January 2023

QIAcube® Connect User Manual

Sample to Insight

Contents

1 Introduction

Thank you for choosing the QIAcube Connect. We are confident it will become an integral part of your laboratory. Before using the QIAcube Connect, it is essential that you read this user manual carefully and pay attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation of the instrument and to maintain the instrument in a safe condition.

1.1 About this user manual

This user manual provides information about the QIAcube Connect in the following sections:

1. Introduction
2. Safety Information
3. General Description
4. Installation Procedures
5. Operating Procedures
6. Cleaning and Maintenance
7. Troubleshooting
8. Glossary
9. Appendix A – Technical data
10. Appendix B – QIAcube Connect Accessories
11. Appendix C – Consignes de sécurité (Safety Information in French)
12. Appendix D – Sicherheitshinweise (Safety Information in German)
13. **Error! Reference source not found.**

1.1.1 Technical assistance

At QIAGEN®, we pride ourselves on the quality and availability of our technical support. Our Technical Services Departments are staffed by experienced scientists with extensive practical and theoretical expertise in molecular biology and the use of QIAGEN products. If you have any questions or experience any difficulties regarding the QIAcube Connect or QIAGEN products in general, do not hesitate to contact us.

QIAGEN customers are a major source of information regarding advanced or specialized uses of our products. This information is helpful to other scientists as well as to the researchers at QIAGEN. We therefore encourage you to contact us if you have any suggestions about product performance or new applications and techniques.

For technical assistance and more information, please see our Technical Support Center at **www.qiagen.com/support/technical-support** or call one of the QIAGEN Technical Service Departments or local distributors (see back cover or visit **www.qiagen.com**).

1.1.2 Policy statement

It is the policy of QIAGEN to improve products as new techniques and components become available. QIAGEN reserves the right to change specifications at any time.

To produce useful and appropriate documentation, we appreciate your comments on this user manual. Please contact QIAGEN Technical Services.

1.2 Intended use of the QIAcube Connect

QIAcube Connect is designed to perform fully automated purification of nucleic acids and proteins in molecular biology applications. The system is intended for use by professional users trained in molecular biological techniques and the operation of the QIAcube Connect.

The QIAcube Connect is intended to be used only in combination with QIAGEN kits indicated for use with the QIAcube Connect for the applications described in the kit handbooks.

1.3 Requirements for QIAcube Connect users

The table below covers the general level of competence and training necessary for transportation, installation, use, maintenance, and servicing of the QIAcube Connect.

Task	Personnel	Training and experience
Delivery	No special requirements	No special requirements
Installation, routine use and maintenance	Laboratory technicians or equivalent	Appropriately trained and experienced personnel familiar with use of computers and automation in general
Servicing	QIAGEN Field Service Specialists only	Trained and authorized by QIAGEN

2 Safety Information

Before using the QIAcube Connect, it is essential that you read this user manual carefully and pay attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation of the instrument and to maintain the instrument in a safe condition.

Note: Translations of the Safety Information in French and German are available in Appendix C – Consignes de sécurité and Appendix D – Sicherheitshinweise.

The following types of safety information appear in this manual.

WARNING 	The term WARNING is used to inform you about situations that could result in **personal injury** to you or other persons. Details about these circumstances are given in a box like this one.

CAUTION 	The term CAUTION is used to inform you about situations that could result in **damage to the instrument** or other equipment. Details about these circumstances are given in a box like this one.

The advice given in this manual is intended to supplement, not supersede, the normal safety requirements prevailing in the user's country.

2.1 Proper use

WARNING 	**Risk of personal injury and material damage** **[W1]** Improper use of the QIAcube Connect may cause personal injuries or damage to the instrument. The QIAcube Connect must only be operated by qualified personnel who have been appropriately trained. Servicing of the QIAcube Connect must only be performed by a QIAGEN Field Service specialist.

Perform the maintenance as described in section 6 Cleaning and Maintenance . QIAGEN charges for repairs that are required due to incorrect maintenance.

WARNING 	**Risk of personal injury and material damage** **[W2]** The QIAcube Connect is too heavy to be lifted by one person. To avoid personal injury or damage to the instrument, do not lift the instrument alone.

WARNING 	**Risk of personal injury and material damage** [W3] Do not attempt to move the QIAcube Connect during operation.

CAUTION 	**Damage to the instrument** [C1] Avoid spilling water or chemicals onto the QIAcube Connect. Damage caused by water or chemical spillage will void your warranty.

In case of emergency, power OFF the QIAcube Connect at the power switch located in front of the instrument and unplug the power cord from the power outlet.

CAUTION 	**Damage to the instrument** [C2] Only use QIAGEN spin columns and QIAcube Connect specific consumables with the QIAcube Connect. Damage caused by use of other types of spin columns or chemistries will void your warranty.

WARNING 	**Risk of personal injury and material damage** [W4] Do not use damaged rotor adapters. The rotor adapters can only be used once. High g forces exerted in the centrifuge can cause damage to re-used rotor adapters.

CAUTION 	**Damage to the instrument** [C3] Empty the tip disposal container prior to use to prevent a tip jam in the waste drawer. Failure to empty the waste container may block the robotic arm that could cause run failure or instrument damage.

WARNING 	**Risk of personal injury and material damage** [W5] To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

CAUTION 	**Damage to the instrument** [C4] Only use the correct volume of liquids. Exceeding the recommended volume of liquids may damage the centrifuge rotor or instrument.

WARNING 	**Risk of fire or explosion** [W6] When using ethanol or ethanol-based liquids on the QIAcube Connect, handle such liquids carefully and in accordance with the required safety regulations. If liquid has been spilled, wipe it off and leave the QIAcube Connect hood open to allow flammable vapors to disperse.

WARNING 	**Risk of explosion** **[W7]** The QIAcube Connect is intended for use with reagents and substances supplied with QIAGEN kits or other than outlined in respective Information for use. Use of other reagents and substances may lead to fire or explosion.

If hazardous material is spilled on or inside the QIAcube Connect, the user is responsible for carrying out appropriate decontamination.

Note: Do not place items on top of the QIAcube Connect hoods.

CAUTION 	**Damage to the instrument** **[C5]** Do not lean against the touchscreen when it is pulled out.

2.2 Electrical safety

Note: Disconnect the line power cord from the power outlet before servicing.

WARNING 	**Electrical hazard** **[W8]** Any interruption of the protective conductor (earth/ground lead) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. **Lethal voltages inside the instrument** When the instrument is connected to line power, terminals may be live and opening covers or removing parts is likely to expose live parts.

WARNING 	**Damage to electronics** **[W9]** Before powering ON the instrument, make sure that the correct supply voltage is used. Use of incorrect supply voltage may damage the electronics. To check the recommended supply voltage, refer to the specifications indicated in the type plate of the instrument.

WARNING 	**Risk of electric shock** **[W10]** Do not open any panels on the QIAcube Connect. **Risk of personal injury and material damage** Only perform maintenance that is specifically described in this user manual.

To ensure satisfactory and safe operation of the QIAcube Connect, follow these guidelines:

- The line power cord must be connected to a line power outlet that has a protective conductor (earth/ground).
- Do not adjust or replace internal parts of the instrument.
- Do not operate the instrument with any covers or parts removed.
- If liquid has spilled inside the instrument, power OFF the instrument, disconnect it from the power outlet, and contact QIAGEN Technical Services.

If the instrument becomes electrically unsafe, prevent other personnel from operating it, and contact QIAGEN Technical Services.

The instrument may be electrically unsafe when:

- It or the line power cord appears to be damaged.
- It has been stored under unfavorable conditions for a prolonged period.
- It has been subjected to severe transport stresses.
- Liquids come in contact directly with electrical components of the QIAcube Connect.

2.3 Environment

Operating conditions

WARNING 	**Explosive atmosphere** **[W11]** The QIAcube Connect is not designed for use in an explosive atmosphere.

CAUTION 	**Damage to the instrument** **[C6]** Direct sunlight may bleach parts of the instrument and cause damage to plastic parts. The QIAcube Connect must be located out of direct sunlight.

2.4 Biological safety

Specimens and reagents containing materials from humans should be treated as potentially infectious. Use safe laboratory procedures as outlined in publications such as Biosafety in Microbiological and Biomedical Laboratories, HHS (**www.cdc.gov/biosafety**).

Samples

Samples may contain infectious agents. You should be aware of the health hazard presented by such agents and should use, store, and dispose of such samples according to the required safety regulations.

WARNING 	**Samples containing infectious agents** **[W12]** Some samples used with this instrument may contain infectious agents. Handle such samples with the greatest of care and in accordance with the required safety regulations. Always wear safety glasses, 2 pairs of gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe, and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents as defined in the applicable Material Safety Data Sheets (MSDSs) or OSHA*, ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

2.5 Chemicals

WARNING 	**Hazardous chemicals** **[W13]** Some chemicals used with this instrument may be hazardous or may become hazardous after completion of the protocol run. Always wear safety glasses, gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are not exposed to hazardous levels of toxic substances (chemical or biological) as defined in the applicable Material Safety Data Sheets (MSDSs) or OSHA,* ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

* OSHA : Occupational Safety and Health Administration (United States of America).
† ACGIH : American Conference of Government Industrial Hygienists (United States of America).
‡ COSHH : Control of Substances Hazardous to Health (United Kingdom).

Toxic fumes

If working with volatile solvents or toxic substances, you must provide an efficient laboratory ventilation system to remove vapors that may be produced.

WARNING 	**Toxic fumes** **[W14]** Do not use bleach to clean or disinfect the QIAcube Connect. Bleach in contact with salts from the buffers can produce toxic fumes.

WARNING 	**Toxic fumes** **[W15]** Do not use bleach to disinfect used labware. Bleach in contact with salts from the buffers used can produce toxic fumes.

2.6 Waste disposal

Used labware, such as sample tubes, QIAGEN spin columns, filter-tips, buffer bottle and enzyme tubes, or rotor adapters, may contain hazardous chemicals or infectious agents from the purification process. These hazardous wastes must be collected and disposed of properly according to local safety regulations.

For more information about how to dispose of the QIAcube Connect, see section 9.6 Waste Electrical and Electronic Equipment (WEEE).

WARNING 	**Hazardous chemicals and infectious agents** **[W16]** The waste may contain toxic material and must be disposed of properly. Refer to your local safety regulations for proper disposal procedures.

2.7 Mechanical hazards

The hood of the QIAcube Connect must remain closed during operation of the instrument. Only open the hood when instructed to do so by the instruction for use.

While loading the worktable, always stand clear of the instrument. Do not lean on the worktable when the robotic arm of the instrument is moving to reach loading position with its lid open. Wait until the robotic arm completed its movements before you start to load or unload.

WARNING 	**Moving parts** **[W17]** Avoid contact with moving parts during operation of the QIAcube Connect. Under no circumstances should you place your hands under the robotic arm when it is lowering. Do not attempt to move any tip racks or tubes whilst the instrument is operating.

WARNING 	**Moving parts** **[W18]** To avoid contact with moving parts during operation of the QIAcube Connect, the instrument must be operated with the hood closed. If the hood sensor or lock is not functioning correctly, contact QIAGEN Technical Services.

2.7.1 Centrifuge

Make sure that the rotor and buckets are installed correctly. All buckets must be mounted before starting a protocol run, regardless of the number of samples to be processed. If the rotor or buckets show signs of mechanical damage or corrosion, do not use the QIAcube Connect; contact QIAGEN Technical Services.

CAUTION 	**Damage to the instrument** **[C7]** The QIAcube Connect must not be used if the centrifuge lid is broken, or if the lid lock is damaged. Make sure that no loose material is inside the centrifuge during operation. Make sure that the rotor is installed correctly and that all buckets are properly mounted, regardless of the number of samples to be processed. Load the rotor only as instructed by the software. Only use rotors, buckets, and consumables designed for use with the QIAcube Connect. Damage caused by use of other consumables will void your warranty. We recommend replacing the centrifuge rotor and buckets after 20000 cycles, which is equivalent to 9 years of usage with two runs per day for 220 days each year. For more information contact QIAGEN Technical Services.

In case of breakdown caused by power failure, the centrifuge lid can be opened manually to remove the samples (see section 7.3.2).

WARNING 	**Moving parts** **[W19]** In case of breakdown caused by power failure, remove the power cord and wait 10 minutes before attempting to manually open the centrifuge lid.

CAUTION 	**Damage to the instrument** **[C8]** After a power failure, do not move the z-module (robotic arm) manually in front of the instrument. Damage may occur if the QIAcube Connect hood is closed and collides with the z-module.

WARNING 	**Risk of personal injury and material damage** **[W20]** Raise the centrifuge lid carefully. The lid is heavy and may cause injury if it falls.

CAUTION 	**Risk of overheating** **[C9]** To ensure proper ventilation, maintain a minimum clearance of 10 cm at the sides and rear of the QIAcube Connect. Slits and openings that ensure the ventilation of the QIAcube Connect must not be covered.

2.8 Heat hazard

The QIAcube Connect worktable contains a heated shaker.

WARNING 	**Hot surface** **[W21]** The shaker can reach temperatures of up to 70°C (158°F). Avoid touching it when it is hot. Carefully remove the samples after a run.

2.9 Maintenance safety

WARNING/ CAUTION 	**Risk of personal injury and material damage** **[W22]** Only perform maintenance that is specifically described in this user manual.

WARNING 	**Risk of explosion** **[W23]** When cleaning the QIAcube Connect with alcohol-based disinfectant, leave the QIAcube Connect hood open to allow flammable vapors to disperse. Only clean the QIAcube Connect when worktable components have cooled down.

WARNING 	**Risk of fire** **[W24]** Do not allow cleaning fluid or decontamination agents to come into contact with the electrical parts of the QIAcube Connect.

WARNING 	**Risk of personal injury and material damage** **[W25]** To prevent the rotor nuts from loosening during operation of the centrifuge, securely tightened the nuts using the rotor key supplied with QIAcube Connect.

WARNING 	**UV irradiation hazard** **[W26]** A mechanical lock ensures that the hood must be closed for operation of the UV LED. If the hood sensor or lock is not functioning correctly, contact QIAGEN Technical Services.

WARNING 	**Risk of personal injury and material damage** **[W27]** Make sure that lids from spin columns and 1.5 mL microcentrifuge tubes are in the correct position and pushed all the way down to the bottom of the slots on the sides of the rotor adapter. Incorrectly positioned lids can break off during centrifugation.

WARNING 	**Risk of personal injury and material damage** **[W28]** Be sure the lid is completely removed from the spin column. Spin columns with partially removed lids may not be removed properly from the rotor, causing the protocol run to crash.

CAUTION 	**Damage to the instrument** **[C10]** Do not use bleach, solvents, or reagents containing acids, alkalis or abrasives to clean QIAcube Connect.

CAUTION 	**Damage to the instrument** **[C11]** Do not use spray bottles containing alcohol or disinfectant to clean surfaces of the QIAcube Connect. Spray bottles should be used only to clean items that have been removed from the worktables.

2.10 Radiation safety

WARNING 	**Risk of personal injury** **[W29]** Do not expose your skin to UV-C light from the UV LED lamp.

WARNING 	**Risk of personal injury** **[W30]** Hazard Level 2 laser light: Do not stare into the light beam when using handheld bar code scanner.

2.11 Symbols on the QIAcube Connect

Symbol	Location	Description
	Next to the Shaker	Heat hazard – the temperature of the shaker can reach up to 70°C (158°F).
	Near the centrifuge; near the robotic arm	Mechanical hazard — avoid contact with moving parts.
	On the instrument, near bottle rack	Fire hazard – usage of ethanol in bottle rack.
	In front of worktable	Biological hazard – some samples used with this instrument may contain infectious agents and must be handled with gloves.
	Inside the waste drawer	Biohazard — the waste drawer may be contaminated with biohazardous material and must be handled with gloves.
	Type plate on the back of the instrument	CE mark for European Conformity
	Type plate at the back of the instrument	CSA listing mark for Canada and the USA
	Type plate on the back of the instrument	FCC mark of the United States Federal Communications Commission
	Type plate on the back of the instrument	RCM mark for Australia and New Zealand
	Type plate on the back of the instrument	RoHS mark for China (the restriction of the use of certain hazardous substances in electrical and electronic equipment)
	Type plate on the back of the instrument	Waste Electrical and Electronic Equipment (WEEE) mark for Europe
	Type plate on the back of the instrument	Legal manufacturer
	At the back of the instrument	Consult instructions for use

3 General Description

The QIAcube Connect performs fully automated processing of up to 12 samples. The QIAcube Connect is designed to automate selected QIAGEN kits. The QIAcube Connect controls integrated components, including a centrifuge, heated shaker, pipetting system, UV LED and robotic gripper.

The QIAcube Connect is preinstalled with various protocols for processing QIAGEN spin columns for purification of RNA, genomic DNA, plasmid DNA, viral nucleic acids or proteins, plus DNA and RNA cleanup. The user selects a protocol using the touchscreen and loads labware, samples, and reagents onto the QIAcube Connect worktable. The user then closes the instrument hood and starts the protocol, which provides all necessary commands for sample lysis and purification using QIAGEN spin columns. A fully automated load check helps to ensure correct loading of the worktable.

The range of protocols available is continually expanding, and additional QIAGEN protocols can be downloaded free of charge at **www.qiagen.com/QIAcubeProtocols**.

Offering an augmented user interface, users stay connected to their instrument through the built-in screen and also remotely with the tablet and QIAcube Connect App of the associated Connectivity Package (see section 10 Appendix B - QIAcube Connect Accessories), enabling quick response times and ability to monitor runs while being away from the instrument.

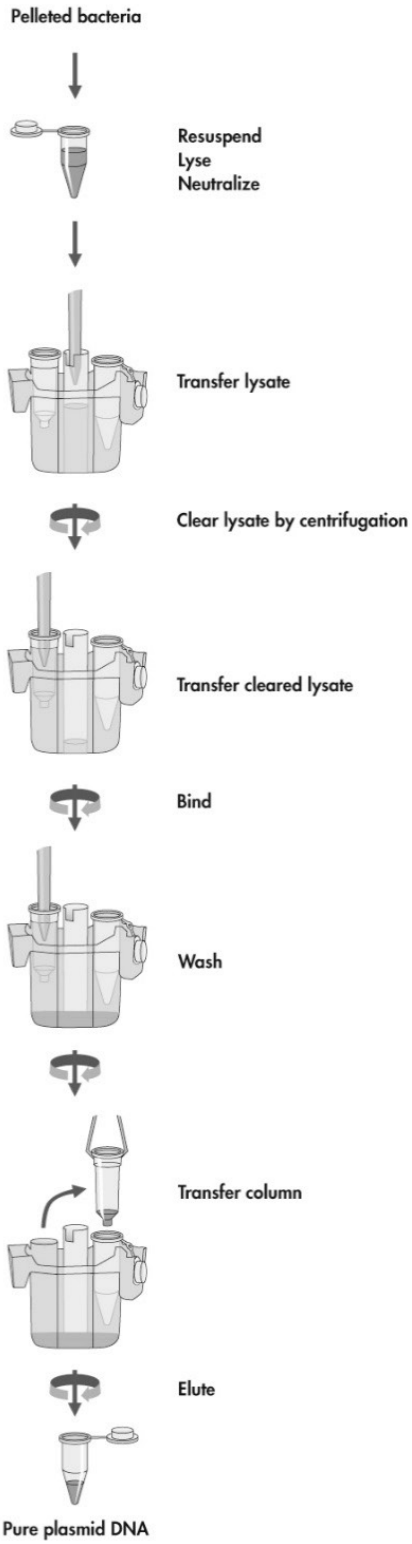
3.1 QIAcube Connect principle

Sample preparation using the QIAcube Connect follows the same steps as the manual procedure (i.e., lyse, bind, wash and elute). Depending on chosen application, the procedure may be alternated, or steps may not be required. No change in purification chemistry is required as you simply continue to use trusted QIAGEN spin-column kits.

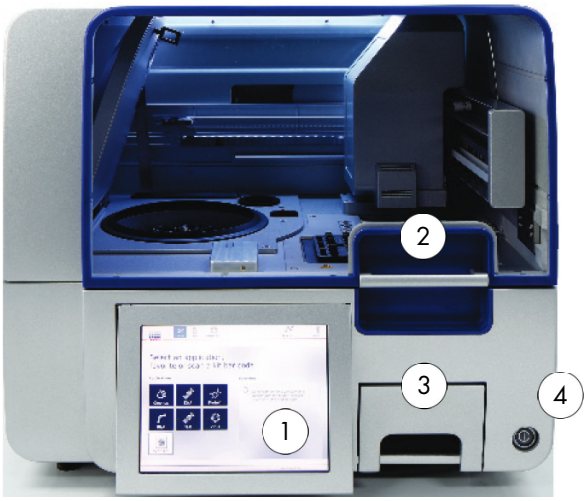
1. Samples are lysed in the orbital shaker, which can be heated if required by the protocol.
2. Each lysate is transferred to a spin column in a rotor adapter. If the lysate needs to be homogenized or cleared, it is first transferred to the middle position of the rotor adapter.
3. Nucleic acids or proteins bind to the silica membrane or purification resin of the QIAGEN spin column and are washed to remove contaminants.
4. The spin column is transferred to a microcentrifuge tube for elution of purified nucleic acids or protein.

For an example workflow using a QIAGEN spin-column kit, see the flowchart on the next page.

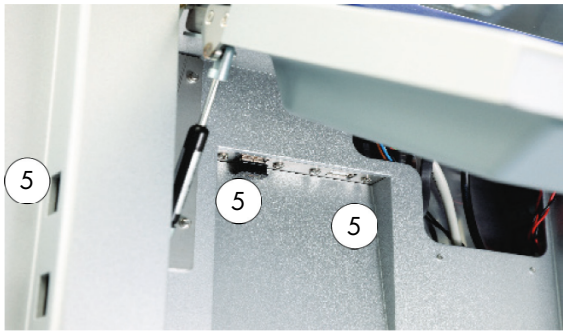
QIAprep Miniprep Standard Procedure



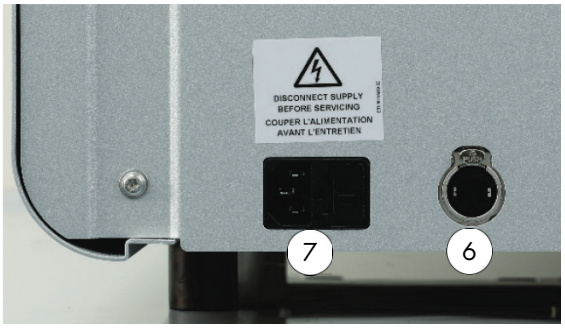
3.2 External features of the QIAcube Connect



Front view of the QIAcube Connect



Pulled-out touchscreen



Rear view of QIAcube Connect

Rear view of QIAcube Connect

1	Touchscreen	5	2 USB ports on the left side of the touchscreen; 2 USB ports behind the touchscreen (Wi-Fi module plugged into 1 USB port)
2	Hood	6	RJ-45 Ethernet port
3	Waste drawer	7	Power cord socket
4	Power switch	8	Cooling air outlet
		9	External barcode scanner (not depicted)

Touchscreen

The QIAcube Connect is controlled using a swivel-mounted touchscreen. The touchscreen allows the user to operate the instrument and to guide the user through worktable setup. During sample processing, the touchscreen shows the protocol status and remaining time.

Pulled-out touchscreen

Hood

The QIAcube Connect hood protects users from the moving robotic arm and from potentially infectious material placed on the worktable. The hood can be manually opened to gain access to the worktable. During operation of the QIAcube Connect, the hood must remain closed and should only be opened when instructed to do so by the software. Therefore, a hood lock has been implemented to avoid inappropriate opening.

WARNING 	**Moving parts** **[W18]** To avoid contact with moving parts during operation of the QIAcube Connect, the instrument must be operated with the hood closed. If the hood sensor or lock is not functioning correctly, contact QIAGEN Technical Services.

Power switch

The power switch is located at the front right of the QIAcube Connect and is used to power ON and OFF the instrument.

RJ-45 Ethernet port

The RJ-45 Ethernet port located at the back of the instrument beside the power cord socket, is only used to connect the QIAcube Connect to local area network via cable.

USB ports

The QIAcube Connect has four USB ports. Two are located on the left of the touchscreen and two are located behind the touchscreen.

The USB ports located on the left of the touchscreen allow connection of the QIAcube Connect to a USB flash drive. Data files, such as support package, protocols or report files, can be transferred via the USB port from the QIAcube Connect to the USB flash drive. The USB ports can also be used to plug in the supplied external barcode scanner.

USB ports located below the touchscreen, allow insertion of a Wi-Fi adapter to enable Wi-Fi connection to a local network.

Important: Use only the USB flash drive provided by QIAGEN. Do not connect other USB flash drive devices to USB ports.

Important: Do not remove the USB flash drive while downloading or transferring data or software to or from the instrument.

Important: Use of a Wi-Fi adapter is only allowed for certified countries. Refer to **www.qiagen.com/QIAcubeConnectResources** for a list of certified countries. Always turn off the QIAcube Connect in order to plug or unplug the Wi-Fi USB device. Plug-and-play of the Wi-Fi USB device while the instrument is turned on is not supported.

Waste drawer

Used disposable filter-tips are discarded through two slots in the worktable and collected in the waste drawer. Used columns (e.g., QIAshredder columns) are also discarded into this drawer.

CAUTION 	**Damage to the instrument** **[C3]** Empty the tip disposal container prior to use to prevent a tip jam in the waste drawer. Failure to empty the waste container may block the robotic arm that could cause run failure or instrument damage.

WARNING 	**Hazardous chemicals and infectious agents** **[W16]** The waste may contain toxic material and must be disposed of properly. Refer to your local safety regulations for proper disposal procedures.

WARNING 	**Hazardous chemicals** **[W13]** Some chemicals used with this instrument may be hazardous or may become hazardous after completion of the protocol run. Always wear safety glasses, gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are not exposed to hazardous levels of toxic substances (chemical or biological) as defined in the applicable Material Safety Data Sheets (MSDSs) or OSHA*, ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

WARNING 	**Samples containing infectious agents** **[W12]** Some samples used with this instrument may contain infectious agents. Handle such samples with the greatest of care and in accordance with the required safety regulations. Always wear safety glasses, 2 pairs of gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe, and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents as defined in the applicable Material Safety Data Sheets (MSDSs) or OSHA*, ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

Power cord socket

The power cord socket is located at the rear right of the QIAcube Connect and allows connection of the QIAcube Connect to a power outlet via the supplied power cord.

WARNING 	**Electrical hazard** **[W8]** Any interruption of the protective conductor (earth/ground lead) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. **Lethal voltages inside the instrument** When the instrument is connected to line power, terminals may be live and opening covers or removing parts is likely to expose live parts.

* OSHA : Occupational Safety and Health Administration (United States of America).
† ACGIH : American Conference of Government Industrial Hygienists (United States of America).
‡ COSHH : Control of Substances Hazardous to Health (United Kingdom).

WARNING 	**Damage to electronics** **[W9]** Before powering ON the instrument, make sure that the correct supply voltage is used. Use of incorrect supply voltage may damage the electronics. To check the recommended supply voltage, refer to the specifications indicated in the type plate of the instrument.

WARNING 	**Risk of electric shock** **[W10]** Do not open any panels on the QIAcube Connect. **Risk of personal injury and material damage** Only perform maintenance that is specifically described in this user manual.

Cooling air outlet

Cooling air outlets are located at the rear left side of the QIAcube Connect and allow cooling of the internal components of the QIAcube Connect.

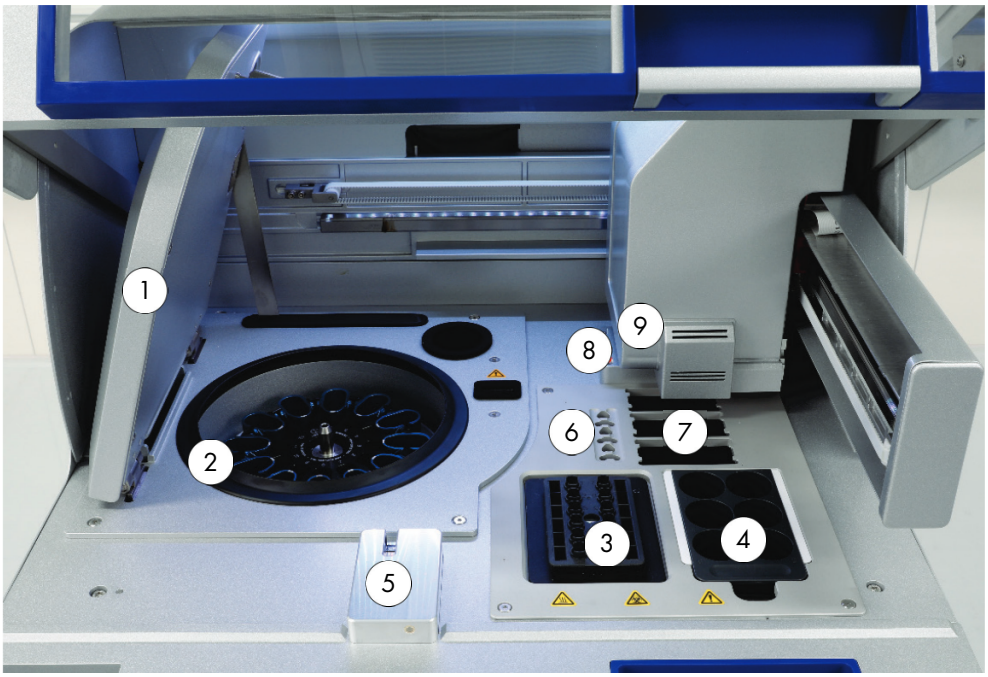
CAUTION 	**Risk of overheating** **[C9]** To ensure proper ventilation, maintain a minimum clearance of 10 cm at the sides and rear of the QIAcube Connect. Slits and openings that ensure the ventilation of the QIAcube Connect must not be covered.

External barcode scanner

The QIAcube Connect is equipped with a 2D handheld barcode scanner to allow kit bar code and sample bar code scanning.

WARNING 	**Risk of personal injury** **[W30]** Hazard Level 2 laser light: Do not stare into the light beam when using handheld bar code scanner.

3.3 Internal features of the QIAcube Connect



Internal view of the QIAcube Connect.

1	Centrifuge lid	**6**	Microcentrifuge tube slots
2	Centrifuge	**7**	3 Slots for tip racks
3	Shaker	**8**	Disposal slots for tips and columns
4	Reagent bottle rack	**9**	Robotic arm (includes gripper, pipetting system, optical sensor, ultrasonic sensor, and UV LED)
5	Tip sensor and hood lock		

Centrifuge

The centrifuge is equipped with 12 swing-out buckets, each of which can hold a disposable rotor adapter. Up to 12 samples can be processed per run. For ease of use and high process safety, a grey line marks the side of the bucket that must face toward the center of the rotor. All centrifuge buckets must be mounted before starting a run, regardless of the number of samples to be processed. Be sure to follow the loading instructions provided by the software to ensure correct loading of the centrifuge.

The centrifuge can also be operated individually via the touchscreen (refer to section 6.6.3 Operating the centrifuge after cleaning on page 112).

Note: Be sure to follow the centrifuge loading instructions provided by the software.

WARNING 	**Risk of personal injury and material damage** **[W5]** To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

WARNING 	**Risk of personal injury and material damage** **[W20]** Raise the centrifuge lid carefully. The lid is heavy and may cause injury if it falls.

Shaker

The heated orbital shaker enables fully automated lysis of up to 12 samples. Two kinds of shaker adapters are available for 2 mL microcentrifuge tubes and 2 ml screw-cap tubes. Sample tubes are placed into a rack that fits onto the shaker adapter. The lid of each microcentrifuge tube or shaker rack plug of each screw-cap tube is held in a slot at the edge of the shaker rack. This ensures that microcentrifuge tubes cannot be displaced during sample processing and allows shaker loading to be checked. The shaker can also be operated individually via the touchscreen (see section 5.1).

Shaker rack with 2 mL microcentrifuge tubes

Note: For shaker loading follow instructions provided by the software.

WARNING 	**Risk of personal injury and material damage** **[W5]** To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

WARNING 	**Hot surface** **[W21]** The shaker can reach temperatures of up to 70°C (158°F). Avoid touching it when it is hot. Carefully remove the samples after a run.

Reagent bottle rack

The reagent bottle rack holds up to six 30 mL QIAcube Connect specific reagent bottles and, for ease of use and high process safety, fits onto the QIAcube Connect worktable only in the correct orientation. Liquid is aspirated from the bottles by the pipetting system. A labeling strip should be attached to the reagent bottle rack. For increased convenience and ease of use, the labeling strip fits only in the correct orientation on the reagent bottle rack. The use of the labeling strip ensures that the rack is correctly positioned on the worktable for liquid-level detection.

