QuantStudio™ 5 Real-Time PCR Instrument (for Human Identification)

Publication Number MAN0016701 Revision B.0

This guide contains the information needed to prepare your site for installation of the QuantStudio™ 5 Real-Time PCR System.

Site preparation overview

A Thermo Fisher Scientific service representative will contact you to schedule the installation.

Note: Customers have the option to install the instrument themselves.

IMPORTANT! Thermo Fisher Scientific does not install, service, or repair instruments in areas designated BioSafety Level 3 (BSL-3) or BioSafety Level 4 (BSL-4).

Before the installation:

1. Review this guide.
2. Receive and inspect the shipment (page 11).
3. Ensure that the purchase order is complete.
4. Move the packaged instrument to the installation site (page 12).
5. Complete the site preparation checklist (page 3).
   This task is required for a service representative to complete the installation.

Installation time

After the instrument is unpacked, installation and verification take approximately 1.5 hours. For additional information, see the user documents that are provided with the instrument.

Site preparation checklist

IMPORTANT! Complete, date, and initial all items in the following checklist before the scheduled installation date. If the site preparation checklist is not complete when the Thermo Fisher Scientific service representative arrives, the scheduled installation may be postponed.

Note: If you install the instrument yourself, complete all items in the following checklist before you begin the installation.

✓	Date	Initials	Site preparation requirement	See page
☐			Customer responsibilities have been reviewed.	4
☐			Personnel have been assigned tasks and responsibilities.	
☐			The installation site is identified and meets the following requirements:	
			☐ Space and clearance	5
			☐ Environmental	7
			☐ Electrical	8
			☐ Computer-to-instrument configuration	10
			☐ Safety	11
☐			The instrument was received and inspected as follows:	11
			☐ All shipping list items are the items ordered at the time of purchase.	
			☐ Any damage to shipping containers was reported to the shipping company that delivered the instrument.	
			☐ Any damage or mishandling was recorded on the shipping documents.	
			☐ Store RNase P plate at –20°C.	
			☐ Store the two HID calibration plates at –20°C.	
☐			The installation site is cleared and ready for the instrument installation.	12
☐			The packaged instrument and other shipping containers are moved to the installation site.	
☐			All materials for installation and operation are available.	13

Customer responsibilities

Personnel	Responsibilities
Site preparation/ installation coordinator	• Receives and inspects the instrument. • Unpacks and stores the reagents and plates as specified. • Reviews the site preparation guide for safety information and the instrument requirements. • Coordinates personnel and tasks. • Chooses the installation site. • Reviews checklists with applicable personnel, then the service representative[1], to verify that the site is properly prepared. • Schedules the installation and informs personnel of the installation day. • Ensures that the site is clear of unnecessary material on the installation day. • Is available during installation to assist the service representative.[1]
Laboratory safety representative	• Reviews the site preparation guide for safety information. • Ensures that the required safety practices and equipment are in place. • Is available at all times while the service representative is at the customer's facility.[1]
Laboratory personnel/ primary users	• Reviews safety information. • Ensures that all customer-provided materials for installation are present at the site. • Ensures that primary users (responsible for training other users) are available during installation, so that they can be trained on the instrument.[1]
Facilities personnel	• Ensures that the installation requirements are met for: – Space at the installation site – Building clearances – Humidity and temperature – Waste collection – Electrical supply – Computer – Safety and installation materials • If possible, moves the instrument packages to the site before the installation date. • Is available during installation to assist service representative and laboratory personnel.[1] • Ensures that at least two people are available to help the service representative move and position the instrument.[1]

[1] Required for service representative installation of the instrument.

Site requirements

Dimensions and weights

Note: All measurements are rounded to the nearest whole- or half-unit.

Components (packaged)

WARNING! PHYSICAL INJURY HAZARD. The packages are heavy. Do not attempt to lift or move the packages without professional assistance. Any incorrect lifting or moving of the packages can cause serious injury.

Ensure the building clearances allow for the passage of each packaged component.

