Thermo Scientific PikoReal Real-Time PCR System

User Manual

Rev. 2.2

Part of Thermo Fisher Scientific

Thermo SCIENTIFIC

Thermo Scientific PikoReal Real-Time PCR System

User Manual

Rev.2.2, Cat. no. N11471

Thermo SCIENTIFIC

License and trademark information
This product is covered by the following patents and patents pending: EP1973664B1, JP5248503B2 and US20080061429A1.

Notice
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 Canadian Patent 1,339,653 owned by Applied Biosystems. No right is conveyed expressly, by implication or by estoppel, under any other patent claim. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California, 94404, USA.

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Remark on screenshots and product images
Screenshots and product images may differ from your system depending on the product and firmware versions.

No liability for consequential damages
Thermo Fisher Scientific shall not be liable for any damages whatsoever arising out of the use or inability to use this product.

Power failure
The system requires uninterrupted power supply in order to operate correctly. Thermo Fisher Scientific has no responsibility whatsoever for system malfunctions arising from power failures.

Cat. No. N11471
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Manufacturer
Thermo Fisher Scientific Oy
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FI-01621
FINLAND

About This User Manual

Intended users

The Thermo Scientific™ PikoReal™ Real-Time PCR System, as a standalone instrument or with Thermo Scientific™ PikoReal™ Software, can be used in research laboratories by professional personnel.

Firmware versions

This user manual is applicable to PikoReal firmware version combination Piko: 2.2.41 and RT: 1.1.12.23 Firmware versions can be checked by selecting TOOLS in main menu and then selecting SYSTEM INFO. If you are using instrument with older version of the firmware, please refer to older version of the manual stored in the original installation CD.

How to use this user manual

This user manual is for the following instruments: 24-well PikoReal Real-Time PCR System (Cat. no. TCR0024) and 96-well PikoReal Real-Time PCR System (Cat. no. TCR0096). It aims to give you the information you need for:

- Reviewing safety precautions
- Installing the PikoReal Real-Time PCR System
- Operating the instrument
- Adjusting the settings and servicing the instrument
- Troubleshooting the instrument

This user manual also describes all the features and specifications of the PikoReal Real-Time PCR System, and provides ordering information for instruments, spare parts, reagents and consumables.

Read the manual in its entirety before operating the instrument.

Keep the user manual for future reference. The user manual is an important part of the instrument and should be readily available.

For more information

For PikoReal Software related issues, refer to the *Thermo Scientific™ PikoReal™ Software User Manual* (Cat. no. N12076).

For the latest information on products and services, visit our website:

`http://www.thermoscientific.com/pikoreal`

In our efforts to provide useful and appropriate documentation, we would appreciate any comments you may have on this user manual to your local Thermo Fisher Scientific representative.

Safety symbols and markings

These symbols are intended to draw your attention to particularly important information and alert you to the presence of hazards.

Safety symbols and markings used on the PikoReal Real-Time PCR System

The following symbols and markings appear on the type label and the instrument itself.

Power on

Power off

Serial number

Catalog number

Date of manufacture

Consult instructions for use

WEEE symbol This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC.

One label with the following text (Figure 2–3):

ATTENTION!
Always insert the plug into the Piko first, and then insert the power cord into the wall outlet.

Warning and other markings used in the documentation

The following symbols and markings appear in this user manual.

Warning Risk of electric shock.

Warning Biohazard risk.

Warning Hot surface, risk of burns.

Warning Risk of injury to the user(s).

Caution Risk of damage to the instrument, other equipment or loss of performance or function in a specific application.

Note Marks a hint, important information that is useful in the optimum operation of the system, or an item of interest.

Safety instructions

Read the User Manual Operating the PikoReal Real-Time PCR System 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 PikoReal Real-Time PCR System. NOT FOR CHILDREN.

Do Not Attempt to Repair the System 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 into contact with the electronics, even when the system is off or unplugged, may cause an electrical shock or harm.

Do Not Use Flammable, Hazardous or Radioactive Liquids with the PikoReal Real-Time PCR System.

Contents

Chapter 1
Introduction to the PikoReal Real-Time PCR System

The PikoReal Real-Time PCR System (Figure 1-1) is a gene quantification and genotyping platform in 24- and 96-well block formats. Using PikoReal Software, the system is applicable to absolute quantification, relative quantification, melt curve analysis, high resolution melt analysis, and allelic discrimination. The PikoReal Real-Time PCR System is designed to a minimal footprint, making the system ideal for personal bench top use and field applications, for example.

Figure 1-1. PikoReal 96 Real-Time PCR System

The combination of several innovative technologies applied in design, including optics, unique heat sink design, block design, plate size and the usage of special plasticware, create many advantages over conventional qPCR systems. The PikoReal Real-Time PCR System is fast, fulfills high-level requirements of temperature uniformity over the wells and creates significant savings in reagent, plastic material and energy consumption.

The PikoReal Real-Time PCR System uses Thermo Scientific™ UTW™ (ultra-thin wall) microwell plates that are 1/4 of the size of conventional microwell plates. The plates adhere to industry standards regarding well

spacing and sample capacity and are compatible with multichannel pipettes, reagent dispensers and automated liquid handling systems. The PikoReal 24 also utilizes standard low profile 8-well strips and 0.2 ml tubes.

The optical system comprises a charge-coupled device (CCD) camera, optical filters and an individual light-emitting diode (LED) for each of the five channels. The channel selection is built on a motorized linear shuttle that moves to five channel positions.

The PikoReal is controlled by PikoReal Software via an Ethernet connection (with up to 5 connections) or alternatively as a standalone instrument with USB memory stick loaded protocols.

The PikoReal Real-Time PCR System has the following features:

- **Compact design** – The PikoReal Real-Time PCR System has a compact design giving a minimal footprint for personal bench top use and field applications.
- **Unique thermal system** – Three Peltier elements and a patented heat sink design provide a fast and even heat distribution and removal.
- **5 LED optical system** – Separate LEDs for each channel offer a wide excitation range (475–640 nm) and multiplexing for four dyes.
- **Piko format** – The PikoReal Real-Time PCR System sample blocks (24-well and 96-well) will only accept microplates with a footprint with the dimensions of a microscope slide – the Piko format. The 24-well sample block is also compatible with all standard low-profile 8-tube strips and single tubes.
- **Automatic lid** – The heated lid is internally motor-controlled and the lid will automatically adjust to the optimal temperature and sealing pressure.
- **External power supply** – The PikoReal Real-Time PCR System uses an external 200 watt power supply (an approach commonly used with lap-top computers).

Note Conventional format full-sized microplates are not compatible with the PikoReal blocks.

The PikoReal Real-Time PCR System is available in two different configurations:

- PikoReal 24
    - Cat. no. TCR0024
    - for use with 24-well Piko PCR plates, standard 8-well strips and 0.2 ml tubes

- PikoReal 96
    - Cat. no. TCR0096
    - for use with 96-well Piko PCR plates.

The following components form the complete technology platform for performing real-time PCR based DNA analyses:

- PikoReal Real-Time PCR System
- PikoReal Software (see "PikoReal Software" on page 18)
- UTW consumables (see "Consumables" on page 18)
- qPCR reagents (see "Reagents" on page 21).

Introduction to qPCR

Quantitative real-time PCR (qPCR) is a method for analyzing DNA by detecting the amount of PCR product after each PCR cycle by the incorporation of fluorescent dyes into the reaction. The amplification and detection of a specific DNA sequence is integrated into a simultaneous process within a single instrument. The product accumulation is detected and measured throughout the reaction – in real-time. The detection is based on monitoring fluorescent molecules that are incorporated into the amplified products as a dsDNA binding dye or within labeled target specific primers or probes.

The quantitation is based on correlation between the measured fluorescence intensity and the amount of DNA formed. Collecting quantitative data of a known dilution series of the target DNA can be used to give insight into the PCR reaction kinetics and reaction efficiency. The gene quantification analysis method can be absolute (copy number, concentration) or relative (to a known reference gene and calibrator sample). Examples of qualitative analysis include gene identification and genotyping, e.g. studying DNA sequence variations, such as single nucleotide polymorphism.

The basic difference from end-point PCR technique is that in addition to the qualitative result – detecting the presence of a PCR product, a quantitative result – the initial amount of the amplified product – can be determined. qPCR offers many advantages over traditional end-point PCR methods: high sensitivity over a broad dynamic range, reproducibility, low contamination risk and the exclusion of post-PCR manipulations for analysis. It also facilitates high-throughput and multiplexing applications.

Intended use

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 Canadian Patent 1,339,653 owned by Applied Biosystems.