Note: Reagent bottles designed for use with the QIAcube Connect must be used. Otherwise, errors may occur during liquid detection.

Reagent bottle rack with white labeling strips at the sides

WARNING 	**Risk of fire or explosion** **[W6]** When using ethanol or ethanol-based liquids on the QIAcube Connect, handle such liquids carefully and in accordance with the required safety regulations. If liquid has been spilled, wipe it off and leave the QIAcube Connect hood open to allow flammable vapors to disperse.

WARNING 	**Risk of explosion** **[W7]** The QIAcube Connect is intended for use with reagents and substances supplied with QIAGEN kits or other than outlined in respective Information for use. Use of other reagents and substances may lead to fire or explosion.

WARNING 	**Risk of personal injury and material damage** **[W5]** To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

WARNING 	**Hot surface** **[W21]** The shaker can reach temperatures of up to 70°C (158°F). Avoid touching it when it is hot. Carefully remove the samples after a run.

Tip sensor

During sample preparation, the tip sensor checks that the tip adapter has picked up a tip and checks whether it is a 200 µL or a 1000 µL type filter-tip.

Microcentrifuge tube slots

In addition to the 12 tubes that the shaker can accommodate, up to 3 additional microcentrifuge tubes can be used in the microcentrifuge accessory position. These slots are used by applications in which, for example, proteinase K or another enzyme is required for the purification protocol.

Tip rack slots

Three tip racks can be placed on the QIAcube Connect worktable. Tips can be purchased in prefilled tip racks holding 200 µL filter-tips or 1000 µL filter tips, regular or wide-bore.

Note: Only filter-tips designed for use with the QIAcube Connect must be used.

Disposal slots for tips and columns

Disposable filter-tips are alternately discarded through each of the round-shaped tip disposal slots into the waste drawer. This prevents discarded tips from piling up in the waste drawer.

Used columns (e.g., QIAshredder columns) are discarded through the square-shaped disposal slot into the waste drawer.

Robotic arm

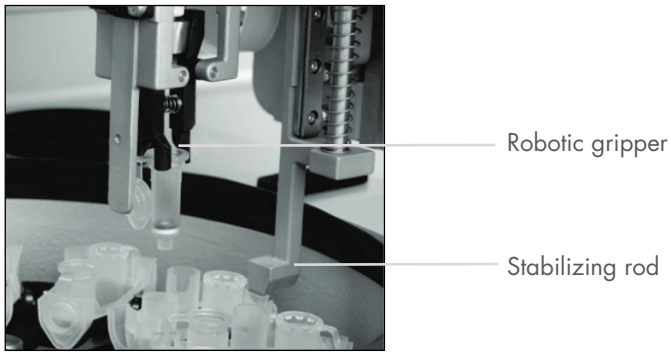
The robotic arm provides accurate and precise positioning of the robotic gripper and pipetting system on the QIAcube Connect worktable and includes an optical and ultrasonic sensor, as well as a UV LED.

WARNING	**Moving parts** **[W18]** To avoid contact with moving parts during operation of the QIAcube Connect, the instrument must be operated with the hood closed. If the hood sensor or lock is not functioning correctly, contact QIAGEN Technical Services.

WARNING	**Moving parts** **[W17]** Avoid contact with moving parts during operation of the QIAcube Connect. Under no circumstances should you place your hands under the robotic arm when it is lowering. Do not attempt to move any tip racks or tubes whilst the instrument is operating.

Robotic gripper

The robotic gripper transfers spin columns. During transfer of a spin column, a stabilizing rod holds the rotor adapter in place, ensuring it remains properly seated in the centrifuge bucket. The robotic gripper is behind the panel covering the robotic arm.



Robotic gripper automates spin-column processing

Pipetting system

The QIAcube Connect is equipped with a single-channel pipetting system that moves in the X, Y and Z directions. The dilutor, fitted with a tip adapter, is connected to a precision syringe pump, which enables accurate transfer of liquids. The tip adapter allows aspiration and dispensing of liquid through an attached disposable tip. Disposable filter-tips (200, 1000, and 1000 µL wide-bore) are used for sample processing to minimize the risk of cross-contamination.

Optical sensor

During the load check, the optical sensor checks that the number of rotor adapters corresponds to the number of samples in the shaker and that both shaker and rotor are correctly loaded. The optical sensor also checks the type of tips loaded on the worktable and whether there are enough tips for the protocol run.

Ultrasonic sensor

During the load check, the ultrasonic sensor checks that the buffer bottles in the reagent bottle rack contain enough buffer for the protocol run.

Note: The ultrasonic sensor has a black beam columnator. If, for any reason, this beam columnator falls off or is missing, the instrument will display an error message to inform the user that the beam columnator is missing and that runs cannot be started. To replace the beam columnator, it needs to be manually adjusted to its original position (see image below).

Black beam columnator (see red circle) of the ultrasonic sensor

UV LED

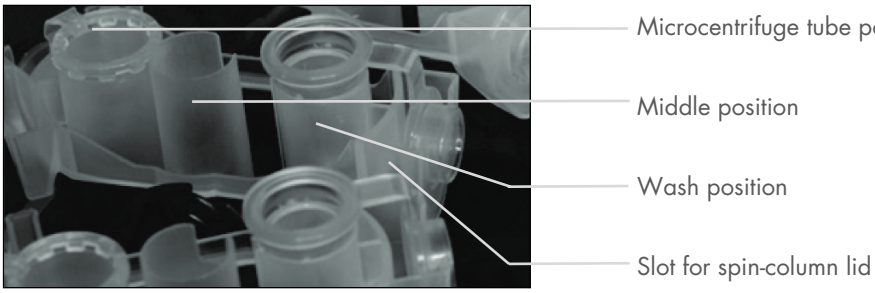
The QIAcube Connect is equipped with a UV LED light for decontamination. During the maintenance decontamination procedure, the UV LED is moved over the worktable. The hood and the waste drawer must be closed before starting the procedure and must not be opened during the procedure.

WARNING 	**Risk of personal injury** **[W29]** Do not expose your skin to UV-C light from the UV LED lamp.

3.4 Disposables

Rotor adapter

A disposable rotor adapter holds a QIAGEN spin column and a microcentrifuge tube in a centrifuge bucket during sample processing. If required by the protocol, an additional column (e.g., QIAshredder column) can be placed in the middle position of the rotor adapter. For ease of use and high process safety, the rotor adapters are designed so that they fit into a centrifuge bucket only in the correct orientation. Spin-column and microcentrifuge tube lids are held securely in slots at the edge of the rotor adapter.



Assembly of a rotor adapter

The wash position of the rotor adapter is open at the bottom, enabling wash buffers to flow through and collect at the bottom of the rotor adapter during centrifugation. The other two positions in the rotor adapter are closed. Be sure to follow the loading instructions provided by the software.

WARNING 	**Risk of personal injury and material damage** **[W4]** Do not use damaged rotor adapters. The rotor adapters can only be used once. High g forces exerted in the centrifuge can cause damage to used rotor adapters.

WARNING 	**Risk of personal injury and material damage** **[W5]** To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

4 Installation Procedures

This section provides instructions on installation environment requirements as well as unpacking, installing, configuring and packing the QIAcube Connect.

4.1 Installation environment

4.1.1 Site requirements

The QIAcube Connect must be located out of direct sunlight, away from heat sources and away from sources of vibration and electrical interference. Refer to Appendix A – Technical data on page 127 for the operating conditions (temperature and humidity). The site of installation should be free of excessive drafts, excessive moisture and excessive dust and should not be subject to large temperature fluctuations.

Use a level workbench that is large enough and strong enough to accommodate the QIAcube Connect. Refer to Appendix A – Technical data for the weight and dimensions of the QIAcube Connect.

Ensure that the workbench is dry, clean and vibration-proof and has additional space for accessories.

The QIAcube Connect must be placed within approximately 1.5 m of a properly grounded (earthed) AC power outlet. The power line to the instrument should be voltage regulated and surge protected. Ensure that the QIAcube Connect is positioned so that it is easy to access the power connector at the back of the instrument and the power switch on the front at all times, and that it is easy to power the instrument OFF and disconnect it.

Note: It is recommended to plug the instrument directly into its own power outlet and not to share the power outlet with another lab equipment. Do not place the QIAcube Connect on a vibrating surface or near vibrating objects.

WARNING 	**Explosive atmosphere** **[W11]** The QIAcube Connect is not designed for use in an explosive atmosphere.

CAUTION 	**Risk of overheating** **[C9]** To ensure proper ventilation, maintain a minimum clearance of 10 cm at the sides and rear of the QIAcube Connect. Slits and openings that ensure the ventilation of the QIAcube Connect must not be covered.

WARNING 	**Risk of personal injury and material damage** **[W2]** The QIAcube Connect is too heavy to be lifted by one person. To avoid personal injury or damage to the instrument, do not lift the instrument alone.

CAUTION 	**Damage to the instrument** **[C6]** Direct sunlight may bleach parts of the instrument and cause damage to plastic parts. The QIAcube Connect must be located out of direct sunlight.

4.1.2 Power requirements

The QIAcube Connect operates at: 100–240 V AC, 50/60 Hz, 650 VA

Ensure that the voltage rating of the QIAcube Connect is compatible with the AC voltage available at the installation site. Mains supply voltage fluctuations are not to exceed 10% of nominal supply voltages.

WARNING 	**Damage to electronics** **[W9]** Before powering ON the instrument, make sure that the correct supply voltage is used. Use of incorrect supply voltage may damage the electronics. To check the recommended supply voltage, refer to the specifications indicated in the type plate of the instrument.

WARNING 	**Electrical hazard** **[W8]** Any interruption of the protective conductor (earth/ground lead) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. **Lethal voltages inside the instrument** When the instrument is connected to line power, terminals may be live and opening covers or removing parts is likely to expose live parts.

4.1.3 Grounding requirements

To protect operating personnel, the National Electrical Manufacturers' Association (NEMA) recommends that the QIAcube Connect be correctly grounded (earthed). The instrument is equipped with a 3-conductor AC power cord that, when connected to an appropriate AC power outlet, grounds (earths) the instrument. To preserve this protection feature, do not operate the instrument from an AC power outlet that has no ground (earth) connection.

WARNING 	**Electrical hazard** **[W8]** Any interruption of the protective conductor (earth/ground lead) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. **Lethal voltages inside the instrument** When the instrument is connected to line power, terminals may be live and opening covers or removing parts is likely to expose live parts.

4.2 Unpacking the QIAcube Connect

WARNING 	**Risk of personal injury and material damage** **[W2]** The QIAcube Connect is too heavy to be lifted by one person. To avoid personal injury or damage to the instrument, do not lift the instrument alone.

1. Before unpacking the QIAcube Connect, move the package to the site of installation and check that the arrows on the package point upward. In addition, check whether the package is damaged. In case of damage, contact QIAGEN Technical Service.
2. Open the top of the transportation box to remove the *QIAcube Connect Quick-Start Guide* and power cord before lifting the box.
3. Remove the black foam protector lid and lift the box.
4. When lifting the QIAcube Connect, slide your fingers under both sides of the workstation and keep your back straight.

   Important: Do not hold the touchscreen display while unpacking or lifting the QIAcube Connect, this might damage the instrument.
5. Check if the packing list document is included after unpacking the QIAcube Connect.
6. Read the packing list to check that you have received all items. If anything is missing, contact QIAGEN Technical Services.
7. Check that the QIAcube Connect is not damaged and that there are no loose parts. If anything is damaged, contact QIAGEN Technical Services. Make sure that the QIAcube Connect has equilibrated to ambient temperature before operating it.
8. Retain the package in case you need to transport the QIAcube Connect in the future. Refer to section 4.5, Packing the QIAcube Connect for more details. Using the original package minimizes the possibility of damage during transportation of the QIAcube Connect.

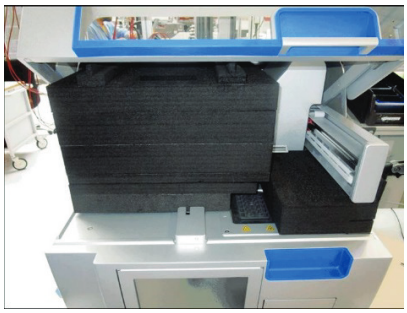
4.3 Installing the QIAcube Connect

This section describes important actions that must be performed before operating the QIAcube Connect. These actions include:

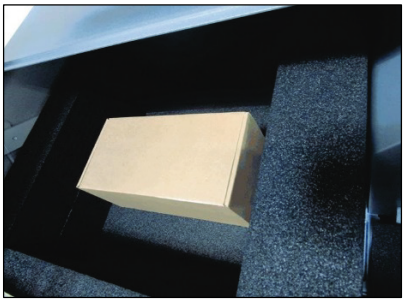
- Removal of the QIAcube Connect accessories and shipping material.
- Installation of the AC power cord.
- Installation of external barcode scanner
- Installation of the centrifuge rotor and buckets.

4.3.1 Removal of the QIAcube Connect accessories and shipping material

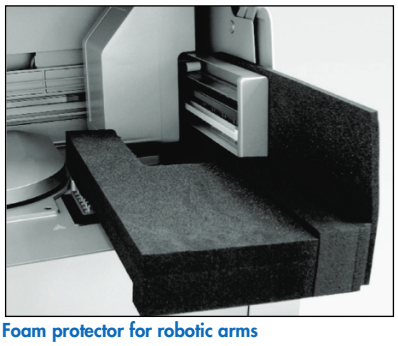
1. Remove the power cord and quick-start guide from the foam packing material on top of the QIAcube Connect.
2. Remove the USB flash drive, rotor key, rotor nut, Allen key, S2 shaker adapter and shaker rack plugs from the waste drawer.
3. Carefully peel off the protective film from the QIAcube Connect hood.
4. To remove the foam protectors above the centrifuge, gently pull the top foam protector towards you (see picture below). After removal of the top foam protector, gently pull the middle foam protector towards you and find the barcode reader enclosed within the middle foam (see picture below). Gently remove the bottom foam protector above the centrifuge.
5. To remove the foam protector around the robotic arm, gently pull the foam protector towards you (see picture below). After removing the protector for the robotic arm, ensure to close the QIAcube Connect hood.



Foam protector above centrifuge



Barcode scanner enclosed within middle foam protector



Foam protector for robotic arms

4.3.2 Installation of AC power cord

1. Remove the power cord from the foam packing material on top of the QIAcube Connect.

   Note: Only use the power cord that is supplied with the QIAcube Connect.
2. Ensure that the power switch is set to OFF: outer position is OFF and inner position is ON.
3. Check that the voltage rating on the label at the back of the QIAcube Connect matches the voltage available at the installation site.
4. Plug the power cord into the instrument power-cord socket.
5. Plug the power cord into a grounded power outlet.

WARNING 	**Damage to electronics** **[W9]** Before powering ON the instrument, make sure that the correct supply voltage is used. Use of incorrect supply voltage may damage the electronics. To check the recommended supply voltage, refer to the specifications indicated in the type plate of the instrument.

WARNING 	**Electrical hazard** **[W8]** Any interruption of the protective conductor (earth/ground lead) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. **Lethal voltages inside the instrument** When the instrument is connected to line power, terminals may be live and opening covers or removing parts is likely to expose live parts.

4.3.3 Installation of external barcode scanner

1. Remove the barcode scanner from the box.
2. Plug the USB connector of the scanner into one of the USB ports located on the left of the QIAcube Connect touchscreen.

4.3.4 Installing the centrifuge rotor and buckets

The centrifuge rotor and buckets are pre-installed in the QIAcube Connect. When setting up the QIAcube Connect for the first time, switch on the instrument (see chapter 5.2) and remove the transportation foam inserts from the centrifuge after it opens. In case the centrifuge rotor and buckets have been manually removed (e.g., during maintenance), follow the instructions below to re-install them.

1. The rotor can be mounted in only one orientation. The pin on the rotor shaft fits into a notch on the underside of the rotor directly underneath rotor position 1.
2. Line up position 1 of the rotor with the pin on the rotor shaft and carefully lower the rotor onto the shaft.
3. Install the rotor nut on top of the rotor and tighten securely using the rotor key supplied with the QIAcube Connect. Make sure that the rotor is securely seated. If the rotor nut is not tightened properly, it can become loose during operation of the centrifuge and can cause serious damage to the instrument. Such damage is not covered by the warranty.
4. Insert the rotor buckets. The side of the rotor bucket that must face toward the rotor shaft is marked with a grey line. Hold the bucket at an angle with the grey line facing the center of the rotor and hang the bucket on the rotor. Check that all buckets are properly suspended and can swing freely.

Important: All centrifuge buckets must be mounted before starting a run.

Before starting next protocol run, follow the instructions in section 6.6.3 Operating the centrifuge after cleaning.

WARNING 	**Risk of personal injury and material damage** **[W25]** To prevent the rotor nuts from loosening during operation of the centrifuge, securely tightened the nuts using the rotor key supplied with QIAcube Connect.

WARNING 	**Risk of personal injury and material damage** **[W20]** Raise the centrifuge lid carefully. The lid is heavy and may cause injury if it falls.

CAUTION 	**Damage to the instrument** **[C7]** The QIAcube Connect must not be used if the centrifuge lid is broken, or if the lid lock is damaged. Make sure that no loose material is inside the centrifuge during operation. Make sure that the rotor is installed correctly and that all buckets are properly mounted, regardless of the number of samples to be processed. Load the rotor only as instructed by the software. Only use rotors, buckets, and consumables designed for use with the QIAcube Connect. Damage caused by use of other consumables will void your warranty. We recommend replacing the centrifuge rotor and buckets after 20000 cycles, which is equivalent to 9 years of usage with two runs per day for 220 days each year. For more information contact QIAGEN Technical Services.

4.3.5 Installing the shaker adapter

A shaker adapter must be installed before the shaker can be used. Two types of shaker adapter are available:

- Adapter for 2 mL microcentrifuge safe-lock tubes (marked with "2")
- Adapter for 2 mL screw-cap tubes (marked with "S2").

The QIAcube Connect is delivered with the shaker adapter for 2 mL microcentrifuge safe-lock tubes already installed. If you need to install the shaker adapter for 2 mL screw-cap tubes, follow these steps:

1. Remove the shaker rack.
2. Remove the shaker adapter for 2 mL microcentrifuge safe-lock tubes by unscrewing the retaining screws. Use the Allen key supplied with the QIAcube Connect.
3. Place the shaker adapter for 2 mL screw-cap tubes onto the shaker.
4. Tighten the 2 retaining screws using the Allen key. 0.

Note: Make sure to use the correct adapter as displayed on the touchscreen during run setup. This helps to ensure optimal instrument performance. Using an incorrect shaker adapter can adversely affect pipetting performance and protocol results.

4.4 Configuration of the QIAcube Connect

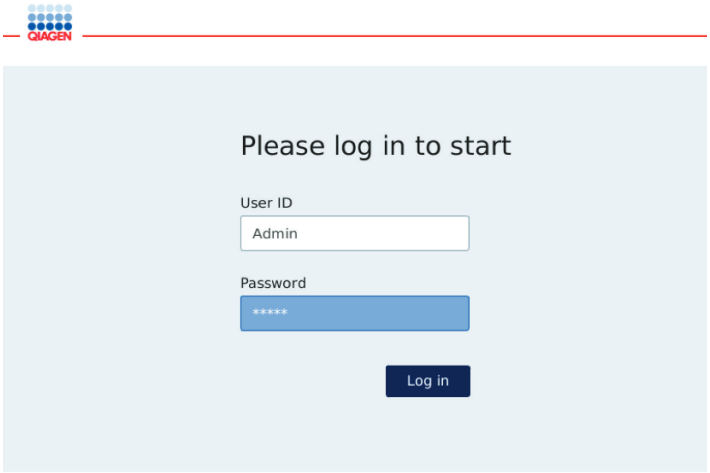
When using the QIAcube Connect for the first time, it is recommended to define the required settings. Other settings can be made later when needed.

For details on using the touchscreen and software, refer to section 0

QIAcube Connect software on page 54.

To configure the QIAcube Connect, follow the steps below.

1. Close the instrument hood.
2. Press the power switch to the inner position to power ON the instrument. The startup screen appears and the beeper sounds (if enabled in the sound settings). The instrument automatically performs the initialization tests. If the centrifuge lid is closed, it will open.
3. Initially, only one user account is available: the pre-installed default user. Press **OK** on the touchscreen to confirm the message.
4. Initially, if no maintenance has been recorded yet, the maintenance status is initialized using a default file. Press **OK** to confirm the message.
5. The **Login** screen appears after the initialization.



Login screen

6. Initially, only one default user is available. In this case, enter **Admin** in both the **User ID** and **Password** fields using the on-screen keyboard. Touch in the entry field to open the on-screen keyboard. After the first login, the system will ask you to change the password for **User Admin**. For details, refer to section 5.1 on how to enter text or numbers.
7. Press **Log in**. The **Setup** screen appears.

Setup screen

8. If you need to return to the **Setup** screen from another screen, press the **Setup** icon ( ).

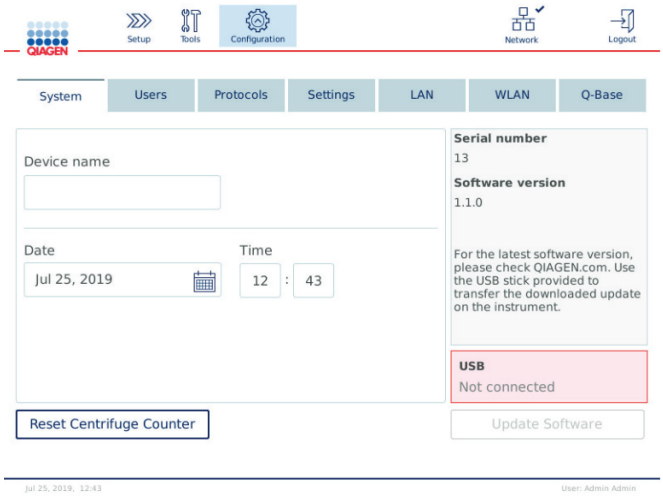
4.4.1 System configurations

This section describes how to set the following system configurations:

- Name for the QIAcube Connect
- Current date and time

These settings can only be made by users with Administrator role. When using the QIAcube Connect for the first time, it is recommended to set the current date and time.

1. On the menu bar, press the **Configuration** icon ( ).
2. Press the **System** tab. This tab is only available for users assigned the Administrator role.



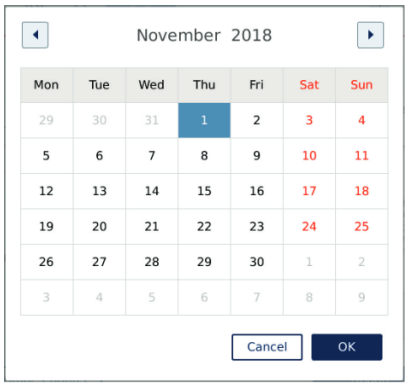
System configuration screen

3. Optionally, enter a name for the QIAcube Connect. The device name serves as the network/host name when connecting the instrument to the network.

   The name can have up to 24 characters: letters A–Z, a–z, digits 0–9 and a hyphen (-).

   The name must start with a letter and cannot end with a hyphen (-).

4. In the **Date** and **Time** fields, select the current date and enter the current time for the instrument. These are used to track the start and end time of a run and are also part of the run report. Date and time are not synchronized using the network. To change the date, touch the calendar icon ( ) and select the date.
5. Use the left and right arrow icons to change the month Then touch the current day and press **OK** to confirm.



Calendar window with date picker

4.4.2 Settings configuration

This section describes the optional settings that can be defined by each user:

- Audio volume
- Display brightness
- Internal light

The settings apply to the current user.

1. On the menu bar, press the **Configuration** icon ( ).
2. Press the **Settings** tab. This tab is available for all users.

Settings screen

3. To adjust the audio volume or display brightness, touch the desired position on the virtual slider on the screen. For audio volume, a sound is played with the set volume.
4. Check the box next to **Use internal light** to turn on the LED light inside the instrument. Uncheck the box to turn it off.
5. To return to the Setup screen, press the **Setup** icon ( ).

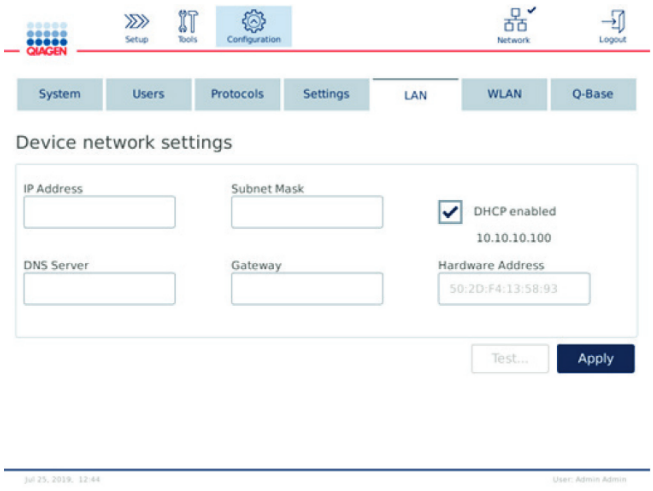
4.4.3 Network configuration and QIAsphere Base connection

The QIAcube Connect can be connected via intranet, allowing real-time status monitoring and other connectivity applications using the QIAsphere App, see **www.qiagen.com/qiasphere**. This configuration requires connecting the QIAcube Connect as well as the QIAsphere Base of the Connectivity Package to your network. Follow the instructions below to configure a wired or wireless network connection first before you connect your QIAcube Connect to a QIAsphere Base.

Only users assigned the role Administrator can change the network configuration. It is recommended to consult your network administrator when configuring the network. For communication with QIAsphere Base, the outbound TCP port 443 (https) is used; ping is supported.

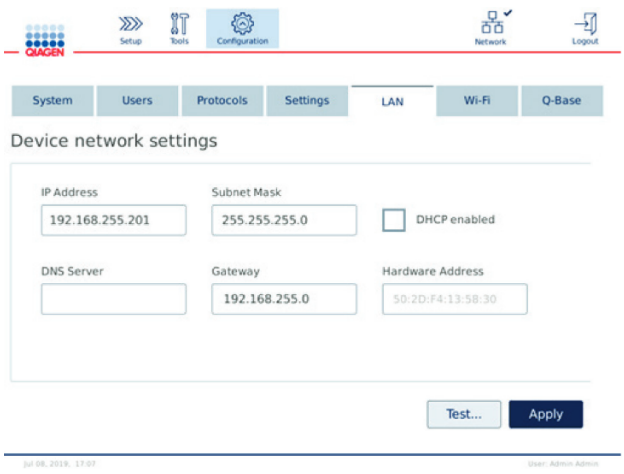
Configuring a wired network connection of the QIAcube Connect

1. Connect the QIAcube Connect to a local area network (LAN) by using an Ethernet cable and the RJ45 Ethernet Port on the rear side of the QIAcube Connect.
2. On the menu bar, press the **Configuration** icon ( ).
3. Press the **LAN** tab.
4. To automatically configure the network via DHCP, check the **DHCP enabled** box. Leave all fields empty when using this setting. The assigned IP address will be displayed below the box.



Device network settings screen

5. To manually configure the network, uncheck the **DHCP enabled** box. Enter the **IP address**, **Subnet mask** and **Gateway** in the respective fields, using the IPv4 format shown in the picture above. Entering the **DNS server** is optional. These settings will not be validated by the QIAcube Connect.



Device network settings screen with manual network configuration entries

6. Press **Apply** to confirm and save the settings made. Proceed with connecting QIAcube Connect to the QIAsphere Base as described on page 50.

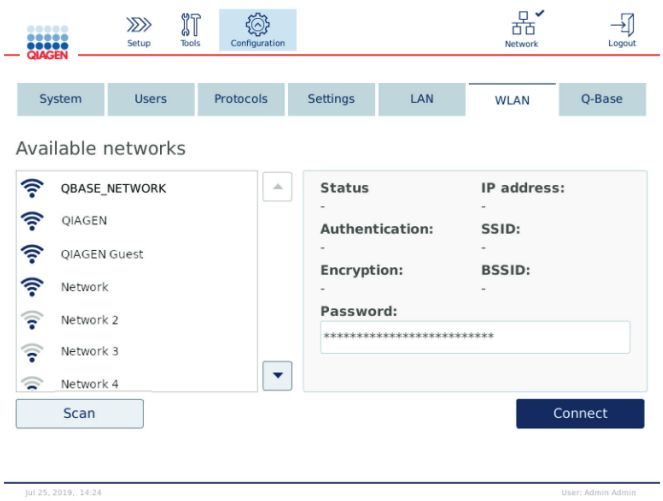
Configuring a wireless connection of the QIAcube Connect

The QIAcube Connect supports only WPA-PSK and WPA2-PSK. Additionally, the SSID of the Wi-Fi network must be visible. Connection to a hidden SSID is not supported.

Before Wi-Fi can be configured, the Wi-Fi USB device supplied with the QIAcube Connect must be plugged into one of the USB ports behind the touchscreen.

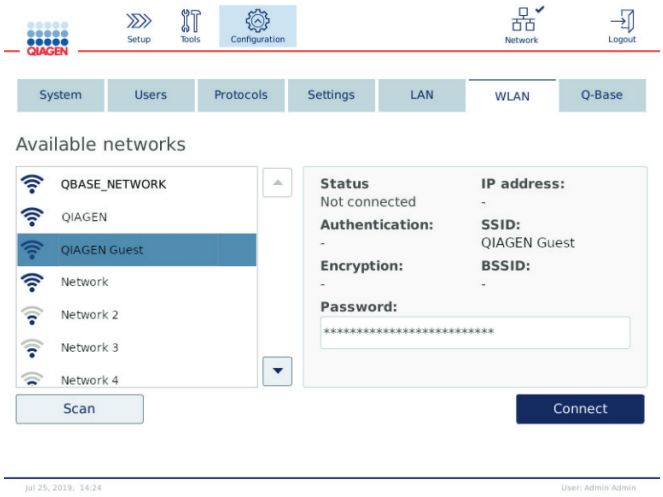
Important: Always turn off the QIAcube Connect before you plug in or unplug the Wi-Fi USB device. Plug-and-play of the Wi-Fi USB device while the instrument is turned on is not supported.

1. On the menu bar, press the **Configuration** icon ( ).
2. Press the **Wi-Fi** tab.
3. Press **Scan** to scan for available networks. The networks are listed based on their signal strength.



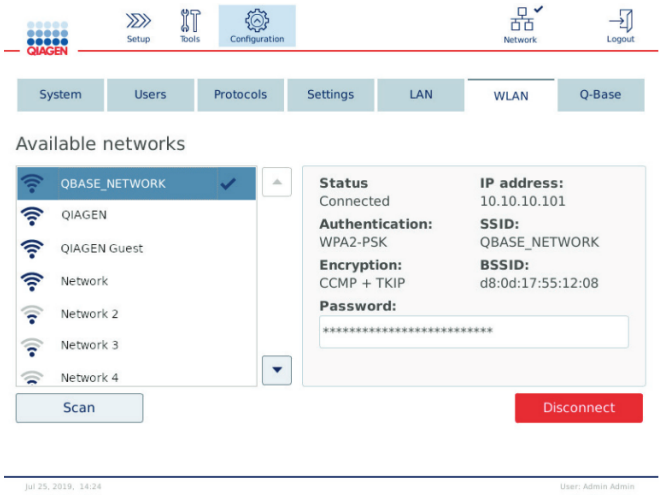
Available networks screen

4. Select one of the available networks from the list. The details for the selected network are shown at the right.



Available networks screen before network connection

5. Enter the wireless network password and press **Connect** to connect to the network. The connected network is marked in the list.



Available networks screen with established wireless network connection

Note: If a network is previously configured and a connection is established successfully at least once, the instrument will connect to that network automatically.

6. To disconnect from Wi-Fi press **Disconnect**. Proceed with connecting QIAcube Connect to the QIAsphere Base as described below.

Connecting QIAcube Connect to the QIAsphere Base

Follow first the instructions of the QIAsphere User Manual (**www.qiagen.com/qiasphere**) to connect the QIAsphere Base to the same local network as the QIAcube Connect is connected to. During this procedure, the QIAsphere Base receives an IP address which is required in the following configuration:

1. On the QIAcube Connect touchscreen, press **Configuration**, then press the **Q-Base** or **QIAsphere Base** tab.
2. Ensure **Communication Enabled** box is checked.
3. Enter **QIAsphere Base IP** address in the **Q-Base URL** field and press **Apply**.
4. Agree to the terms and conditions when prompted.
5. Reboot the QIAcube Connect and log in. Your QIAcube Connect is now connected to the QIAsphere Base and you can proceed with setting up QIAsphere according to the QIAsphere User Manual.

