Piko® Thermal Cycler User Manual

FINNZYMES
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Purchase of this instrument conveys a limited non-transferable immunity from suit for the purchaser's own internal research and development and applied fields other than human in vitro diagnostics under non-real-time thermal cycler patents of Applera Corporation.

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Finnzymes is not responsible for any injury or damage caused by using this instrument for any purpose other than that for which it is intended, or by modifications made to the instrument that are not performed by Finnzymes or a Finnzymes authorized agent.

Version 1.2, July 2010

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Safety Warnings

Caution! This symbol indicates risk of harm or personal injury. Always consult the User Manual before touching the area of the Piko® Thermal Cycler that displays this symbol.

Caution! This symbol indicates a risk of personal injury or harm by electrical shock. Always consult the User Manual before touching the area of the Piko Thermal Cycler that displays this symbol.

Caution! This symbol indicates risk of personal injury or burn by contact with a very hot surface. Avoid touching such surfaces.

Read the User Manual! Operating the Piko® Thermal Cycler without first reading the entire User Manual may constitute a risk to your health. Only a person capable of handling electrical equipment should use the Piko® Thermal Cycler. NOT FOR CHILDREN.

Do Not Attempt to Repair! Do not remove the cover of the system. Do not try to repair or replace broken components – you put yourself at risk for electrical shock. Removing the cover or replacing/removing components will void the warranty. Contact customer service or your local distributor if your system is not functioning properly.

Do Not Touch the Sample Block! Certain components, including the sample block and heated lid, will become excessively hot. Touching these components may cause burns.

Do Not Tamper with Electronics! Coming in contact with the electronics, even when the system is off or unplugged, may cause an electrical shock or harm.

Do Not Use Flammable or Hazardous Liquids with the Piko Thermal Cycler!

Safe Use Guidelines

The Piko® Thermal Cycler is designed to be used safely under the following conditions:

- Indoor use
- Altitudes up to 2000 m
- Ambient, environmental temperatures between 5°C – 30°C
- Up to a maximum, non-condensing humidity of 80 %
- Transient over voltage per Installation Category 2, IEC664
- Pollution degree 2, in accordance with IEC664

Electromagnetic interference

This product conforms to the "Class A" standards for electromagnetic emissions intended for laboratory equipment applications. It is possible that emissions from this product may interfere with some sensitive appliances when placed nearby or in the same circuit as these appliances. The user should be aware of this potential risk and take appropriate measures to avoid interference.

Glossary and Conventions

Glossary

PCR: polymerase chain reaction.

Touchdown PCR: a protocol in which time and/or temperature are changed in small increments and are added or subtracted to a step. These changes continue to progress from cycle to cycle throughout the entire loop section of the protocol.

Typographical

All buttons on the keypad are referred to in brackets. The following is an example referring to the "open" button on the keypad: "press [OPEN] to disengage the heated lid, and release the block along the sliding rails of the Piko Thermal Cycler."

Bolded words refer to items or functions that may be selected from the programming menu. The following is an example for initiating a protocol: "To run a protocol, first select **RUN** using the function key."

Piko® Thermal Cycler Overview

The Piko Thermal Cycler delivers high performance in a compact package. It incorporates novel technical solutions that allow significant reductions in PCR run times and the overall size of the instrument. The Piko Thermal Cycler is an ideal solution for both conventional and fast PCR applications. The Piko Thermal Cyclers are available in two different block configurations: 24-well and 96-well.

The instrument has several important features:

Automatic Lid – The heated lid is not manually operated. Instead, it is internally motor-controlled. The lid will automatically adjust to the optimal temperature and sealing pressure.

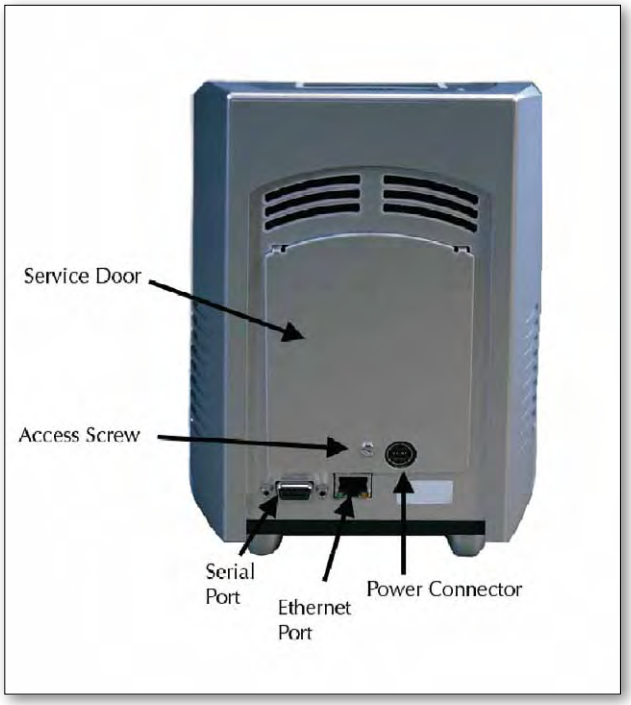
External Power Supply – The Piko Thermal Cycler uses an external 180 watt power supply (an approach commonly used with lap-top computers). This is made possible by the instrument's unusually low power consumption.

Note: Conventional format microplates will not fit within the Piko Thermal Cycler.