The PikoReal Real-Time PCR System has not been validated for IVD purposes. Human or veterinary IVD applications may also require additional licenses not covered by the instrument.

As the PikoReal is part of an analyzing system for the end user, the user is responsible for validation of the whole system to enable production of reliable and safe results. If the assay performance is essential to the analysis, the test result has to be assured using internal quality controls or an alternative test.

Use for any other than the above-mentioned purposes is excluded.

Chapter 2
General Description

This chapter describes the main parts of the PikoReal instrument.

Instrument views

The front view of the PikoReal instrument is shown in Figure 2–2.

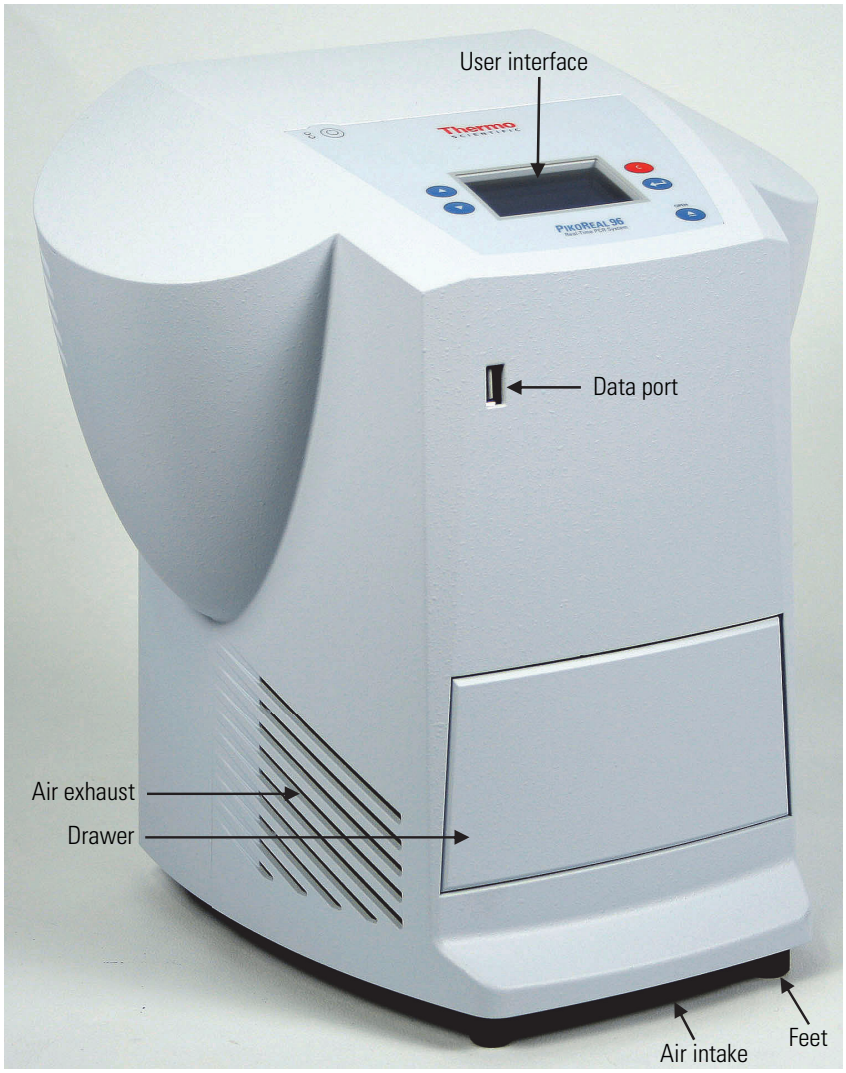


Figure 2–2. PikoReal front view

The rear view of the PikoReal instrument is shown in Figure 2–3.

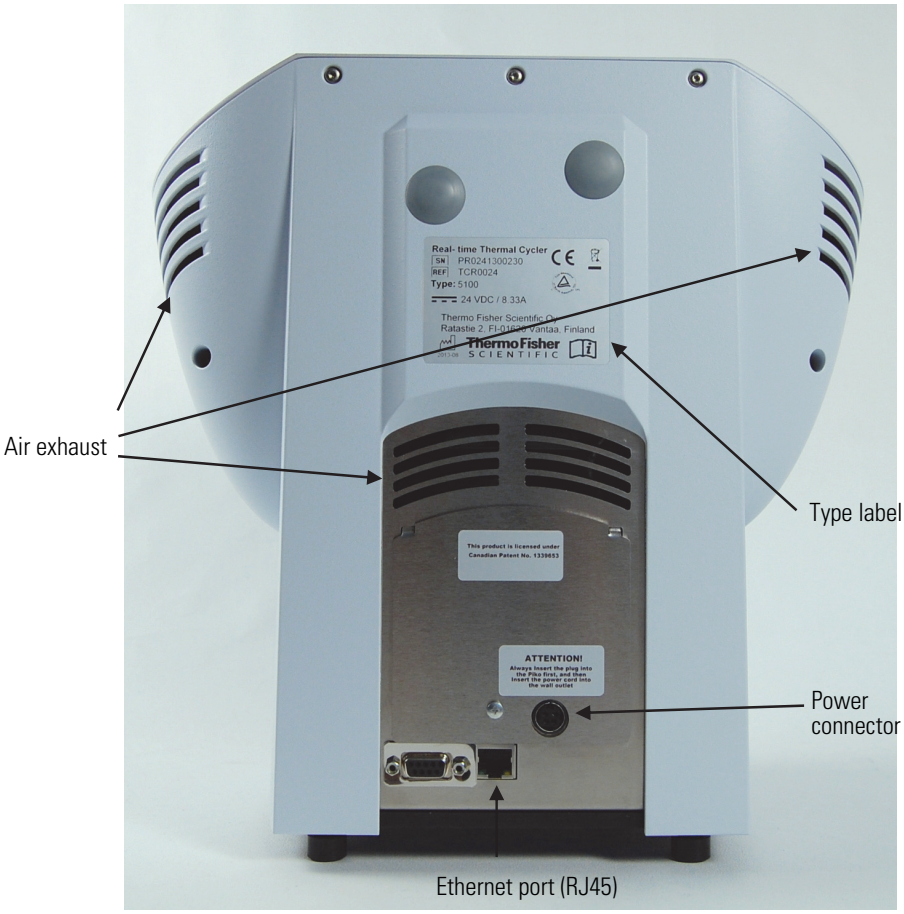


Figure 2–3. PikoReal rear view

Caution Do not block the air intake or the air exhaust vents (Figure 2–2 and Figure 2–3). Be careful not to place, for example, a piece of paper under the air intake.

Warning Do not place anything in front of the drawer. Items may be knocked over when opening the drawer.

PikoReal user interface

The PikoReal user interface (UI) and its functions are shown in Figure 2–4.

Figure 2–4. PikoReal user interface

Status indicator

On the top left corner of the instrument user interface is a status indicator light that has the following states (Table 2–1):

Table 2–1. Status indicator

	Indicator	Status
Upper light	Constant blue	Instrument is on but not in use.
	Blinking blue	Instrument is on and in use.
Lower light	Constant red	System error. For more information, see Chapter 7: "*Troubleshooting Guide*".

Power supply

The PikoReal Real-Time PCR System is equipped with an external 200 watt power supply.

A green light on the power supply indicates normal operation.

The power supply will get warm during normal operation.

Note If the internal circuit breaker trips, the green light of the power supply will go off. The power supply must be unplugged from the power outlet for 5 minutes to reset it.

Note Do not cover the power supply with anything as this will impede the ability of the power supply to efficiently dissipate heat.

PikoReal Software

The PikoReal is operated with the PikoReal Software application. Up to five PikoReals can be simultaneously operated from a single computer. For more information, refer to the *Thermo Scientific PikoReal Software User Manual* (Cat. no. N12076).

Block formats

The PikoReal Real-Time PCR instrument is available in two block formats (Figure 2–5 and Figure 2–6).

Figure 2–5. 24-well, 50 µl max. volume for PCR

Figure 2–6. 96-well, 20 µl max. volume for PCR

Consumables

PikoReal 24-well and 96-well formats utilize Piko PCR plates, which are 1/4th the size of standard PCR plates. See Figure 2–7.

The plates maintain the industry standard for well volumes and well spacing, ensuring the compatibility with standard multi-channel pipettes (both 8- and 16-channel) and liquid handling robots.

Four 24-well plates are equivalent to a standard ANSI 96-well plate and four 96-well Piko PCR plates are equivalent to a standard ANSI 384-well plate.

Plate frames are available to assemble Piko PCR plates into standard ANSI format plate size (see Chapter 8: "*Ordering Information*").