4.5 Packing the QIAcube Connect

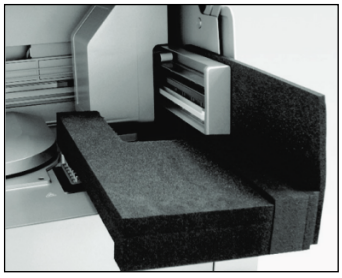
Warning: The QIAcube Connect is too heavy to be lifted by one person. To avoid personal injury or damage to the instrument, do not lift the instrument alone.

WARNING 	**Risk of personal injury and material damage** **[W2]** The QIAcube Connect is too heavy to be lifted by one person. To avoid personal injury or damage to the instrument, do not lift the instrument alone.

Before transporting the QIAcube Connect, the instrument must first be decontaminated. Refer to section 6.8, Decontaminating the QIAcube Connect for more details. Then prepare the instrument as follows:

1. Prepare the packing material. Materials required are the cardboard carton, the pallet with foam blocks, the foam lid and the foam protector for the robotic arm.

   Note: The centrifuge lid must be open to allow access to the inside of the centrifuge. If the lid is not open, perform steps 2–5 below. If the lid is already open, proceed to step 6.
2. Close the instrument hood.
3. On the menu bar, press the **Tools** button.
4. In the Tools menu, press the Run Modules tab.
5. In the Run Modules menu, press the Centrifuge tab and then press Open Centrifuge Lid.
6. Undo the rotor nut on top of the rotor using the rotor key, and carefully lift the rotor off the rotor shaft.
7. Close the hood.
8. On the menu bar, press the **Tools** button.
9. In the **Tools** menu, press the **Run Modules** tab.
10. In the **Run Modules** menu, press the **Centrifuge** tab and then press **Close Centrifuge Lid**.
11. When the centrifuge lid is closed, power OFF the QIAcube Connect and open the hood.
12. Insert the foam protector into the front of the instrument.
13. Press the foam down between the centrifuge and the robotic arm.



Foam protector inserted between the centrifuge and the robotic arm

14. Push the foam until the rear end touches the back wall of the instrument. Ensure that the arm is held firmly in place and cannot move.
15. Make sure that the QIAcube Connect hood can be closed properly. The hood should lightly brush against the foam.
16. Place the accessories into the waste drawer. The following accessories should be packed in air cushion bags:
    - Rotor key
    - Allen key
    - Rotor nut
    - USB flash drive
    - WLAN module
    - Shaker rack plugs
    - Shaker adapter
17. Place the handheld scanner into dedicated handheld scanner box.
18. Place the QIAcube Connect onto the pallet and put the black foam lid over the top of the instrument. Place the box onto the instrument.

    Important: When lifting the QIAcube Connect, slide your fingers under both sides of the instrument and keep your back straight.

    Important: Do not hold the touchscreen display while lifting the QIAcube Connect, as this might damage the instrument.

WARNING 	**Risk of personal injury and material damage** **[W2]** The QIAcube Connect is too heavy to be lifted by one person. To avoid personal injury or damage to the instrument, do not lift the instrument alone.

19. Place the accessories into the black foam lid. The following accessories should be packed in air cushion bags:
    - Rotor with swing-out buckets
    - Power cord
20. Seal the outside edges of the carton with tape to protect against moisture.

    Note: Using the original package minimizes potential damage during transportation of the QIAcube Connect.

5 Operating Procedures

This section describes how to operate the QIAcube Connect.

Before proceeding, we recommend that you familiarize yourself with the features of the instrument by referring to sections 3.2 and 3.3.

Important: The QIAcube Connect is designed for use with QIAGEN spin columns only. Geometry of spin columns manufactured by other suppliers may not be compatible with the QIAcube Connect.

CAUTION 	**Damage to the instrument** **[C2]** Only use QIAGEN spin columns and QIAcube Connect specific consumables with the QIAcube Connect. Damage caused by use of other types of spin columns or chemistries will void your warranty.

The hood of the QIAcube Connect must remain closed during operation of the instrument. Only open the hood when instructed to do so by the software.

WARNING 	**Moving parts** **[W18]** To avoid contact with moving parts during operation of the QIAcube Connect, the instrument must be operated with the hood closed. If the hood sensor or lock is not functioning correctly, contact QIAGEN Technical Services.

WARNING 	**Risk of personal injury and material damage** **[W3]** Do not attempt to move the QIAcube Connect during operation.

WARNING 	**Risk of personal injury and material damage** **[W1]** Improper use of the QIAcube Connect may cause personal injuries or damage to the instrument. The QIAcube Connect must only be operated by qualified personnel who have been appropriately trained. Servicing of the QIAcube Connect must only be performed by a QIAGEN Field Service specialist.

WARNING 	**Risk of personal injury and material damage** **[W4]** Do not use damaged rotor adapters. The rotor adapters can only be used once. High g forces exerted in the centrifuge can cause damage to used rotor adapters.

CAUTION 	**Damage to the instrument** **[C3]** Empty the tip disposal container prior to use to prevent a tip jam in the waste drawer. Failure to empty the waste container may block the robotic arm that could cause run failure or instrument damage.

WARNING 	**Risk of personal injury and material damage** **[W5]** To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

CAUTION 	**Damage to the instrument** **[C4]** Only use the correct volume of liquids. Exceeding the recommended volume of liquids may damage the centrifuge rotor or instrument.

WARNING 	**Risk of fire or explosion** **[W6]** When using ethanol or ethanol-based liquids on the QIAcube Connect, handle such liquids carefully and in accordance with the required safety regulations. If liquid has been spilled, wipe it off and leave the QIAcube Connect hood open to allow flammable vapors to disperse.

WARNING 	**Risk of explosion** **[W7]** The QIAcube Connect is intended for use with reagents and substances supplied with QIAGEN kits or other than outlined in respective Information for use. Use of other reagents and substances may lead to fire or explosion.

CAUTION 	**Damage to the instrument** **[C5]** Do not lean against the touchscreen when it is pulled out.

WARNING 	**Samples containing infectious agents** **[W12]** Some samples used with this instrument may contain infectious agents. Handle such samples with the greatest of care and in accordance with the required safety regulations. Always wear safety glasses, 2 pairs of gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe, and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents as defined in the applicable Material Safety Data Sheets (MSDSs) or OSHA*, ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

* OSHA : Occupational Safety and Health Administration (United States of America).
† ACGIH : American Conference of Government Industrial Hygienists (United States of America).
‡ COSHH : Control of Substances Hazardous to Health (United Kingdom).

WARNING 	**Hazardous chemicals** **[W13]** Some chemicals used with this instrument may be hazardous or may become hazardous after completion of the protocol run. Always wear safety glasses, gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are not exposed to hazardous levels of toxic substances (chemical or biological) as defined in the applicable Material Safety Data Sheets (MSDSs) or OSHA*, ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

WARNING 	**Moving parts** **[W17]** Avoid contact with moving parts during operation of the QIAcube Connect. Under no circumstances should you place your hands under the robotic arm when it is lowering. Do not attempt to move any tip racks or tubes whilst the instrument is operating.

WARNING 	**Hot surface** **[W21]** The shaker can reach temperatures of up to 70°C (158°F). Avoid touching it when it is hot. Carefully remove the samples after a run.

WARNING/ CAUTION 	**Risk of personal injury and material damage** **[W22]** Only perform maintenance that is specifically described in this user manual.

* OSHA : Occupational Safety and Health Administration (United States of America).
† ACGIH : American Conference of Government Industrial Hygienists (United States of America).
‡ COSHH : Control of Substances Hazardous to Health (United Kingdom).

5.1 QIAcube Connect software

The QIAcube Connect is operated through a touchscreen, which guides you step-by-step through the correct loading of the work deck and selection of the protocol.

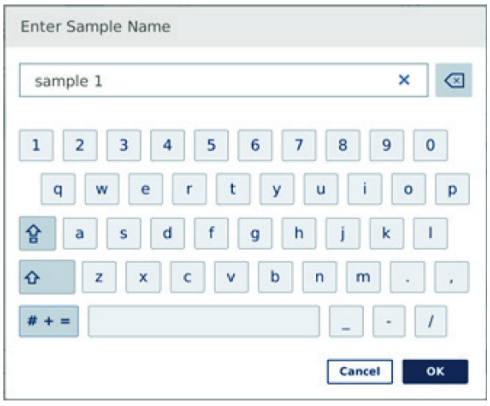
Note: The instrument's touchscreen does not support swiping and multi gestures.

General functions of the QIAcube Connect touchscreen are described below.

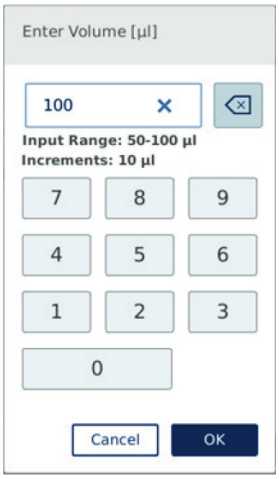
Button/Icon	Function
	Enables the user to scroll up through a list.
	Enables the user to scroll down through a list.
	The software automatically proceeds to the next screen.
	Returns to the previous screen.
	Returns to previous screen without saving any changes.
	Enables the user to change certain settings (e.g., to edit a user account).
	Enables the user to delete certain settings (e.g., to delete a user).
Text fields	Enables to edit text or value. A pop-up keyboard enables these changes.
Row in tables	Can be pressed to select the respective row. Either item will be selected, or row will be highlighted.
	Press to show additional information to respective item
	Press to show important information that must be followed during run setup for respective item.
	Press to show additional information to respective item
	Press to show important information that must be followed during run setup for respective item.
	Navigation back to the Setup screen
	Tools/Maintenance functions
	Configuration
	Log out from the instrument

To enter text or numbers, touch the respective field. The corresponding on-screen keyboard will be displayed.

Keyboard for entering a password



Keyboard for entering a sample name



Keyboard for editing a protocol parameter

For protocol parameters, the value range is displayed. In the example shown in the screenshot above, values from 50–100 µL can be entered, but only in steps of 10 µL.

Buttons and icons in the on-screen keyboard are described below.

Button/Icon	Function
	Remove character to the left.
	Clear all from the field.
	To type the next letter in upper-case. After the letter has typed, the keyboard will show lower-case letters again.
	Switch to upper-case letters. Allows to type a number of upper-case letters. Press the symbol again to return to lower-case letters.
	Show special characters.
	Return to letters.
	Confirm and close.
	Discard and close.

If the entered value is not correct, the field border will change to red. It is not possible to proceed to the next screen in this case. Press the field again and correct the value according to the range displayed next to the field.

5.2 Switching the QIAcube Connect on and off

Switching on the QIAcube Connect

1. Close the instrument hood.
2. Switch on the instrument by pressing the power switch to the inner position. You will hear a sound (if sound settings are enabled), and a startup screen appears. The instrument automatically performs initialization tests. If the centrifuge lid was closed, it will open.

Switching off the QIAcube Connect

1. Switch off the instrument by pressing the power switch to the inner position.

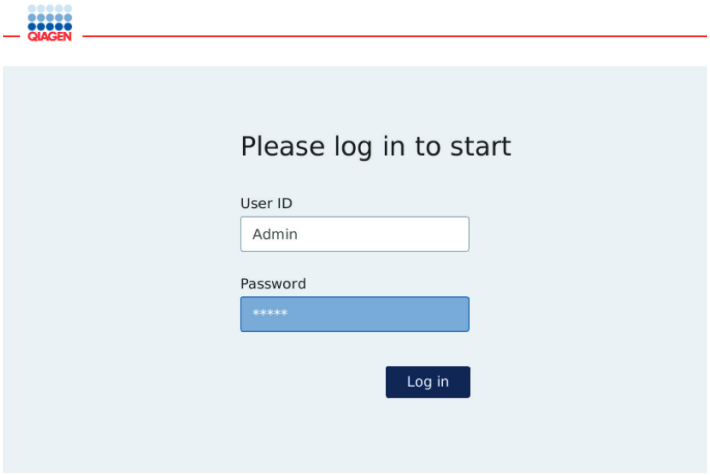
   Note: After powering OFF the QIAcube Connect, you must wait for a few seconds before you power ON the instrument again. The system might fail to start if you do not allow the QIAcube Connect to rest for a few seconds before powering ON.

5.3 Logging in and Logging out

Logging in

1. Close the instrument hood.
2. Switch on the instrument.

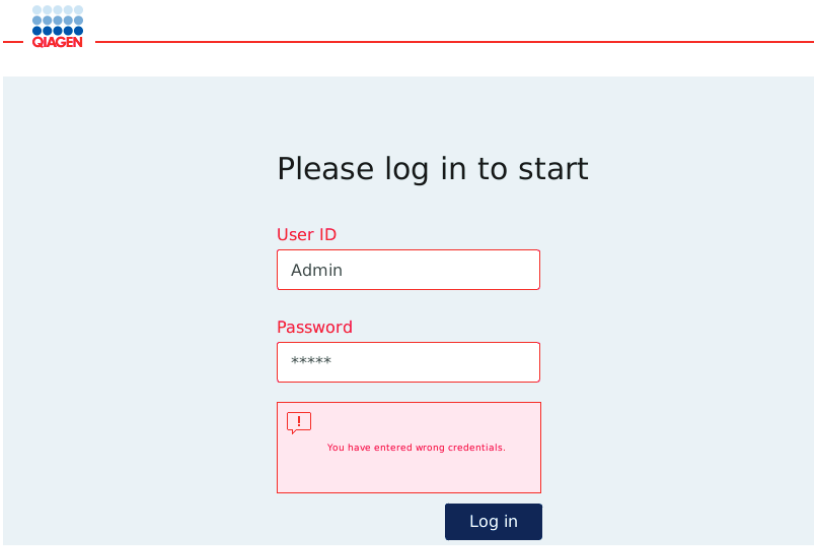
   After the initialization is complete, the **Login** screen appears.



Login screen

3. Enter **User ID** and **Password** using the on-screen keyboard.
4. Press **Log in**.
5. The **Setup** screen appears.

In case of a failed login, an exclamation icon (!) and information screen will appear. Touch the respective field to enter the **User ID** and **Password** again, ensuring that you enter the information correctly. The **User ID** is case sensitive.



Information screen from failed login, for example, due to entering incorrect password

Logging out

1. Press **Logout** at the top right of the screen.
2. To log out, conform the message with **OK**. To stay logged in, press **Cancel**.
3. The login screen appears.

5.4 Setting up a protocol run

Commonly used QIAGEN standard protocols are installed on the QIAcube Connect upon delivery. All available QIAGEN protocols can be downloaded from the QIAcube Connect web portal: **www.qiagen/QIAcubeProtocols**. For instructions on installing downloaded protocols see section 5.11.1 Installing new protocols.

Important: Before starting any protocol, thoroughly read the relevant QIAGEN kit handbook.

Protocol setup starts from the Setup screen. The touchscreen software will guide you through the protocol run setup and worktable loading steps. The display screens vary depending on the protocol in use and may look different from the screens shown in this section.

1. Prepare the samples to be processed using the protocol indicated in the protocol selection screen. Refer to the kit handbook for more information, if required.
2. To start the run setup, select from **Applications**, **Favorites** or **Scan kit**. To scan the 2-D bar code of the QIAGEN kit, press **Scan Kit** and then use the handheld scanner, or just scan the bar code.

Setup screen

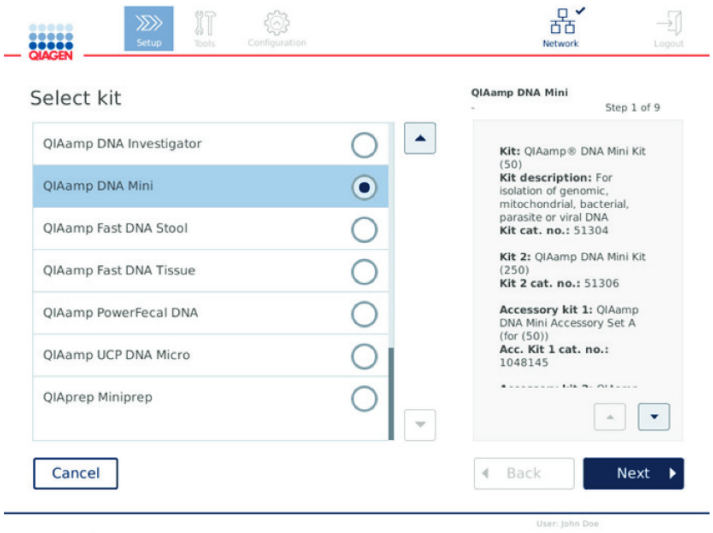
The software will automatically proceed to the next screen. If you scanned a kit bar code or if you selected a protocol from **Favorites**, the software may skip the **Kit**, **Material** and/or **Protocol Selection** screens. The software will skip the selection screen if the required information will be provided by kit bar code scanning or selection from **Favorites**.

3. To enter information in the next screens, follow the instructions provided in the sections below. Depending on your selections, the number and order of the screens displayed on your instrument may vary.

   Each section below contains a screenshot image. Follow the instructions in that section with the corresponding screen displayed on your instrument.

In general, press **Next** to proceed to the next screen, or press **Back** to return to the previous screen. **Next** will only be active if all required information has been entered in the current screen.

5.4.1 Kit selection

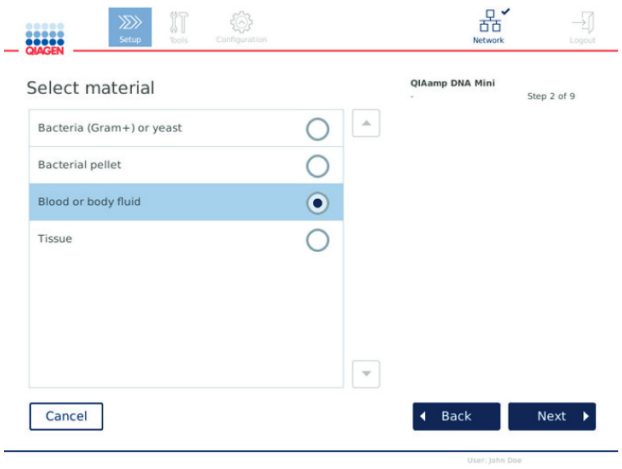


Select kit screen

1. Use the **Up** and **Down** arrow icons (or) to scroll through the list of kits.

   Select the kit to be used for your run by touching the corresponding row. Only one kit can be selected per run. Information about the selected kit is shown in the right pane.
2. Press **Next** to proceed to defining the sample material.

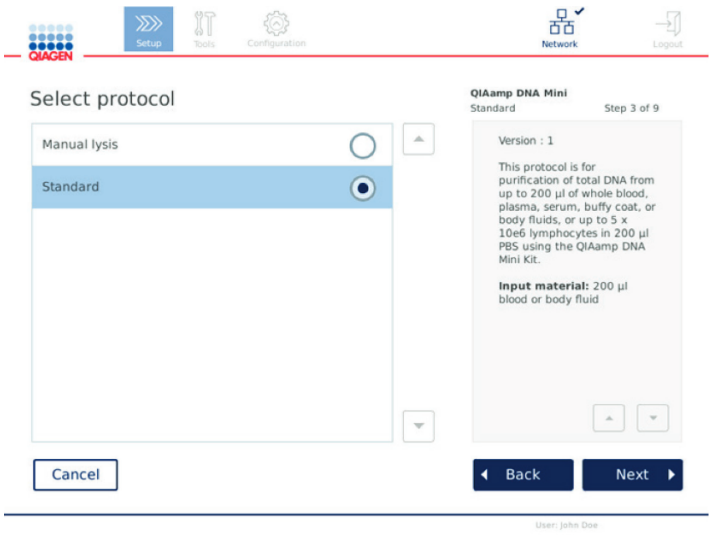
5.4.2 Material selection



Select material screen

1. Select the sample material by touching the corresponding row. Only one sample material type can be selected per run.
2. Press **Next** to proceed to defining the protocol.

5.4.3 Protocol selection

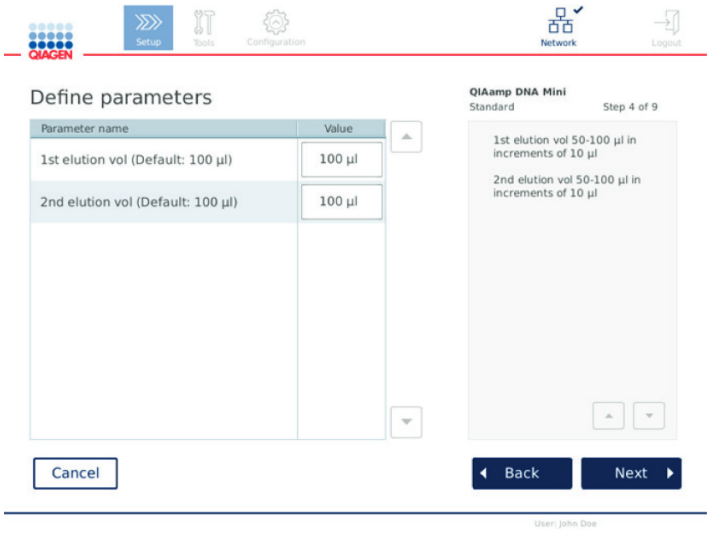


Select protocol screen

1. Select the protocol by touching the corresponding row. Only one protocol can be selected per run. Make sure to read all essential and critical information in the right pane before proceeding to the next step.
2. Press **Next** to proceed to defining the run parameters.

5.4.4 Parameter definition

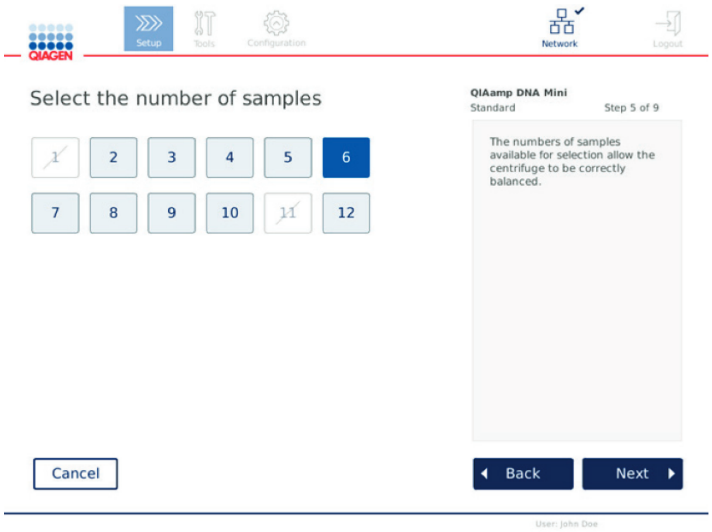
Depending on the selected protocol, certain parameters must be defined. The protocol defines default settings, which can be changed. Follow the instructions in the information pane on the right regarding changing the values and which increments can be used.



Define parameters screen

1. If required, press the **Value** field to change a parameter value using the on-screen keyboard. Refer to section 5.1 for details about the on-screen keyboard.
2. Press **Next** to proceed to defining the sample number. The software automatically proceeds to the next screen. Follow the instructions in the corresponding section below.

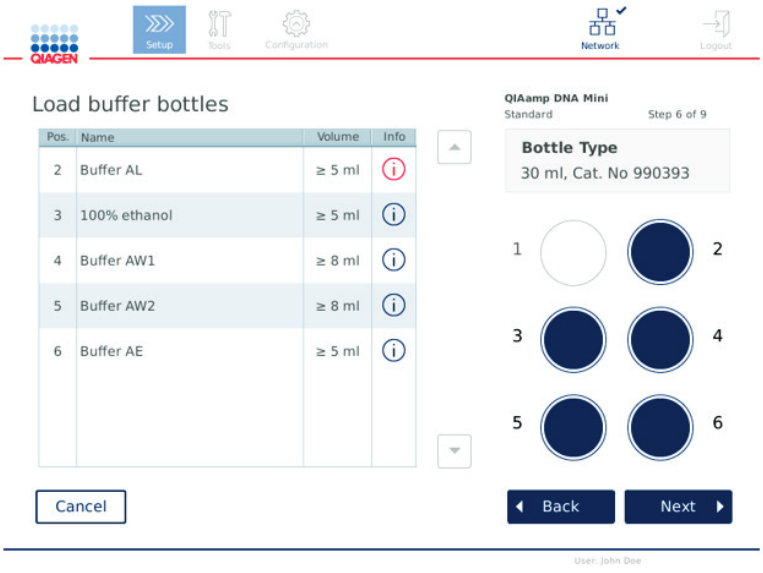
5.4.5 Sample number definition



Define sample numbers screen

1. To select the number of samples for the run, press the corresponding number on the screen. Sample numbers that would lead to a misbalance during centrifugation cannot be chosen.
2. Press **Next** to proceed to loading the reagents.

5.4.6 Loading buffer bottles



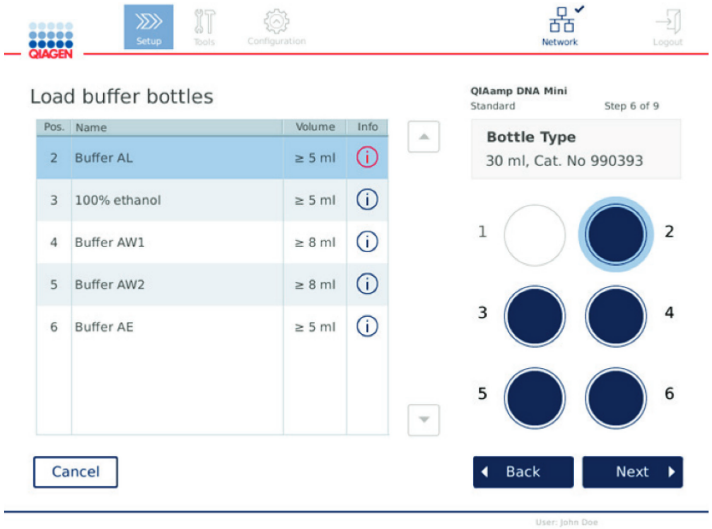
Load buffer bottles screen

The **Load buffer bottles** screen guides you through setting up the required buffers for the run. Make sure to read all essential and critical information before proceeding to the next step.

Note: To avoid run issues and to guarantee proper sitting of buffer bottle rack, the buffer bottle rack must be equipped with rack labeling strips.

Depending on the selected protocol, loading of buffer bottles might not be required. In this case, the software will indicate that this step can be skipped.

1. Prepare the reagents as shown on the screen. Refer to the respective kit handbook for further information. Always ensure that you use the required tube types. When pouring, ensure that the buffer does not foam or contain large air bubbles.



Load buffer bottle screen circles the position on the buffer bottle rack for selected buffer in the list.

   Before proceeding to the next step, ensure that you read all essential and critical information indicated in the **Information** icon (ⓘ) marked in red. Press the icon to open the information.

2. Make sure that the buffer bottles contain the minimum volumes described in the **Volume** column. Each bottle can hold a maximum volume of 30 mL, which can also be used for subsequent runs. Later, when the run is started, the instrument will determine the filling volume.
3. Place each opened buffer bottle in the correct position of the reagent bottle rack as shown on the screen. The rack will only fit on the worktable if its orientation is correctly set.
4. Once all the buffer bottles are placed on the reagent bottle rack, place the rack on the worktable. Ensure that the rack is oriented correctly with number 1 on the top.

   Important: Be sure to place the reagent bottle rack correctly into the designated worktable slot. Bottle racks that are in a leaning position could cause errors during liquid detection.

5. Press **Next** to proceed to loading the tips and enzymes. The software automatically proceeds to the next screen. Follow the instructions in the corresponding section below.

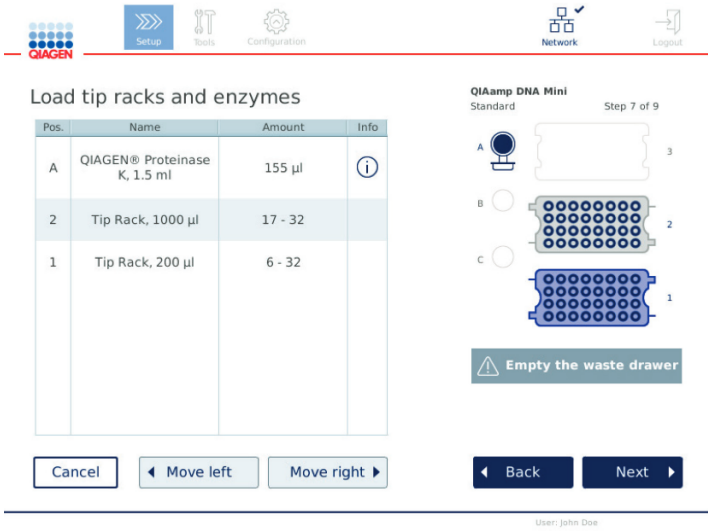
WARNING	**Risk of fire or explosion** [W6] When using ethanol or ethanol-based liquids on the QIAcube Connect, handle such liquids carefully and in accordance with the required safety regulations. If liquid has been spilled, wipe it off and leave the QIAcube Connect hood open to allow flammable vapors to disperse.

5.4.7 Loading tips and enzymes

Important: When the **Loading tips and enzymes** screen appears, the robotic arm will automatically move slowly – even when the instrument hood is open – so you can access all of the loading positions. Always stand clear of the instrument while the robotic arm is moving. Wait until the robotic arm has completed its movements before you start to load or unload tip racks or enzymes. After you are finished loading and you proceed from this screen, the robotic arm will automatically move back to its original position (above tip rack position 3).

If more than one rack of the same tip type is loaded, the instrument will use the tip rack placed in position 1 first, then continue to position 2, and then position 3. To use a partially filled rack first, load it in position 1.

Depending on the selected protocol, loading of tips and enzymes might not be required. In this case, the software will indicate that this step can be skipped.



Loading tip racks and enzymes screen

If for any reason the robotic arm prevents you from reaching a loading position, do not move the robotic arm manually. Instead, proceed as follows:

- Press **Move left**. The robotic arm will start to move. The hood can remain open during this movement.
- Ensure that you stand clear of the instrument while the robotic arm is moving. Wait until the robotic arm has completed its movements.

Follow the instructions below to load enzyme, reagents and tips:

1. Prepare enzymes and/or reagent(s) listed on the screen. Refer to the corresponding kit handbook for more information. Before proceeding to the next step, make sure that you read all essential and critical information indicated in the **Information** icon (ⓘ) marked in red.
2. Make sure that you are using the correct tube type. Press the **Information** icon (ⓘ) in the respective row to show the details.
3. Make sure that you provide the correct volume as indicated on screen. The volume shown on the screen is the minimum volume to be loaded. To avoid spill-over during the run, do not exceed this volume significantly.
4. Place the opened tube in the worktable position as indicated in the table on the screen. It is important that you load the tube in the correct worktable position.
5. Place the lid of the microcentrifuge tube securely in the lid slot next to the tube.
6. Make sure that the required number of tips for each tip type are loaded as indicated on the screen. It is possible to use up the tip racks, if the minimum required number of tips for each type is loaded.

   The loading position shown on the screen is the recommended position for tip racks. The position can also be changed. Later, when starting the run, the instrument will check if the correct tip racks are placed on the worktable and if there are enough tips for the protocol run.

   There are 3 different kinds of tip racks that can be used on the QIAcube Connect, depending on the protocol selected. A blue rack for 200 µL filter-tips, a light grey rack for 1000 µL filter-tips and a dark grey rack for 1000 µL wide-bore filter-tips. The instrument uses the notches on the filter-tip rack to identify the type. To prevent mix up that may lead to a run issue, do not manually refill tip racks. Only use tips designed for use with the QIAcube Connect.

   Important: Do not use damaged filter tips. Do not load damaged tip racks onto the worktable.

   Note: When using partially filled tip racks, consider the order in which the racks are loaded. The tip rack placed in position 1 will be used first.
7. Ensure that you empty the waste drawer containing used disposable labware before every run to avoid waste accumulation.
8. Press **Next** to proceed to loading the centrifuge or shaker rack, depending on the selected protocol.

   Important: After loading and you proceed from the **Loading tips and enzymes** screen, the robotic arm will automatically move back to its original position (above tip rack position 3).