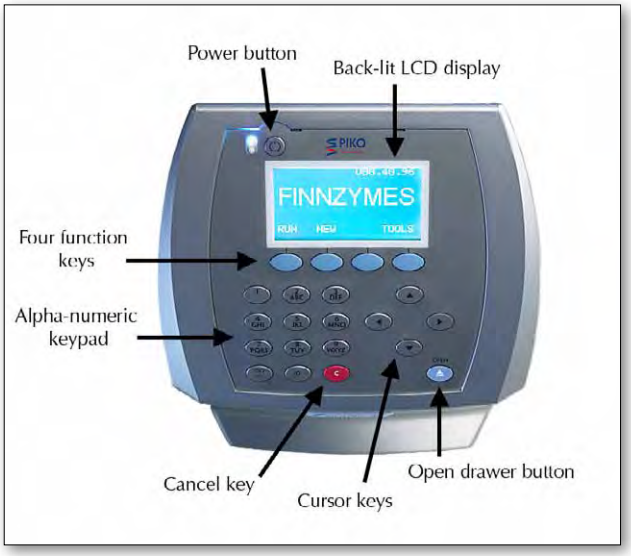
Illustrations

Front View

Rear View



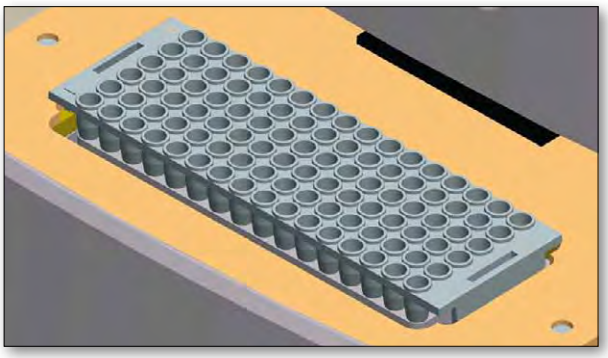
User-interface



Block Formats

24-well, 50 µl max volume for PCR

96-well, 20 µl max volume for PCR



Instrument Specifications

Dimensions	
Size: Weight:	16 cm wide, 17 cm deep, 23 cm high 4 kg (includes power supply and cord)
Electrical	
Power Supply: Line Voltage: Frequency: Power failure recovery:	180W, 24V, 7.5A 100 – 240 VAC 50 – 60 Hz Yes
Certifications	CE, CSA and ISO9001
Instrument Configuration	
Block Formats: Display: Memory: Communication ports:	24-well and 96-well (not interchangable) Backlit LCD 40 folders with 99 programs each Ethernet, Serial
Programming	
Adjustable Ramp Rate: Touchdown:	Yes Yes
Thermal Performance	
Max Ramp Rate: Thermal Uniformity: Thermal Accuracy: Settling Time: Thermal Range:	5°C heating and 4.5°C cooling +/- 0.3°C within 1s of clock start at 95°C +/- 0.2°C Achieve thermal specifications within 1 s of start of clock 0°C - 99.9°C

Installation

Items included

Inside the Piko Thermal Cycler package you should find the following:

- Piko Thermal Cycler
- Power supply
- CD-ROM with User Manual and Updater Application
- Sample pack of PCR vessels
- Quick Start Guide

Note: The power cord is not supplied by the manufacturer; it should be supplied by your local distributor. The Piko Thermal Cycler power supply accepts a standard computer cord set (C19 to C14 connectors in the U.S.).

If you have not received the above items in your shipment, please contact your local distributor. Please save all packing material in case you need to return the Piko Thermal Cycler for maintenance.

The Piko Thermal Cycler set-up

Setting up the Piko Thermal Cycler can be performed in 5 simple steps:

1. Remove all components from packaging.
2. Install the Piko in a protected location where no one can step on or trip over the line cord, and where the line cord remains accessible in case of a need to unplug the unit.

3. Plug the power supply into the back of the Piko Thermal Cycler.
4. Insert the power cord into the power supply.
5. Insert the power cord into the outlet.
6. System will power up automatically.

Caution: To prevent risk of shock or damage to the instrument, it is very important that the power supply be first connected to the Piko Thermal Cycler before plugging it into the outlet.

Conditions for proper use

Important! It is highly recommended that all users of the Piko Thermal Cycler read the next section carefully. The performance and the reliability of the Piko Thermal Cycler are closely linked to the working conditions in which the system is run. To ensure that your Piko Thermal Cycler system will provide years of top-level performance and will have the fewest problems, please adhere to the following environmental requirements:

Absolute environmental requirements – The Piko Thermal Cycler is rated to operate reliably within the following environmental conditions. Please avoid extremes of these environmental ranges to best preserve the long-term performance and life span of the instrument.

Ambient temperature:	5°C – 30°C
Ambient relative humidity:	up to 80 %
Altitude:	under 2000 m

Recommended working conditions – The Piko Thermal Cycler will perform optimally and exhibit highest reliability within the following working conditions.

Ambient temperature:	15°C – 25°C
Ambient relative humidity:	under 50 %
Altitude:	under 1000 m

Airflow – Airflow is paramount to high-speed performance and high reliability. It is important to maintain good heat sink cooling capability. It is best to have a cool source of incoming air and an unobstructed exhaust of air. Follow these four guidelines to best ensure optimum heat sink function:

Obstruction-free intake of air. Do not set on a hot surface or on laboratory bench paper. Do not slide any paper or other material under the system as this may hamper the airflow or be sucked into the system.