Both 24-well and 96-well Piko PCR Plates are sealed with adhesive seals or heat sealing films. The 24-well Piko PCR Plate can also be sealed with strip caps.

The 24-well sample block is also compatible with low profile 8-tube strips and single tubes with flat optical caps.

***** Not available in US.

Note If you are using single tubes, you must use at least eight tubes that are placed symmetrically with at least one tube in each corner of the block.
You can use empty tubes to fill the above requirement when analyzing fewer samples.

Figure 2–7. Piko PCR plates

UTW technology

Thermo Fisher Scientific Piko PCR plates, strips and tubes utilize UTW (ultra-thin wall) technology and are recommended to be used with PikoReal.

UTW reaction vessels were used in the optimization of the temperature algorithms of the instrument as well as in the validation of its performance.

Note For the highest signal-to-background ratio and elimination of possible well-to-well cross-talk, white plates, strips and tubes are recommended.

The UTW consumables are half the thickness (< 0.15mm) of conventional PCR consumables and thus improve the thermal transfer between block and sample (see Figure 2–8 and Figure 2–9).

The uniform tube design allows repeatable and consistent results from well to well.

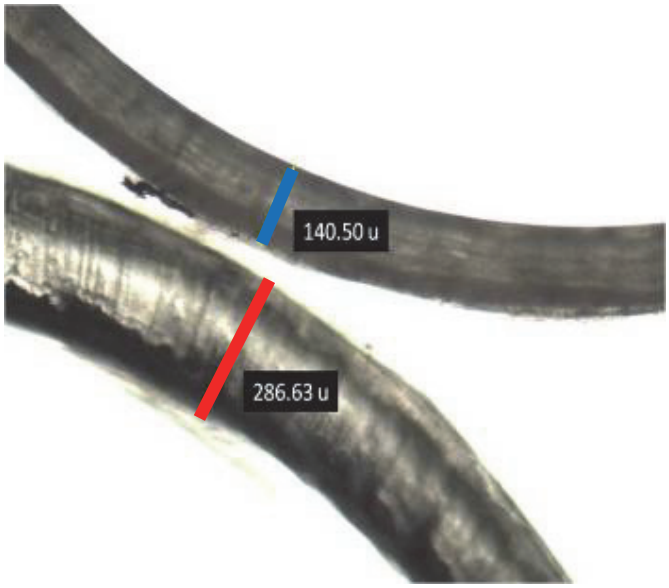


Figure 2–8. The tube wall thickness of UTW consumables (marked as **blue**) is half that of standard consumables (marked as **red**).

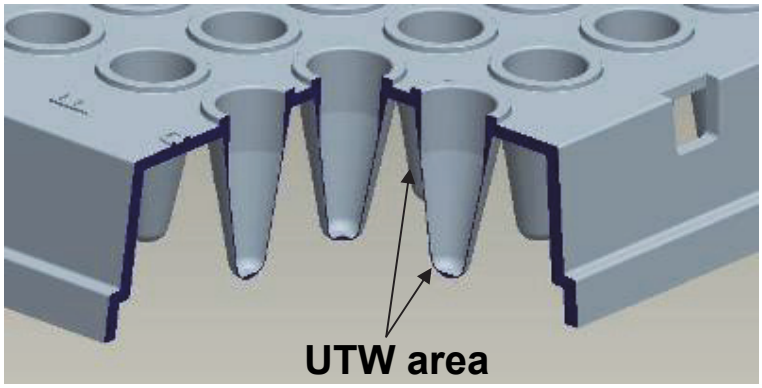


Figure 2–9. The lower portion of the UTW reaction vessels is ultra-thin.

For more information on the consumables, refer to Chapter 8: "*Ordering Information*" and http://www.thermoscientific.com/pikoreal.

Reagents

Thermo Scientific offers a comprehensive selection of qPCR reagents to be used with the PikoReal Real-Time PCR System. These include, for example, universal reagents for SYBR Green and probe chemistries, SNP Genotyping as well as Solaris pre-designed qPCR assays for gene-expression analysis.

For more information on the reagents, refer to Chapter 8: "*Ordering Information*" and http://www.thermoscientific.com/pikoreal.

Dye calibration

The PikoReal has been precalibrated to use the following fluorophores:

- FAM™
- HEX™
- Yakima Yellow™
- ROX™
- Texas Red™
- Cy™5

The PikoReal Real-Time PCR System is also compatible with SYBR™ Green I and similar DNA binding dyes. If you wish to calibrate other dyes into the system, refer to Appendix A: "*Color Calibration*" in the *PikoReal Software User Manual* (Cat. no. N12076).

Dispensers

Thermo Fisher Scientific provides a variety of dispensers compatible with Piko PCR plates: Thermo Scientific™ Finnpipette™ and Thermo Scientific™ Matrix™ multichannel pipettes, adjustable electronic Matrix pipettes as well as Thermo Scientific™ Multidrop™ Combi reagent dispensers and Thermo Scientific™ Versette™ automatic liquid handlers.

For more information on Thermo products, refer to http://www.thermoscientific.com.

Heat sealers

Thermo Fisher Scientific provides a variety of Thermo Scientifi ALPS ™ heat sealers to be used with heat sealing films.

For more information on heat sealer products, refer to Chapter 8: "*Ordering Information*" or http://www.thermoscientific.com and http://www.matrixtechcorp.com.

Chapter 3
Installation

This chapter describes the installation of the PikoReal Real-Time PCR System.

What to do upon delivery

This section covers the relevant procedures to be carried out on receipt of the instrument.

Unpacking the instrument

Move the packed instrument to its site of operation. To prevent condensation, the instrument should be left in its protective plastic wrapping until the ambient temperature has been reached.

Note Unpack the PikoReal Real-Time PCR System according to the separate instructions included in the package.

Unpack the PikoReal Real-Time PCR System and its accessories carefully so that the arrows on the transport packaging point upwards. Place the instrument onto a laboratory bench.

Caution Do not touch or loosen any screws. Doing so may cause misalignment and will void the instrument warranty.

Retain the original packaging for future transportation or in case you need to return the PikoReal Real-Time PCR System for maintenance. The packaging is designed to ensure safe transport and minimize transit damage. Use of insufficient packaging materials may invalidate the warranty. Retain all instrument-related documentation provided by the manufacturer for future use.

If you relocate your instrument or ship it for service, refer to “Packing for service” on page 47.

Checking delivery for completeness and damage

Check the enclosed packing list against the order. Check that the delivery includes the following items:

- PikoReal Real-Time PCR System
- PikoReal Software for PikoReal Real-Time PCR System CD
- Power supply

- Power cord
- Ethernet cable
- Unpacking/packing instructions

Note that a personal computer is not provided by Thermo Fisher Scientific. A PC is required for full use of the PikoReal functionalities. For recommended PC requirements, refer to the *PikoReal Software User Manual* (Cat. no. N12076).

Visually inspect the transport package, the instrument and the accessories for any possible damage. If any parts are missing or damaged, contact your local Thermo Fisher Scientific representative or Thermo Fisher Scientific Oy.

Environmental requirements

When setting up your PikoReal Real-Time PCR System, avoid locations with excessive dust, vibrations, strong magnetic fields, direct sunlight, draft, excessive moisture or large temperature fluctuations.

The instrument will perform optimally and exhibit the highest reliability within the recommended environmental ranges (Table 3–2). Although the instrument is rated to operate reliably within the absolute environmental ranges, avoid the extremes to best preserve the long-term performance and life span of the instrument.

Table 3–2. Operating conditions

Environmental condition	Absolute ranges	Recommended ranges
Ambient temperature	5–30°C	15–25°C
Ambient relative humidity	below 80%	below 50%
Altitude	below 2000 m	below 1000 m

Make sure that:

- The working area is flat, dry, clean and vibration-proof, and leaves additional room for cables, covers, etc.
- There is sufficiently room behind the instrument to enable disconnecting the device.
- The ambient air is clean and free of corrosive vapors, smoke and dust.
- The ambient temperature range is between +5°C and +30°C.
- The humidity is low so that condensation does not occur (relative humidity is between 10% and 80%).

Caution Do not operate the instrument in an environment where potentially damaging liquids or gases are present.

Note To ensure that your PikoReal Real-Time PCR System will provide years of top-level performance and will have the fewest problems, adhere to the given environmental requirements.

Air flow

Airflow is paramount to high-speed performance and high reliability. Maintain good heat sink cooling capability by ensuring a cool source of incoming air and an unobstructed exhaust of air.

To ensure obstruction-free intake of air:

- Do not set the instrument on a hot surface or on laboratory bench paper.
- Do not slide any paper or other material under the instrument as this may hamper the airflow or be sucked into the instrument.