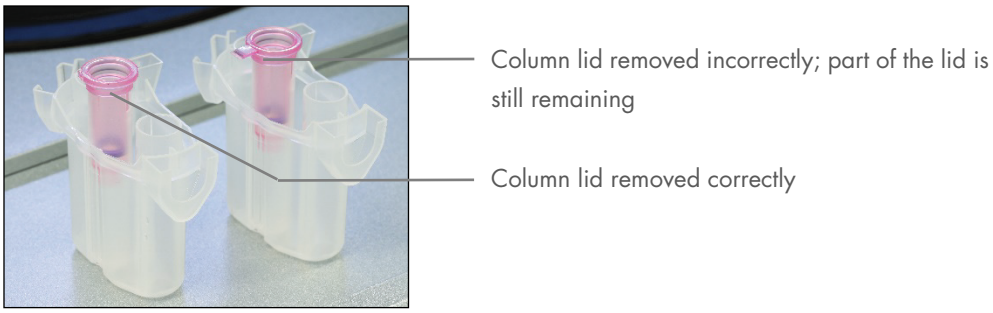
5.4.8 Loading the centrifuge

The **Loading centrifuge** screen guides you through setting up the required rotor adapters and centrifuge for the run. Make sure to read all essential and critical information before proceeding to the next step.

Depending on the selected protocol, loading of the centrifuge might not be required. In this case, the software will indicate that this step can be skipped.

Rotor adapters can be placed into a rotor adapter holder, enabling convenient and easy preparation and loading of columns. Place the columns, tubes or samples into the appropriate positions in each rotor adapter as instructed by the software.

If the software instructs you to cut off the lid of a spin column for a certain rotor adapter position, do this before loading the spin column. Be sure that the lid is completely removed from the spin column. Spin columns with partially removed lids may not be gripped properly by the robotic gripper, and may cause the protocol run to crash.



Comparing correct and incorrect removed column lids

If the protocol requires use of spin columns with screw caps (e.g., Qproteome Albumin/IgG Depletion Spin Columns), remove the screw cap from the spin column, and screw on a spin column adapter ring (not supplied with the QIAcube Connect; see section 10 Appendix B - QIAcube Connect Accessories) onto the column. The spin column adapter ring enables the robotic gripper to transfer the column during the purification procedure. Break off the bottom closure of the spin column before placing into the rotor adapter.

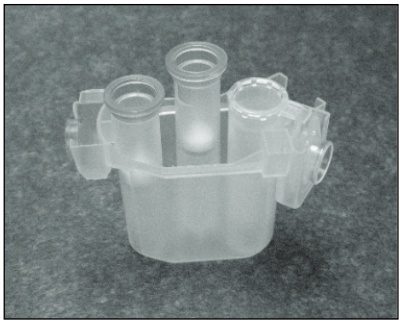
Mounting a spin column adapter ring.

Ensure that the tubes and spin columns have been pushed firmly into the appropriate rotor adapter position.

Place the lids into the correct lid position of the rotor adapter as indicated on your screen in the **Lid position** table column and the rotor adapter illustration. Make sure that the lids are pushed all the way down to the bottom of the slots on the sides of the rotor adapter. Incorrectly positioned lids can break off during centrifugation and cause the protocol run to crash.

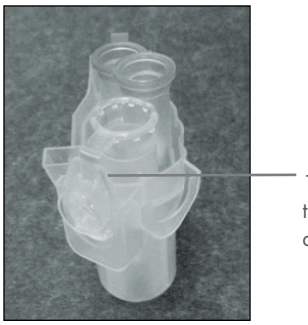
A

B

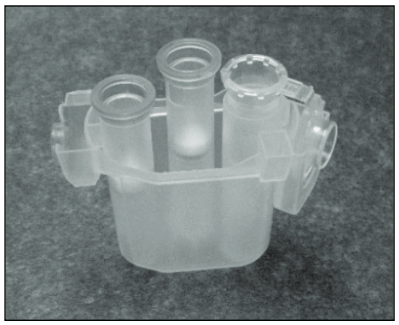


Correctly loaded rotor adapter. A Rotor adapter is correctly loaded, and the 1.5 mL microcentrifuge tube lid is in the correct position; **B** Correctly loaded rotor adapter seen from the side.

C



D



Incorrectly loaded rotor adapter. C Rotor adapter is incorrectly loaded with a 1.5 mL microcentrifuge tube. The lid of the tube is not pushed all the way down to the bottom of the slot of the rotor adapter and could break off during centrifugation (compare with part A of the above figure); **D** Incorrectly loaded rotor adapter seen from the side (compare with part **B** of the above figure).

E

Rotor adapter is incorrectly loaded with a 1.5 mL microcentrifuge tube. The lid of the tube is positioned in the wrong slot of the rotor adapter. During column transfer, the lid of the spin column could crash onto the lid of the 1.5 mL microcentrifuge tube, causing the protocol run to crash.

WARNING	**Risk of personal injury and material damage** [W5] To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

WARNING	**Risk of personal injury and material damage** [W4] Do not use damaged rotor adapters. The rotor adapters can only be used once. High g forces exerted in the centrifuge can cause damage to used rotor adapters.

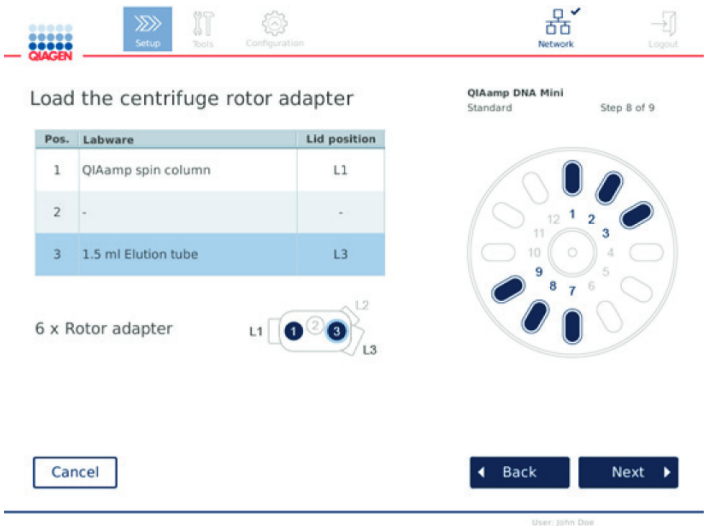
WARNING	**Risk of personal injury and material damage** [W27] Make sure that lids from spin columns and 1.5 mL microcentrifuge tubes are in the correct position and pushed all the way down to the bottom of the slots on the sides of the of the rotor adapter. Incorrectly positioned lids can break off during centrifugation.

WARNING	**Risk of personal injury and material damage** [W28] Be sure the lid is completely removed from the spin column. Spin columns with partially removed lids may not be removed properly from the rotor, causing the protocol run to crash.

Depending on the selected protocol, samples can be loaded onto the shaker or directly into the centrifuge. Follow the instructions below the screenshot corresponding to your screen. Your screen may look different depending on the selected protocol.

Loading the centrifuge in case samples are loaded onto shaker

This section describes a workflow that includes the shaker unit (e.g., for lysis). Tubes with samples need to be loaded onto the shaker unit (refer to section 5.4.9 Loading the shaker), and the centrifuge must be prepared according the following description.



Load the centrifuge rotor adapter screen when samples are loaded onto the shaker. Position 2 of the rotor adapter is empty.

The number and tube positions of rotor adapters required for the protocol run will be shown in the table and illustration on your screen. The table shows how to load and position each rotor adapter. The **Pos.** column indicates the position in the rotor adapter, and the **Lid position** column indicates where to place the lid of a particular tube.

For each rotor adapter:

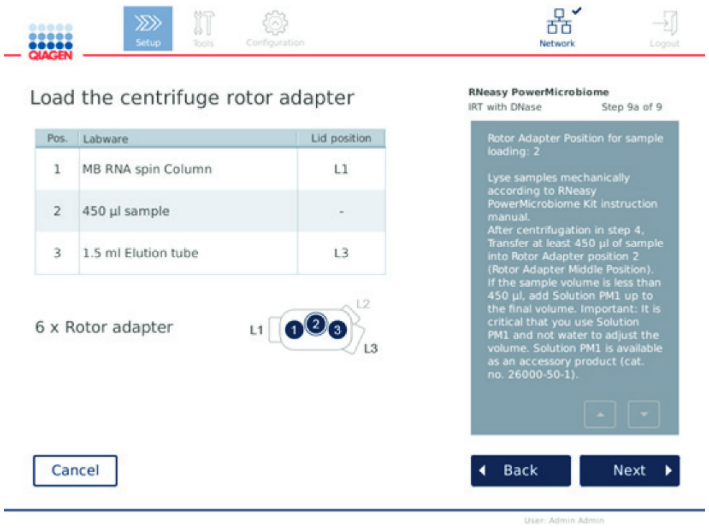
1. Load each tube/spin column in its correct position as indicated in the table on the screen. Touch the table row to highlight the particular tube position in the illustration below the table.
1. Ensure that the tubes and spin columns are pushed firmly into the appropriate rotor adapter position.
2. Make sure that the lids are pushed all the way down to the bottom of the slots on the sides of the rotor adapter. Ensure that you place the lids in the correct lid positions.
3. If required and described in the table, cut off the lid, or screw on a spin-column adapter ring and break off the bottom of the spin column.
4. Repeat steps 1–3 until all rotor adapters have been prepared.
5. Place the loaded rotor adapters into the centrifuge buckets as shown on the right side of the screen. For ease of use and high process safety, the rotor adapters only fit into the centrifuge buckets in one orientation.
6. Press **Next** to proceed with loading the samples into the shaker. Follow the instructions in section 5.4.9 Loading the shaker. Depending on the selected protocol, the sequence of the next screens can be different.

Loading samples into the centrifuge

This section describes a workflow that does not include the shaker unit (e.g., for lysis). Samples are directly loaded into the centrifuge. For workflows including the shaker unit, refer to section Loading the centrifuge in case samples are loaded onto shaker on page 69.

The procedures for loading samples into the centrifuge are shown on both sides of the screen.

Prepare the required number of rotor adapters as shown on the screen.



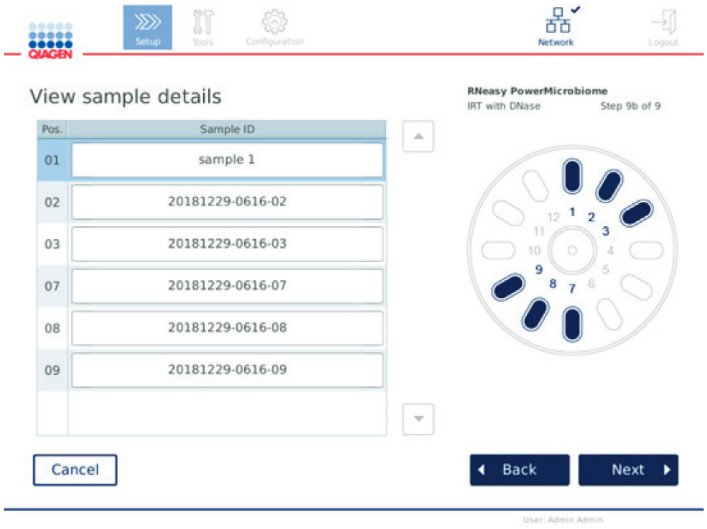
Load the centrifuge rotor adapter screen when samples are loaded into the centrifuge. Samples are loaded in position 2 of the rotor adapter.

The number and tube positions of the rotor adapters required for the run are shown in the table and in the illustration. The table shows how to load each rotor adapter. The **Pos.** column indicates the position in the rotor adapter, and the **Lid position** column indicates where to place the lid of a particular tube.

For each rotor adapter:

1. For samples: Prepare and load the samples as outlined on the screen. Make sure to load the correct sample amount. Ensure that you read all essential and critical information indicated in the blue **Information** box on the right side of the screen.
2. Load each tube/spin column in its correct position as indicated in the table on the screen. Touch the table row to highlight the particular tube position in the illustration below the table.
3. Ensure that the tubes and spin columns are pushed firmly into the appropriate rotor adapter position.
4. Make sure that the lids are pushed all the way down to the bottom of the slots on the sides of the rotor adapter. Ensure that you place the lids in the correct lid positions.

   If required and described in the table, cut off the lid, or screw on a spin-column adapter ring and break off the bottom of the spin column.
5. Repeat steps 1–4 until all rotor adapters have been prepared.
6. Press **Next** to proceed loading of rotor adapters into centrifuge.
7. If required, change the default value in the **Sample ID** fields using the on-screen keyboard. You can enter the value manually or scan the sample bar code using the external barcode scanner. The sample ID is initially created using the YYYYMMDD-HHMM-no. format.



View sample details screen.

Note: Sample IDs are part of the run reports and can be part of log files and audit trail. These IDs are not encrypted.

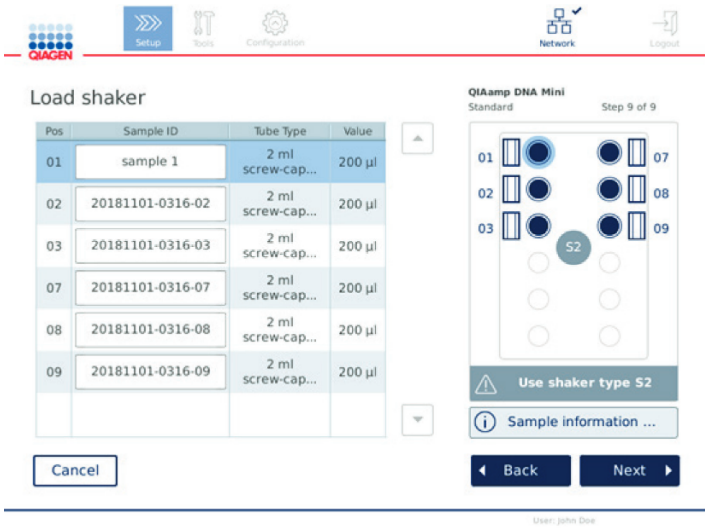
8. Place the prepared rotor adapters into the centrifuge buckets as shown on the right side of screen. For ease of use and safety, the rotor adapters fit in the centrifuge buckets in only one orientation. To prevent sample mix up, ensure to load the particular Sample ID into the defined centrifuge position.
9. Press **Next** to proceed to start the run.

5.4.9 Loading the shaker

The **Load shaker** screen guides you through the loading of the shaker.

Depending on the selected protocol, loading of the shaker might not be required. In this case, the software will indicate that this step can be skipped.

Depending on the selected protocol, samples and/or other tubes must be loaded on the shaker.



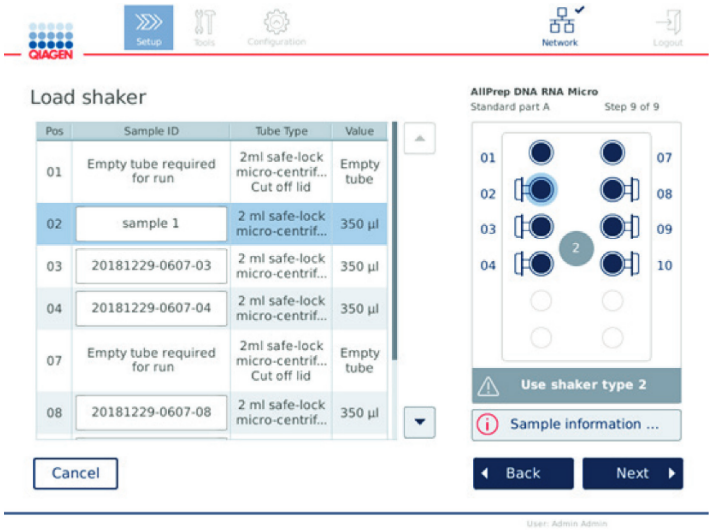
Loading of shaker; lid positions filled with shaker rack plugs

In this step, the software displays the shaker positions, tubes and volume to be loaded in the table and in the schematic on the right. Make sure to load the correct shaker rack type as described on the right side of the screen. Make sure to read all essential and critical information before proceeding to the next step.

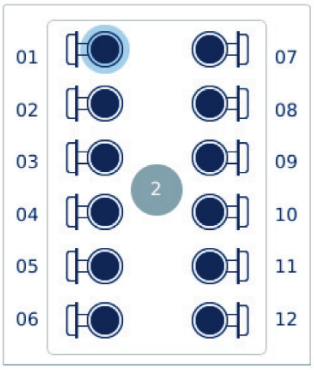
1. Ensure that you are using the correct shaker rack type.
2. If required, change the default **Sample IDs** in the respective fields using the on-screen keyboard. You can enter the value manually or scan the sample bar code using a barcode scanner. The sample ID is initially created using the YYYYMMDD-HHMM-no. format.

   Note: Sample IDs are part of the run reports and can be part of log files and audit trail. They are not encrypted.
3. Prepare the correct tubes. Ensure that you read all essential and critical information indicated in the **Information** icon (ⓘ) marked in red.
4. Load the tubes into the correct position of the shaker rack. Touch the table row to highlight the position in the schematic at the right.
5. Depending on the tube type, a shaker rack plug or the tube lid must be placed into the slot next to the tube, as shown on the screen or indicated in the **Information** icon (ⓘ). Make sure that the lid/shaker rack plug is securely seated in the slot. Do not place a lid or shaker rack plug next to an empty shaker rack position.

   Note: Depending on the protocol used, positions 1 and 7 may be used differently from the other positions. Ensure that you follow the instructions in the table and in the schematic to load the shaker correctly. In this screen below, no lid or shaker rack plug is required for these positions.

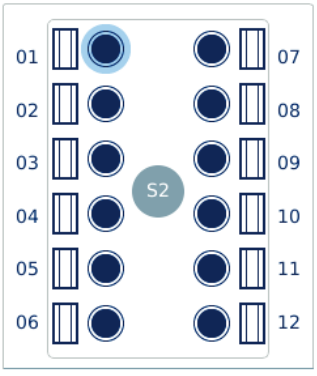


Example of protocol using shaker positions 1 and 7 differently. For this example, do not load lids or shaker rack plugs for these positions.

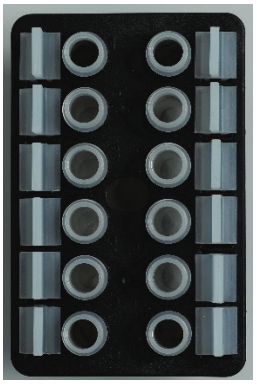


Loading the shaker rack with sample tubes that have attached lids

Lids of sample tubes must be securely placed into the slots at the edge of the shaker rack



Loading the shaker rack with sample tubes that have screw-cap lids



Shaker rack plugs must be placed into the slots at the edge of the shaker rack

6. Press **Next** to proceed to starting the run or loading the centrifuge, depending on your selected protocol.

WARNING	**Risk of personal injury and material damage** [W5] To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

Do not use 1.5 mL microcentrifuge tubes on the shaker. These microcentrifuge tubes can cause filter-tips to stick during sample transfer. Using this tube on the shaker can damage the pipetting system and can cause a centrifuge crash.

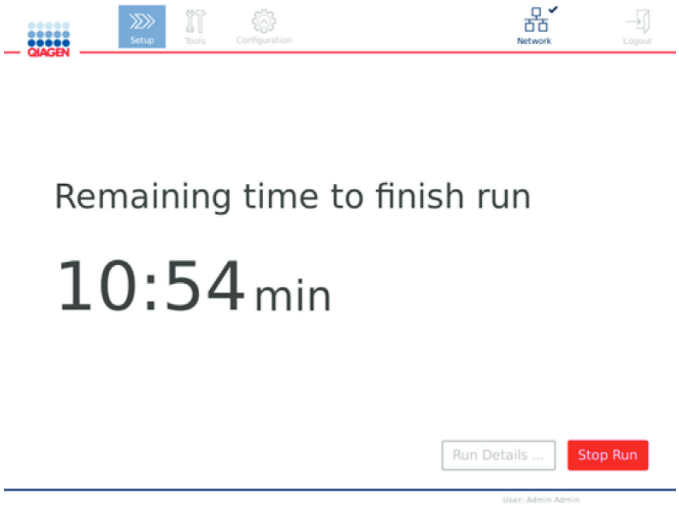
5.5 Starting a protocol run

A confirmation message will appear when the final step on the last setup screen has been completed.

1. Close the hood to continue.
2. Press **Start** to begin the run. The screen will display the estimated run duration. If required, press **Back** to return to the previous setup screen.

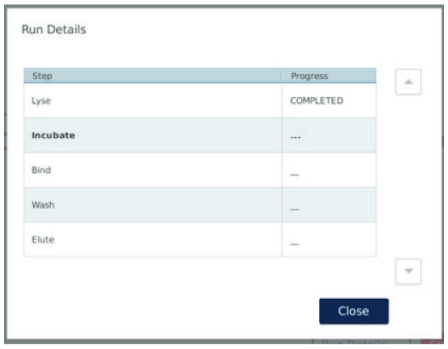
   Important: Do not open the instrument hood during a run. In the event the hood is opened during a run, the run will stop. If the tip adapter has picked up a tip, it must be removed manually.

   Note: For the very first run, the estimated run duration is not available.



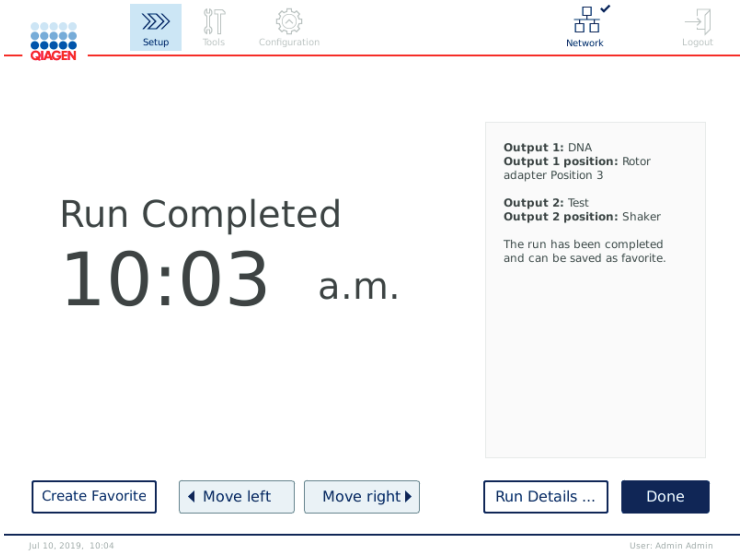
Run status screen during a protocol run

During the run, you can press the **Run Details** button to display the run steps. To return to the run view, press **Close**.



Run details screen

3. When the protocol run is completed, the output position and content will be shown on the right side of the screen. Make sure that you follow the proper procedures for storing and handling the samples.



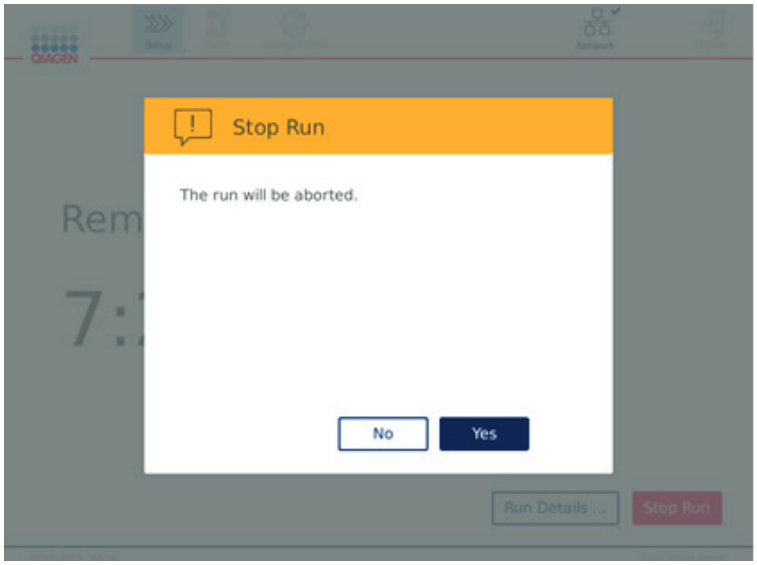
Run completed screen

Optionally, press **Create favorite** and enter a name to save the run setup of the finished run for future re-use (see section 5.7 Adding protocol to favorites). This name will appear in the **Setup** screen in the **Favorites** section at the right.

Note: It is recommended to perform regular maintenance as described in section 6.3 Regular maintenance before starting the next run.

5.6 Stopping a protocol run

In case of emergency, a run can be stopped by pressing the **Stop Run** button on the run status screen (see page 79). To confirm the run stopped, click **Yes** in the **Stop Run** dialog.



Stop run screen

If a run is stopped, perform the daily maintenance as described in section 6.4 Daily maintenance, and ensure that no plastic parts are present in the centrifuge before starting the next run.

Note: If a protocol run is stopped, the run cannot be restarted; the samples must be processed manually (refer to section 7.3.1 Protocol interruption).

5.7 Adding protocols to favorites

When a protocol is finished, it can be added to the Favorites section on the Setup screen for quicker access in the future.

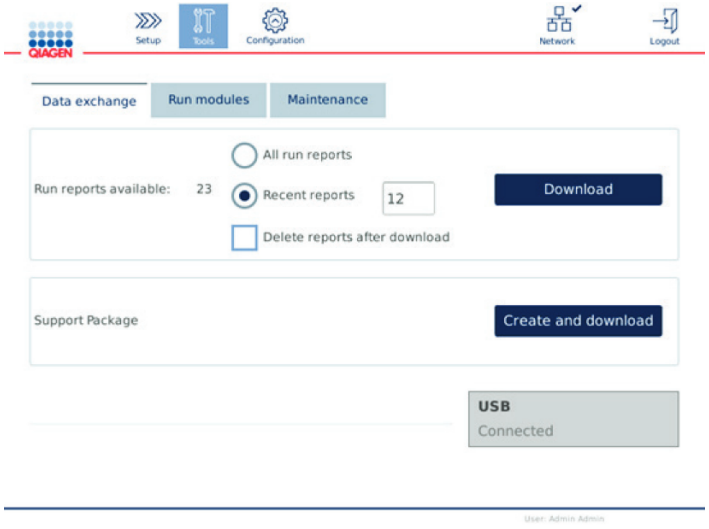
1. Press **Create Favorite** on the Run Completed screen (see page 90).
2. The protocol appears in the Favorite section in the Setup screen.
   Note: If the **Favorites** section on the **Setup** screen is full, the earliest created favorite will be removed from the section to make space for the new favorite.

5.8 Saving run reports to the USB flash drive

Run reports are automatically saved on the instrument after each run. The number of run reports on the instrument is limited to 200. If this number is reached, the oldest run report will be replaced by the new run report.

To transfer run reports to the USB flash drive, proceed as follows:

1. Press the **Tools** icon ( ) on the menu bar.
2. Press the **Data exchange** tab. The number of available run reports is shown on the screen.



Data exchange screen

3. If not yet connected, connect the USB flash drive to one of the USB ports at the left of the touchscreen.
4. To save all available run reports to the USB flash drive, select **All run reports**. To save only the recent reports, select **Recent reports**. To enter the number of reports to be saved, touch in the **Recent reports** field.
5. If you would like to delete reports from the instrument after download, press **Delete reports after download**.
6. Press **Download** to save the reports to the USB flash drive.

   A confirmation message that run reports are successfully saved to the USB flash drive will appear. The USB flash drive can be removed from the instrument.

   Important: Do not remove the USB flash drive while the files are downloading. Wait until the download is completed.

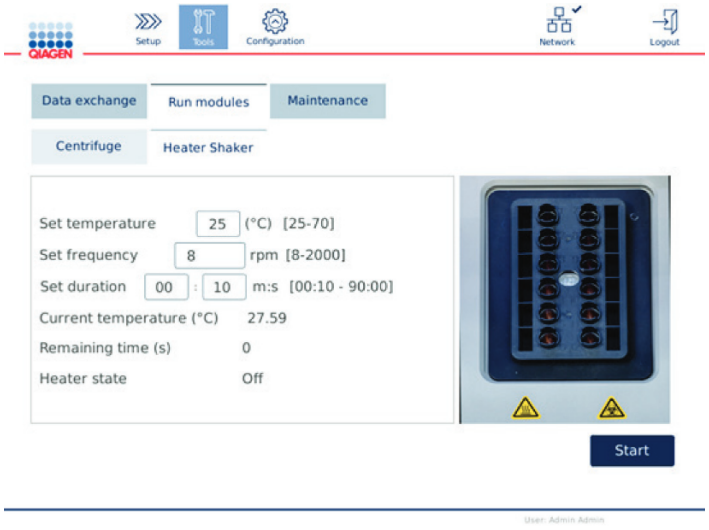
5.9 Independent heater/shaker operation

The heater/shaker can be operated individually if the QIAcube Connect is not running a protocol. The heating and shaking functions are not interlinked and can be used independently or in combination.

Do not attempt to move the QIAcube Connect during operation.

WARNING	**Hot surface** **[W21]** The shaker can reach temperatures of up to 70°C (158°F). Avoid touching it when it is hot. Carefully remove the samples after a run.

1. Press the **Tools** icon ( ) on the menu bar.
2. Press the **Run Modules** tab.
3. Press the **Heater Shaker** tab.



Heater Shaker operation screen

4. Press the appropriate field to select the **Frequency**, **Temperature** and **Duration** using the on-screen keyboard.
5. Load the shaker rack tubes containing samples.
6. Close the hood to start run.

The remaining time and current temperature and status of the heater are displayed on the screen. Wait until the operation is completed.

To stop the run progress, press **Stop**.

Heater Shaker operation screen

5.10 Independent centrifuge operation

The centrifuge can be operated individually if the QIAcube Connect is not running a protocol.

Do not attempt to move the QIAcube Connect during operation.

CAUTION	**Damage to the instrument** **[C7]** The QIAcube Connect must not be used if the centrifuge lid is broken, or if the lid lock is damaged. Make sure that no loose material is inside the centrifuge during operation. Make sure that the rotor is installed correctly and that all buckets are properly mounted, regardless of the number of samples to be processed. Load the rotor only as instructed by the software. Only use rotors, buckets, and consumables designed for use with the QIAcube Connect. Damage caused by use of other consumables will void your warranty. We recommend replacing the centrifuge rotor and buckets after 20000 cycles, which is equivalent to 9 years of usage with two runs per day for 220 days each year. For more information contact QIAGEN Technical Services.

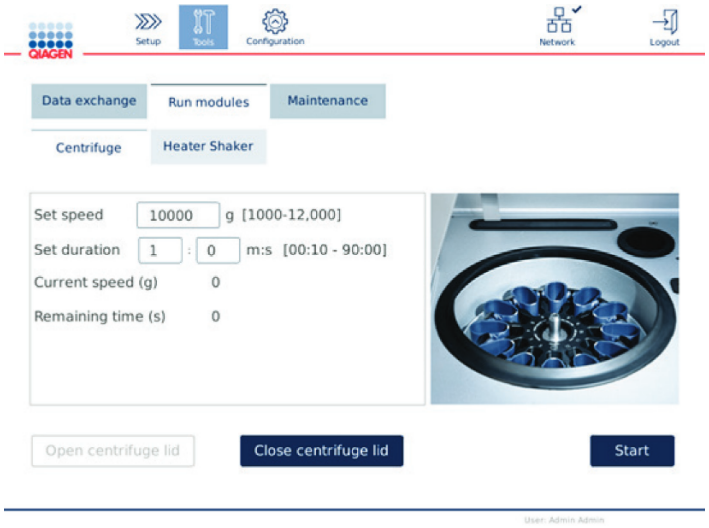
WARNING	**Moving parts** **[W19]** In case of breakdown caused by power failure, remove the power cord and wait 10 minutes before attempting to manually open the centrifuge lid.

CAUTION	Damage to the instrument [C8]
	After a power failure, do not move the z-module (robotic arm) manually in front of the instrument. Damage may occur if the QIAcube Connect hood is closed and collides with the z-module.

CAUTION	Risk of overheating [C9]
	To ensure proper ventilation, maintain a minimum clearance of 10 cm at the sides and rear of the QIAcube Connect. Slits and openings that ensure the ventilation of the QIAcube Connect must not be covered.

WARNING	Risk of personal injury and material damage [W20]
	Raise the centrifuge lid carefully. The lid is heavy and may cause injury if it falls.

