2.4. Cleaning



CAUTION

Before **cleaning** the Thermoshake devices, disconnect the power and make sure that the temperature at the heating plate is below +50°C.

The contact surface should be cleaned regularly to ensure optimum heat transfer into 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. Liquids must not enter into the unit.

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

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

2.5. Decontamination

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

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

NOTE

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

NOTE

In case of **decontamination with gas**, make sure that no liquid enters inside the device. Usually the device is in operation and connected to the power outlet, as ventilation is needed for an effective decontamination with gas.

2.6. Calibration / Verification

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

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

2.7. Return for Repair only with RMA Number

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

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

→ Decontamination and Cleaning, page 12.

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

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

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

2.8. Transportation and Storage

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

2.9. 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 current safety regulations of your country.

All INHECO devices are RoHS and WEEE compliant.