To ensure obstruction free exhaust of air:

- Always keep at least 10 cm of distance between the exhaust vents and any large solid objects or walls.
- Do not have other instruments exhaust directly at the PikoReal Real-Time PCR System.

Clean the fins of the heat sink and the instrument regularly (see "Cleaning the heat sink" on page 45).

Installation steps

This section describes the installation steps that have to be carried out before operating the instrument.

Caution If the instrument was stored or transported in a cold environment, allow it to reach room temperature before plugging it in. Leave the instrument to sit for at least three hours before installing and switching it on, to prevent condensation causing a short circuit.

Connecting the power supply cable

To connect the power supply cable:

Warning Never operate your instrument from a power outlet that has no ground connection. Never use a power supply cable other than the Thermo Scientific power supply cable designed for your region.

1. Plug the power supply into the back of the PikoReal Real-Time PCR System (Figure 3–10).

Caution To prevent risk of shock or damage to the instrument, always connect the power supply first to the instrument before plugging it into the power outlet.

2. Insert the power cord into the power supply.

3. Insert the power cord into the power outlet.

The system will power up automatically.

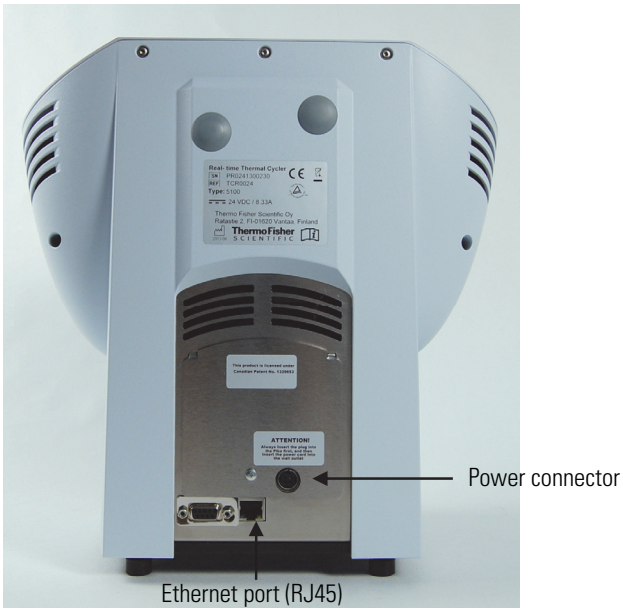


Figure 3–10. Connecting the power supply cable and the Ethernet cable

Connecting to the network

Connect the Ethernet cable to the back of the PikoReal Real-Time PCR System (Figure 3–10). You must use a shielded Ethernet cable (Cat5e/Cat6e, FTP/STP). For more information, refer to the *PikoReal Software User Manual* (Cat. no. N12076).

Connecting to the data port

The data port (see Figure 2–2 on page 15) is to be used with USB memory devices only. For instructions on how to use a USB memory device, refer to “Running a protocol” on page 30 and “Run data to USB” on page 41.

Warnings and cautions

This instrument is designed to be safe for use. When correctly installed, operated and maintained, it will present no hazard to the user.

The following recommendations are given for added user safety.

Electrical

Ensure that the power supply cable supplied with the unit is always used. If a correct type of mains cable is not provided, use only cables certified by the local authorities.

The power plug should only be inserted into a socket outlet with a protective ground contact. Never use an extension cable without a protective ground wire. Always ensure that the electricity supply in the laboratory conforms to that specified on the type label of the instrument.

Warning Only authorized technical service personnel are allowed to open the instrument.

Warning Do not touch switches or electrical outlets with wet hands. Switch the instrument off before disconnecting it from the mains supply.

Operational check

Before you put the instrument into use, perform the following operational check:

1. Plug the instrument into the mains. The instrument automatically proceeds to perform the self tests. The self tests are performed each time the instrument is turned on.

2. After approximately 30 seconds a beep signal indicates the test completion.

3. The operational check has passed if no error messages appear. In case of errors, refer to “Warning and error codes” on page 53.

Note Partial self tests are performed every time a protocol is started.

Installing PikoReal Software

The PikoReal Software is on the Thermo Scientific™ PikoReal™ Real-Time PCR System CD (Cat. no. N12119). The CD also contains the instrument and software user manuals.

For installation instructions, refer to the *PikoReal Software User Manual* (Cat. no. N12076).

Chapter 4
Routine Operation

The operation of the PikoReal Real-Time PCR System is described below.

Switching on

Before switching the instrument on, check that all the cables are properly fitted according to the installation instructions. Note that when you plug the instrument into the mains, it automatically starts.

If the instrument is plugged in and on standby mode, switch the instrument on by pressing the **POWER** button.

After startup, the instrument lid pre-heats automatically. After three hours' inactivity, the lid pre-heating is turned off.

Status indicator

To the left side of the power button on the keypad are two indicator lights with the following indications:

Upper light	**Constant blue**	System is on and NOT in use.
	Blinking blue	System is on and in use.
Lower light	**Constant red**	System has recently experienced an error or warning. Refer to Chapter 7: "*Troubleshooting Guide*" for more information.

Main menu

The PikoReal user interface (see Figure 2–4) features four function keys which are used to select different menu options.

The function fields on the **Main** menu have the following actions:

RUN Runs a protocol from USB or instrument memory.

STAT Shows the Status screen (when running).

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 previous menu or it will cancel your run immediately when you continuously hold down the button. Pressing "C" also clears a message from the display.

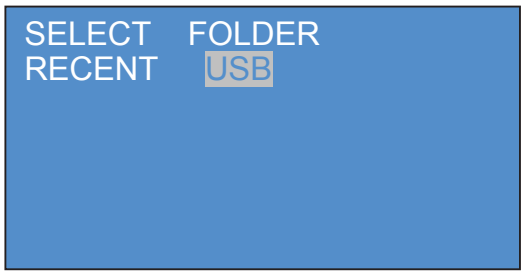
↵ Selects the highlighted item.

Running a protocol

The protocols can be run using PikoReal Software (and Ethernet connection) or from a USB memory stick. The last protocol, which was run using the software, can also be rerun from the instrument memory. To run a protocol using PikoReal Software, refer to the *PikoReal User Software Manual* (Cat. No. N12076). To run a protocol from USB or from the instrument memory:

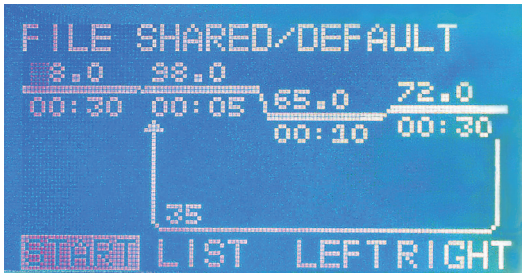
1. Select **RUN** in the **Main** menu and press Enter.

2. If a USB is attached, the USB folder will appear and is highlighted as default folder. The last performed protocol , which was run using the software, is stored in the [Recent] folder (and also in the [Shared] folder).



3. Select a folder and press Enter. The protocols stored in that folder will be displayed.

4. Select the protocol and press Enter. The protocol will be displayed in semi-graphical mode.



Note Protocol files on the USB memory stick can have a name that is up to eight characters long.

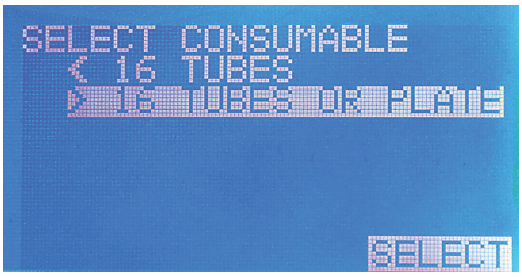
Note Thermo Fisher Scientific does not guarantee that all USB memory devices are compatible with the instrument.

5. The protocol can be viewed in list mode or graph mode, and browsed using the Left/Right or the Up/Down arrow keys, correspondingly.

6. After selecting the view mode (list or graph), start a run by selecting **START** and pressing Enter.

With a 24-well PikoReal Real-Time PCR System, the users will be presented with consumable and volume options. With a 96-well PikoReal Real-Time PCR System, the users will only be presented with volume options.

7. Select the consumable (that is, the vessel type) for a 24-well PikoReal Real-Time PCR System. Select either:
   - **< 16 TUBES** if using 8–16 individual 0.2 ml tubes **or**
   - **> 16 TUBES OR PLATE** if using a 24-well Piko PCR Plate.



Caution To avoid risk of contaminating the instrument, always use high-quality plastic consumables, such as UTW consumables. For more information, refer to Chapter 8: "*Ordering Information*".