1. Press the **Tools** icon ( ) on the menu bar.
2. Press the **Run Modules** tab.
3. Press the **Centrifuge** tab.



Centrifuge operation screen

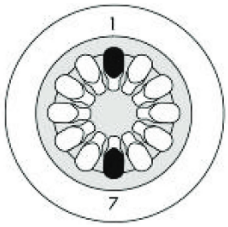
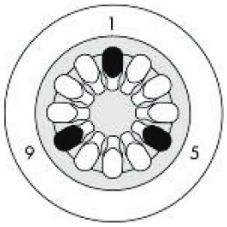
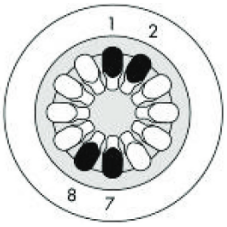
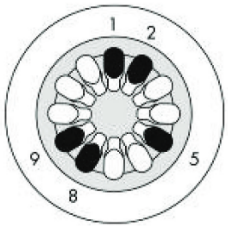
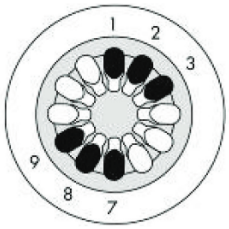
4. Press the appropriate field to select the **Speed** and **Duration** using the on-screen keyboard.
5. If the centrifuge lid is not open, press **Open Centrifuge Lid**.
6. If required, load opened 1.5 mL microcentrifuge elution tubes and/or QIAGEN spin columns into the rotor adapters and place the lids into the appropriate slots in the rotor adapter.

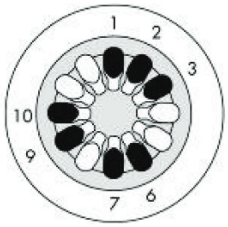
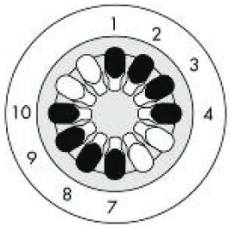
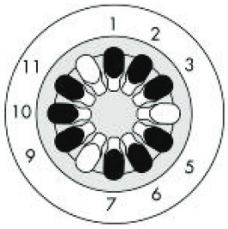
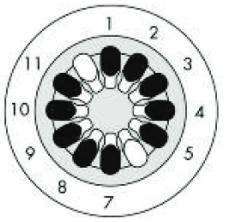
7. Ensure that the tubes and spin columns are pushed firmly into the appropriate rotor adapter position.
8. Make sure that the lids are pushed all the way down to the bottom of the slots on the sides of the rotor adapter. If required, cut off the lid.
9. Place the rotor adapters into the centrifuge.

   Important: If fewer than 12 samples are to be processed, ensure that you load the correct centrifuge positions as described in the **Loading scheme** table below. One or 11 samples cannot be loaded.
10. Close the hood and press **Start** to start centrifugation.

    Note: The Close centrifuge lid button is not needed to start a centrifuge run, as the lid will close automatically. It is only required in case you need to prepare the QIAcube Connect for shipment.

Loading scheme:

No. of samples	Centrifuge loading scheme
2	
3	
4	
5	
6	

No. of samples	Centrifuge loading scheme
7	
8	
9	
10	
12	Load all positions

5.11 Managing protocols

Commonly used QIAGEN standard protocols are installed on the QIAcube Connect upon delivery. The range of QIAGEN standard protocols is continuously expanding, and these protocols are downloadable at no cost at **www.qiagen.com/QIAcubeProtocols**. QIAGEN's Application Lab Specialists can also customize these protocols or develop new protocols depending on your needs. Protocols that are no longer required can be easily removed from the QIAcube Connect.

Protocols can only be managed by users assigned the Administrator role.

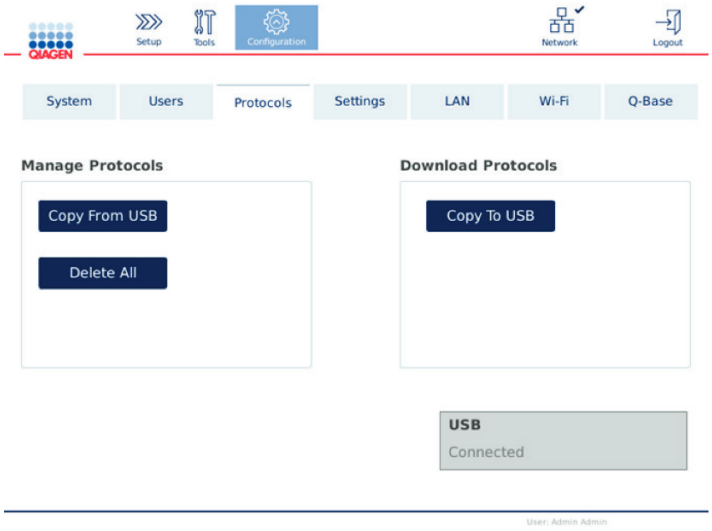
5.11.1 Installing new protocols

1. On a computer running Microsoft® Windows®, download the new protocols from this URL: **www.qiagen.com/QIAcubeProtocols**.

   Use the USB flash drive that was shipped with the QIAcube Connect to transfer the protocol files to the instrument. Create a new folder on the USB flash drive with the name **Protocol_Upload** and copy the new protocol zip file(s) to this directory. Do not unzip the files. Make sure to use the correct directory, otherwise, the QIAcube Connect will not find the protocols.

   Note: Do not rename or modify the protocol files. Otherwise, they cannot be used.

11. Connect the USB flash drive to the QIAcube Connect using one of the USB ports at the left of the touchscreen.
12. Select the **Configuration** icon ( ).
13. Press the **Protocols** tab.



Protocols configuration screen

14. Press **Copy from USB**.
15. A message is displayed indicating how many protocols are found on the USB flash drive. Press **Yes** to start uploading.

All protocol zip file(s) in the **Protocol_Upload** folder will be installed.

Note: Already installed protocols will not be overwritten. If you attempt to re-install an existing protocol, a message will appear indicating that not all protocols could be copied.

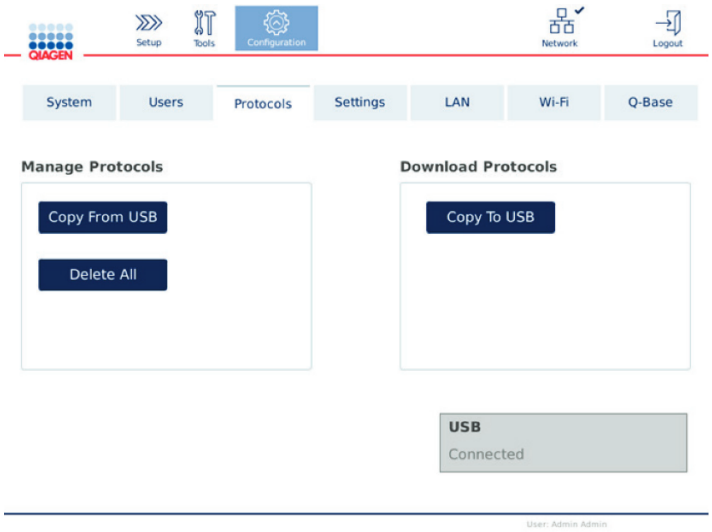
16. Wait until the transfer is complete. A message is displayed when the transfer is complete.
17. Remove the USB flash drive and power OFF the QIAcube Connect.
18. Wait a few seconds and then power ON the QIAcube Connect. To use the new protocols, log in again.

To transfer all installed protocols to the USB flash drive, press **Copy to USB**.

5.11.2 Deleting protocols

Important: Before deleting, you should back up the protocols on the USB flash drive provided with the instrument.

1. Select the **Configuration** icon ( ).
2. Press the **Protocols** tab.



Protocols configuration screen

3. To delete all protocols installed on the instrument, press **Delete All**. It is not possible to delete a single protocol from the QIAcube Connect.

   Note: After deleting all protocols, a selective upload of protocols will reduce the options during run setup.

5.11.3 Saving protocols

Protocols can be downloaded from the instrument to USB flash drive to transfer them to another instrument or to save them before a software update. Use the USB flash drive provided by QIAGEN.

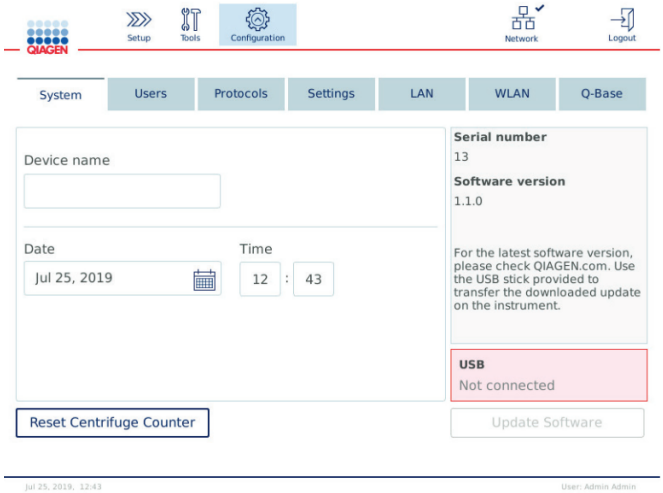
1. Connect the USB flash drive that was shipped together with the instrument to the QIAcube Connect using one of the USB ports at the left of the touchscreen.
2. Select the **Configuration** icon ( ).
3. Press the **Protocols** tab.
4. From the Download Protocols section, press Copy To USB.

5.12 Updating software

If an updated software version is available for download, it can be accessed at **www.qiagen.com/QIAcubeConnectRessources**. The download creates a ZIP file.

The software can only be updated by users assigned the role Administrator. It is recommended to download all run reports before updating the software and to create a support package, because run reports and support packages will be lost during software update (see section 5.8 Saving run reports to the USB flash drive and section 7.2 Creating a support package).

1. On the menu bar, press the **Configuration** icon ( ).
2. Press the **System** tab.
3. The currently installed software version is shown at the right.



System configuration screen

4. On a computer running Microsoft Windows, download and transfer the software ZIP file to the main folder of the USB flash drive provided with the QIAcube Connect and extract the ZIP file there.

   Note: After extraction, make sure the following 4 files are in the main folder of the USB flash drive:
   qiacube1.bin
   qiacube2.bin

qiacube-connect-<version>.tar.gz

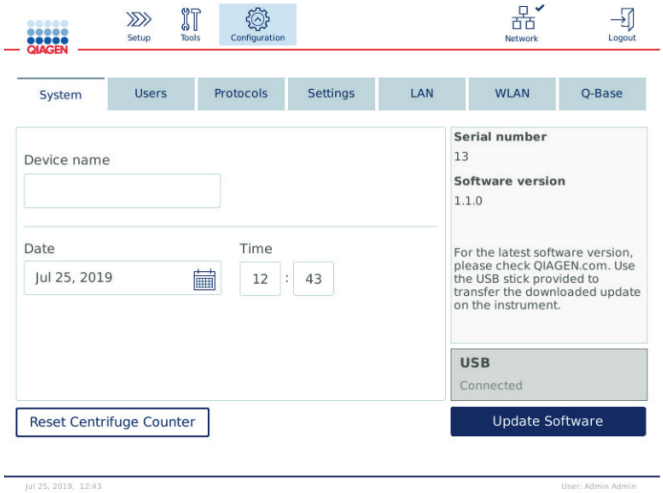
qiacube-connect-<version>.tar.gz.md5sum.

The update will not work if one of the files is missing or has been renamed. Make sure that only the files for one software version are in the main folder of the USB flash drive.

5. Connect the USB flash drive to the instrument using one of the USB ports at the left of the touchscreen.

   Important: Make sure that all run reports and support packages have been backed up before proceeding to the next step. See section 5.8 Saving run reports to the USB flash drive and section 7.2 Creating a support package.

6. Press **Update Software** to start the software update. Follow the instructions on the screen.



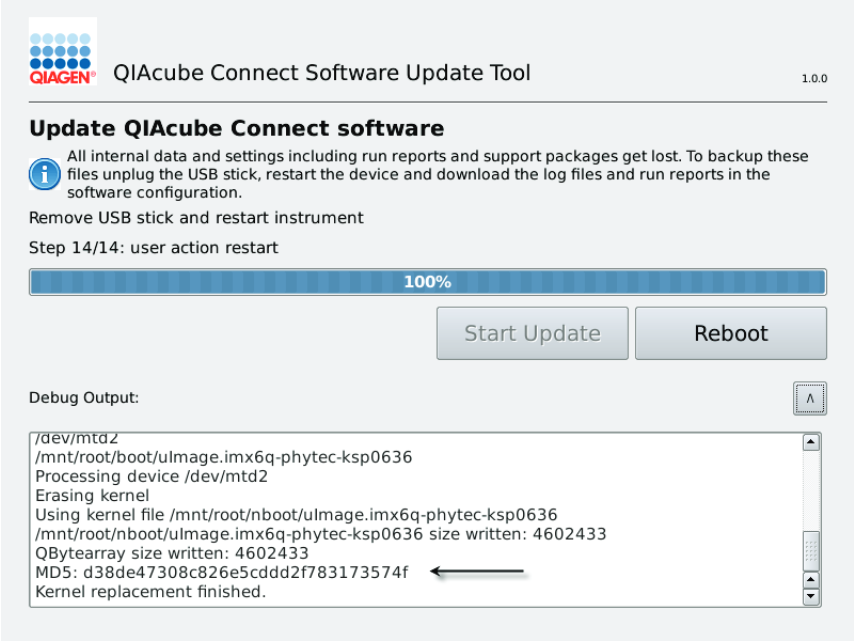
System configuration screen

7. The software update tool is displayed. Press **Start update** to start the software update.

Software update tool screen

Press **Cancel** if you do not want to update the software. In this case, the instrument will initialize without updating the software.

8. Wait until the update has completed.
9. Press the arrow button to open the **Details** screen.



Software update tool with update details to see the MD5 checksum

10. Compare the MD5 checksum on the screen with the checksum provided on the software download page. If the checksums are not identical, contact QIAGEN Technical Services.
11. Press **Reboot** to continue. The instrument will initialize with the updated software.
12. When instructed by the screen, remove the USB flash drive from the USB port.
13. Use a computer running Microsoft Windows to delete the previously downloaded software files from the USB flash drive.

5.13 User Management

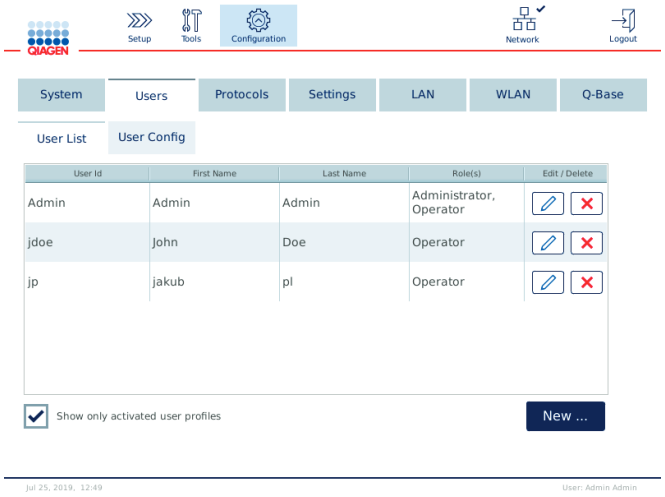
The QIAcube Connect is provided with a User Management feature. This feature enables you to set up multiple users with two different roles: administrator and operator. When you use the QIAcube Connect for the first time, a default user named Admin is already pre-installed and configured with both roles assigned. The user management feature is only available for users assigned the Administrator role.

5.13.1 Setting up a new user

1. Press the **Configuration** icon ( ) on the menu bar.

2. Press the **Users** tab.

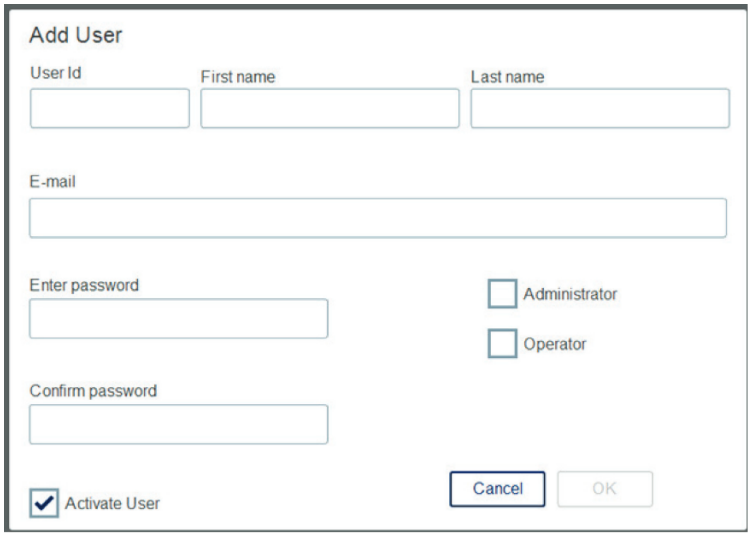
   The configured users are shown in the table. Each row contains the data for one user.



List of configured users in the user management

   Note: It is recommended to create at least one other user with the administrator role.

3. Press **New** to add a new user.
4. Enter the respective data for the new user. Keep the **Activate User** box checked.



Add User screen

   The **User ID**, **First name** and **Last name** fields are mandatory. These fields may contain up to 30 letters and numerical characters. The user ID must be unique for each user profile. It must contain at least one letter and cannot contain blank spaces. The user ID is used for logging in and is printed on run reports. The first and last name are displayed on the touchscreen for the currently logged in user.

The **Password** field is mandatory and must contain 8–40 letters or numerical characters. Enter the same password into the **Confirm password** field.

Select the user role: **Administrator** and/or **Operator**. The operator may only use the instrument, while the administrator is also allowed to configure the system. One user can have both roles assigned at the same time. The default user **Admin** has both user roles assigned.

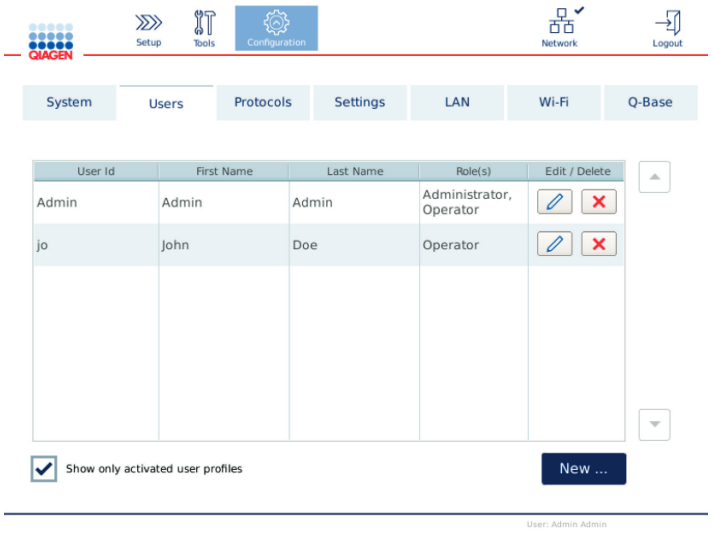
The **E-mail** address field is optional. The system does not confirm whether the e-mail address entered is valid.

5. Press **OK** to save the new user.

5.13.2 Changing data for an existing user

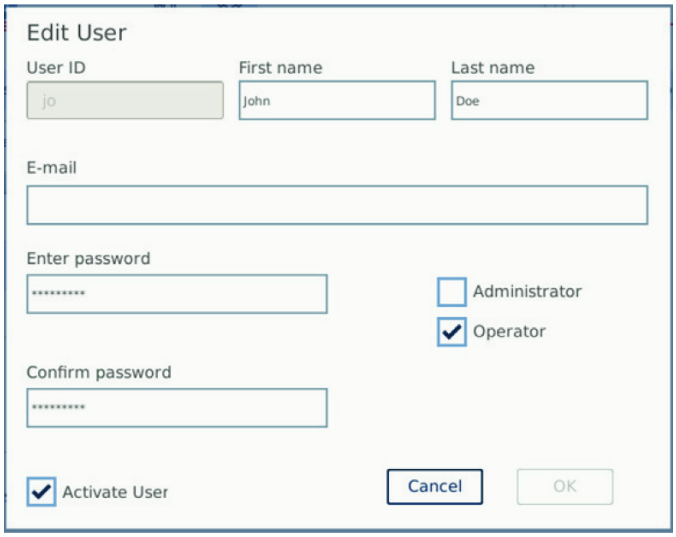
1. Press the **Configuration** icon ( ) on the menu bar.
2. Press the **Users** tab.

   The configured users are shown in the table. Each row contains the data for one user.



List of configured users in the user management

3. In the user profile row, press the **Edit** ( ) icon.
4. A screen will appear showing the current information of the user. Edit the information as necessary.



Edit User screen

The user's password will not be displayed. If you touch the password field, the existing password will be cleared, and a new password must be entered and confirmed.

5. To confirm the changes, press **OK**. To close the dialog and discard the changes, press **Cancel**.

5.13.3 Deleting or temporarily deactivating a user

1. To delete a user, press the **Delete** icon ( ) in the user profile row. It is not possible to delete the currently logged-in administrator.
2. To temporarily deactivate a user, press the **Edit** icon ( ) in the user profile row. Uncheck the **Activate User** box. It is not possible to deactivate the currently logged-in administrator.
3. To reactivate a user profile, press the **Edit** icon ( ) in the user profile row. Check the **Activate user** box.

Note: If a user tries to login with the wrong password, the user profile will be automatically deactivated after 10 failed login attempts.

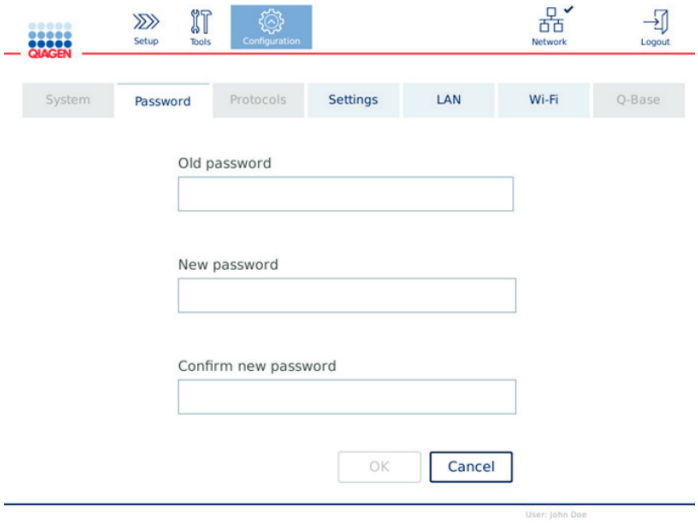
Deactivated users can be displayed in the users list by unchecking the box **Show only activated user profiles.** If the box is unchecked, all user profiles will be listed.

5.13.4 Changing password

Users with the Administrator role are allowed to change or reset the passwords of all other users, including other admins. We recommend creating at least one additional administrator as a backup for the pre-installed administrator user **Admin**. Refer to section 5.13.2 Changing data for an existing user on page 91 for more details. Passwords are never displayed in this process, so the administrator cannot view password.

User with Operator role can change its own password. Follow the instructions below:

1. Press the **Configuration** icon ( ) on the menu bar.
2. For users with the role **Operator**, the **Password** tab is automatically active



Change password screen

3. Enter the old password into the **Old password** field. Touch the field to open the on-screen keyboard.
4. Enter a new password into the **New password** field, and re-enter the new password in the **Confirm new password** field.
5. Press **OK** to save the new password. Press **Cancel** to discard any changes and to keep the old password.
6. To return to the setup screen, press the **Setup** icon ( ).

6 Cleaning and Maintenance

WARNING/ CAUTION 	**Risk of personal injury and material damage** **[W22]** Only perform maintenance that is specifically described in this user manual.

The following maintenance procedures must be carried out to ensure reliable operation of the QIAcube Connect:

- Regular maintenance: after each protocol run
- Daily maintenance: after the last protocol run of the day
- Monthly maintenance: every month
- Periodic maintenance: when necessary; at least every 6 months

Optionally, these procedures may be performed to check and ensure the reliability of operation of the QIAcube Connect:

- UV Run: reduces pathogen and nucleic acid contamination
- Tightness Test: ensures the tightness of the tip adapter (e.g., after O-Ring change)

The software provides step-by-step guidance under **Tools/Maintenance** for the maintenance procedures listed above, except for the regular maintenance.

Following these procedures ensures that the QIAcube Connect is free from dust and liquid spills.

Select the cleaning agent according to the objective of the cleaning procedure, the sample material used and the downstream assay.

WARNING 	**Risk of fire or explosion** **[W6]** When using ethanol or ethanol-based liquids on the QIAcube Connect, handle such liquids carefully and in accordance with the required safety regulations. If liquid has been spilled, wipe it off and leave the QIAcube Connect hood open to allow flammable vapors to disperse.

Before using any cleaning or decontamination methods except those recommended by the manufacturer, users should check with the manufacturer that the proposed method will not damage the equipment.

6.1 Cleaning agents

The following disinfectants and detergents are recommended for cleaning the QIAcube Connect.

Note: If you want to use disinfectants different from those recommended, ensure that their compositions are like those described below.

General cleaning of the QIAcube Connect:

- Mild Detergents (e.g., Mikrozid® AF sensitive)
- 70% ethanol (for cleaning the worktable only; not for cleaning the QIAcube Connect hood)

6.2 Disinfection

Ethanol-based disinfectants can be used for disinfection of surfaces, such as the worktable or inside the centrifuge: e.g., 25 g ethanol and 35 g 1-propanol per 100 g liquid or Mikrozid Liquid (Schülke & Mayr GmbH, cat. no. 109160).

Disinfectants based on glyoxal and quaternary ammonium salt can be used for submerging worktable items, the centrifuge rotor, and the waste drawer: e.g., 10 g glyoxal, 12 g lauryldimethylbenzylammonium chloride, 12 g myristyldimethylbenzylammonium chloride, and 5–15% nonionic detergent per 100 g liquid, Lysetol® AF (Gigasept® Instru AF in Europe, cat. no. 107410, or DECON-QUAT® 100, Veltek Associates, Inc., in the USA, cat. no. DQ100-06-167-01).

General instructions

- Do not use spray bottles to spray cleaning or disinfectant liquids onto surfaces of the QIAcube Connect workstation. Spray bottles should be used only for items that have been removed from the workstation.
- If solvents or saline, acidic, or alkaline solutions are spilt on the QIAcube Connect or if QIAGEN buffers splash the instrument hood, wipe the spilt liquid away immediately.
- Follow manufacturer's safety instruction for handling cleaning agents.
- Follow manufacturer's instruction for soaking time and concentration of the cleaning agents. Immersing for longer than the recommended soak time can harm the instrument.
- Do not use alcohol or alcohol-based disinfectants to clean the QIAcube Connect hood. Exposing the QIAcube Connect hood to alcohol or alcohol-based disinfectants will cause surface cracking. Clean the QIAcube Connect hood with distilled water only or a mild detergent.
- Do not submerge buffer bottles in 70% alcohol. The blue ring is not ethanol resistant.
- Take care that no liquid runs down the touchscreen. Liquid may be drawn through the dust protection sealing by capillary forces and cause malfunction of the display. To clean the touchscreen, moisten a soft lint-free cloth with water, ethanol, or a mild detergent and carefully wipe the display. Wipe dry with a paper towel.

Removal of RNase contamination

RNase*Zap*® RNase Decontamination Solution (Ambion, Inc., cat. no AM9780) can be used for cleaning surfaces and submerging worktable items, centrifuge rotor, and waste drawer. RNase*Zap* can also be used to perform decontamination by spraying the respective worktable items.

Removal of nucleic acid contamination

DNA-ExitusPlus™ (AppliChem, cat. no. A7089,0100) can be used for cleaning surfaces and submerge worktable items, centrifuge rotor, and waste drawer. DNA-ExitusPlus can also be used to perform decontamination by spraying the respective worktable items. DNA-ExitusPlus is very sticky and foamy. For this reason, after cleaning the items with DNA-ExitusPlus, it is required to clean the items with a wet cloth several times, or rinse them with running water, until the DNA-ExitusPlus is completely removed. This is especially important for the rotor and swing-out buckets so that the buckets do not get stuck during centrifugation and positioning.

CAUTION 	**Damage to the instrument** **[C10]** Do not use bleach, solvents, or reagents containing acids, alkalis, or abrasives to clean QIAcube Connect.

CAUTION 	**Damage to the instrument** **[C11]** Do not use spray bottles containing alcohol or disinfectant to clean surfaces of the QIAcube Connect. Spray bottles should be used only to clean items that have been removed from the worktables.

WARNING 	**Risk of fire** **[W24]** Do not allow cleaning fluid or decontamination agents to come into contact with the electrical parts of the QIAcube Connect.

WARNING 	**Risk of electric shock** **[W10]** Do not open any panels on the QIAcube Connect. **Risk of personal injury and material damage** Only perform maintenance that is specifically described in this user manual.

WARNING 	**Hazardous chemicals and infectious agents** **[W16]** The waste may contain toxic material and must be disposed of properly. Refer to your local safety regulations for proper disposal procedures.

WARNING 	**Risk of personal injury and material damage** **[W1]** Improper use of the QIAcube Connect may cause personal injuries or damage to the instrument. The QIAcube Connect must only be operated by qualified personnel who have been appropriately trained. Servicing of the QIAcube Connect must only be performed by a QIAGEN Field Service specialist.

WARNING 	**Risk of explosion** **[W23]** When cleaning the QIAcube Connect with alcohol-based disinfectant, leave the QIAcube Connect hood open to allow flammable vapors to disperse. Only clean the QIAcube Connect when worktable components have cooled down.

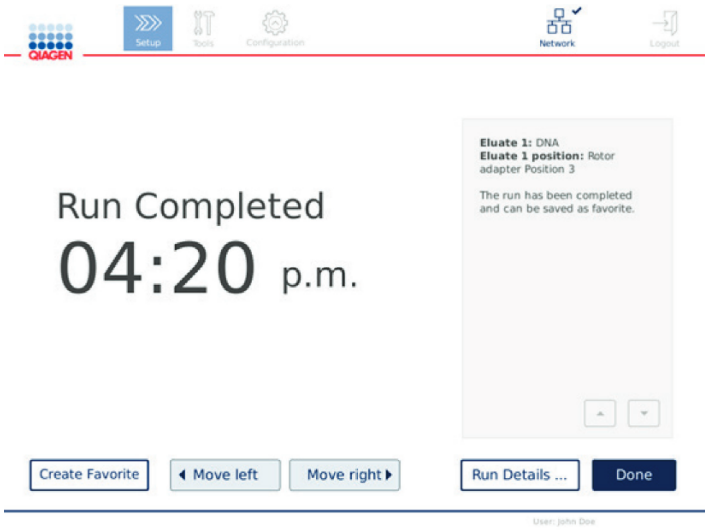
WARNING 	**Risk of fire or explosion** **[W6]** When using ethanol or ethanol-based liquids on the QIAcube Connect, handle such liquids carefully and in accordance with the required safety regulations. If liquid has been spilled, wipe it off and leave the QIAcube Connect hood open to allow flammable vapors to disperse.

WARNING 	**Toxic fumes** **[W14]** Do not use bleach to clean or disinfect the QIAcube Connect. Bleach in contact with salts from the buffers can produce toxic fumes.

WARNING 	**Toxic fumes** **[W15]** Do not use bleach to disinfect used labware. Bleach in contact with salts from the buffers used can produce toxic fumes.

6.3 Regular maintenance

After running a protocol, perform the regular maintenance procedure described below.



Run completed screen

1. Open the waste drawer and empty tips and columns (if necessary) into a suitable laboratory waste container.
2. Remove used disposable labware and unwanted samples and reagents from the worktable. Discard them according to your local safety regulations.

   Note: If the robotic arm prevents you from reaching a position, do not move the robotic arm manually. Instead, proceed as follows:

   Press **Move left** or **Move right** on the Run Completed screen, as needed. The robotic arm will start to move. The hood can remain open during this movement.

   Ensure that you stand clear of the instrument while the robotic arm is moving. Wait until the robotic arm has completed its movements.
3. Replace the lids of the reagent bottles and close tightly. Store the bottles according to the instructions in the relevant kit handbook.

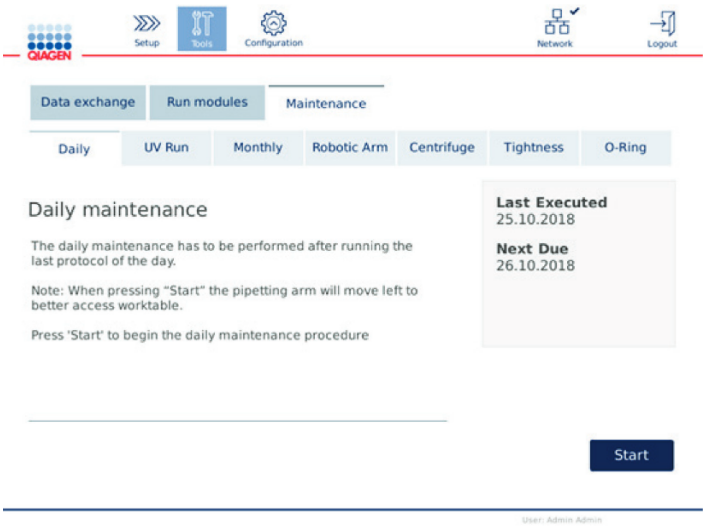
You can now run another protocol or switch off the QIAcube Connect.