Package	Height	Length (depth)	Width	Weight
Instrument (on pallet)	63 cm (25 in.)	69 cm (27 in.)	42 cm (16.5 in.)	35 kg (77 lb)
Computer (laptop)	22 cm (9 in.)	42 cm (16.5 in.)	59 cm (23 in.)	7 kg (15 lb)
Computer (minitower)	36 cm (14 in.)	47 cm (18.5 in.)	54 cm (21 in.)	14.5 kg (32 lb)
Monitor (with stand)	18 cm (7 in.)	46 cm (18 in.)	41 cm (16 in.)	7 kg (15 lb)

Components (unpacked)

Ensure that the installation site bench space can accommodate the dimensions and support the weights of the purchased configuration.

Component	Height	Length (depth)	Width	Weight
Instrument	40 cm (16 in.)	50 cm (20 in.)	27 cm (10.5 in.)	26 kg (57 lb)
Computer (laptop)	4 cm (1.5 in.)	25 cm (10 in.)	38 cm (15 in.)	2.5 kg (5 lb)
Computer (minitower)	36 cm (14 in.)	42 cm (16.5 in.)	17.5 cm (7 in.)	9.5 kg (21 lb)
Monitor (with stand)	37 cm (15 in.)	18 cm (7 in.)	41 cm (16 in.)	5 kg (11 lb)
Keyboard	3 cm (1.5 in.)	14 cm (5.5 in.)	45 cm (18 in.)	1 kg (2.5 lb)

Instrument clearances

During instrument installation and maintenance, it is necessary to access the back of the instrument. If the back of the instrument faces a wall, ensure that there is sufficient clearance on the bench to rotate the instrument for access.

IMPORTANT! For safety, the power outlet for the instrument must be accessible.

Component	Top	Front	Sides	Back
Instrument	30 cm (12 in.)	30 cm (12 in.)	15 cm (6 in.)	15 cm (6 in.)
Computer	—	15 cm (6 in.)	—	15 cm (6 in.)

Instrument and computer connections

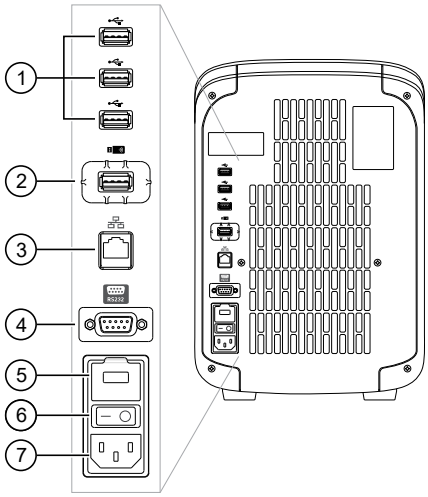


Figure 1 Instrument back panel

1. USB ports
2. WiFi USB port—Not applicable
3. Ethernet Port—RJ45 port for 100/1,000 Mbps Ethernet communication with the instrument
4. RS232 Port—For service use only
5. Fuse Cover
6. Power Switch
7. Power Port—100 to 240 VAC

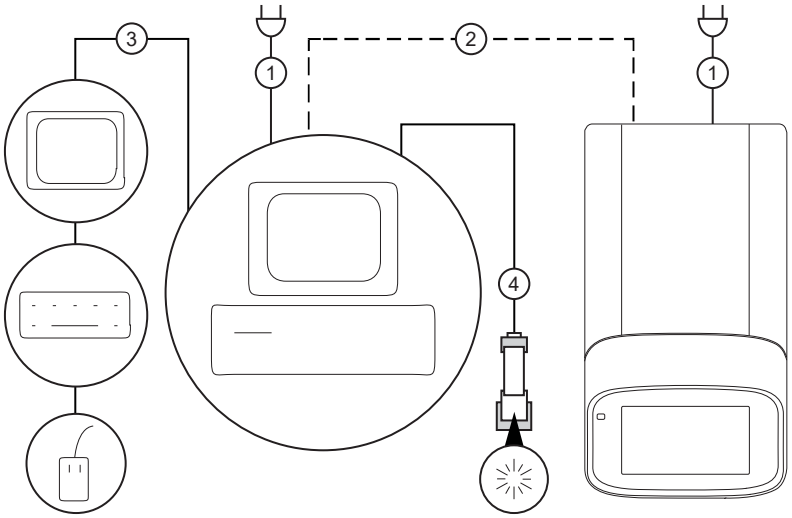


Figure 2 Instrument-to-computer connections (barcode scanner connected to the computer)

Minitower configuration

① Detachable power supply cord compatible with local power supply receptacle.
② Connection between the computer and the instrument.
③ Connection between the computer and the monitor, keyboard, and mouse.
④ Connection between the computer and the *(optional)* handheld barcode scanner.