Note If less than 16 x 0.2 ml tubes have been loaded and **> 16 TUBES OR PLATE** is selected by mistake, the lid pressure may cause the tubes to become crushed or deformed.

Note If you are using single tubes, you must use at least eight tubes that are placed symmetrically with at least one tube in each corner of the block. You can use empty tubes to fill the 8-tube requirement when analyzing fewer samples.

8. Enter the sample volume (µl per well) using the arrow keys.
   - 24-well PikoReal: 10–50 µl
   - 96-well PikoReal: 5–20 µl

9. Press Enter to confirm the desired volume.

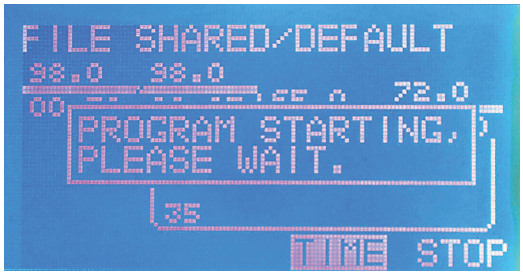
Note When a run begins, the lid inside the instrument will begin moving, a blue indicator light will flash, and the running protocol will be displayed in semi-graphical mode on a **Status** screen (see "Monitoring a run" on page 33).

Monitoring a run

You can monitor a run in two screens: Status screen and Time status screen.

Status screen

Upon initiation of a run, initialization tests are carried out and the Status screen is displayed. The current temperature step in the protocol is represented by a flashing line (graph view) or highlighted (list view), and the protocol and host folder are displayed on the top of the screen.

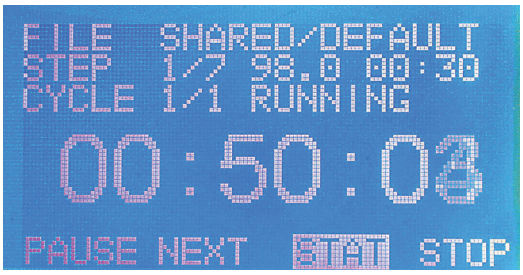


Note If you press the **C** key during the run, the **Main** menu screen is displayed with a **STAT** option. Selecting **STAT** returns the display to the **Status** screen.

Time screen

To enter the Time screen, select **TIME** and press **Enter**.

The digitals in the middle of the screen display the time (hours, minutes and seconds) remaining until the completion of the running protocol. The file name and host folders are displayed on the top of the screen.

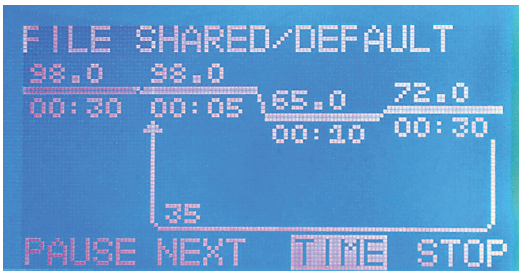


The following status parameters are displayed:

- **FILE** – Displays the path and filename of the current protocol.
- **STEP** – Displays the step number, temperature and time of the currently running temperature step.
- **CYCLE** – Displays the current cycle number (within a GOTO loop).

Functions in the screens

In both the Status and Time status screens, the following actions can be used:



PAUSE Pauses the run at the present temperature step, or at the next step if ramping. When paused, this option becomes **RESUME**.

NEXT Skips to the next protocol step.

TIME Toggles to the Status screen.

STOP Stops the protocol.

You can also return to the **Main** menu while the instrument is running by pressing the **C** key on the keypad.

Tools menu

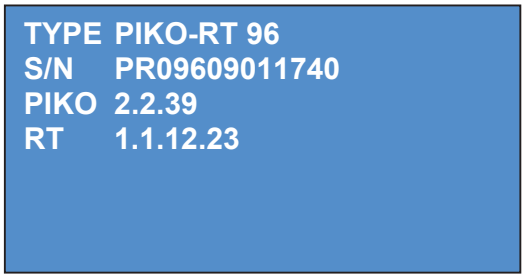
Select **TOOLS** in the **Main** menu, and press **Enter**.

The **TOOLS** menu provides six options, which are accessed using the arrow keys and then by pressing Enter:

- **SYSTEM INFO** – Displays system info.
- **DIAGNOSTICS** – Allows users to check lid parameters, sensor parameters, display settings, and clock settings.
- **NETWORK** – Allows users to view network address values for networking PikoReal.
- **SERVICE** – Used by authorized service personnel only!
- **LOGFILES** – Displays protocol and instrument log files.
- **PARK INSTRUMENT** – Prepares the instrument for transportation.
- **RUN DATA TO USB** – Appears when a USB memory stick is inserted. Copies the data of the previous protocol to the memory stick once the protocol is ready.

System info

Select SYSTEM INFO in the **TOOLS** menu with the arrow keys and press **Enter**.



The System Info screen displays information about the device and software:

- **TYPE** – Displays the type of PikoReal instrument.
- **S/N** – Displays the serial number of the device.
- **PIKO** – Displays the firmware version of the PIKO module (i.e. the thermal cycler module).
- **RT** – Displays the firmware version of the RT module (i.e. the real-time module).

Diagnostics

Select DIAGNOSTICS in the **TOOLS** menu with the arrow keys and press Enter.

The Diagnostics screen displays data about the four following settings:

- **LID** (see “Lid” on page 37)
- **SENSORS** (see “Sensors” on page 37)
- **DISPLAY** (see “Display” on page 38)
- **CLOCK** (see “Clock” on page 38)

Lid

Select DIAGNOSTICS in the **TOOLS** menu with the arrow keys and press **Enter**.

Select LID with the arrow keys and press **Enter**.

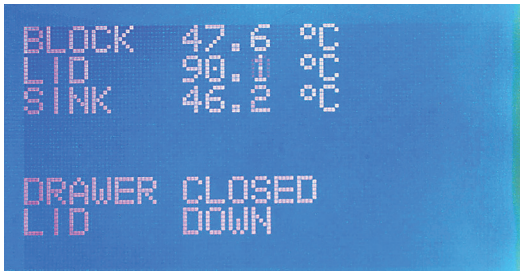
The Lid screen displays the offset settings for ZERO, LOW, MED (=MEDIUM) and HIGH lid pressure. Users may be asked to read these values to the service personnel as part of a troubleshooting procedure.

The user can drive the LID UP and DOWN by pressing Enter when the offset is selected. Note that this is not possible during a run.

Sensors

Select DIAGNOSTICS in the **TOOLS** menu with the arrow keys and press **Enter**.

Select SENSORS with the arrow keys and press **Enter**.



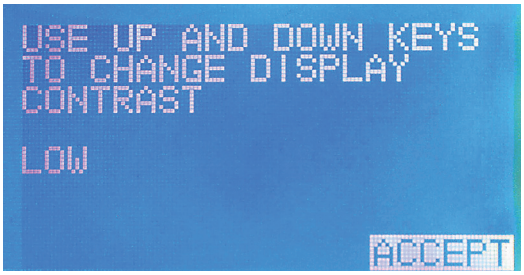
The Sensors screen displays sensor data from the device:

- **BLOCK** – Displays the current block temperature.
- **LID** – Displays the current lid temperature.
- **SINK** – Displays the current sink temperature.
- **DRAWER** – Displays the state of the drawer (OPEN/CLOSED).
- **LID** – Displays the state of the lid (UP/DOWN).

Display

Select DIAGNOSTICS in the **TOOLS** menu with the arrow keys and press **Enter**.

Select DISPLAY with the arrow keys and press **Enter**.



The display screen allows you to adjust the contrast of the PikoReal's LCD screen. The contrast is lowered or raised by pressing the Up and Down arrow keys. The change in contrast will appear immediately.

Press Enter to accept the new contrast setting.

Clock

Select DIAGNOSTICS in the **TOOLS** menu with the arrow keys and press **Enter**.

Select CLOCK with the arrow keys and press **Enter**.

The Clock screen allows viewing of the PikoReal's internal date and time settings.

Use the PikoReal Software (PC software) to modify the date and time.

Note If the PikoReal instrument is unplugged and without power for more than 72 hours, you may have to reset the clock.

Network

Select NETWORK in the **TOOLS** menu with the arrow keys and press **Enter**.

The Network screen allows the user to view the IP address, the subnet mask (MASK), the gateway (GW), the Domain Name Server (DNS), and the MAC address (MAC). It is not possible to edit the MAC address.

Note It is not possible to change the MASK, GW or DNS values without help from authorized technical service.