Obstruction-free exhaust of air. Always keep at least 10 cm of distance between the exhaust vents and any large solid object such as walls, larger instruments, or other thermal cyclers. Do not have other instruments exhaust directly at the Piko Thermal Cycler system.

Clean fins of heat sink. Inspect the fins of the heat sink on a regular basis. Dirty heat sinks have a significantly lower capacity to eject heat. Please clean the fins if they become dirty or covered in dust. You can use a cotton swab, a brush, or compressed air to remove dust.

Cleaning the Piko Thermal Cycler - Clean the outside of the Piko Thermal Cycler with a damp, soft cloth or tissue whenever something has been spilled on it or the cover is dusty. A mild soap solution may be used if needed. Clean block wells with swabs moistened with water, 95% ethanol, or a 1:100 dilution of bleach in water.

Vessels compatible with Piko Thermal Cycler

The Piko Thermal Cycler sample blocks (24-well and 96-well) will only accept microplates with a footprint in the dimension of a microscope slide. This Piko format gives the Piko Thermal Cycler its compactness as well as its ability to deliver excellent performance.

However, note that most low profile thin-wall PCR tubes with flat caps are also compatible with the 24-well Piko Thermal Cycler. For a complete listing of product numbers and additional product information, visit our website at www.finnzymes.com.

UTW® Ultra-thin wall vessels provided by Finnzymes are recommended. These vessels were used in the optimization of the temperature algorithms of the instrument as well as in the validation of its performance. UTW vessels provide more consistent results in fast PCR protocols.

Operation

LED function

To the right side of the power button on the keypad are two LEDs. Please note the following:

Constant Blue:	System on and NOT in use.
Blinking Blue:	System on and in use.
Constant Red:	System has recently experienced an error. Please go to error log on page 14 for more information.

Main menu

The Piko Thermal Cycler user interface features four function keys which are used to select different menu options. The function keys on the Main Menu have the following actions:

[F1] **RUN**	Runs saved protocols. Allows editing of saved protocols.
[F2] **NEW**	Begins programming of a new protocol.
[F3] **STAT**	Shows Status Screen (when running).
[F4] **TOOLS**	Accesses global settings or diagnostic routines.
[C]	The red button with a "C" is the Cancel button. It will either bring you back to the Main Menu or it will cancel your run immediately.

Creating a New Protocol: Semi-graphical Mode

From the main screen, press the **NEW** button using the second blue function key [F2]. This will bring up a DEFAULT protocol, which is permanently stored in the SHARED folder. If changes are made and saved to this file and folder, then each time **NEW** is selected the latest saved version of the DEFAULT protocol will appear.

The DEFAULT protocol is a semi-graphical representation of a typical PCR temperature cycling routine:

A temperature step is represented by a horizontal line with a temperature value (with a resolution of 0.1, in °C) above the line, and a time value (in mm:ss) below the line. If a step is highlighted, this line will flash. Use the cursor keys ([◀] and [▶]) to toggle between temperature steps. The function key menu and cursor actions are as follows:

Function key actions:

[F1] **ADD**	Adds a temperature step to the right of the highlighted step or allows the addition of a **GOTO** routine.
[F2] **DEL**	Deletes the highlighted temperature step.
[F3] **OPT**	Allows the programming of advanced options into the highlighted step (temperature increment, extend or slow ramp rate).
[F4] **SAVE**	Saves the protocol, or saves as a new named protocol.

Cursor actions:

[▲]	Edits temperature value.
[▼]	Edits time value.
[◀] [▶]	Edits cycle number (GOTO value) if highlighted step is part of a temperature cycle.
[◀]	Toggles to the step to the left of the highlighted step.
[▶]	Toggles to the step to the right of the highlighted step.

Entering and editing temperature and time values

The temperature or time value may be edited by moving the cursor to the field and then editing it directly. To enter values, use the numbers on the keypad as you would write them. The decimal point will be added automatically. For a temperature of 60.5°C, enter the following: "6, 0, 5." Similarly, for a time value, enter the numbers as you would write them: for a 1 minute and forty-five second hold, enter the following: "0, 1, 4, 5." The minutes and seconds are also separate fields, and can be edited independently.

Note: To enter an infinite hold, press the lower left key on the keypad (with the ∞ symbol).

Entering advanced programming options

From the protocol editing screen, press the **OPT** selection using the [F3] key.

The function key actions:

[F1] **INC**	Adds (or subtracts) a defined temperature increment to a temperature step, such that the amount of the increment will be added to (or subtracted from) each successive cycle. This is used for Touchdown protocols. Input range = (+/-) 0.1°C to 9.9°C per cycle.
[F2] **EXT**	Adds (or subtracts) a defined time extension to a temperature step, such that the amount of the extension is added to (or subtracted from) each successive cycle. Input range = (+/-) 1 to 99 seconds per cycle.
[F3] **RAMP**	Slows the ramp rate of a highlighted step to a value below the maximum. Input range = 0.1 to 8.0°C/second.
[F4] **DONE**	Accepts advanced option values and returns to protocol editing screen.

Note: If advanced options have been entered, the OPT menu label will be reverse displayed (have a white background) when the affected step is highlighted. This will remind the user that an option has been programmed into that step.

Adding a cycling loop

From the protocol editing screen, with the cursor on the last step of the desired loop, press the **ADD** selection using the [F1] key. Select **GOTO** using the [F2] key.