Environmental requirements

Table 1 Environmental requirements

Condition	Acceptable range
Installation site	Indoor use only
Electromagnetic interference	Do not use this device in close proximity to sources of strong electromagnetic radiation (for example, unshielded intentional RF sources). Strong electromagnetic radiation may interfere with the proper operation of the device.
Altitude	Between sea level and 2000 m (6500 ft) above sea level
Operating conditions	• Humidity: 15–80% relative humidity (noncondensing) • Temperature: 15°C to 30°C (59°F to 86°F) **Note:** For optimal performance, avoid rapid or extreme fluctuations in room temperature.
Storage and transport conditions	• Humidity: 20–80% relative humidity (noncondensing) • Temperature: –30°C to 60°C (–22°F to 140°F)
Thermal output	During operation, the net thermal output, based on the actual current draw of the instrument, is expected to be approximately 960 W (3275 Btu/h).
Vibration	Ensure that the instrument is not adjacent to strong vibration sources, such as a centrifuge, pump, or compressor. Excessive vibration will affect instrument performance.

Table 1 Environmental requirements *(continued)*

Condition	Acceptable range
Pollution degree	The instrument has a Pollution Degree rating of II. The instrument may only be installed in an environment that has nonconductive pollutants such as dust particles or wood chips. Typical environments with a Pollution Degree II rating are laboratories and sales and commercial areas. The noise output of the instrument is ≤ 60 dB when running.
Other conditions	Ensure the instrument is located away from any vents that could expel particulate material onto the instrument components. Avoid placing the instrument and computer adjacent to heaters, cooling ducts, or in direct sunlight.

Electrical requirements

WARNING! For safety, the power outlet used for powering the instrument must be accessible at all times. See “Instrument clearances” on page 6 for information about the space needed between the wall and the instrument. In case of emergency, you must be able to immediately disconnect the main power supply to all the equipment. Allow adequate space between the wall and the equipment so that the power cords can be disconnected in case of emergency.

WARNING! Use of accessories, transducers, and cables other than those specified or provided by the manufacturer of the equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

- Electric receptacle with grounding capability
- Maximum power dissipation: ~960 W (not including computer and monitor)
- Mains AC line voltage tolerances must be up to ±10 percent of nominal voltage

Device	Rated voltage	Circuit required	Rated frequency	Rated power
Instrument	100–240 ±10% VAC[1]	10 A	50/60 Hz	960 W
Computer (laptop)	100–240 ±10% VAC	10 A	50/60 Hz	90 VA
Computer (desktop)	100–240 ±10% VAC	10 A	50/60 Hz	125 VA
Monitor				65 VA

[1] If the supplied power fluctuates beyond the rated voltage, a power line regulator may be required. High or low voltages can adversely affect the electronic components of the instrument.

Electrical protective devices

We recommend the use of electrical protective devices to protect the system in environments with large voltage and power fluctuations.

Recommended devices
Power line regulator
• 1.5-kVA power line regulator • Use in areas where the supplied power fluctuates in excess of ±10% of the normal voltage. • Power fluctuations can adversely affect the function of the instrument and computer. **Note:** A power line regulator monitors the input current and adjusts the power supplied to the instrument or computer. It does not protect against a power surge or failure.
Surge protector
• 10-kVA surge protector (line conditioner) • Use in areas with frequent electrical storms or near devices that are electrically noisy, such as refrigerators, air conditioners, or centrifuges. • Short-duration, high-voltage power fluctuations can abruptly terminate the function of, and thereby damage the components of, the computer and the instrument. **Note:** A dedicated line and ground between the instrument, computer, and the building's main electrical service can also prevent problems caused by power fluctuations.
Uninterruptible power supply (UPS)
• 1.5-kVA uninterruptible power supply (UPS) • Use in areas prone to power failure. • Power failures and other events that abruptly terminate the function of the instrument and computer can corrupt data and possibly damage the system. ⚠ **WARNING! PHYSICAL INJURY HAZARD.** Do not attempt to lift the UPS unit without assistance of at least two people. Improper lifting can cause painful and permanent back injury. Refer to the UPS manufacturer user guide for more information. **IMPORTANT!** A UPS provides power for a limited time. It is meant to delay the effects of a power outage, not to serve as a replacement power source. In the event of a power loss, power off the instrument and computer unless you expect to regain power within the battery life of the UPS.