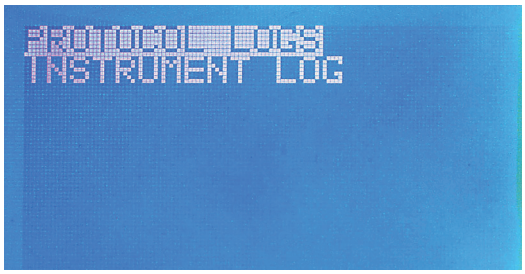
Use the PikoReal Software (PC software) to change the IP address of the instrument, if necessary.

Service

Note that this function is to be used by authorized Thermo Fisher Scientific service personnel only.

Logfiles

Select LOGFILES in the **TOOLS** menu with the arrow keys and press **Enter**.



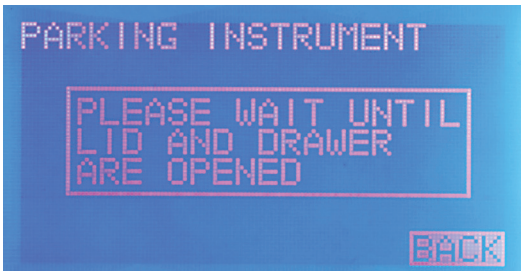
The Logfiles screen allows the user to view protocol and instrument related log files:

- **PROTOCOL LOGS** – Displays the log files of the last 10 executed protocols.
- **INSTRUMENT LOG** – Displays the instrument log files.

Park instrument

With the park instrument option, the user can prepare the device for transportation.

Select PARK INSTRUMENT in the **TOOLS** menu with the arrow keys and press **Enter**. Follow the instructions on the screen.



Note In older models of the instrument a locking screw is used to securely lock optic components in place. This is indicated on the back panel of those instruments.

Run data to USB

Select RUN DATA TO USB in the **TOOLS** menu with the arrow keys and press **Enter**. Note that he USB memory stick has to be inserted.

Answer the prompt using the arrow keys and press Enter. This option enables copying the backup data of the last performed protocol to the memory stick once the protocol is ready. This option is disabled while the protocol is active.

Note Thermo Fisher Scientific does not guarantee that all USB memory devices are compatible with the instrument.

Shutting down

To shut down the PikoReal Real-Time PCR System:

1. Remove any UTW vessels, tube strips or single tubes from the instrument.

2. Answer the prompt using the arrow keys and press off the instrument after use by holding down the **POWER** button continuously.

Chapter 5
Maintenance

Regular and preventive maintenance

Contact local authorized technical service or your local Thermo Fisher Scientific representative for assistance, if necessary.

Maintenance checklist

This chapter contains an outline of the points mentioned in the checklist below (Table 5–3). Routine and service procedures must be performed by the user to prevent unnecessary wear or hazards and are described below at the frequency with which they should be applied.

Table 5–3. Maintenance checklist

Item	Weekly	Yearly	When necessary	When sending to service / relocating
Wipe away spilled saline solutions, solvents, acids or alkaline solutions from outer surfaces immediately to prevent damage, and wipe with deionized distilled water. See “Cleaning of the instrument” on page 44.			✓	
If any surfaces have been contaminated with biohazardous material, disinfect with a mild sterilizing solution. See “Instrument care” on page 44.			✓	
Clean the case of the instrument periodically. See “Cleaning of the instrument” on page 44.	✓			
Clean the block wells when necessary. See “Cleaning the block and wells" on page 45.			✓	
Clean the heat sink when necessary. See “Cleaning the heat sink" on page 45.			✓	
Decontaminate the instrument when relocating the instrument or sending it for service. See “Decontamination procedure” on page 46.				✓
Service the instrument regularly. See “Cleaning of the instrument” on page 44 and “Maintaining a system log” on page 48.		✓		

✓ = depending on the laboratory conditions and the use and configuration of the instrument

Instrument care

For proper instrument care, follow the instructions below.

- Always ensure that the electricity supply in the laboratory conforms to that specified on the type label of the instrument.
- To guarantee the continuous reliability and accuracy of the PikoReal Real-Time PCR System, avoid interfering with any of the optical system components. A misalignment of the light path affects measurements.
- Prevent any liquid from entering the instrument.
- Keep the instrument free of dust and other foreign matter.
- It is recommended that you clean the case of the instrument periodically to maintain its good appearance (see "Cleaning of the instrument" on page 44).
- In the event of any damage, contact your local Thermo Fisher Scientific representative for service.

Caution Although the PikoReal Real-Time PCR System is constructed from high-quality materials, you must immediately wipe away spilled saline solutions, solvents, acids or alkaline solutions from outer surfaces to prevent damage and wipe with deionized distilled water.

Caution Keep the instrument block clean to avoid dust and dirt from entering the measurement chamber.

Cleaning of the instrument

Clean the instrument regularly as stated below.

1. Turn the power off and unplug the instrument.
2. Wear disposable gloves to protect yourself.
3. Clean the instrument outside and the keypad with a soft cloth dampened with water.
4. Plastic covers and surfaces can also be cleaned with a mild laboratory detergent, mild bleach or diluted alcohol solution.

Warning If you have spilt infectious agents on the instrument, decontaminate the instrument. Refer to "Decontamination procedure" on page 46.

Caution Painted surfaces can be cleaned with most laboratory detergents. Dilute the cleaning agent as recommended by the manufacturer. Do not expose painted surfaces to concentrated acids or alcohols for prolonged periods of time as damage may occur.

Caution Do not use any solutions containing oxidative chemicals, such as strong hypochlorites and peroxides or strong bases, on any of the anodized aluminum surfaces, as this may cause permanent damage to the finish.

Caution Abrasive cleaning agents are not recommended, because they are likely to damage the paint finish.

Caution Never use acetone as it will damage the covers.

Caution Do not autoclave any part of this instrument.

Cleaning the block and wells

To clean the block and wells (Figure 2–2, Figure 2–5 and Figure 2–6), follow the instructions below.

1. Turn the power off and unplug the instrument.
2. Wear disposable gloves to protect yourself.
3. Clean the block surface at least once a week using a soft cloth or tissue paper soaked in a mild detergent solution, soap solution or 70% ethanol. Wipe up spills immediately. Do not use formaldehyde or strong alkalines.
4. Clean the block wells with swabs moistened with water, 95% ethanol, or a 1:100 dilution of bleach in water.

Warning If you have spilt infectious agents on the block wells, decontaminate the instrument. Refer to “Decontamination procedure” on page 46.

Cleaning the heat sink

Inspect the fins of the heat sink on a regular basis. Dirty heat sinks have a significantly lower capacity to eject heat.

Clean the fins if they become dirty or covered in dust. Use a cotton swab, a brush, or compressed air or a vacuum device to remove dust.

Disposal of materials

Follow laboratory and country-specific procedures for biohazardous or radioactive waste disposal. Refer to local regulations for the disposal of infectious material.

Warning The samples can be potentially infectious. Dispose of all used disposable UTW vessels, strips, and tubes, syringes, disposable tips, disposable gloves, and so on as biohazardous waste. Be cautious and always use gloves.

Decontamination procedure

If you have spilled infectious agents, carry out the decontamination procedure.

Warning The decontamination procedure should be performed by authorized and trained personnel in a well-ventilated room wearing disposable gloves, protective glasses and clothing.

Decontamination should be performed in accordance with normal laboratory procedures. Any decontamination instructions provided with the reagents used should be followed.

It is strongly recommended to perform the complete decontamination procedure before relocating the instrument from one laboratory to another.

Example of decontaminants:

- Ethanol 70%
- Virkon solution 1–3%
- Glutaraldehyde solution 4%
- Chloramine T
- Microcide SQ 1:64
- Decon 90 min. 4%

To decontaminate the instrument:

1. Wear disposable gloves to protect yourself.
2. Prepare the decontaminant.
3. Switch off the power and disconnect the power supply cable.

4. Empty the drawer.

5. Disinfect the outside of the instrument or to remove stains using a cloth dampened with 70% ethanol.

6. Place the instrument in a large plastic bag. Ensure that the drawer door is out.

7. Place a cloth soaked in the prepared decontaminant solution into the bag. Ensure that the cloth does not come into contact with the instrument.

8. Close the bag firmly and leave the instrument in the bag for at least 24 hours.

9. Remove the instrument from the bag.

10. After decontamination, clean the instrument using a mild detergent.

11. After performing this decontamination procedure, enclose a signed and dated Certificate of Decontamination (see Appendix B: "*Certificate of Decontamination*") both inside the transport package and attached to the outside of the package.