An arrow will appear that will point, by default, to the temperature step directly before the final step in the loop. Use the [◀] cursor key to move the arrow to a different temperature step. The number of cycles is displayed in the middle of the loop arrow, at the bottom of the screen. This value may be edited using the key pad. Press the **DEL** selection [F4] to delete a cycling routine. Press the [Yes] key to accept changes, or press the [No] key to cancel and go back to the previous screen.

Function key actions:

[F1] [F2] [F3]	No action.
[F4] **DEL**	Deletes the displayed GOTO cycle.
[Yes]	Accepts new cycle loop or edits to the cycle loop.
[No]	Cancels and returns to previous screen.

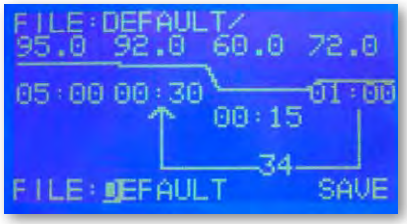
Cursor actions:

[◀] [▶]	Toggles the arrow between steps to select GOTO destination for cycling.

Important! The GOTO value is the number of repetitions of the loop, which is 1 less than the total number of cycles. For example, to program 35 cycles, 34 repetitions should be entered into the GOTO step.

Saving a protocol

From the protocol editing screen, press the **SAVE** selection using the [F4] key.



The current file name will be displayed in the lower left hand corner of the screen. To save changes to current file name, press **SAVE** [F4]. To change the file name, use the keypad to rename the file, then press **SAVE** [F4].

Note: Text entry is similar to that of a cell phone. A number or character is automatically entered after a one second delay. Pressing key will toggle through the assigned number and three characters (for example, press the key labeled [2,A,B,C,] two times to select "A" and wait 1 second). A file name can be a maximum of 8 characters long.

Press **SAVE** [F4] to save the protocol to a folder. The screen will display the folder options.

Function key actions:

[F1] **SELECT**	Selects the folder to which the protocol will be saved.
[F2]	No Action
[F3] **NEW**	Creates a new named folder.
[F4] **BACK**	Returns to previous screen.

Cursor actions:

[◀] [▶] [▼] [▲]	Highlights folder for selection.

Note: A protocol may not be saved to the {RECENT} folder.

Before a protocol is saved to a folder, final confirmation will be presented:

Function key actions:

[F1] **YES**	Saves protocol file to selected folder and returns to Main Menu.
[F2] **YES&RUN**	Saves protocol file to selected folder, and begins to run the protocol.
[F3]	No Action
[F4] **BACK**	Returns to previous screen.

Important! If YES&RUN is selected, the instrument will immediately begin to run the protocol. Samples should already be loaded if this selection is made.

Note: If a file with the same name already exists in the folder, the user will be warned and offered the choice of overwriting the file or going back to choose a different file name or folder.

Note: Programs may be edited either in semi-graphical mode or in list mode. List mode is only available when editing existing protocols, not when creating a new protocol. To create a program in **LIST** mode, select **RUN** from the main menu, open any protocol, and select **LIST** from the blue button menu at the bottom of the screen.

Editing a protocol

1. From the Main Menu select **RUN** [F1].
2. Highlight a folder using the cursor keys.
3. Press **OPEN** [F1] to open the selected folder.
4. Highlight a protocol file using the cursor keys.
5. Press **OPEN** [F1] to open the selected protocol file. This will display the semi-graphical representation of the protocol.

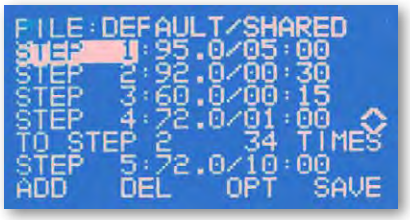
Function key actions:

[F1] **START**	Begins to run selected protocol or begins the run sequence (24-well Piko Thermal Cycler only).
[F2] **EDIT**	Allows editing of the protocol in semi-graphical mode .
[F3] **LIST**	Allows editing in list mode (see below).
[F4] **BACK**	Returns to previous screen.

Creating a Protocol: List Mode

Note: You can not create a new protocol in LIST mode. When you hit NEW from the main screen, you are automatically put into semi-graphical mode and you can not switch to LIST mode. To program in LIST mode, you must open an existing protocol from the RUN menu, and then EDIT that.

List mode is an alternate view of a protocol that provides a simplified approach to editing. Each temperature step is displayed as a text list. The cursor keys are used to scroll up and down through the steps, and left and right to the editable (time and temperature) fields.



Function key actions:

[F1] **ADD**	Adds a temperature step to the step below the highlighted step or allows addition of a GOTO routine.
[F2] **DEL**	Deletes the highlighted step.
[F3] **OPT**	Allows the programming of advanced options into the highlighted step (temperature increment, extend or slow ramp rate).
[F4] **SAVE**	Saves the protocol, or saves as a new named protocol.

Cursor actions:

[▼] [▲]	Scrolls to temperature and GOTO steps.
[◀] [▶]	Toggles between temperature and time fields within a temperature step. Toggles between GOTO step number and number of times to repeat cycle.

Note: To enter an infinite hold, press the lower left key on the keypad (with the ∞ symbol).

Entering advanced options in list mode

From the list editing screen, select **OPT** [F3].