Computer-to-instrument configuration

IMPORTANT! For HID use, the QuantStudio™ 5 Real-Time PCR System has been validated for a direct (computer-to-instrument) configuration. During installation, a Thermo Fisher Scientific service representative can set up only a direct configuration.

Direct configuration	
• A computer provided by Thermo Fisher Scientific with the HID Real-Time PCR Analysis Software	
• Computer-to-instrument connection: – Direct, wired connection between the computer and the instrument using an Ethernet cable	

Antivirus requirements

No antivirus software is provided because customer preferences and network requirements vary. You are responsible for installing antivirus software of your choice to protect the computer against viruses.

Compatible USB drive formats

The system supports USB drives with formats: FAT, FAT32, and NTFS.

IMPORTANT! Do not use a USB drive with exFAT formatting. It may cause file corruption.

Safety requirements

Safety practices

A safety representative from your facility must ensure that:

- Personnel establish and follow all applicable safety practices and policies to protect laboratory personnel from potential hazards.
- All applicable safety devices and equipment are available at all times.

Required safety equipment

Your laboratory has specific safety practices and policies designed to protect laboratory personnel from potential hazards that are present. Follow all applicable safety-related procedures at all times.

The following safety equipment and protection from hazards must be available at the installation site:

- Protection from any sources of hazardous chemicals, radiation (for example, lasers, radioisotopes, radioactive wastes, and contaminated equipment), and potentially infectious biological material that may be present in the area where the service representative will work.
- Appropriate fire extinguisher:
  - You are responsible for providing an appropriate fire extinguisher for use on or near the equipment.
  - The types and sizes of fire extinguishers shall be suitable for use on electrical and chemical fires as specified in current codes, regulations, and/or standards, and with approval of the Fire Marshall or other authority having jurisdiction.
  - The installation of appropriate fire extinguishers shall be in addition to other fire-protection systems and not as a substitute or alternative to them.
- Eyewash
- Safety shower
- Eye and hand protection
- Adequate ventilation, including vent line/fume hood, if applicable
- Biohazard waste container, if applicable
- First-aid equipment
- Spill cleanup equipment
- Applicable Safety Data Sheets (SDSs)

Receive and inspect the shipment

1. Verify that the items on the shipping list are the same items that you ordered at the time of purchase.
2. Carefully inspect the shipping containers. Report any damage to customer support. Record any damage or mishandling on the shipping documents.
3. Unpack and store the reagents and plates as specified.

Store the calibration plates

The following calibration plates are required for the installation:

- ABY™ Spectral Calibration Plate, 96-Well 0.2-mL (Cat. No. 4461591)
- JUN™ Spectral Calibration Plate, 96-Well 0.2-mL (Cat. No. 4461593)

Store the calibration plates at –20°C (–15°C to –25°C).

Move the instrument packages to the installation site

1. Clear the installation site of all unnecessary materials.
2. Move the instrument packages and other shipping containers to the installation site.

CAUTION! Do not tip the packaged instrument on end. Tipping may damage the instrument hardware and electronics.

3. Follow the pre-printed instructions on the instrument packaging to install the instrument.

CAUTION! **PHYSICAL INJURY HAZARD.** Do not attempt to lift or move the instrument without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques. Improper lifting can cause painful and permanent back injury. Depending on the weight, moving or lifting an instrument may require two or more people.

Note: After installation, keep the instrument packaging in case you need to relocate the instrument.

Materials for installation and operation

Installation materials

Ensure the following materials are available before installation of the instrument.

- Safety glasses, lab coats, and chemical-resistant, disposable gloves (powder-free)
- Easily accessible specified power outlet
- (*Optional*) Electrical protective devices (universal power supply unit, surge protector, and/or power line regulator)
- (*Optional*) External network connection
- Refrigerator or cold-room (4°C)
- Freezer (–20°C)
- Lint-free tissues
- Water

Operation materials

Additional supplies and consumables are necessary for routine operation of the instrument. For information about these additional supplies, see the user documentation provided with the instrument. Use only supplies as specified by Thermo Fisher Scientific.