Packing for service

To pack the PikoReal Real-Time PCR System for service, follow the instructions presented below:

- Inform about the use of hazardous materials.
- Remove any UTW vessels, tube strips or single tubes before decontamination. Decontaminate the instrument.
- Park the instrument. Refer to "Park instrument" on page 40.
- Use the original packaging for shipping.
- Pack the instrument according to the packing instructions.
- Enclose a dated and signed "*Certificate of Decontamination*" (see Appendix B) both inside and attached to the outside of the package, in which you return your instrument (or other items).
- Enclose the return authorization number (RGA) given by your local Thermo Fisher Scientific representative.
- Indicate the fault after you have been in touch with your local Thermo Fisher Scientific representative or the Thermo Fisher Scientific technical service department.

Maintaining a system log

A system log, which includes a short summary of the use, maintenance procedures, error messages and other information about the use of the system, is very useful in properly maintaining the system. Refer to Appendix A: "*System Log*". Copy the table as many times as necessary, but leave the blank original inside the user manual.

Disposal of the instrument

If the PikoReal Real-Time PCR System is exposed to potentially infectious chemical samples, toxic or corrosive chemicals or radioactive chemicals, waste management of the complete instrument must be carried out to ensure that there is no risk of contamination.

Warning Decontaminate the instrument before disposal. Refer to "Decontamination procedure" on page 46.

Follow laboratory and country-specific procedures for biohazardous or radioactive waste disposal.

Dispose of the instrument according to the legislation stipulated by the local authorities concerning take-back of electronic equipment and waste. The proposals for the procedures vary by country.

Pollution degree	2 (see "Safety specifications" on page 50)
Method of disposal	Electronic waste Contaminated waste (Infectious waste)

Regarding the original packaging and packing materials, use the recycling operators familiar to you.

For more information, contact your local Thermo Fisher Scientific representative.

Chapter 6
Technical Specifications

Instrument specifications

Thermo Fisher Scientific reserves the right to change any specifications without prior notice as part of our continuous product development program (Table 6–4).

Table 6–4. Instrument specifications

Instrument specifications	
Dimensions	
Size	30 cm (W), 23 cm (D), 31 cm (H) [11.8" (W) x 9.1" (D) x 12.2" (H)]
Weight	9.2 kg [20.3 lbs.] (includes power supply and cord)
Electrical	
Power supply	200 W, 24 V, 8.3 A
Line voltage	90–240 VAC
Input current	2.5 A and 4.0 A
Frequency	50–60 Hz
Power failure recovery	Yes (for 24 hours)
Instrument configuration	
Block formats	24-well, 96-well (not interchangeable)
Display	Backlit LCD
Communication ports	Ethernet, USB (memory stick only)
Programming	
Adjustable ramp rate	Yes
Touchdown	Yes
Typical thermal performance	
Max. ramp rate	> 5°C/s heating, > 4.5°C/s cooling
Thermal uniformity	± 0.3°C at 95°C; ± 0.15 at 60°C; ± 0.2 at 72°C
Thermal accuracy	± 0.2°C
Thermal range	4°C and 99.9°C
Typical optical performance	
Excitation	5 LEDs
Excitation range	475–640 nm
Detection	CCD
Detection range	520–740 nm

Cont.

Instrument specifications	
Measuring time	All channels < 13 s Single channel < 3 s
Filter wavelength range	Channel 1: Excitation range 475–500 nm Emission range 520–550 nm Channel 2: Excitation range 515–535 nm Emission range 557–590 nm Channel 3: Excitation range 570–590 nm Emission range 615–650 nm Channel 4: Excitation range 600–640 nm Emission range 666–-740 nm Channel 5: Excitation range 475–500 nm Emission range 520–590 nm

Safety specifications

This section describes the safety specifications for the PikoReal Real-Time PCR System.

In conformity with the requirements

PikoReal Real-Time PCR System bears the following markings:
Type 5100
CE mark
90–240 Vac, 50/60 Hz
EUT: 24 VDC, 8.33 A
PSU: 90–240 Vac, 50–60 Hz, 2.5 A or 4 A

PikoReal Real-Time PCR System conforms to the following requirements:
2006/95/EC (Low Voltage Directive)
2004/108/EC (Electromagnetic Compatibility Directive, EMC)
2002/96/EC (WEEE Directive)

The safety specifications are also met under the following environmental conditions in addition to or in excess of those stated in the operating conditions:	
Altitude	Up to 2000 m
Temperature	+5°C to +40°C
Humidity	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
Mains supply fluctuations	± 10% from nominal
Installation category (overvoltage category)	II according to IEC 60664-1 (see **Note** 1)
Pollution degree	2 according to IEC 60664-1 (see **Note** 2)

Note 1) The *installation category* (overvoltage category) defines the level of transient overvoltage which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example, in CAT II which is the category used for instruments in installations supplied from a supply comparable to public mains, such as hospital and research laboratories and most industrial laboratories, the expected transient overvoltage is 2500 V for a 230 V supply and 1500 V for a 120 V supply.

2) The *pollution degree* describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only nonconductive pollution, such as dust, occurs with the exception of occasional conductivity caused by condensation.

Chapter 7
Troubleshooting Guide

Note Do not use the instrument if it appears to malfunction.

Handling abnormal situations

If there is an abnormal situation during operation, such as fluids spilling inside the instrument:

1. Switch off the instrument (Figure 2–4 on page 17).
2. Unplug the instrument immediately from the power supply (Figure 3–10 on page 26).
3. Carry out appropriate corrective measures. However, do not disassemble the instrument.
4. If the corrective measures taken do not help, contact authorized technical service or your local Thermo Fisher Scientific representative.

Power failure

In case of less than a 24-hour power failure, the instrument continues the interrupted run from the same protocol step it was performing at the time of the interruption.

If the protocol was in the melting curve phase (see the *PikoReal Software User Manual*), the instrument continues the run from the start of the melting curve protocol.

The instrument gives a warning code dependent of the length of the power failure (W1 or E1, see Table 7–5).

Warning and error codes

Warnings inform about possible unwanted events occurring during the protocol execution (Table 7–5). The protocol is not stopped, but the event might have some effect on the results.

Errors inform about a failure occurring during the protocol execution (Table 7–6). All errors, except E1, cause the protocol to stop and all heating units to be turned off.

When an error is detected, the current operation is aborted. After an error, it is best to restart from the beginning after the problem has been fixed. When an error occurs, the error code and the suggested actions are presented. You can restore the data of the last run in event of technical problems.

Press [C] to clear the warning or error message.

Table 7–5. Warnings

Code	Symbolic name	Description	Action text
W1	POWER FAILURE	This warning is set if the power was lost during protocol execution for less than 24 h and the protocol was recovered.	CHECK LOGFILES
W8	BLOCK TEMP HIGH	This warning is set if the block temperature is over 112°C.	
W9	LID TEMP HIGH	This warning is set if the lid temperature is over 115°C.	
W10	SINK TEMP HIGH	This warning is set if the sink temperature is over 75°C.	CHECK THAT THE HEATSINK IS CLEAN
W27	PROTOCOL STOPPED	This warning is set if the protocol is stopped before the end of the protocol.	
W28	CAMERA FAILURE	This warning is set if the first camera plate read command fails.	
W29	PROTOCOL PAUSED	This warning is set if the protocol is paused during the protocol run.	CHECK LOGFILES
W30	CYCLES ADDED	This warning is set if extra cycles are added to a protocol loop.	CHECK LOGFILES
W31	STEP SKIPPED	This warning is set if the protocol step is skipped (NEXT).	CHECK LOGFILES
W35	LID PRESSURE FAIL	This warning is set if protocol is paused, drawer opened and protocol resumed.	CHECK LOGFILES

Table 7–6. Errors

Code	Symbolic name	Description	Action text
E1	POWER FAILURE	This error is set if the power was lost during protocol execution for over 24 h.	CHECK LOGFILES
E3	BLOCK TEMP.	This error is set if the block temperature is over 115°C.	CONTACT SUPPORT
E4	LID TEMP.	This error is set if the lid temperature is over 125°C.	CONTACT SUPPORT
E5	SINK TEMP.	This error is set if the sink temperature is over 85°C.	ENSURE THAT THE AIRFLOW TO THE FAN IS NOT OBSTRUCTED. IF PROBLEM PERSIST CONTACT SUPPORT

Continued

Cont.