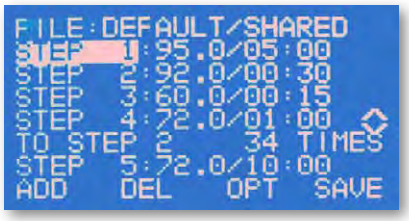
Function key actions:

[F1] **RAMP**	Slows the ramp rate of a highlighted step to a value below the maximum. Input Range = 0.1 to 8.0 °C/second.
[F2] **TIME**	Adds (or subtracts) a defined time extension to a temperature step, such that the amount of the extension is added to (or subtracted from) each successive cycle. Input range = (+/-) 1 to 99 seconds per cycle.
[F3] **TEMP**	Adds (or subtracts) a defined temperature increment to a temperature step, such that the amount of the increment is added to (or subtracted from) each successive cycle. This is used for Touchdown protocols. Input range = (+/-) 0.1°C to 9.9°C per cycle.
[F4] **BACK**	Returns to previous screen.

Note: If advanced options have been entered, the OPT menu label will be reverse displayed (have a white background) when the affected step is highlighted. This will remind the user that an option has been programmed into that step.

Saving a protocol

From the list mode editing screen, press the **SAVE** selection using the [F4] key.



The current file name will be displayed in the lower left hand corner of the screen. To save changes to current file name, press **SAVE** [F4]. To change the file name, use the keypad to rename the file, then press **SAVE** [F4].

Note: Text entry is similar to that of a cell phone. A number or character is automatically entered after a one second delay. Pressing key will toggle through the assigned number and three characters (for example, press the key labeled [2, A,B,C] twice to select "A" and wait 1 second). A file name can be a maximum of 8 characters long.

Press **SAVE** [F4] to save the protocol to a folder. The screen will display the folder options.

Function key actions:

[F1] **SELECT** Selects the folder to which the protocol will be saved.
[F2] No Action
[F3] **NEW** Creates a new named folder.
[F4] **BACK** Returns to previous screen.

Cursor actions:

[▼] [▲] [◀] [▶] Highlights folder for selection.

Note: A protocol may not be saved to the {RECENT} folder.

Before a protocol is saved to a folder, final confirmation will be presented:

Function key actions:

[F1] **YES** Saves protocol file to selected folder and returns to Main Menu.
[F2] **YES&RUN** Saves protocol file to selected folder, and begins to run the protocol, or begins run sequence (24-well Piko Thermal Cycler only).
[F3] No Action
[F4] **BACK** Returns to previous screen.

Note: If a file with the same name already exists in the folder, the user will be warned and offered the choice of overwriting the file or going back to choose a different file name or folder.

Important! If YES&RUN is selected, the instrument will immediately begin to run the protocol. Samples should already be loaded if this selection is made.

Managing Folders

From the Main Menu, select **RUN** [F1].

Function key actions:

[F1] **OPEN** Opens a folder and displays its contents.
[F2] **NEW** Creates a new folder.
[F3] **MOD** Renames or Deletes a folder.
[F4] **MAIN** Returns to Main Menu.

Creating a New Folder

Press **NEW** [F2], and a prompt will appear to the right of NEW FOLDER in the display.

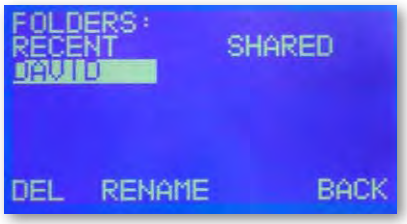
Enter the desired folder name using the keypad (7-character maximum). To password protect the folder, use the cursor key [▶] to highlight the password field, and enter a password (4-character maximum). A password protected folder will prevent unauthorized users from editing protocols within the folder, or from saving new protocols to the folder. Password protection does not prevent unauthorized users from viewing or running the protocols within the folder. If the **PASSWORD** field is left blank, the folder will not be password protected.

Note: If a password is lost or forgotten, please contact Finnzymes' tech support (finnzymes.techsupport@thermofisher.com) for instructions on how to reset the folder.

Note: Text entry is similar to that of a cell phone. A number or character is automatically entered after a one second delay. Pressing the key will toggle through the assigned number and three characters (for example, press the key labeled [2, A,B,C] twice to select "A" and wait 1 second). A folder name can be a maximum of 7 characters long.

Modifying an Existing Folder

Press **MOD** [F2].



The screen will present two options: **DEL** [F1] will delete a folder and all of its contents, and **RENAME** [F2] will rename a folder. Password protected folders require the entry of a password to delete or rename a folder. The {RECENT} and {SHARED} folders may not be deleted or renamed.

Running a Protocol

From the Main Menu, press **RUN** [F1].

There are two permanent folders: the {RECENT} folder stores the last six protocols that were run on the Piko Thermal Cycler, and the {SHARED} folder can be saved to and accessed by all users. User created folders ({DAVID}, in this example) will also be displayed.

Highlight a folder and press **OPEN** [F1]. The protocols residing in that folder will be displayed.

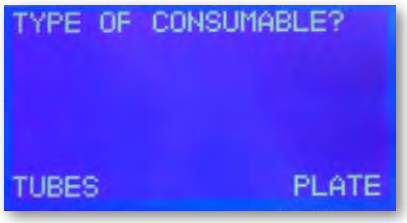
Highlight protocol and press **OPEN** [F1]. The protocol will be displayed in semi-graphical mode.

Press **START** [F1]. With a 24-well Piko Thermal Cycler, users will be presented with consumable and volume options (see next section). With a 96-well Piko Thermal Cycler, users will be presented with volume options only.