6.4 Daily maintenance

After running the last protocol of the day, perform the daily maintenance procedure. The software guides you through each step to be performed:

1. To start the daily maintenance, press the **Tools** icon ( ) on the menu bar.

2. Then press the **Maintenance** tab and select the **Daily** subtab. The screen shows the **Last Executed** and the **Next Due** daily maintenance dates.



Daily maintenance screen

3. Press **Start**. Follow the instructions on the screen. Details are provided in the next steps below.

   The robotic arm will automatically move slowly to the left – even if the instrument hood is open – to provide access to the loading positions. Always stand clear of the instrument while the robotic arm is moving. Wait until the robotic arm has completed its movements before you start to unload.

4. Remove used disposable labware, adapters and unwanted samples and reagents from the worktable. If required, discard them according to your local safety regulations.
5. Close the buffer bottles tightly and store according to the instructions in the relevant kit handbook.
6. Press **Done** to confirm that the steps have been completed.
7. Empty the waste drawer and check that the inlay is clean. If necessary, clean the inlay of the waste drawer with alcohol-based disinfection wipes, or by soaking using one of the cleaning agents listed above, and then rinse with distilled water.
8. Wipe and clean the worktable with alcohol-based disinfection wipes. Incubate as appropriate, rinse thoroughly with distilled water and wipe dry with paper towels.

   Note: Do not use alcohol or alcohol-based disinfectants to clean the hood.

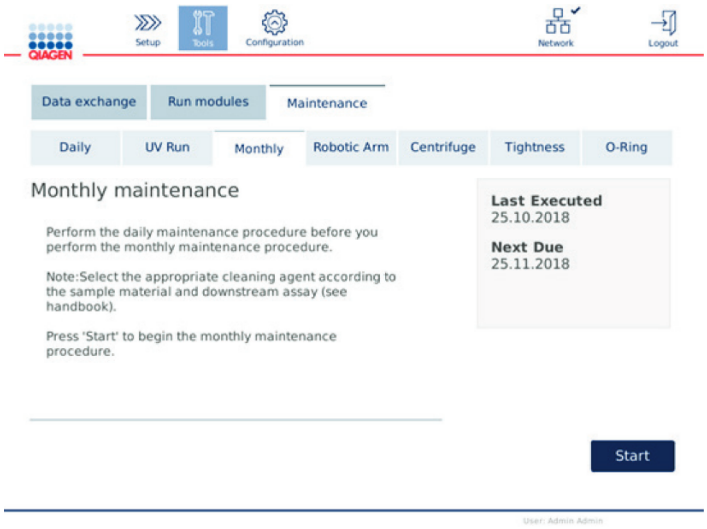
9. Press **Done** only when the steps listed above have been successfully completed. The date of the last performed daily maintenance is updated automatically.

   The robotic arm will automatically move back to its original position (above tip rack position 3).

6.5 Monthly maintenance

Perform the daily maintenance procedure (refer to section 6.4 Daily maintenance) before you perform the monthly maintenance procedure. Select the appropriate cleaning agent according to the sample material and downstream assay (refer to section 6.1 Cleaning agents).

1. To start the monthly maintenance, press **the Tools** icon ( ) on the menu bar.
2. Then press the **Maintenance** tab and select the **Monthly** subtab. The screen shows the **Last Executed** and the **Next Due** monthly maintenance dates.



Monthly maintenance screen

3. Close the hood.
4. Press **Start**. Follow the instructions on the screen. Details are provided in the next steps below.

   The robotic arm will move to the cleaning position.
5. Thoroughly clean the worktable with alcohol-based disinfection wipes. Incubate as appropriate, rinse thoroughly with distilled water and wipe dry with paper towels.

   Important: Do not use alcohol or alcohol-based disinfectants to decontaminate the QIAcube Connect hood.
6. Clean the touchscreen with alcohol-based disinfection wipes and wipe dry afterwards.

   Important: Take care that no liquid runs down the touchscreen. Liquid may be drawn through the dust protection sealing by capillary forces and cause malfunction of the display. To clean the touchscreen, moisten a soft lint-free cloth with 70% ethanol or a mild disinfectant and carefully wipe the display. Wipe dry with a paper towel.
7. Clean the outer hood with a soft lint-free cloth moistened with water or mild detergent.
8. Clean the shaker adapter (grey), shaker tray (metal adapter), buffer bottle rack (and waste drawer in liner if not done during daily maintenance) with alcohol-based disinfection wipes.

9. Incubate the shaker adapter (grey), shaker tray (metal adapter), buffer bottle rack and waste drawer in liner by soaking as appropriate. Rinse thoroughly with distilled water and wipe dry with lint-free paper towels. If the shaker rack plugs are used, treat them in the same way.
10. Press **Done** only when the steps listed above have been successfully completed. The date of the last performed monthly maintenance is updated automatically.

    Important: Inspect the waste drawer during maintenance. Contact QIAGEN Technical Services if any broken parts are observed.
11. Transfer the run reports from the instrument to the USB flash drive and remove the run reports from the instrument. Only the last 200 run reports are saved on the instrument. For details refer to section 5.8 Saving run reports to the USB flash drive.

6.6 Periodic maintenance

The periodic maintenance consists of cleaning the robotic arm modules and centrifuge. It is recommended to be conducted when necessary, but at least every 6 months.

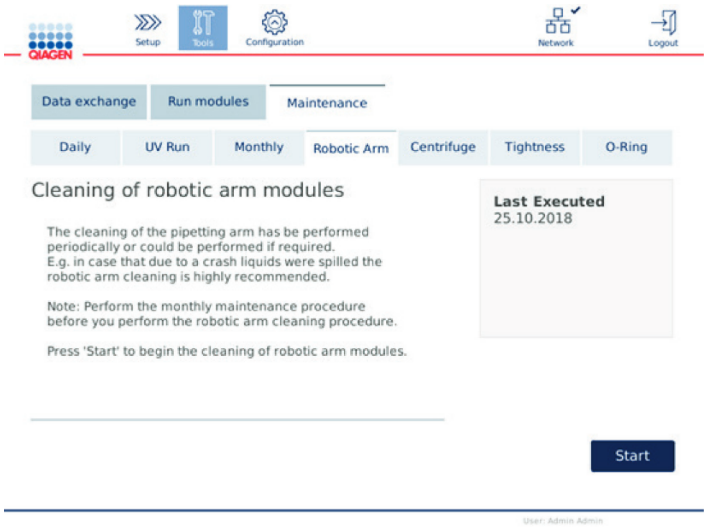
Select the appropriate cleaning agent according to the sample material and downstream assay (refer to section 6.1 Cleaning agents).

6.6.1 Cleaning the robotic arm modules

Cleaning of the robotic arm modules must be performed periodically or could be performed if required. For example, the robotic arm modules must be cleaned if liquids were spilled due to crash.

Note: Perform the monthly maintenance procedure before you perform the robotic arm cleaning procedure.

1. To start cleaning the robotic arm modules, press the **Tools** icon on the menu bar. Press the **Maintenance** tab and select the **Robotic arm** subtab. The screen shows the **Last Executed** maintenance date of the robotic arm modules.



Robotic arm maintenance screen

2. Press **Start** to begin the cleaning of robotic arm modules. Follow the instructions on the screen. Details are provided in the next steps below.
3. Make sure that used Labware, adapters and reagents are removed from the worktable. Close the hood.
4. Press **Next** to move to cleaning position.
5. Remove the waste drawer and open hood.
6. Open the waster drawer. Moisten a soft lint-free cloth with water and carefully clean the optical sensor, tip adapter, gripper unit, rotor adapter stabilization rod and the spin column lid holder. Wipe these items dry as indicated on the touchscreen of the instrument.
7. Close the hood and press **Done** to finish cleaning of robotic arm. The date of the last performed cleaning of robotic arm is updated automatically.

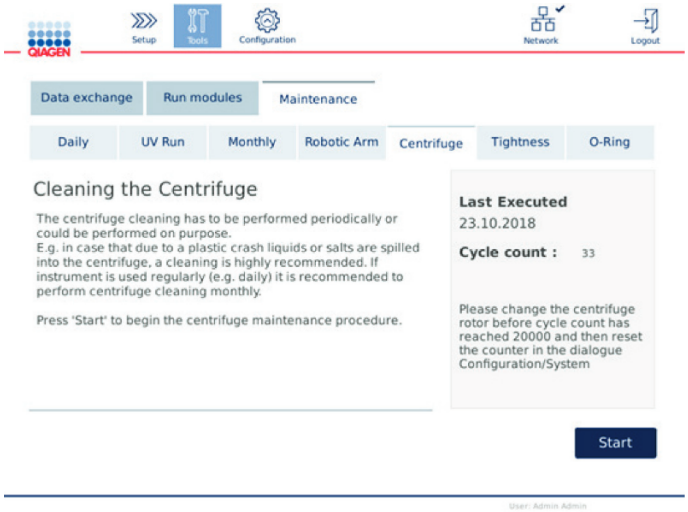
6.6.2 Cleaning the centrifuge

Cleaning of the centrifuge arm must be performed periodically or could be performed if required. For example, the centrifuge must be cleaned in case of plastic crash or spillage of liquids due to crash.

WARNING	**Risk of personal injury and material damage** [W5] To prevent plastic crash, load the tubes properly. After a plastic crash, sharp plastic particles could be inside the centrifuge. Be careful when handling items inside the centrifuge.

Note: Perform the monthly maintenance procedure before you perform the cleaning of centrifuge procedure.

1. To start cleaning the centrifuge, press the **Tools** icon and press the **Centrifuge** subtab under the **Maintenance** tab. The screen shows the **Last Executed** centrifuge maintenance date.



Centrifuge maintenance screen

2. Press **Start** to begin the centrifuge cleaning procedure. Follow the instructions on the screen. Details are provided in the next steps below.
3. The centrifuge lid must be open to allow access to the inside of the centrifuge. The lid should be opened only after the centrifuge has come to a complete stop. If the lid does not open automatically, close the hood and press the **Open Centrifuge Lid** button.
4. Switch off the instrument and perform cleaning as outlined in the following sections (below):
   - Cleaning the rotor and buckets
   - Cleaning the centrifuge
   - Maintenance of the rotor nut
   - Installing the centrifuge rotor and buckets

5. When cleaning is completed, turn on the instrument and log in. Press the **Tools** icon and then the **Maintenance** tab. Select the **Centrifuge** subtab.
6. Press **Start** again then press **Done** to confirm cleaning. The date of the last performed cleaning of centrifuge is updated automatically.

Cleaning the rotor and buckets

Note: Ensure that the instrument is switched off during cleaning.

1. Make sure the QIAcube Connect is switched off.
2. Remove all disposable rotor adapters, including tubes and spin columns, from the buckets.
3. Remove the buckets from the rotor. Undo the rotor nut on top of the rotor using the rotor key, and carefully lift the rotor off the rotor shaft.

Rotor key

4. Submerge the rotor, buckets and rotor nut in cleaning agent. Incubate as appropriate.
5. Rinse thoroughly with distilled water. Use a brush (e.g., a toothbrush or tube brush) to clean any parts that are difficult to access, such as the bucket mount and the rotor head. Wipe surfaces dry with a soft lint-free cloth. If available, dry the buckets and rotor with pressurized air.

Brushing a bucket

Brushing the rotor

Important: Make sure the paper towels and brush used are lint-free.

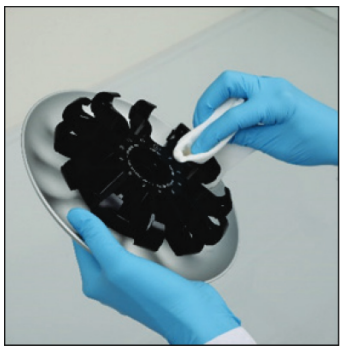
Important: Make sure that all residual salt is removed.

Important: Make sure to remove all traces of cleaning agent from the centrifuge buckets. Residual agent can cause the buckets to jam.

6. Carefully check the rotor for damage. If the rotor is damaged or shows signs of wear or corrosion, do not use the rotor. Contact QIAGEN Technical Services.

7. Apply a few drops of mineral oil (Anti-Corrosion Oil (rotor), cat. no. 9018543) on a soft, lint-free cloth, and wipe the bucket mount and rotor claw. A thin, invisible oil film should cover the bucket mount and rotor claw, but no droplets or smear should be apparent.
8. Apply oil to the rotor claw and to the bucket mount.

   Important: Before applying oil to the rotor buckets on the rotor, make sure that the rotor and all buckets are completely dry.



Rotor head

Bucket mounts

Cleaning the centrifuge

Note: Ensure that the instrument is switched off during cleaning.

1. Moisten a soft lint-free cloth with cleaning agent and clean the inside of the centrifuge and the centrifuge gasket. Incubate as appropriate.
2. Clean the inside of the centrifuge and the gasket with distilled water and wipe dry with lint-free paper towels. If available, use a vacuum cleaner.

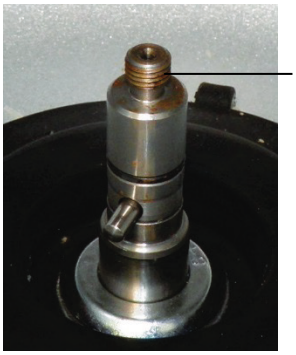
   Important: Make sure the gaskets remain in the proper positions.
3. Clean the centrifuge lid with a soft lint-free cloth moistened with cleaning agent. Incubate as appropriate, clean with water and wipe dry with paper towels.
4. Check the centrifuge gasket for damage. If the gasket is damaged or shows signs of wear, contact QIAGEN Technical Services.

Maintenance of the rotor nut

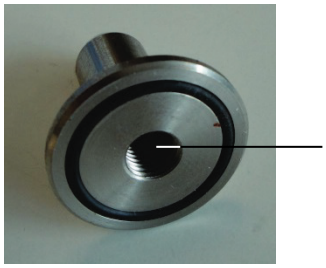
Note: Ensure that the instrument is switched off during cleaning.

Note: Always perform the cleaning procedure after disassembly of the rotor and at least twice a year.

After cleaning the rotor thread, apply a few drops of mineral oil (Anti-Corrosion Oil (rotor), cat. no. 9018543) on a lint-free cloth, and wipe the thread. A thin, invisible oil film should cover the rotor thread but no droplets or smear should appear.



Rotor thread.



Inner thread of the rotor nut.

After cleaning the inner thread of the rotor nut, wipe the thread using Anti-Corrosion Oil as described above.

Installing the centrifuge rotor and buckets

Note: Ensure that the instrument is switched off during cleaning.

1. Mount the rotor.
2. The rotor can be mounted in only one orientation. The pin on the rotor shaft fits into a notch on the underside of the rotor directly underneath rotor position 1. Line up position 1 of the rotor with the pin on the rotor shaft and carefully lower the rotor onto the shaft.
3. Install the rotor nut on top of the rotor and tighten securely using the rotor key supplied with the QIAcube Connect. Make sure that the rotor is securely seated.

Rotor key.

Rotor nut.

If the rotor nut is not tightened properly, it can become loose during operation of the centrifuge and can cause serious damage to the instrument. Such damage is not covered by the warranty.

WARNING	**Risk of personal injury and material damage** [W25] To prevent the rotor nuts from loosening during operation of the centrifuge, securely tightened the nuts using the rotor key supplied with QIAcube Connect.

4. Insert the rotor buckets. The side of the rotor bucket that must face toward the rotor shaft is marked with a grey line. Hold the bucket at an angle with the grey line facing the center of the rotor and hang the bucket on the rotor. Check that all buckets are properly suspended and can swing freely.

   Important: All centrifuge buckets must be mounted before starting a run.

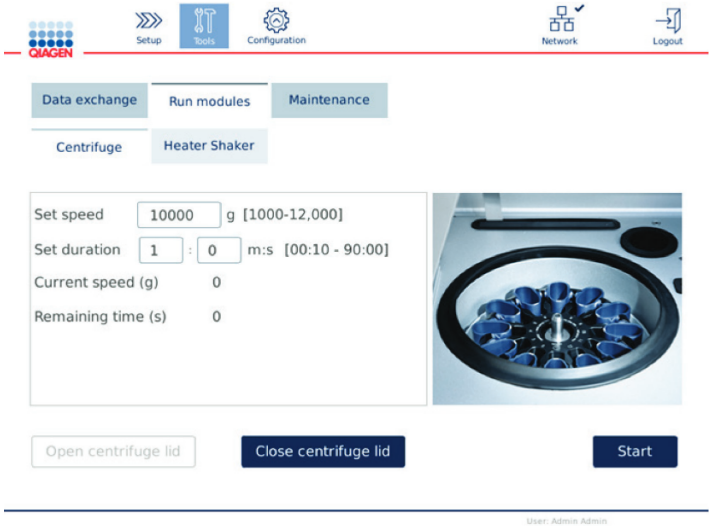
Before starting next protocol run, follow the instructions in section 6.6.3 Operating the centrifuge after cleaning.

6.6.3 Operating the centrifuge after cleaning

The centrifuge must be operated independently before starting further runs to check if residual plastic parts are still in the centrifuge.

Note: Rotor adapters and other consumables are not required.

1. Switch the instrument on and log in.
2. To start a centrifuge run, press the **Tools** icon on the menu bar and then the **Run Modules** tab. The centrifuge tab is open by default.



3. In the **Set speed** and **Set duration** fields, set the speed to 10,000 g and the duration to 1 min (1:0 m:s), respectively.
4. Press **Start** to begin the centrifuge run.
5. Carefully listen to the sound during centrifugation. See below for more details regarding the sound.

Unusual sound during centrifugation

If any grinding, rattling or crunching sounds are heard during the centrifugation, there could be still loose plastic particles inside the centrifuge. Repeat the cleaning procedure as described in section 6.6.2.

Note: It may be necessary to repeat the procedure several times to remove all plastic particles.

No unusual sound during centrifugations

If no unusual sound from loose plastic particles can be heard during centrifugation, the next protocol run can be started.

Note: The **Open centrifuge lid** and **Close centrifuge lid** buttons are not needed to start a centrifuge run, as the lid will close automatically. Instead, they are needed in case you need to prepare the QIAcube Connect for shipment or during troubleshooting.

6.7 Optional Maintenance

6.7.1 UV run

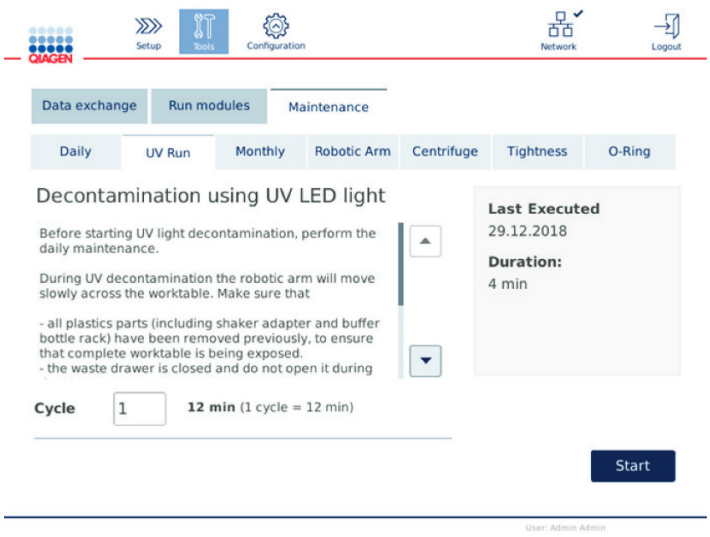
The UV run is recommended to be performed daily for decontamination purposes. It helps to reduce possible pathogen or nucleic acid contamination of the QIAcube Connect worktables. The efficiency of inactivation (test organism *E. coli*) is to be determined on layer thickness and sample type. QIAGEN cannot guarantee complete eradication of specific pathogens.

During UV decontamination, the robotic arm will move slowly across the worktable. The default cycle number is 1 (approximately 12 minutes) for maintenance. In case you visually see splashes on the worktable, you must increase the cycle number based on used sample material/pathogens.

Note: Before starting the UV irradiation procedure, ensure that daily maintenance (see section 6.4) is performed and thereby all samples, eluates, reagents and disposable labware are removed from the worktable.

During each cycle, an average summed dose rate of 28 to 46 mW*s/cm^2 can be achieved by UV LED light.

1. To start the UV decontamination, press the **Tools** icon on the menu bar. Press the **Maintenance** tab and select the **UV Run** subtab. The screen shows the **Last Executed** UV run date and the **Cycle duration.**



UV run screen

2. In the **Cycle** field, change the number of cycles. The default cycle number is 1 (approximately 12 minutes).
3. Ensure that all disposable labware has been removed from the worktable.

   Important: Ensure that the waste drawer is closed. Do not open it during the UV run.
4. Close the hood and press **Start** to begin the UV run.
5. Press **Done** once the UV run is completed. The date of the last performed UV-run is updated automatically.

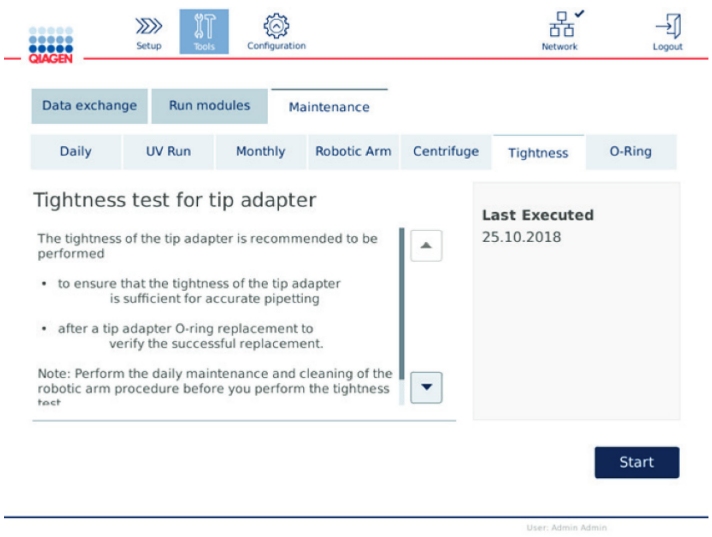
WARNING 	**Risk of personal injury** Do not expose your skin to UV-C light from the UV LED lamp.	**[W29]**

6.7.2 Tightness test

To ensure that the tightness of the tip adapter is sufficient for accurate pipetting, the tightness test of the tip adapter must be performed. This test must also be performed after replacing a tip adapter O-Ring to verify if replacement is successful.

Note: Perform the daily maintenance and cleaning of the robotic arm procedure before you perform the tightness test. See section 6.4 Daily maintenance and 6.6.1 Cleaning the robotic arm modules.

1. To start the tightness test, press the **Tools** icon on the menu bar. Press the **Maintenance** tab and select the **Tightness** subtab. The screen shows the **Last Executed** tightness test date.



Tightness test screen

2. Press **Start** to begin with the tightness test procedure. Follow the instructions on the screen. Details are provided in the next steps below.
3. Open the hood and load a 1000 µL tip rack with at least one 1000 µL tip into tip rack position 1.
4. Place an empty 2 mL safe-lock microcentrifuge tube (cat. no. 990381) in position 1 of the shaker (shaker type 2).
5. Place a buffer bottle filled with ≥10 mL 96–100% ethanol in position 1.
6. Close the hood and press **Next** to start tightness test.

   After the load check, the robotic arm will pick up a tip, aspirate ethanol and move to the tube. The tip will remain in place above the tube for 2 minutes. The tip will be discarded into the waste afterwards.
7. Wait until the test has been completed and then press **Next**.
8. After the protocol is completed, open the QIAcube Connect hood and remove the buffer bottle and tips to store them accordingly.
9. Remove the tube and visually check if liquid is present:

   If no liquid is present, press **Yes** to record that the test passed.

   If liquid is present, press **No** to record that the test failed.
10. In case the test failed, repeat the test. If test fails again, it is recommended to replace the O-Ring first (see section 7.3.5 O-Ring exchange) or contact QIAGEN Technical Services.
11. Press **Done** to finalize tightness test procedure. The date of the last performed tightness test is updated automatically.

6.8 Decontaminating the QIAcube Connect

If the QIAcube Connect is contaminated with infectious material, it should be decontaminated. If hazardous material is spilt on or inside the QIAcube Connect, the user has responsibility for carrying out appropriate decontamination.

The QIAcube Connect should also be decontaminated before shipping (e.g., back to QIAGEN). In this case, a decontamination certificate must be completed to confirm that the decontamination procedure has been carried out.

To decontaminate the QIAcube Connect, follow the daily, monthly and periodic maintenance procedure in sections 6.4–6.6, using the recommended disinfection agents. In addition, perform a UV run with at least 5 cycles as outlined in section 6.7.1.

6.9 Servicing

Contact your local QIAGEN Field Service Specialist or your local distributor for more information about flexible Service Support Agreements from QIAGEN.

WARNING 	**Risk of personal injury and material damage** **[W1]** Improper use of the QIAcube Connect may cause personal injuries or damage to the instrument. The QIAcube Connect must only be operated by qualified personnel who have been appropriately trained. Servicing of the QIAcube Connect must only be performed by a QIAGEN Field Service specialist.

7 Troubleshooting

This section provides information about what to do if an error occurs while using the QIAcube Connect.

7.1 Contacting QIAGEN Technical Services

Whenever encountering a QIAcube Connect error, be sure to have the following information at hand:

- Protocol name and version (found in the report file)
- Software version (see section 5.12).
- Sample input material
- Detailed description of the error situation

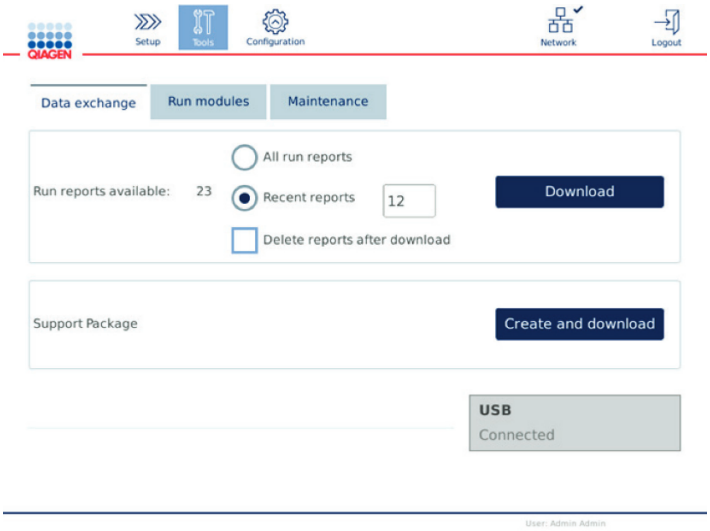
This information will help you and your QIAGEN Technical Service Specialist to deal most efficiently with your issue.

Note: Information about the latest software and protocol versions can be found at **www.qiagen.com**. In some cases, updates may be available for addressing specific problems.

7.2 Creating a support package

The support package is a zip file that can be sent to QIAGEN Technical Services for diagnosis and trouble shooting.

1. On the menu bar, press the **Tools** icon ( ).
2. Press the **Data Exchange** tab.
3. Connect the USB flash drive to one of the 2 USB ports next to the touchscreen.



Data exchange screen

4. Press **Create and Download**. The support package will be created and saved on the USB flash drive in the **Support_Package** folder.

7.3 Operation

	Comments and suggestions
Centrifuge	
Bucket does not swing back into place	Clean the centrifuge and rotors as described in section 6.
Imbalance detected	Make sure the rotor is symmetrically loaded according to instructions on run setup screens. Remove the rotor and check the centrifuge chamber for loose plasticware. Power OFF the QIAcube Connect, wait for a few minutes, and power it ON again. If the error persists, contact QIAGEN Technical Services.
Imbalance detected; loud noise heard during centrifugation	Ensure that loose parts are cleared from the worktable prior to centrifuge operation to avoid loose parts jamming or damaging the centrifuge.
Shaker	
Incorrect repositioning of shaker	The shaker should re-position itself towards the right side once shaking is completed. Remove any obstructions that prevent the shaker from returning to the correct position.
Robotic arm	
Robotic arm does not return to set position	Ensure that the instrument is placed on a stable, flat and level surface as described in section 4.1.1. In other cases, contact QIAGEN Technical Services.
Pipettor	
Pipet tips not picked up by automatic pipettor	Make sure that the tip rack is not damaged and is correctly positioned on the worktable.
Pipet tips not disposed of correctly	Empty the waste drawer and ensure it is not broken. Check that tip disposal slot is not damaged or obstructed. Perform regular maintenance, as described in section 6.3
Droplets observed on worktable	The pipettor is dripping liquid. Check that the reagent bottles contain the correct buffers and are correctly placed in the reagent bottle rack. Be sure to use the right plasticware. Check the volumes in the sample tubes and tubes of accessory buffer(s), if applicable. Do not exceed the recommended amount of starting material to avoid blocking disposable filter-tips. If tip racks have been refilled, make sure that the correct tips were used. Check tightness of pipettor in maintenance section as described in section 6.7.2. If leakage could be detected change O-Ring as described in section 7.3.5. If issue persists, contact QIAGEN Technical Services.

	Comments and suggestions
Mechanical	
Frame of instrument is distorted (e.g., uneven, unstable or not level)	Ensure that the instrument is placed on a stable, flat and level surface as described in section 4.1.1.
Hood sensor error: instrument will not function	Ensure the hood is properly closed. The instrument will not function if the hood is open.
Broken instrument hood	Ensure that only the cleaning products as described in section 6 are used on the hood.
Waste drawer jams but can still be inserted	Empty the waste drawer. Perform daily maintenance, as described in section 6.4.
Incorrectly inserted waste drawer	Handle the waste drawer with both hands when inserting or removing the drawer.
Pipet tips not disposed of correctly	Make sure the top of the tip disposal slot (refer to section 3.3) is not broken.
Scratches appear on the instrument	Always use the cleaning products as described in section 6. Do not use bleach or ethanol, as they can damage the surface of the instrument.
Electronic	
Display does not turn on	Do not touch the display with excessive force or use corrosive chemicals to clean the display surface. Contact QIAGEN Technical Services for repair.
Error when copying files to USB	Power OFF the QIAcube Connect, wait for a few minutes, and power it ON again. Save the file(s) to the USB flash drive again. Check the USB flash drive on a PC to ensure it is functional. If the error persists, contact QIAGEN Technical Services.
USB device not detected	Power OFF the QIAcube Connect, wait for a few minutes, and power it ON again. Insert the USB flash drive into the USB port. Check the USB flash drive on a PC to ensure it is functional. If the error persists, contact QIAGEN Technical Services.
Login screen not visible when launching instrument	If the touchscreen does not display the login screen, but instead a software update message is shown, power OFF the QIAcube Connect, wait for a few minutes. Ensure that the USB flash drive is not inserted in the USB port. Power ON the QIAcube Connect again. The login screen should be visible. If the error persists, contact QIAGEN Technical Services.
Error displayed when inserting the USB flash drive into a Windows PC	Ignore the message. In most cases, no scan is needed; use the USB flash drive as usual. Do not reformat the USB on the Windows PC. This will lead to complete data loss on the USB flash drive, and it can no longer be used with the QIAcube Connect.

7.3.1 Protocol interruption

If an error occurs during a protocol run, it is possible to continue sample preparation manually. The error code, the description and the step at which the protocol stopped are displayed in the touchscreen.

To continue sample processing:

1. Note the step at which the protocol stopped. This is displayed in the touchscreen.
2. Remove the samples and reagents from the QIAcube Connect.
3. Refer to the appropriate protocol in the relevant kit handbook and continue sample processing manually.

7.3.2 Centrifuge

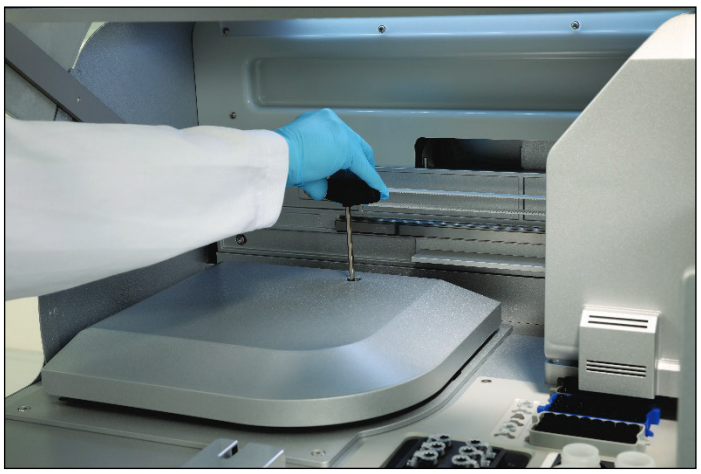
Opening the centrifuge lid in the event of a breakdown

In case of power failure, the centrifuge lid can be manually opened so that the samples can be removed. To open the centrifuge lid, follow the instructions below.