Code	Symbolic name	Description	Action text
E11	CALIB. TABLE	This error is set if any calibration values or the calibration derived from them is corrupt.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT
E12	SINK TEMP. LOW	This error is set if the sink temperature is below -20°C.	WAIT FOR THE INSTRUMENT TO REACH OPERATING TEMP. IF PROBLEM PERSISTS CONTACT SUPPORT
E13	BLOCK TEMP. LOW	This error is set if the block temperature is below -20°C.	WAIT FOR THE INSTRUMENT TO REACH OPERATING TEMP. IF PROBLEM PERSISTS CONTACT SUPPORT
E14	LID TEMP. LOW	This error is set if the lid temperature is below -20°C.	WAIT FOR THE INSTRUMENT TO REACH OPERATING TEMP. IF PROBLEM PERSISTS CONTACT SUPPORT
E15	BLOCK TEMP. SHIFT	This error is set if the block temperature changes more than 10°C during a 500 ms interval.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT
E17	LID TEMP. SHIFT	This error is set if the lid temperature changes more than 20°C during a 500 ms interval.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT
E18	LID POS. FAILURE	This error is set if the lid encounters pressure too early. In case of Piko 24, this makes it incompatible with doomed caps.	RETRY. IF PROBLEM PERSISTS SEE MANUAL
E21	BLOCK TEMP. CHANGE	This error is set if the block is heated with more than a 6 A current for 5 sec and the change in the block temperature is not bigger than 1°C.	CONTACT SUPPORT
E22	LOG FILE	The log files have been corrupted and the log file memory has been cleared.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT
E31	CAMERA FAILURE	This error is set if the camera plate read command fails twice.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT
E32	RT-UNIT FAILURE	This error is set if the connection to the RT unit fails.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT

Cont.

Code	Symbolic name	Description	Action text
E33	SELF TEST FAILURE	This error is set if the RT self test fails. The self test is run at every boot and protocol start and it checks that the camera is found, the filter is initialized and the plate is configured.	REBOOT INSTRUMENT. IF PROBLEM PERSISTS CONTACT SUPPORT
E35	LID TEMP. CHANGE	This error is set if the lid is active, the temperature difference to the target is more than 20°C and the response to a 10 seconds heating is less than 2°C.	CONTACT SUPPORT
E36	STRAIN GAUGE FAILURE	This error is set if the lid pressure sensor is broken.	CONTACT SUPPORT
E37	LID OPTO FAILURE	This error is set if the lid position sensor is unable to detect the home position.	RETRY. IF PROBLEM PERSISTS SEE MANUAL
E40	DRAWER FAILURE	This error is set if the drawer is opened, but the drawer optical sensor state is not changed in 100 ms.	CONTACT SUPPORT

Chapter 8
Ordering Information

Contact your local Thermo Fisher Scientific representative for ordering and service information (Table 8–7 through Table 8–11).

PikoReal

Table 8–7. Instrument catalog number

Code	Item
TCR0024	PikoReal Real-Time PCR System, 24-well
TCR0096	PikoReal Real-Time PCR System, 96-well

List of spare parts and accessories

Table 8–8. Codes for spare parts and accessories

Code	Item	Qty
N11471	*PikoReal Real-Time PCR System User Manual*	1
N12076	*PikoReal Software User Manual*	1
N12119	PikoReal Software for PikoReal Real-Time PCR System CD	1
EA12101M-240-VAN	CMP power supply EA12101M-240-VAN	1
5180220	Power cable (UK)	1
1210550	Power cable (Euro)	1
1210520	Power cable (USA/Japan)	1
N08421	Power cable (China)	1
N12094	Ethernet cable	1
TCR0096DEMO	PikoReal 96 demo kit (1 plate)	1
TCR0024DEMO	PikoReal 24 demo kit (1 plate)	1
TCR0096VAL	PikoReal 96 validation plate	1
TCR0024VAL	PikoReal 24 validation plate	1
PRK1963	Aluminum Support rack for 96-well plates and 24-well Piko PCR Plates	1
PRK1383	Aluminum Support rack for 384-well plates and 96-well Piko PCR Plates	1
AB-1391	Adhesive Seal Applicator	1

List of consumables

Table 8–9. Codes for consumables

Code	Item	Quantity
SPL0240	Thermo Scientific Piko PCR Plate, 24-well, clear	200 plates
SPL0241	Thermo Scientific Piko PCR Plate, 24-well, white	200 plates
SPL0960	Thermo Scientific Piko PCR Plate, 96-well, clear	200 plates
SPL0961	Thermo Scientific Piko PCR Plate, 96-well, white	200 plates
SFR0241	Thermo Scientific Piko 24-well PCR Plate Frame, white	50 frames
SFR0961	Thermo Scientific Piko 96-well PCR Plate Frame, white	50 frames
TCS1080	Thermo Scientific flat 8-cap strips for Piko PCR Plates, optically clear	120 strips
AB-0812	Clear Seal Diamond Heat Sealing Film	100 seals
TUC0010	Thermo Scientific Piko UTW individual tubes, clear tube/clear cap	960 tubes
TUC0011	Thermo Scientific Piko UTW individual tubes, white tube/clear cap	960 tubes
ASF0020	Thermo Scientific sealing film, Piko PCR Plate size	400 seals
AB-0771	Low Profile Thermo Strip, clear 0.2 ml low profile thin walled 8 tube strips	120 strips
AB-0771/w	Low Profile Thermo Strip, white 0.2 ml low profile thin walled 8 tube strips	120 strips
AB-0866	Ultra Clear Cap Strips	120 strips

List of reagents

Table 8–10 shows examples of reagents available for the PikoReal. For more information and other available products, refer to http://www.thermoscientific.com/pikoreal.

Table 8–10. List of reagents

SYBR Green chemistry	
K0251/ K0252	Maxima SYBR Green qPCR Master Mix (2X), ROX Solution provided
F-415S/L	DyNAmo Flash SYBR Green qPCR Kit
F-416S/L	DyNAmo ColorFlash SYBR Green qPCR Kit
Probe based chemistry	
K0261/K0262	Maxima Probe qPCR Master Mix (2x), ROX Solution provided
F-455S/L	DyNAmo Flash Probe qPCR Kit
F-456S/L	DyNAmo ColorFlash Probe qPCR Kit
SNP Genotyping (based on hydrolysis probes)	
F-480S/L/XL	DyNAmo SNP Genotyping Master Mix
Solaris qPCR Gene Expression Assays (human and mouse)	
AX-XXXXXX-XX-0X00* *Catalog number is product-specific. Please refer to www.thermoscientific.com/solaris to select the appropriate assay	Each pre-designed Solaris qPCR Assay consists of a single probe (200 nM) and primer pair (800 nM each) specific to your target gene. Each assay is designed to a consensus sequence that covers all known splice variants of the target gene. The sequence information is provided.
AB-4350 / AB-4351 / AB-4352	Solaris qPCR Gene Expression Master Mix Plus ROX vial / including ROX / including Low ROX
K-002200-C1-XXXX Package size (XXXX): 100/200/400/1000 x 25µL rxns	Solaris RNA Spike Control Kit
cDNA Synthesis Kits for qPCR	
K1641/ K1642	Maxima First Strand cDNA Synthesis Kit for RT-qPCR
AB-1453/A, AB-1453/B	Verso cDNA Synthesis Kit (with Solaris® qPCR Master Mixes)

List of heat sealers

Table 8–11. List of heat sealers

Code	Item
AB-0384/110	Thermo Scientific ALPS 25 Manual Heat Sealer, 110 V
AB-0384/220	Thermo Scientific ALPS 25 Manual Heat Sealer, 220 V
AB-1443	Thermo Scientific ALPS 50 V Microplate Heat Sealer

Appendix A
System Log

Instrument name/number:

User	Date	Comments

PHOTOCOPIABLE

Appendix B
Certificate of Decontamination

Name: _____

Address: _____

Tel./Fax: _____

Instrument: _____ Serial no.: _____

A) I confirm that the returned items have not been contaminated by body fluids, toxic, carcinogenic or radioactive materials or any other hazardous materials.

B) I confirm that the returned items have been decontaminated and can be handled without exposing the personnel to health hazards.

Materials used in the unit: Chemicals + Biological • Radioactive *)

Specific information about contaminants:

_____

_____

Decontamination procedure[1]:

_____

_____

Date and place: _____

Signature: _____

Name (block capitals): _____

*) The signature of a Radiation Safety Officer is also required when the unit has been used with radioactive materials.

This unit is certified by the undersigned to be free of radioactive contamination.

Date and place: _____

Signature: _____

Name (block capitals): _____

PHOTOCOPIABLE

[1] Please include decontaminating solution used.

Glossary

CCD Charge-coupled device.

intercalator In biochemistry, intercalator is a type of molecule that binds to DNA and inserts itself into the DNA structure.

LED Light-emitting diode.

MAC Short for Media Access Control address, a hardware address that uniquely identifies each node of a network.

PCR Polymerase chain reaction.

qPCR Quantitative real-time PCR.

RFU Relative fluorescence unit.

UI User interface.

UTW Ultra-thin wall.

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W

Notes

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