Supplemental information

This section contains desktop software, networking, and Thermo Fisher™ Connect Platform information that is applicable to the QuantStudio™ 5 Real-Time PCR System, but has not been validated for HID use.

Install the HID Real-Time PCR Analysis Software

Computer requirements for the software

If you purchased a computer provided by Thermo Fisher Scientific, you can install the HID Real-Time PCR Analysis Software and use it to control the instrument.

Thermo Fisher Scientific does not provide technical support for customer-provided computers. Thermo Fisher Scientific provides limited support for Thermo Fisher Scientific-supplied computers that have been altered from their default configuration.

You can install the software on a customer-provided computer and use the software to create templates and analyze data. Minimum requirements for a customer-provided computer are:

- Processor (minimum: 2.9 GHz):
  - *(Recommended)* Intel™ Core™ i7 Quad Core™ CPU, 2.9 GHz
  - Intel™ Core™ i5 Quad Core™ CPU, 2.9 GHz
- 16 GB of RAM (The software may experience communication errors if run on computers with less than 1 GB.)
- One hard drive with at least 10 GB available
- 20/48X IDE CD-ROM drive
- USB v1.2
- Ethernet network interface adapter (10BASE-T) [Required only if you plan to connect the computer to a local area network (LAN).]
- Microsoft™ Windows™ 10 IoT Enterprise (LTSC 2019 or 2021)

Install the software

IMPORTANT! You must have Administrator privileges on the computer to install HID Real-Time PCR Analysis Software.

Install instructions are available in the Release Notes.

1. Obtain the appropriate upgrade version of the HID Real-Time PCR Analysis Software for your system.

Instrument	Upgrade version of the HID software
7500 Real-Time PCR System for Human Identification	v1.3 or v1.4
QuantStudio™ 5 Real-Time PCR System (with 0.2-mL 96-Well Sample Block) with firmware v1.3.x	v1.3
QuantStudio™ 5 Real-Time PCR System (with 0.2-mL 96-Well Sample Block) with firmware v1.5.1	v1.4

2. Insert the HID Real-Time PCR Analysis Software DVD into a computer.
3. Open the Release Notes, then follow the appropriate install instructions for your system.

Register to access the Thermo Fisher™ Connect Platform

The Thermo Fisher™ Connect Platform is an online dashboard that provides data analytics software applications and secure storage. Register online to access the analysis applications and 10 GB of free data storage. The first time you upload data from the instrument to the Connect Platform, an additional 10 GB of storage is provided.

1. Go to **thermofisher.com/connect**.
2. Follow the instructions on the screen to access an existing account or to create a new account.

Instrument-to-computer connections

Supported options for instrument and computer connections

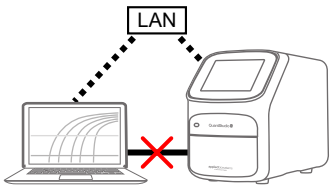
We support the following direct, networked (LAN–local area network), or Thermo Fisher™ Connect Platform configurations. Configurations other than those listed are not recommended. Select a configuration that meets the needs of your laboratory's instrument, software, and workflow requirements.

IMPORTANT! Do *not* connect *both* an Ethernet cable and the Wi-Fi module (Cat. No. A26774) to the instrument. Configuring the instrument for both wired and wireless connection can interfere with instrument operation.

Note: For detailed information about networking your instrument, see the *QuantStudio™ 3 and 5 Real-Time PCR Systems IT Checklist* (Pub. No. MAN0013738).

Direct configuration option	
• A computer provided by Thermo Fisher Scientific with the HID Real-Time PCR Analysis Software	
• Computer-to-instrument connection: – Direct, wired connection between the computer and the instrument using an Ethernet cable **IMPORTANT!** A direct instrument-to-computer connection *cannot* be combined with the LAN or the Connect Platform configurations.	

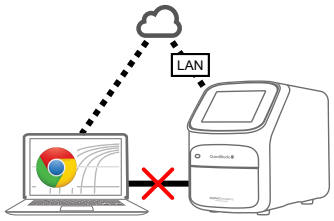
Networked configuration option	
• A computer provided by Thermo Fisher Scientific with the HID Real-Time PCR Analysis Software • The computer and instrument must have the same subnet mask within the same network.	