WARNING 	**Moving parts** **[W19]** In case of breakdown caused by power failure, remove the power cord and wait 10 minutes before attempting to manually open the centrifuge lid.

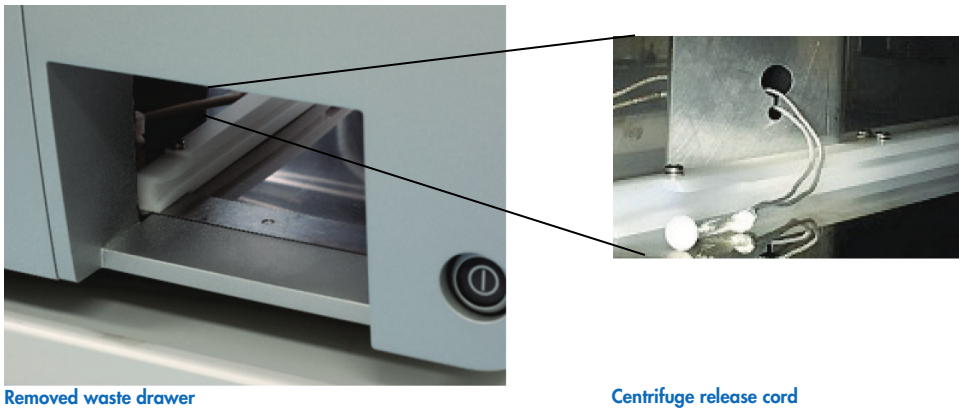
WARNING 	**Risk of personal injury and material damage** **[W20]** Raise the centrifuge lid carefully. The lid is heavy and may cause injury if it falls.

1. Power OFF the QIAcube Connect.
2. Unplug the power cord from the power outlet. Wait 10 minutes for the rotor to stop.
3. Open the instrument hood.
4. Carefully move the robotic arm to the right side of the worktable, furthest away from the centrifuge lid.
5. Remove the screw protection on top of the centrifuge lid. Using the rotor key, turn the screw counter-clockwise.



Turning the screw in the centrifuge lid

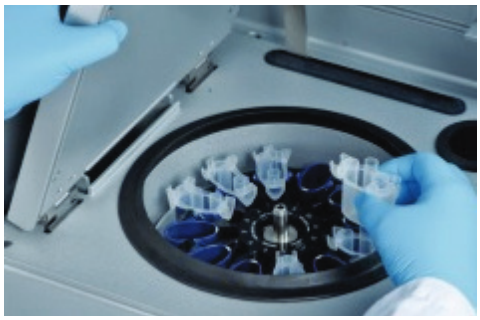
6. Remove the waste drawer. The centrifuge release cord will be visible on the left side of the waste drawer compartment.



Removed waste drawer

Centrifuge release cord

7. Pull the cord firmly to release the lid from the lock.
8. Manually raise the centrifuge lid.
9. Hold the raised lid and remove the samples and rotor adapters from the rotor.



Removing rotor adapters

Contact QIAGEN Technical Services for instructions on how to reset the lid.

Liquid spills in the centrifuge

The rotor adapter is designed for use with QIAGEN automated protocols. Do not fill the rotor adapters with liquid.

Liquid spills may occur if QIAGEN spin columns become blocked due to sample overloading. Do not exceed the maximum amount of starting material.

Incorrect installation of the centrifuge buckets may also cause rotor adapters to leak. Check that the buckets are installed properly and can swing freely.

If there is a liquid spill in the centrifuge, clean according to the instructions in section 6.

7.3.3 Reagent volume detection and ultrasonic pipe

To help prevent errors during detection of reagent volumes, make sure that both rack labeling strips are attached to the reagent bottle rack. These strips ensure that the reagent bottle rack is positioned correctly on the worktable for liquid detection during the load check.

The instrument does not start a load check if the ultrasonic pipe (black cap) of the ultrasonic sensor is missing. Check if cap has been installed before starting a load check.

Black beam columnator (see red circle) of the ultrasonic sensor

7.3.4 Touchscreen

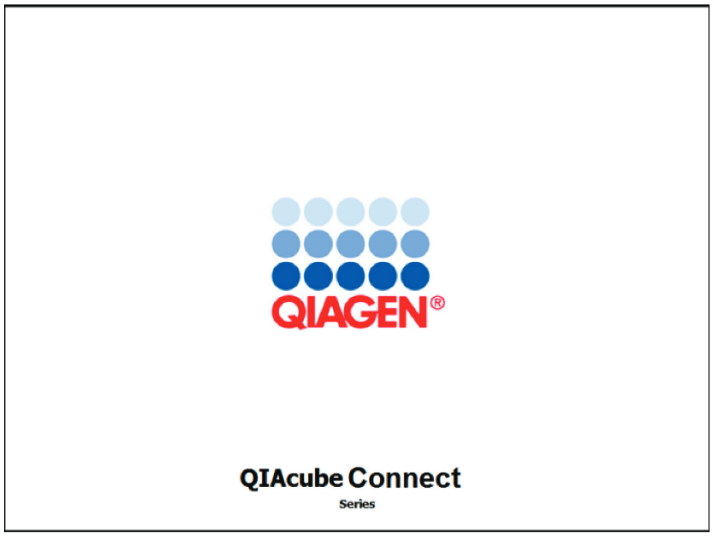
Every time the user presses a button on the touchscreen, a small red sign is displayed at the place where the touchscreen recognizes the contact. If the point of touch and the recognized contact are at different positions, a re-calibration of the touchscreen can be performed. The calibration function can be reached during the instrument's startup procedure.

It is recommended to use a touch pen or an unused tip for optimal calibration results. In case you use a tip, discard the tip after calibration.

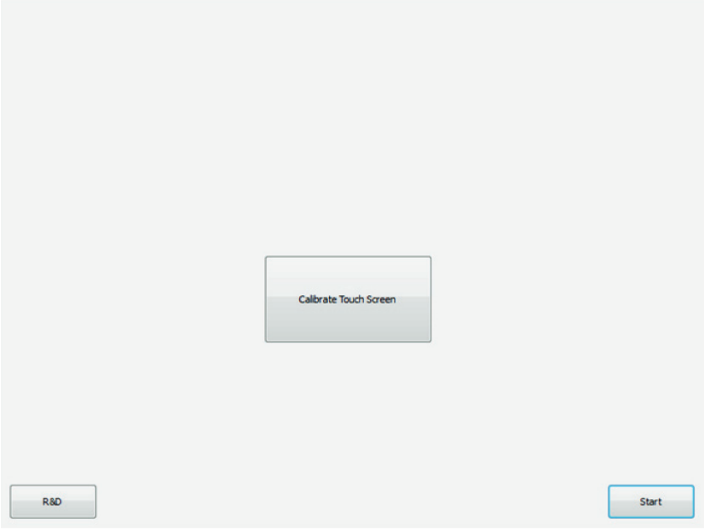
To re-calibrate the touchscreen:

1. Turn OFF the QIAcube Connect.
2. Wait a few minutes and then turn ON the instrument again.
3. In the second screen press the QIAGEN logo.

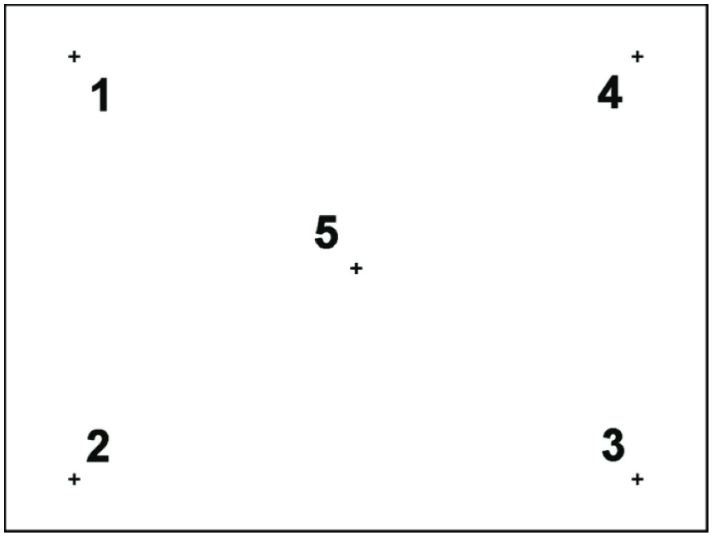
   Note: If you do not press the logo, the instrument will continue initialization.



4. Press **Calibrate touchscreen**.



5. An information message is displayed. The message will close automatically after 10 seconds.
6. Plus signs (+) will be shown at different positions on the screen. For each of these, press the center of the + sign. After one position is touched, the next position will be shown. The graphic below shows the positions and the order in which the + signs will appear.



7. The calibration is finished after all five positions have been touched. Calibration results are saved automatically. The previous screen is shown again.
8. Press **Start**. The instrument continues initialization using the new calibration settings.

To cancel the calibration process, turn OFF the QIAcube Connect.

7.3.5 O-Ring exchange

O-Ring replacement must be performed if the tightness test (see section 6.7.2 Tightness test) failed or if the following issues are observed:

- Uneven volume transfers
- Dripping on the worktable

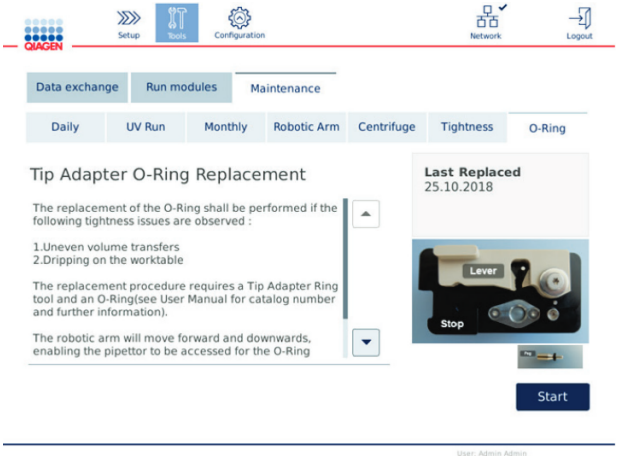
In any case, it is recommended to consult QIAGEN technical service. The replacement procedure requires the O-Ring change tool and an O-Ring. See section 10 Appendix B - QIAcube Connect Accessories, for ordering details.

O-Ring tool with prepared new O-Ring

The O-Ring replacement is semi-automatically and includes movement of robotic arm.

Note: Perform the daily maintenance and cleaning of the robotic arm procedure before you replace the O-Ring.

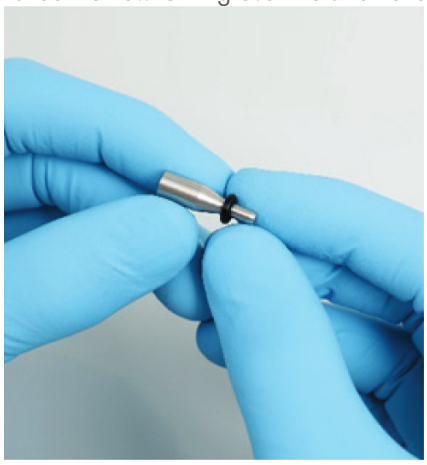
1. To start the O-Ring replacement, press the **Tools** icon on the menu bar. Press the **Maintenance** tab and select the **O-Ring** subtab. The screen shows the last O-Ring replacement date.



O-Ring maintenance screen

2. Close the hood and press **Start** to begin the O-Ring replacement procedure. Follow the instructions on the screen. Details are provided in the next steps below.
3. To prepare the O-Ring tool, perform the following steps:

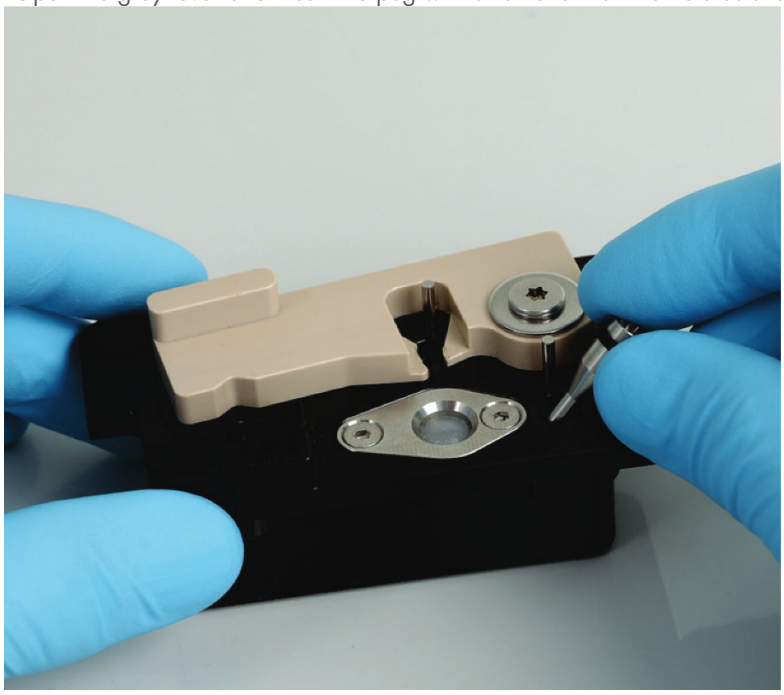
   3a. Slide the new O-Ring over the small end of the peg.



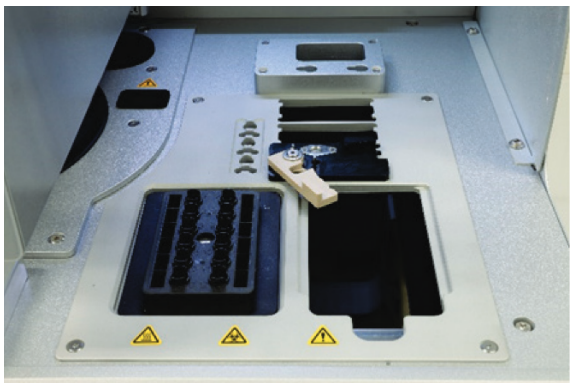
   3b. Push the grey lever until you reach the black stop, and insert the small end of the peg into the hole.

   3c. Press the peg down using the back end of the tweezers until the O-Ring sits (in the middle) on the larger end of the peg.

3d. Open the grey lever and insert the peg with small end first into hole as shown.



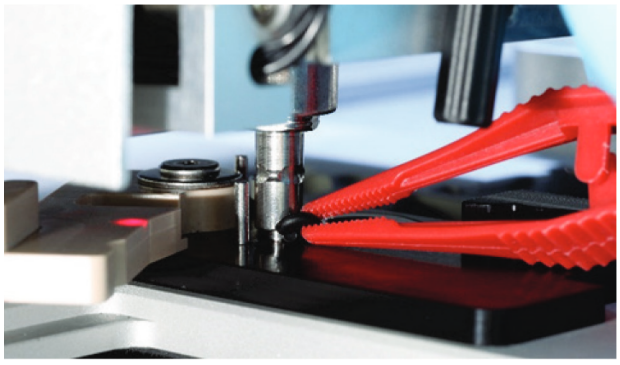
4. Press **Next** on the screen and begin loading of the O-Ring tool into the QIAcube Connect.
5. Load the O-Ring tool by opening the grey lever into tip rack position 1 (nearest to user).



6. Close the hood and press **Next** to begin cutting of the O-Ring.
7. To cut and remove the O-Ring, perform the following steps:

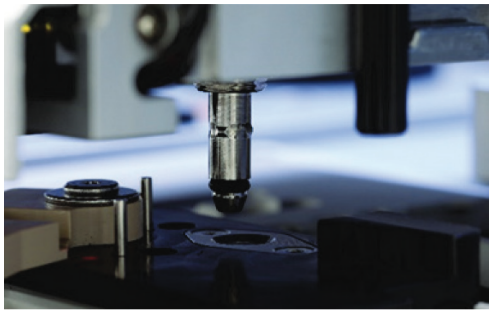
7a. To cut the O-Ring, open the hood and rotate the grey lever counter-clockwise until you reach the black stop.

7b. Open the grey lever and remove the O-Ring (by using the tweezers) from pipetting channel.
Note: If required, repeat cutting process until O-Ring is cut completely and can be removed.



8. Close the hood and press **Next** to pick up the prepared new O-Ring.

9. Open the hood and visually check if new O-Ring sits firmly on tip adapter.



Note: If the O-Ring was not successfully picked up, complete the O-Ring replacement procedure and restart.

10. Close the hood press **Next** to remove the O-Ring change tool.
11. Open the hood and remove the O-Ring change tool.
12. Wipe and clean the O-Ring change tool with alcohol-based disinfection wipes. Incubate as appropriate, rinse thoroughly with distilled water and wipe dry with paper towels.
13. Press **Done** to complete the O-Ring replacement. The date of the last performed O-Ring replacement is updated automatically.

WARNING 	**Risk of personal injury and material damage** **[W1]** Improper use of the QIAcube Connect may cause personal injuries or damage to the instrument. The QIAcube Connect must only be operated by qualified personnel who have been appropriately trained. Servicing of the QIAcube Connect must only be performed by a QIAGEN Field Service specialist.

8 Glossary

Term	Description
Centrifuge	A component of the QIAcube Connect that accommodates a rotor with 12 swing-out buckets. Each bucket holds a disposable rotor adapter.
Disposal slots	Slots in the QIAcube Connect worktable through which used tips and columns (e.g., QIAshredder columns) are discarded into the waste drawer.
Hood	The main door at the front of the QIAcube Connect. When open, it provides complete access to the worktable.
Error code	A 3- or 4-digit number that indicates an error of the QIAcube Connect.
Filter-tip	An item of labware that is picked up by the tip adapter during operation of the QIAcube Connect. Liquid is aspirated into and dispensed from a filter-tip.
Initialization	An operation performed automatically when the QIAcube Connect is switched on and if required before each protocol run to check the operation of the QIAcube Connect.
Microcentrifuge tube slots	Three slots located in the labware tray that accommodate accessory buffers, in 1.5 mL or 2 mL microcentrifuge tubes.
Pipetting system/ Pipettor unit	The component of the QIAcube Connect that aspirates and dispenses liquid. The pipetting system moves up and down above the worktable and contains a syringe pump that is connected to a tip adapter.
Power switch	A button located at the front of the QIAcube Connect in the bottom-right corner. It allows the user to switch the QIAcube Connect on and off; inner position is ON and outer position is OFF.
Protocol	A set of instructions for the QIAcube Connect that allows the instrument to automate a nucleic acid or protein purification procedure. Protocols are run using the touchscreen.
Reagent bottle rack	A rack that can accommodate six 30 mL bottles on the QIAcube Connect worktable.
Robotic gripper	A component of the QIAcube Connect robotic arm that moves spin columns during sample processing.
Rotor adapter	A disposable plastic adapter that fits into a centrifuge bucket and holds a QIAGEN spin column and microcentrifuge tube during sample processing.
Tip adapter	A metal probe installed on the pipettor head. During operation of the QIAcube Connect, the tip adapter picks up filter-tips from the worktable.
Tip disposal slots	Slots in the QIAcube Connect worktable through which used filter-tips are discarded into the waste drawer.
Tip rack	A plastic rack that accommodates filter-tips on the worktable.
Touchscreen	The user interface that allows the user to operate the QIAcube Connect.
Waste drawer	A drawer that collects used filter-tips and disposable columns.
Worktable	The surface of the QIAcube Connect where samples, reagents, and filter-tips are loaded.

9 Appendix A – Technical data

QIAGEN reserves the right to change specifications at any time.

9.1 Operating conditions

Power	100–240 V AC, 50/60 Hz, 650 VA Mains supply voltage fluctuations are not to exceed 10% of nominal supply voltages. **Note**: The apparent power can exceed 650 VA for up to 2 seconds during the centrifuge acceleration and can reach an approximate value of 1000 VA.
Fuse	2x T8A L 250V
Overvoltage category	II
Air temperature	18 to 28°C (64.4 to 82.4°F)
Relative humidity	15–75% (noncondensing)
Altitude	Up to 2000 m (6500 ft.)
Place of operation	For indoor use only
Pollution level	2
Environmental class	3K2 (IEC 60721-3-3)

9.2 Transport conditions

Air temperature	–25°C to 60°C (–13°F to 140°F) in manufacturer's package
Relative humidity	Max. 75% (noncondensing)
Environmental class	2K2 & 2M2 (IEC 60721-3-2)

9.3 Storage conditions

Air temperature	15°C to 30°C (59°F to 86°F) in manufacturer's package
Relative humidity	Max. 75% (noncondensing)
Environmental class	1K2 (IEC 60721-3-1)

9.4 Mechanical data and hardware features

Dimensions (hood closed)	Width: 65 cm (25.6 in.) Height: 58 cm (22.8 in.) Depth: 62 cm (24.4 in.)
Dimensions (hood open)	Width: 65 cm (25.6 in.) Height: 86 cm (34 in.) Depth: 62 cm (24.4 in.)
Mass	QIAcube Connect: 73 kg (160.9 lb.) Accessories: 2.7 kg (6.0 lb.)
Centrifuge	10,640 rpm maximum 12,000 *x g* maximum Swing-out rotor, maximum 45° 12 rotor positions
Shaker	Speed 100–2000 RPM Amplitude 2 mm Heating range of ambient temperature to 70°C (158°F) Ramp-up time of <5 minutes from ambient temperature to 55°C (±3°C) Difference in the temperature detected by the internal sensor and the temperature of the sample liquid is approximately –2°C
Pipetting system	Syringe size 1 mL Pipetting range 5–900 µL
Capacity	Up to 12 samples per run
Touchscreen	10.4" TFT Touchscreen, active area 211.2 x 158.4 mm, resolution 800*600 SVGA
USB flash drive	USB2.0 Compatible OS: Windows 10, Windows 8, Windows 7; Mac OS 9.0 or later; Linux Kernel 2.4.2 or later Operating temperature range: 0 to 70°C Operating humidity range: 10 to 90% (with no condensation) Storage temperature range: –40 to 85°C (–40 to 185°F) Storage humidity range: 10 to 90% (with no condensation) Formatting: FAT32
UV LED	Wavelength: 278 nm Optical power: 200–300 mW

Barcode scanner	Scan Pattern: Area Image (838 x 640-pixel array) Motion Tolerance: Up to 610 cm/s (240 in/s) for 13 mil UPC at optimal focus Symbol Contrast: 20% minimum reflectance difference Decode Capability: Reads standard 1D, PDF, 2D, Postal and OCR symbologies
Software	QIAGEN protocols are preinstalled on the QIAcube Connect or can be downloaded at **www.qiagen.com/MyQIAcubeConnect**.

9.5 Declaration of Conformity

Name and address of the legal manufacturer:

QIAGEN GmbH
QIAGEN Strasse 1
40724 Hilden
Germany

An up-to-date declaration of conformity can be requested from QIAGEN Technical Services.

9.6 Waste Electrical and Electronic Equipment (WEEE)

This section provides information about disposal of waste electrical and electronic equipment by users.

The crossed-out wheeled bin symbol (see below) indicates that this product must not be disposed of with other waste; it must be taken to an approved treatment facility or to a designated collection point for recycling, according to local laws and regulations.

The separate collection and recycling of waste electronic equipment at the time of disposal helps to conserve natural resources and ensures that the product is recycled in a manner that protects human health and the environment.

Recycling can be provided by QIAGEN upon request at additional cost. In the European Union, in accordance with the specific WEEE recycling requirements and where a replacement product is being supplied by QIAGEN, free recycling of its WEEE-marked electronic equipment is provided.

To recycle electronic equipment, contact your local QIAGEN sales office for the required return form. Once the form is submitted, you will be contacted by QIAGEN either to request follow-up information for scheduling collection of the electronic waste or to provide you with an individual quote.

9.7 FCC Declaration

The ''United States Federal Communications Commission'' (USFCC) (in 47 CRF 15. 105) declared that the users of this product must be informed of the following facts and circumstances.

''This device complies with part 15 of the FCC:

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.''

"This Class B digital apparatus complies with Canadian ICES-0003.''

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules and meets all requirements of the Canadian Interference-Causing Equipment Standard ICES-003 for digital apparatus. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in an installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

QIAGEN GmbH Germany is not responsible for any radio television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connection cables and equipment other than those specified by QIAGEN GmbH,

Germany. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

9.8 Liability Clause

QIAGEN shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own personnel, except in cases where the Company has given its written consent to perform such repairs or modifications.

All materials replaced under this warranty will be warranted only for the duration of the original warranty period, and in no case beyond the original expiration date of original warranty unless authorized in writing by an officer of the Company. Read-out devices, interfacing devices, and associated software will be warranted only for the period offered by the original manufacturer of these products. Representations and warranties made by any person, including representatives of QIAGEN, which are inconsistent or in conflict with the conditions in this warranty shall not be binding upon the Company unless produced in writing and approved by an officer of QIAGEN.

10 Appendix B – QIAcube Connect Accessories

For more information and an up-to-date list of available protocols, visit **www.qiagen.com/MyQIAcubeConnect**.

10.1 Ordering Information

Product	Contents	Cat. no.
QIAcube Connect*	Instrument and 1-year warranty on parts and labor	9002864
QIAcube Connect Premium Agreement*	On-site repair service with next business day response time. Includes 1 Inspection Service and travel, labor, and parts	9245209
QIAcube Connect Full Agreement*	On-site repair service with two business day response time. Includes 1 Inspection Service and travel, labor, and parts	9245208
QIAcube Connect Core Agreement*	On-site repair service with 5 business day response time. Includes 1 repair service and 1 Inspection Service during agreement period.	9245260
QIAcube Connect, Installation*	On-site installation and setup of instrument hardware and system software. Training demonstrating routine maintenance, basic troubleshooting, and more for up to 4 laboratory staff members.	9245211
Starter Pack, QIAcube	200 µL filter-tips (1024); 1000 µL filter-tips (1024); 30 mL reagent bottles (12); rotor adapters (240); 1.5 mL elution tubes (240); rotor adapter holder (1)	990395
Accessories		
Filter-Tips, 1000 µL (1024)	Disposable Filter-Tips, racked; (8 x 128)	990352
Filter-Tips, 1000 µL, wide-bore (1024)	Disposable Filter-Tips, wide-bore, racked; (8 x 128); not required for all protocols	990452
Filter-Tips, 200 µL (1024)	Disposable Filter-Tips, racked; (8 x 128); not required for all protocols	990332
Rotor, centrifuge	Rotor for the QIAcube centrifuge	9017848
Swing-out Buckets	Swing-out buckets for the rotor of the QIAcube centrifuge	9017849
Rotor Adapters (10 x 24)	For 240 preps: 240 Disposable Rotor Adapters and 240 microcentrifuge tubes (1.5 mL); for use with the QIAcube Connect	990394
Rotor Adapter Holder	Holder for 12 disposable rotor adapters; for use with the QIAcube Connect	990392

* All configurations include: QIAcube Connect robotic workstation for automated purification of DNA, RNA or proteins using QIAGEN spin-column kits, plus tablet and QIAspere Base to connect to local network, bar code reader and 1-year warranty on parts and labor.

Reagent Bottle Rack	Rack for accommodating 6 x 30 mL reagent bottles on the QIAcube Connect worktable	990390
Reagent Bottles, 30 mL (6)	Reagent Bottles (30 mL) with lids; pack of 6; for use with the QIAcube Connect reagent bottle rack	990393
Shaker Rack Plugs (12)	For use with 2 mL screw cap tubes	9017854
Sample Tubes RB (2 mL)	1000 safe-lock microcentrifuge tubes (2 mL) for use with the QIAcube Connect	990381
USB flash drive	USB flash drive; for use with the QIAcube Connect	9026881
O-Ring Change Tool	O-Ring change tool for use with the QIAcube Connect	9026181
O-Ring Set	Set of 10 O-Rings for use with the QIAcube Connect	9018472
Spin Column Adapter Rings (25)	Spin column adapter rings for use with spin-columns that have screw-caps; not required for all protocols	990399

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at **www.qiagen.com** or can be requested from QIAGEN Technical Services or your local distributor.

11 Appendix C – Consignes de sécurité

Avant d'utiliser le QIAcube Connect, il est impératif de lire attentivement ce manuel et de porter une attention particulière aux consignes de sécurité. Afin de garantir un fonctionnement de l'appareil en toute sécurité et de maintenir l'appareil en bon état de marche, il est impératif de suivre les instructions et consignes de sécurité fournies dans le présent manuel d'utilisation.

Les types d'informations de sécurité suivants sont fournis tout au long du manuel.

AVERTISSEMENT 	Le terme AVERTISSEMENT signale des situations risquant d'entraîner des accidents corporels dont l'utilisateur, ou d'autres personnes, pourraient être victime. Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.

ATTENTION 	Le terme ATTENTION signale des situations risquant d'entraîner des détériorations de l'appareil ou de tout autre matériel. Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.

Les conseils donnés dans ce manuel ont pour but de venir compléter les exigences de sécurité habituelles en vigueur dans le pays de l'utilisateur, et non de s'y substituer.

11.1 Utilisation appropriée

AVERTISSEMENT/ ATTENTION 	**Risque d'accident corporel et de détérioration du matériel** [W1] L'utilisation inappropriée du QIAcube Connect peut entraîner des accidents corporels ou une détérioration de l'appareil. L'utilisation du QIAcube Connect est réservée exclusivement au personnel qualifié ayant été convenablement formé. L'entretien du QIAcube Connect doit être effectué uniquement par des spécialistes de l'entretien sur site QIAGEN ou par des techniciens d'un agent agréé.

Procéder à la maintenance comme décrit dans Cleaning and Maintenance , section 6. QIAGEN facture les réparations dues à une maintenance inappropriée.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W2]** Le QIAcube Connect est trop lourd pour être soulevé par une personne. Pour éviter des dommages corporels ou matériels, ne pas soulever l'instrument tout seul.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W3]** Ne pas essayer de bouger le QIAcube Connect pendant son fonctionnement.

ATTENTION 	**Détérioration de l'instrument** **[C1]** Eviter de renverser de l'eau ou des substances chimiques sur le QIAcube Connect. Tout dommage causé par de l'eau ou des produits chimiques mettra fin à la garantie.

En cas d'urgence, éteindre le QIAcube Connect à l'aide de l'interrupteur d'alimentation situé à l'arrière de l'appareil et débrancher le cordon d'alimentation de la prise de courant.

ATTENTION 	**Détérioration de l'instrument** **[C2]** Utilisez uniquement des colonnes de centrifugation QIAGEN et des consommables spécifiques au QIAcube Connect avec l'instrument. Les détériorations causées par l'utilisation d'autres types de colonnes de centrifugation ou de réactions chimiques annulent la garantie.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W4]** N'utilisez pas d'adaptateurs pour rotor abîmés. Les adaptateurs pour rotor sont à usage unique. L'action importante de la force g exercée à l'intérieur de la centrifugeuse risque d'abîmer les adaptateurs pour rotor déjà utilisés.

ATTENTION 	**Risque de dommages matériels** **[C3]** Videz le conteneur de cônes usagés avant toute utilisation afin d'empêcher tout amoncellement de cônes dans le tiroir à déchets. Si vous ne videz pas le conteneur de déchets, le bras robotisé risque de se bloquer, ce qui peut conduire à un dysfonctionnement ou un endommagement de l'instrument.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W5]** Pour éviter tout écrasement du plastique, chargez les tubes correctement. Suite à l'écrasement du plastique, il se peut que des particules de plastique pointues se trouvent à l'intérieur de la centrifugeuse. Faites attention lors de la manipulation des éléments à l'intérieur de la centrifugeuse.

ATTENTION 	**Détérioration de l'instrument** **[C4]** Utilisez uniquement le bon volume de liquides. Tout dépassement du volume de liquides recommandé risque d'abîmer le rotor de la centrifugeuse ou l'instrument.

AVERTISSEMENT	**Risque d'incendie ou d'explosion** **[W6]** En cas d'utilisation d'éthanol ou de liquides à base d'éthanol sur le QIAcube Connect, manipulez ces liquides avec prudence et conformément aux règles de sécurité nécessaires. En cas de déversement de liquide, essuyez-le et laissez le capot du QIAcube Connect ouvert pour que les vapeurs inflammables puissent s'évaporer.

AVERTISSEMENT	**Risque d'explosion** **[W7]** Le QIAcube Connect est conçu pour être utilisé avec les réactifs et les substances fournis avec les kits QIAGEN ou autrement que de la façon décrite dans le mode d'emploi correspondant. L'utilisation d'autres réactifs et d'autres substances peut provoquer un incendie ou une explosion.