Note: When a run begins, the lid will begin moving, a blue LED light will flash, and the running protocol will be displayed in semi-graphical mode on a status screen (see **Monitoring a Run, page 11**).

Vessel and Volume Options

Press **START** [F1]



With a Piko 24-well Thermal Cycler, users will be given the option of choosing the type of consumable: **TUBES** or **PLATES**.

Function key actions:

[F1] **TUBES** Select if using 1- 24 individual 0.2 ml tubes.
[F4] **PLATE** Select if using 24-well Piko PCR Plate.

Important! If fewer than 16 X 0.2ml tubes have been loaded and PLATE is selected by mistake, the lid pressure may cause the tubes to become crushed or deformed.

After selecting the vessel type (for 24-well Piko Thermal Cycler only), sample volume must be entered.

A prompt will highlight a field requiring the entry of a reaction volume (microliters per well). Use the keypad to enter the correct value.

Here are the volumes allowed for both Piko Thermal Cycler block formats:

24-well Piko Thermal Cycler: 10 – 50 µl
96-well Piko Thermal Cycler: 5 – 20 µl

Function key actions:

[F3] **YES** Accepts volume entry and begins Run.
[F4] **NO** Returns to previous screen.

Note: When a run begins, the lid will begin moving, a blue LED light will flash, and the running protocol will be displayed in semi-graphical mode on a Status Screen (see **Monitoring a Run, page 11**).

Monitoring a Run

Upon initiation of a run, the Piko Thermal Cycler will display the Status Screen.

Function key actions:

[F1] **PAUSE**	Pauses the run on the present temperature step, or next step if ramping. When paused, this option becomes **RESUME**.
[F2]	No Action
[F3] **STAT**	Toggles to the Status Screen.
[F4] **MAIN**	Returns to the Main Menu.

Note: Returning to the Main Menu allows users to write or edit protocols while the instrument is running. A **STAT** [F3] option will appear on the Main Menu Screen to return to the Status Screen when a protocol is running.

The current running temperature step in the protocol is represented by a flashing line, and the protocol and host folders are displayed on the top of the screen.

Function key actions:

[F1] **PAUSE**	Pauses the run on the present temperature step, or next step if ramping. When paused, this option becomes **RESUME**.
[F2] **NEXT**	Skips to the next temperature step of the protocol.
[F3] **TIME**	Toggles to the Time Status Screen.
[F4] **MAIN**	Returns to the Main Menu.

Note: Returning to the Main Menu allows users to write or edit protocols while the instrument is running. A **STAT** [F3] option will appear on the Main Menu Screen to return to the Status Screen when a protocol is running.

Press **TIME** [F3]

The Time Status Screen displays additional information about the run. As with the Status Screen, the file name and host folders are displayed on the top of the screen. Additionally, the following status parameters are displayed:

- "CYCLE": Displays the current cycle number (within a GOTO loop).
- "TEMP": Displays the estimated temperature of the sample.
- "STEP": Displays the step number of the currently running temperature step.
- "TIME REMAINING": Using large numbers, this displays the hours and minutes remaining until the completion of the running protocol.

The Tools Menu

From the Main Menu, select **TOOLS** [F4].

The Tools Menu provides three options which are accessed by pressing the **OPEN** [F1] key:

- "DIAGNOSTICS": Allows users to check or adjust lid parameters, sensor parameters, memory allocation, display settings, and clock settings (see below).
- "NETWORK": Allows users to enter network address values for networking Piko Thermal Cyclers.
- "SERVICE": Used by authorized service personnel only.

Diagnostics: Lid

From the TOOLS menu, highlight "DIAGNOSTICS" and press **OPEN** [F1].

Highlight "LID" and press **OPEN** [F1].

The LID screen displays the calibration settings for ZERO, LOW, MEDIUM and HIGH lid pressure. Users may be asked to read these values to service personnel as part of a troubleshooting procedure. The LID menu will also periodically display the current location of the lid (CURRENT AD:).

Function key actions:

[F1] **UP**	Raises lid to "up" position.
[F2] **DOWN**	Lowers lid to "down" position, using the pressure setting that is highlighted.
[F3]	No Action
[F4] **BACK**	Returns to previous screen.

[▼] [▲]	Arrow keys scroll to different pressure settings.

Diagnostics: Display

From the TOOLS menu, highlight "DIAGNOSTICS" and press **OPEN** [F1]. Highlight "DISPLAY" and press **OPEN** [F1].

The display screen allows you to adjust the contrast of the Piko Thermal Cycler's LCD screen. Contrast is lowered or raised by pressing the up and down arrows keys; the change in contrast will happen immediately.

Function key actions:

[F3] **YES**	Accept LCD contrast settings.
[F4] **NO**	Return to previous screen, without changing LCD contrast settings.

Cursor key actions:

[▲]	Brighter
[▼]	Darker

Diagnostics: Clock

Highlight "DIAGNOSTICS" and press **OPEN** [F1]. Highlight "CLOCK" and press **OPEN** [F1].

The clock menu allows the editing of the Piko Thermal Cycler's internal date and time settings.

Function key actions:

[F3] **YES**	Accepts date and time changes.
[F4] **NO**	Returns to previous screen, without changing date and time settings.

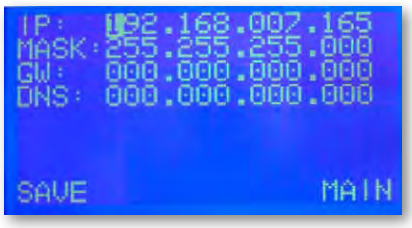
Cursor key actions:

[▲] [▼] [◀] [▶] Toggles between editable fields.