• Computer-to-LAN connection *(select an option)*:
  – Wired connection to the network using an Ethernet cable –*or* –
  – Wireless connection to the network
	

• Instrument-to-LAN connection *(select an option)*:
  – Wired connection to the network using an Ethernet cable –*or* –
  – Wireless connection to the network using the instrument Wi-Fi module	

Connect Platform configuration option
• Internet access and a computer with the Chrome™ web browser to access the Connect Platform

(continued)

Connect Platform configuration option	
• Computer-to-Connect Platform connection *(select an option)*: – Wired connection to the internet using an Ethernet cable –*or* – – Wireless connection to the internet	
• Instrument-to-Connect Platform connection *(select an option)*: – Wired connection to the network using an Ethernet cable –*or* – – Wireless connection to the network using the instrument Wi-Fi module	

Networked (local area network– LAN) configuration

Note: Networked (LAN) configurations can be internal configurations that do not require internet access. However, if you are networking an instrument for Thermo Fisher™ Connect Platform access, the LAN must have internet access.

IMPORTANT! For all wired configurations using an Ethernet cable, we support DHCP or static IP only. Proxy servers are not supported.

- A networked computer can *detect* all instruments that are on the same network and subnet mask.
  However, the computer can only *control* one instrument at a time.
- All networked computers can *detect* each instrument that is on the same network and subnet mask.
  However, the instrument can only be *controlled* by one computer at a time.

Note: For detailed information about networking your instrument, see the *QuantStudio™ 3 and 5 Real-Time PCR Systems IT Checklist* (Pub. No. MAN0013738).

Network requirements

The instrument:

- Is factory-configured for IPv4 TCP/IP communication and includes an Ethernet adapter (100/1,000 Mbps) with an RJ45-type connector for integrating the device into a local area network (LAN).
- Can alternatively be configured for wireless networking (High Power USB WiFi Module required, sold separately as an optional accessory).

The instrument can be configured for *either* wired or wireless networking, not both.

If a Thermo Fisher Scientific service representative is to install the instrument:

- If the instrument will be connected to a LAN, an active, tested network jack must be in place before the scheduled installation date.
- A representative from your information technologies department must be available during the installation to help connect the instrument to your network.

Required materials to network the instrument:

- Wired—Ethernet cable of sufficient length with RJ45 connectors
  - CAT5 cable for a 100 Mbps network connection
  - CAT5e or CAT6 cable for a 1,000 Mbps network connection

  –or–
- Wireless—High Power USB WiFi Module (Cat. No. A26774, sold separately)

Firewall ports that must be open

Ports	Condition
80/443	Standard ports for instrument-to-Thermo Fisher™ Connect Platform and computer-to-Thermo Fisher™ Connect Platform connections
mDNS, 7000	QuantStudio™ 5 Real-Time PCR System (with 0.2-mL 96-Well Sample Block) with firmware v1.3.x Instrument-to-computer connection
mDNS, 7443	QuantStudio™ 5 Real-Time PCR System (with 0.2-mL 96-Well Sample Block) with firmware v1.5.1 Instrument-to-computer connection
mDNS, 5353	Instrument discovery

Documentation and support

Related documentation

Document	Pub. No.
QuantStudio™ 5 Real-Time PCR Instrument Site Preparation Guide (for Human Identification)	MAN0016701
QuantStudio™ 5 Real-Time PCR Instrument User Guide (for Human Identification)	MAN0017162
HID Real-Time PCR Analysis Software User Guide	MAN0009819

Customer and technical support

For support:

- **In North America**—Send an email to **HIDTechSupport@thermofisher.com**, or call **888-821-4443 option 1**.
- **Outside North America**—Contact your local support office.

For the latest services and support information for all locations, go to **thermofisher.com/support** to obtain the following information.

- Worldwide contact telephone numbers
- Product support
- Order and web support
- Safety Data Sheets (SDSs; also known as MSDSs)

Additional product documentation, including user guides and Certificates of Analysis, are available by contacting Customer Support.

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

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Revision history: MAN0016701 B.0 (English)

Revision	Date	Description
B.0	9 November 2022	• Updated the computer requirements and installation instructions for the HID Real-Time PCR Analysis Software (page 15). • For the instrument-to-computer connection, added firewall port 7443 (for instruments with firmware v1.5.1). • Updated "Related documentation" on page 19.
A.0	13 March 2017	New document for the QuantStudio™ 5 Real-Time PCR Instrument for Human Identification.