Note: If the Piko Thermal Cycler is unplugged and without power for more than 72 hours, you may have to reset the clock.

Network: IP, MASK, GW & DNS

From the TOOLS menu, highlight "NETWORK" and press **OPEN** [F1].



The Network menu allows the user to change the IP address, the subnet mask (MASK), the gateway (GW), and the Domain Name Server (DNS). To change a value for any of these fields, scroll to desired location and type in values using the keypad.
Function key actions:

[F1] **SAVE**	Accepts network setting changes.
[F4] **MAIN**	Returns to Main Menu, without changing the network settings.

Cursor key actions:

[▲] [▼] [◀] [▶] Toggles between editable fields.

Service

This function is to be used by authorized Thermo Fisher Scientific service personnel only.

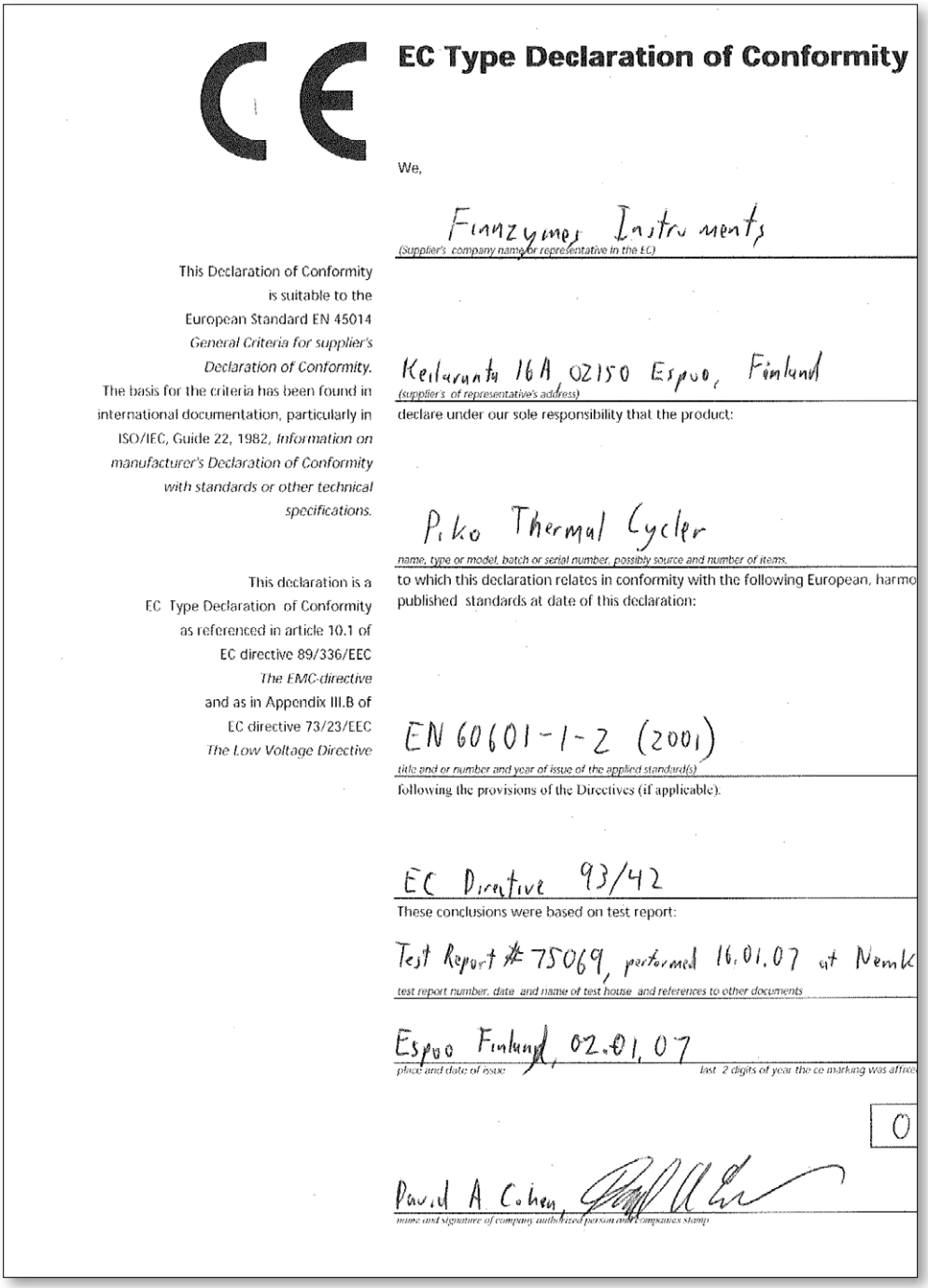
Appendix

Certifications

CSA – This product has been tested to meet the rigorous electrical requirements of the Canadian Standards Association.

CE – The Piko Thermal Cycler meets all of the requirements for electronic equipment as needed to obtain Certification from the European Union.

ISO 9001, 14001 – All design and manufacturing of the Piko Thermal Cycler was done in strict adherence to the standards set forth by ISO 9001 and ISO14001.



CE

EC Type Declaration of Conformity

We,

Finnzymes Instruments
(Supplier's company name or representative in the EC)

This Declaration of Conformity is suitable to the European Standard EN 45014 *General Criteria for supplier's Declaration of Conformity.* The basis for the criteria has been found in international documentation, particularly in ISO/IEC, Guide 22, 1982, *Information on manufacturer's Declaration of Conformity with standards or other technical specifications.*

Keilaranta 16A, 02150 Espoo, Finland
(supplier's of representative's address)

declare under our sole responsibility that the product:

Piko Thermal Cycler
name, type or model, batch or serial number, possibly source and number of items.

This declaration is a EC Type Declaration of Conformity as referenced in article 10.1 of EC directive 89/336/EEC *The EMC-directive* and as in Appendix III.B of EC directive 73/23/EEC *The Low Voltage Directive*

to which this declaration relates in conformity with the following European, harmo published standards at date of this declaration:

EN 60601-1-2 (2001)
title and or number and year of issue of the applied standard(s)

following the provisions of the Directives (if applicable).

EC Directive 93/42

These conclusions were based on test report:

Test Report # 75069, performed 16.01.07 at Nemk
test report number, date and name of test house and references to other documents

Espoo Finland, 02.01.07
place and date of issue

last 2 digits of year the ce marking was affixe

0

David A Cohen
name and signature of company authorized person and companies stamp

Warning and Error Log

If a Warning message appears in the display window of the Piko Thermal Cycler, it may indicate that the system cannot complete the requested action (e.g., "No Free Space for Folder" or "Wrong Password"). You may also receive a Warning message if the system is experiencing difficulty in running a protocol (e.g., "Block temperature Too High" or "Lid Temperature Too Low"). In this case, please check to ensure that the air vents are not blocked and that the fan is working.

If an Error message appears in the display window, your Piko Thermal Cycler will abort the protocol and immediately shut down to prevent any damage to the system.

Should you receive an Error message or a persistent Warning message, please contact your local distributor for support.

Number	Warnings:	Descriptions:
1	WR_NO_EMPTY_FOLDERS	NO FREE SPACE FOR FOLDER
2	WR_FOLDER_NAME_EMPTY	FOLDER NAME EMPTY
3	WR_WRONG_PASSWORD	WRONG PASSWORD
4	WR_PROTOCOL_MEMORY_FULL	MEMORY FULL
5	WR_INVALID_PARAMETER_NUMBER	INVALID PARAMETER NUMBER
6	WR_INVALID_PARAMETER_VALUE	INVALID PARAMETER VALUE
7	WR_AMBIENT_TEMP_TOO_HIGH	AMB. TEMPERATURE HIGH
8	WR_BLOCK_TEMP_TOO_HIGH	BLOCK TEMPERATURE HIGH
9	WR_LID_TEMP_TOO_HIGH	LID TEMPERATURE HIGH
10	WR_SINK_TEMP_TOO_HIGH	SINK TEMPERATURE HIGH
11	WR_STRAIN_GAUGE	STRAIN GAUGE VALUE WARNING
12	WR_DRAWER_POSITION	DRAWER DID NOT MOVE
13	WR_LID_FORCE	LID FORCE WARNING
14	WR_PROGRAM_MEMORY_CORRUPT	PROTOCOL MEMORY CORRUPT WARNING
15	WR_FOLDER_NAME_IN_USE	FOLDER NAME IN USE
16	WR_FILE_NAME_IN_USE	FILE NAME IN USE OLD FILE WILL BE OVERWRITTEN
17	WR_INVALID_SAMPLE_VOLUME	INVALID VOLUME
18	WR_LID_TEMP_TOO_LOW	LID TEMPERATURE LOW
19	WR_INVALID_CALIBRATION_INPUT	INVALID CALIBRATION TEMPERATURE
20	WR_CALIBRATION_FORBIDDEN	STOP PROTOCOL BEFORE CALIBRATION
21	WR_FOLDER_FULL	FOLDER FULL, SELECT ANOTHER
Number	**Errors:**	**Descriptions:**
1	ER_POWER_FAIL	POWER FAILURE
2	ER_AMBIENT_TEMP_TOO_HIGH	AMBIENT TEMPERATURE TOO HIGH
3	ER_BLOCK_TEMP_TOO_HIGH	BLOCK TEMPERATURE TOO HIGH
4	ER_LID_TEMP_TOO_HIGH	LID TEMPERATURE TOO HIGH
5	ER_SINK_TEMP_TOO_HIGH	SINK TEMPERATURE TOO HIGH
6	ER_CURRENT_MEAS_ERROR	BLOCK CURRENT
7	ER_VOLTAGE_MEAS_ERROR	VOLTAGE
8	ER_LID_POS_ERROR_PRES	LID POSITION
9	ER_NO_POWER_FAIL	RESET
10	ER_FAN_FAIL	FAN FAILURE
11	ER_CALIBRATION	CALIBRATION TABLE
12	ER_SINK_TEMP_TOO_LOW	SINK TEMPERATURE LOW
13	ER_BLOCK_TEMP_TOO_LOW	BLOCK TEMPERATURE LOW
14	ER_LID_TEMP_TOO_LOW	LID TEMPERATURE LOW
15	ER_BLOCK_TEMP_SHIFT	BLOCK TEMPERATURE SHIFT
16	ER_PROTOCOL_MEMORY	PROTOCOL MEMORY ERROR
17	ER_LID_TEMP_SHIFT	LID TEMPERATURE SHIFT
18	ER_LID_POS_ERROR_SLOW	LID POSITION
19	ER_LID_POS_ERROR_STEPS	LID POSITION

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