Si des substances dangereuses sont renversées sur le QIAcube Connect ou à l'intérieur de celui-ci, l'utilisateur porte l'entière responsabilité de la réalisation de la procédure de décontamination appropriée.

Remarque: ne pas placer d'objets à la surface des capots des appareils QIAcube Connect.

ATTENTION	**Détérioration de l'instrument** **[C5]** Ne vous appuyez pas contre l'écran tactile lorsqu'il est déboîté.

11.2 Sécurité électrique

Avant l'entretien, débrancher les cordons d'alimentation des prises de courant.

AVERTISSEMENT 	**Risque d'électrocution** **[W8]** Toute interruption du conducteur de protection à l'intérieur ou à l'extérieur de l'instrument, ou déconnexion du raccord du conducteur de protection (terre) peut rendre l'instrument dangereux. Il est interdit d'interrompre volontairement ce conducteur. **Présence de tensions mortelles dans l'instrument** Lorsque l'instrument est relié au secteur, les raccords peuvent être sous tension, et des parties sous tension peuvent être découvertes en ouvrant des capots ou en retirant des pièces (à l'exception de celles auxquelles il est possible d'accéder manuellement).

AVERTISSEMENT 	**Endommagement des composants électroniques** **[W9]** Avant de mettre l'instrument SOUS tension, vérifiez que vous utilisez la bonne tension d'alimentation. L'utilisation d'une tension d'alimentation incorrecte risque d'endommager les composants électroniques. Pour prendre connaissance de la tension d'alimentation recommandée, consultez les spécifications indiquées sur la plaque signalétique de l'instrument.

AVERTISSEMENT 	**Risque d'électrocution** **[W10]** Ne pas ouvrir les panneaux du QIAcube Connect. **Risque de dommages corporels et matériels** Réaliser uniquement la maintenance décrite spécifiquement dans ce manuel.

Afin que le QIAcube Connect fonctionne de manière satisfaisante et en toute sécurité, suivre les conseils suivants :

- Les cordons d'alimentation de l'appareil doivent être branchés sur des prises d'alimentation munies d'un conducteur de protection (terre/masse).
- Les fiches d'alimentation reliées au secteur doivent être facilement accessibles s'il est nécessaire de débrancher rapidement l'équipement du secteur.
- Utilisez uniquement le cordon d'alimentation fourni par QIAGEN.
- En cas de déversement de liquides à l'intérieur de l'appareil, débrancher celui-ci de la prise d'alimentation et contacter les Services techniques de QIAGEN.

Si l'appareil présente un danger électrique, empêcher le reste du personnel de s'en servir et contacter les Services Techniques de QIAGEN. L'appareil peut présenter un danger électrique dans les cas suivants :

- Le cordon d'alimentation présente des signes de détérioration.

- L’appareil a été stocké pendant une longue période dans des conditions non conformes à celles énoncées dans l’Annexe A.
- L’appareil a subi des chocs sévères durant le transport.
- Un liquide a pénétré à l’intérieur de l’appareil

11.3 Atmosphère

AVERTISSEMENT 	**Atmosphère explosive** **[W11]** Le QIAcube Connect n’est pas conçu pour fonctionner dans une atmosphère explosive.

ATTENTION 	**Détérioration de l’instrument** **[C6]** La lumière directe du soleil peut décolorer des parties de l’instrument et endommager des parties en plastique. Placer le QIAcube Connect en dehors de la lumière directe du soleil.

11.4 Sécurité biologique

Lors de la manipulation de substances biologiques, employer des procédures de laboratoire sûres comme décrit dans des publications telles que Biosafety in Microbiological and Biomedical Laboratories, HHS (**www.cdc.gov/od/ohs/biosfty/biosfty.htm**).

11.4.1 Échantillons

En cas de déversement de liquides à l'intérieur de l'appareil, débrancher celui-ci de la prise d'alimentation et contacter les Services techniques de QIAGEN.

AVERTISSEMENT 	**Echantillons contenant des agents infectieux** **[W12]** Certains échantillons utilisés avec cet instrument peuvent contenir des agents infectieux. Manipuler ce type d'échantillon avec le plus grand soin et en accord avec les règles de sécurité requises. Toujours porter des lunettes de protection, deux paires de gants et une blouse de laboratoire. La personne responsable (par exemple le Chef du laboratoire) doit prendre les précautions nécessaires pour assurer la sécurité de l'environnement du poste de travail et pour être sûr que les opérateurs de l'instrument sont suffisamment formés et non exposés à des quantités dangereuses d'agents infectieux comme défini dans "Material Safety Data Sheets (MSDS)" ou des documents "OSHA*, ACGIH† ou COSHH‡". L'évacuation des vapeurs et déchets doit être conforme à tous règlements et dispositions légales - au plan national, départemental et local - concernant la santé et la sécurité.

11.5 Produits chimiques

AVERTISSEMENT 	**Substances chimiques dangereuses** **[W13]** Certaines substances chimiques utilisées avec cet instrument peuvent être dangereuses ou peuvent le devenir après que le protocole ait été effectué. Toujours porter des lunettes de protection, paire de gants et une blouse de laboratoire. La personne responsable (par exemple le Chef du laboratoire) doit prendre les précautions nécessaires pour assurer la sécurité de l'environnement du poste de travail et pour être sûr que les opérateurs de l'instrument sont suffisamment formés et non exposés à des quantités dangereuses de substances toxiques (chimique ou biologique) comme défini dans "Material Safety Data Sheets (MSDS)" ou des documents "OSHA*, ACGIH† ou COSHH‡". L'évacuation des vapeurs et déchets doit être conforme à tous règlements et dispositions légales - au plan national, départemental et local - concernant la santé et la sécurité.

* OSHA: Occupational Safety and Health Administration (États-Unis d'Amérique) (Administration pour la santé et la sécurité du travail).
† ACGIH: American Conference of Government Industrial Hygienists (États-Unis d'Amérique) (Conférence américaine des hygiénistes industriels gouvernementaux).
‡ COSHH: Control of Substances Hazardous to Health (Royaume-Uni) (Contrôle des substances dangereuses pour la santé).

11.5.1 Vapeurs toxiques

Si vous travaillez avec des solvants volatils ou des substances toxiques, vous devez disposer d'un système de ventilation de laboratoire efficace afin d'évacuer les vapeurs qui peuvent être générées.

AVERTISSEMENT 	**Vapeurs toxiques** **[W14]** N'utilisez pas d'eau de Javel pour nettoyer ou désinfecter le QIAcube Connect. Le contact de l'eau de Javel avec des sels provenant des tampons peut produire des vapeurs toxiques.

AVERTISSEMENT 	**Vapeurs toxiques** **[W15]** Ne pas utiliser de produit à base d'eau de Javel pour désinfecter les accessoires de laboratoire usagés. Le contact d'un produit à base d'eau de Javel avec des sels provenant des tampons utilisés peut produire des vapeurs toxiques.

11.6 Traitement des déchets

Les produits en plastique usagés, tels que le QIAcube Connect Disc, peuvent contenir des produits chimiques ou des agents infectieux dangereux. Ces déchets doivent être convenablement collectés et mis au rebut conformément aux règles de sécurité locales.

Pour plus d'informations sur la mise au rebut du QIAcube Connect, consultez la section 9.6 Waste Electrical and Electronic Equipment (WEEE).

AVERTISSEMENT 	**Produits chimiques dangereux et agents infectieux** **[W16]** Les déchets peuvent contenir des matières toxiques et doivent être mis au rebut de manière appropriée. Reportez-vous aux règles de sécurité locales concernant les procédures de mise au rebut appropriées.

11.7 Dangers mécaniques

Le capot du QIAcube Connect doit rester fermé pendant le fonctionnement de l'instrument. Ouvrir le capot uniquement lorsque les instructions d'utilisation vous demandent de le faire.

Lors du chargement de la table de travail, restez toujours à bonne distance de l'instrument. Ne vous penchez pas sur la table de travail quand le bras robotisé de l'instrument se déplace vers la position de chargement lorsque le couvercle est ouvert. Attendez que le bras robotisé termine son déplacement avant de commencer un chargement ou un déchargement.

AVERTISSEMENT 	**Pièces mobiles** **[W17]** Évitez tout contact avec les pièces en mouvement lorsque le QIAcube Connect est en marche. Ne placez en aucun cas vos mains sous le bras robotisé lorsque celui-ci s'abaisse. Ne tentez pas de déplacer des portoirs à cônes ou des tubes lorsque l'instrument est en marche.

AVERTISSEMENT 	**Pièces mobiles** **[W18]** Pour éviter tout contact avec des pièces en mouvement pendant le fonctionnement du QIAcube Connect, l'appareil doit être utilisé avec le capot fermé. Si le capteur ou le verrou du capot ne fonctionne pas correctement, contactez les services techniques de QIAGEN.

11.7.1 Centrifuge

Vérifiez que le rotor et les godets sont correctement installés. Tous les godets doivent être montés avant de lancer un cycle de protocole, quel que soit le nombre d'échantillons à traiter. Si le rotor ou les godets présentent des signes de détérioration mécanique ou de corrosion, cessez d'utiliser le QIAcube Connect et contactez les services techniques de QIAGEN.

ATTENTION 	**Détérioration de l'instrument** **[C7]** Le QIAcube Connect ne doit pas être utilisé si le capot de la centrifugeuse est cassé ou si le verrou du capot est endommagé. Veillez à ce qu'aucun résidu ne se trouve à l'intérieur de la centrifugeuse en cours de fonctionnement. Assurez-vous que le rotor est installé correctement et que tous les godets sont bien montés, quel que soit le nombre d'échantillons à traiter. Chargez uniquement le rotor en suivant les instructions du logiciel. Utilisez uniquement des rotors, des godets et des consommables conçus pour une utilisation avec le QIAcube Connect. Les détériorations causées par l'utilisation d'autres consommables annulent la garantie. Nous vous recommandons de remplacer le rotor et les godets de la centrifugeuse après 20 000 cycles, ce qui équivaut à 9 années d'utilisation avec deux fonctionnements par jour, pendant 220 jours par an. Pour de plus amples informations, contactez les services techniques de QIAGEN.

In case of breakdown caused by power failure, the centrifuge lid can be opened manually to remove the samples (see section 7.3.2).

AVERTISSEMENT 	**Pièces mobiles** **[W19]** Dans le cas d'un arrêt causé par une panne de courant, retirer le câble d'alimentation et attendre 10 minutes avant d'essayer d'ouvrir manuellement le couvercle de la centrifugeuse.

ATTENTION 	**Détérioration de l'instrument** **[C8]** Après une coupure de courant, ne déplacez pas le bras robotisé manuellement devant l'instrument. Vous risquez d'endommager l'instrument si le capot du QIAcube Connect est fermé et entre en collision avec le bras robotisé.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W20]** Soulever le couvercle de la centrifugeuse avec précaution. Le couvercle est lourd et peut causer des blessures si il tombe.

ATTENTION 	**Risque de surchauffe** **[C9]** Laisser un espace d'au moins 10 cm sur les côtés et à l'arrière du QIAcube pour assurer une ventilation efficace. Les grilles et prises d'air assurant la ventilation du QIAcube ne doivent pas être couvertes.

11.8 Dangers liés à la chaleur

La table de travail du QIAcube Connect contient un agitateur chauffé.

AVERTISSEMENT 	**Surface brûlante** **[W21]** L'agitateur peut atteindre des températures jusqu'à 70°C (158°F). Eviter de le toucher quand il est chaud.

11.9 Sécurité relative à la maintenance

AVERTISSEMENT/ ATTENTION 	**Risque de dommages corporels et matériels** **[W22]** Effectuer uniquement la maintenance spécifiquement décrite dans ce manuel.

AVERTISSEMENT 	**Risque d'explosion** **[W23]** Lors du nettoyage du QIAcube Connect avec un désinfectant à base d'alcool, laisser la porte du QIAcube Connect ouverte pour permettre aux vapeurs inflammables de s'évaporer. Nettoyer le QIAcube Connect uniquement quand les composants de la table de travail ont refroidi.

AVERTISSEMENT 	**Risque d'incendie** **[W24]** Ne laissez pas le liquide de nettoyage ou les agents de décontamination entrer en contact avec les contacts électriques du QIAcube Connect.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W25]** Pour empêcher l'écrou du rotor de se desserrer pendant le fonctionnement de la centrifugeuse, serrez-le bien à l'aide de la clé du rotor fournie avec le QIAcube Connect.

AVERTISSEMENT 	**Danger de rayonnement UV** **[W26]** Un verrou mécanique veille à ce que le capot soit fermé pour le fonctionnement de la LED à UV. Si le capteur ou le verrou du capot ne fonctionne pas correctement, contactez les services techniques de QIAGEN.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W27]** Assurez-vous de positionner correctement les couvercles des colonnes de centrifugation et des tubes de 1.5 mL et de les enfoncer jusqu'au bout de l'emplacement sur les bords de l'adaptateur à rotor. Les couvercles placés incorrectement peuvent se casser lors de la centrifugation.

AVERTISSEMENT 	**Risque de dommages corporels et matériels** **[W28]** Assurez-vous d'enlever les couvercles des colonnes de centrifugation. Les colonnes de centrifugations avec un couvercle partiellement enlevé se détachent difficilement du rotor ce qui est la cause d'un crash du protocole.

ATTENTION 	**Détérioration de l'instrument** **[C10]** Ne pas utiliser de produit à base d'eau de Javel, de solvants ou de réactifs contenant des acides, des agents alcalins ou des produits abrasifs pour nettoyer le QIAcube Connect.

ATTENTION 	**Détérioration de l'instrument** **[C11]** N'utilisez pas de flacons pulvérisateurs contenant de l'alcool ou un agent désinfectant pour nettoyer les surfaces du QIAcube Connect. Les flacons pulvérisateurs ne doivent être utilisés que pour nettoyer les éléments qui ont été retirés de la table de travail.

11.10 Sécurité contre les rayonnements

AVERTISSEMENT 	**Risque de blessure personnelle** **[W29]** Ne pas exposer votre peau à la lumière UV-C émise par la lampe UV.

AVERTISSEMENT 	**Risque de blessure personnelle** **[W30]** Lumière laser avec niveau de danger 2 : Ne regardez pas fixement le faisceau lumineux lors de l'utilisation du lecteur de code-barres portable.

11.11 Symboles sur le QIAcube Connect

Symbol	Location	Description
	Agitateur	Risque de brûlures — la température de l'agitateur peut atteindre jusqu'à 70°C (158 °F)
	Près de la centrifugeuse; près du bras robotique	Danger mécanique — éviter d'entrer en contact avec les parties mobiles
	Sur l'instrument, près du portoir de flacons	Risque d'incendie – Utilisation d'éthanol dans le portoir de flacons
	Devant la table de travail	Risque biologique - Certains échantillons utilisés avec cet appareil peuvent contenir des agents infectieux et doivent être manipulés avec des gants
	A l'intérieur du compartiment à déchets	Danger Biologique — le compartiment à déchets peut être contaminé par du matériel présentant un risque biologique et doit être manipulé avec des gants
	Plaque à l'arrière de l'appareil	Marque CE (certification de conformité à la réglementation Européenne)
	Plaque signalétique à l'arrière de l'appareil	Label CSA pour le Canada et les Etats-Unis
	Plaque à l'arrière de l'appareil	Marquage FCC de la commission fédérale des communications des Etats Unis
	Plaque à l'arrière de l'appareil	Label RCM pour l'Australie et la Nouvelle-Zélande
	Plaque à l'arrière de l'appareil	Marquage RoHS pour la Chine (limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques)
	Plaque à l'arrière de l'appareil	Marquage WEEE pour l'Europe
	Plaque signalétique à l'arrière de l'appareil	Fabricant légal
	Table de travail	Lire le manuel d'utilisation.

12 Appendix D – Sicherheitshinweise

Lesen Sie dieses Handbuch sorgfältig durch, bevor Sie den QIAcube Connect benutzen. Beachten Sie dabei insbesondere die Sicherheitshinweise. Die Gebrauchsanweisungen und Sicherheitshinweise im Handbuch müssen befolgt werden, um einen sicheren Betrieb des Geräts zu gewährleisten und das Gerät in einem sicheren Zustand zu erhalten.

In diesem Handbuch werden die folgenden Kategorien von Sicherheitshinweisen verwendet:

WARNUNG 	Der Begriff „WARNUNG“ (“WARNING”) weist Sie auf Situationen hin, in denen eine **Verletzungsgefahr** für Sie selbst oder andere Personen besteht. Nähere Einzelheiten über diese Situationen werden in einem Textfeld wie diesem beschrieben.

ACHTUNG 	Der Begriff „ACHTUNG“ (“CAUTION”) weist Sie auf Situationen hin, in denen das **Gerät oder andere Geräte beschädigt** werden könnten. Nähere Einzelheiten über diese Situationen werden in einem Textfeld wie diesem beschrieben.

Die in diesem Handbuch enthaltenen Hinweise stellen eine Ergänzung und keinen Ersatz der üblichen Sicherheits-anforderungen dar, die im jeweiligen Land gelten.

12.1 Sachgemäße Handhabung

WARNUNG/ ACHTUNG 	**Verletzungsgefahr und Beschädigung des Geräts** [W1] Die unsachgemäße Bedienung des QIAcube Connect kann zu einer Verletzung des Benutzers oder zur Beschädigung des Geräts führen. Die Bedienung des QIAcube Connect darf nur durch qualifiziertes, entsprechend geschultes Personal erfolgen. Die Instandhaltung des QIAcube Connect darf nur durch einen Servicespezialisten des QIAGEN Außendiensts oder Servicetechniker eines autorisierten Vertreters durchgeführt werden.

Führen Sie alle Wartungsarbeiten gemäß den Anweisungen unter Cleaning and Maintenance , Abschnitt 6, durch. QIAGEN stellt Reparaturen, die auf nicht fachgerecht durchgeführte Wartungsmaßnahmen zurückzuführen sind, in Rechnung.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W2]** Der QIAcube Connect ist zu schwer um von einer Person gehoben zu werden. Um Verletzungen des Benutzers oder eine Beschädigung des Gerätes zu vermeiden ist davon abzusehen, das Gerät alleine zu heben.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W3]** Den QIAcube Connect während eines Laufes nicht bewegen.

ACHTUNG 	**Beschädigung des Geräts** **[C1]** Vermeiden Sie es, Wasser oder Chemikalien auf dem QIAcube Connect zu verschütten. Durch verschüttetes Wasser oder verschüttete Chemikalien verursachte Geräteschäden sind nicht durch die Garantie abgedeckt.

Schalten Sie im Notfall den QIAcube Connect aus (der Netzschalter befindet sich auf der Gerätevorderseite), und ziehen Sie den Netzstecker aus der Steckdose.

ACHTUNG 	**Beschädigung des Geräts** **[C2]** Es dürfen ausschließlich QIAGEN Spin-Säulen und QIAcube Connect-spezifische Verbrauchsmaterialien mit dem QIAcube Connect verwendet werden. Kommt es bei der Verwendung von Spin-Säulen oder Chemikalien anderer Hersteller zu Geräteschäden, erlischt die Garantie.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W4]** Verwenden Sie keine beschädigten Rotoradapter. Rotoradapter sind nur für den Einmalgebrauch konzipiert. Benutzen Sie die Rotoradapter kein zweites Mal, da sie durch die hohen g-Kräfte bei der Zentrifugation beschädigt werden können.

ACHTUNG 	**Gefahr von Materialbeschädigungen** **[C3]** Leeren Sie den Pipettenspitzen-Abfallbehälter vor dem Gebrauch, um einen Rückstau der Spitzen in der Abfallschublade zu vermeiden. Wenn der Abfallbehälter nicht geleert wird, kann es zu einer Blockade des Roboterarms kommen, die zu einem Ausfall oder Sachschäden am Gerät führen kann.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W5]** Um eine Beschädigung von Kunststoffteilen zu vermeiden, müssen die Röhrchen ordnungsgemäß geladen werden. Sollten Kunststoffteile beschädigt sein, können sich scharfe Kunststoffstücke innerhalb der Zentrifuge befinden. Bei der Handhabung von Gegenständen innerhalb der Zentrifuge ist daher Vorsicht angebracht.

ACHTUNG 	**Beschädigung des Geräts** **[C4]** Verwenden Sie stets das korrekte Flüssigkeitsvolumen. Eine Überschreitung der empfohlenen Flüssigkeitsvolumen kann Schäden am Zentrifugenrotor oder am Gerät hervorrufen.

WARNUNG 	**Brand- oder Explosionsgefahr** **[W6]** Bei der Verwendung von Ethanol oder von Flüssigkeiten auf Ethanolbasis auf dem QIAcube Connect müssen diese Flüssigkeiten vorsichtig und in Übereinstimmung mit den erforderlichen Sicherheitsbestimmungen gehandhabt werden. Entfernen Sie verschüttete Flüssigkeiten direkt mit den dafür vorgesehenen Materialien. Lassen Sie dabei die Haube des QIAcube Connect geöffnet, sodass sich entzündbare Dämpfe verflüchtigen können.

WARNUNG 	**Explosionsgefahr** **[W7]** Der QIAcube Connect darf ausschließlich mit Reagenzien und Substanzen aus den QIAGEN Kits bzw. gemäß den Angaben in der entsprechenden Gebrauchsanweisung verwendet werden. Die Verwendung anderer Reagenzien und Substanzen kann zu einem Brand oder zu einer Explosion führen.

Falls Gefahrstoffe auf dem oder im QIAcube Connect verschüttet werden, ist der Benutzer für die Durchführung einer entsprechenden Dekontamination verantwortlich.

Hinweis: Stellen Sie keine Gegenstände oben auf der Gerätehaube des QIAcube Connect ab.

ACHTUNG 	**Beschädigung des Geräts** **[C5]** Do not lean against the touchscreen when it is pulled out.

12.2 Schutz vor Stromschlag

Ziehen Sie das Netzanschlusskabel aus der Steckdose, bevor Sie Wartungsarbeiten am Gerät vornehmen.

WARNUNG 	**Gefährdung durch Elektrizität** **[W8]** Das Gerät muss zum Betrieb immer geerdet sein. Es ist verboten, die Schutzleiter im Gerät oder in der Netzzuleitung zu trennen oder zu entfernen. **Gefährliche Spannung im Gerät** Auch in ausgeschaltetem Zustand kann an einigen Stellen im Gerät Netzspannung anliegen, wenn das Gerät am Stromnetz angeschlossen ist. Das Öffnen oder Entfernen von Gehäuseteilen kann diese stromführenden Teile freilegen.

WARNUNG 	**Beschädigung von elektronischen Bauteilen** **[W9]** Stellen Sie vor dem Einschalten des Geräts sicher, dass die korrekte Versorgungsspannung verwendet wird. Eine falsche Versorgungsspannung kann Schäden an der Elektronik hervorrufen. Überprüfen Sie die empfohlene Versorgungsspannung anhand der technischen Daten auf dem Typenschild des Geräts.

WARNUNG 	**Gefährdung durch Elektrizität** **[W10]** Unter keinen Umständen darf das Gehäuse des QIAcube Connect geöffnet werden. **Gefahr von Verletzungen und Sachbeschädigungen** Keine Pflege- und Wartungsarbeiten durchführen, die nicht in diesem Handbuch beschrieben sind.

Um einen zufriedenstellenden und sicheren Betrieb des QIAcube Connect zu gewährleisten, befolgenden Sie bitte die nachstehenden Richtlinien:

- Das Netzkabel muss an eine Wechselstrom-Steckdose mit Schutzleiter (Erdungs-/ Masseleiter) angeschlossen werden.
- Nehmen Sie im Geräteinneren keine Einstellungen an Teilen vor und wechseln Sie keine Teile aus.
- Nehmen Sie das Gerät nicht in Betrieb, wenn Abdeckungen oder Teile entfernt worden sind.
- Falls Flüssigkeit auf dem Gerät verschüttet wird und in das Gerät läuft, dann schalten Sie es sofort aus, trennen Sie es von der Netzspannung (Stecker ziehen!) und setzen Sie sich mit dem Technischen Service von QIAGEN in Verbindung.

Falls die elektrische Sicherheit bei der Bedienung des Geräts nicht mehr gewährleistet werden kann, muss das Gerät gegen unbefugte oder unabsichtliche Benutzung gesichert werden. Kontaktieren Sie anschließend den Technischen Service von QIAGEN. Die elektrische Sicherheit des Geräts ist nicht mehr gegeben, wenn:

- Das Netzkabel beschädigt ist.
- Das Gerät längere Zeit unter ungünstigen Bedingungen, d. h. unter anderen Bedingungen als in Anhang A angegeben, gelagert wurde.
- Das Gerät unsachgemäß transportiert worden ist.

12.3 Atmosphären

12.3.1 Operating conditions

WARNUNG 	**Explosionsfähige Atmosphären** **[W11]** Der QIAcube Connect darf nicht in explosionsfähigen Atmosphären betrieben werden.

ACHTUNG 	**Beschädigung des Geräts** **[C6]** Direktes Sonnenlicht kann Teile des Gerätes bleichen und Plastikteile schädigen. Der QIAcube Connect darf nicht ins direkte Sonnenlicht gestellt werden.

12.4 Biologische Sicherheit

Bei Substanzen und Reagenzien, die humanes Untersuchungsmaterial enthalten, sollte immer von einer möglichen Infektionsgefahr ausgegangen werden. Wenden Sie nur sichere Laborverfahren an, wie sie z. B. in Veröffentlichungen wie Biosafety in Microbiological and Biomedical Laboratories (HHS, www.cdc.gov/biosafety/publications) beschrieben werden.

12.4.1 Proben

Proben können infektiöse Erreger enthalten. Sie sollten sich der Gesundheitsgefahr bewusst sein, die von diesen Erregern ausgeht, und derartige Proben gemäß den erforderlichen Sicherheitsbestimmungen handhaben, lagern und entsorgen.

WARNUNG 	**Infektiöses Probenmaterial** **[W12]** Einige Proben, die mithilfe dieses Geräts verarbeitet werden, können infektiöse Erreger enthalten. Gehen Sie beim Umgang mit diesen Proben mit der größtmöglichen Vorsicht und gemäß den erforderlichen Sicherheitsbestimmungen vor. Tragen Sie immer eine Schutzbrille, zwei Paar Laborhandschuhe und einen Laborkittel. Die verantwortliche Person (z. B. der Laborleiter) muss alle erforderlichen Vorsichtsmaßnahmen treffen, um sicherzustellen, dass die unmittelbare Umgebung des Arbeitsplatzes sicher ist und die Bediener des Geräts ausreichend geschult sind. Außerdem dürfen die Grenzwerte in Bezug auf infektiöse Erreger, die in den entsprechenden Sicherheitsdatenblättern (SDS) oder den Vorschriften der OSHA*, ACGIH† oder COSHH‡ festgelegt sind, nicht überschritten werden. Beim Betrieb des Abzugs und bei der Entsorgung von Abfallstoffen müssen alle Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz auf übernationaler, nationaler und regionaler Ebene eingehalten werden.

* OSHA: Occupational Safety and Health Administration (Vereinigte Staaten von Amerika).
† ACGIH: American Conference of Government Industrial Hygienists (Vereinigte Staaten von Amerika).
‡ COSHH: Control of Substances Hazardous to Health (Vereinigtes Königreich).

12.5 Chemikalien

WARNUNG 	**Gefährliche Chemikalien** **[W13]** Einige Chemikalien, die mit diesem Gerät verwendet werden, können gefährlich sein oder nach Beendigung eines Protokolllaufs gefährlich werden. Tragen Sie immer eine Schutzbrille, Laborhandschuhe und einen Laborkittel. Die verantwortliche Person (z. B. der Laborleiter) muss alle erforderlichen Vorsichtsmaßnahmen treffen, um sicherzustellen, dass die unmittelbare Umgebung des Arbeitsplatzes sicher ist. Auch dürfen die Grenzwerte in Bezug auf infektiöse Erreger, die in den entsprechenden Sicherheitsdatenblättern (SDS) oder den Vorschriften der OSHA*, ACGIH† oder COSHH‡ festgelegt sind, nicht überschritten werden. Beim Betrieb des Abzugs und bei der Entsorgung von Abfallstoffen müssen alle Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz auf übernationaler, nationaler und regionaler Ebene eingehalten werden. Bei der Behandlung von Abluft und bei der Abfallbeseitigung sind alle gesetzlichen Regelungen zur Gesundheit und Sicherheit auf nationaler, regionaler und lokaler Ebene zu berücksichtigen.

12.5.1 Giftige Dämpfe

Alle Arbeiten mit flüchtigen Lösungsmitteln oder toxischen Substanzen müssen unter einem funktionierenden Laborabzugssystem durchgeführt werden, damit die möglicherweise entstehenden Dämpfe abziehen können.

WARNUNG 	**Giftige Dämpfe** **[W14]** Verwenden Sie keine Bleichmittel zum Reinigen oder Desinfizieren des QIAcube Connect Geräts. Bleichmittel können mit Salzen, die in den Puffern enthalten sind, reagieren und giftige Dämpfe erzeugen.

WARNUNG 	**Giftige Dämpfe** **[W15]** Verwenden Sie zum Desinfizieren von gebrauchtem Labormaterial keine Bleichmittel. Bleichmittel können mit Salzen, die in den Puffern enthalten sind, reagieren und giftige Dämpfe erzeugen.

* OSHA : Occupational Safety and Health Administration (Vereinigte Staaten von Amerika).
† ACGIH : American Conference of Government Industrial Hygienists (Vereinigte Staaten von Amerika).
‡ COSHH : Control of Substances Hazardous to Health (Vereinigtes Königreich).

12.6 Entsorgen von Abfällen

Benutzte Kunststoff-Laborartikel können gefährliche Chemikalien enthalten. Derartige Abfälle müssen gemäß den geltenden regionalen Sicherheitsbestimmungen gesammelt und entsorgt werden.

Weitere Informationen zur Entsorgung des QIAcube Connect finden Sie unter Abschnitt 9.6 Waste Electrical and Electronic Equipment (WEEE).

WARNUNG 	**Gefährliche Chemikalien und infektiöse Erreger** **[W16]** In diesem Abfall können toxische Probenmaterialien enthalten sein, die sachgerecht entsorgt werden müssen. Bitte beachten Sie bei der Entsorgung die geltenden Sicherheitsbestimmungen.

12.7 Gefahren durch mechanische Teile

Die Gerätehaube des QIAcube Connect muss während des Betriebs geschlossen sein. Öffnen Sie die Gerätehaube nur, wenn Sie dazu in der Gebrauchsanweisung angewiesen werden.

Halten Sie immer Abstand zum Gerät, wenn Sie die Arbeitsplattform beladen. Stützen Sie sich nicht auf die Arbeitsplattform, wenn sich der Roboterarm des Geräts bei geöffnetem Deckel bewegt, um die Ladeposition einzunehmen. Warten Sie, bis der Roboterarm seine Bewegungen abgeschlossen hat, bevor Sie mit dem Beladen oder Entladen beginnen.

WARNUNG 	**Sich bewegende Geräteteile** **[W17]** Vermeiden Sie jeglichen Kontakt mit sich bewegenden Geräteteilen, während der QIAcube Connect in Betrieb ist. Ihre Hände dürfen sich niemals unter dem Roboterarm befinden, während dieser sich senkt. Versuchen Sie niemals, Pipettenspitzen oder Reaktionsgefäße zu entnehmen oder zu bewegen, während der Roboterarm in Betrieb ist.

WARNUNG 	**Sich bewegende Geräteteile** **[W18]** Um einen Kontakt mit sich bewegenden Teilen beim Betrieb des QIAcube Connect Geräts zu vermeiden, darf das Gerät nur mit geschlossener Haube betrieben werden. Sollten der Haubensensor oder die Haubenverriegelung nicht ordnungsgemäß funktionieren, kontaktieren Sie bitten den Technischen Service von QIAGEN.

12.7.1 Zentrifuge

Vergewissern Sie sich, dass der Rotor und die Zentrifugenbecher ordnungsgemäß installiert sind. Vor dem Start eines Protokolllaufs müssen unabhängig von der Anzahl der zu verarbeitenden Proben alle Zentrifugenbecher eingesetzt werden. Falls der Rotor oder die Zentrifugenbecher Anzeichen einer mechanischen Beschädigung oder von Korrosion aufweisen, verwenden Sie den QIAcube Connect nicht; kontaktieren Sie den Technischen Service von QIAGEN.

ACHTUNG 	**Beschädigung des Geräts** **[C7]** Der QIAcube Connect darf nicht verwendet werden, wenn der Zentrifugendeckel defekt ist oder die Deckelverriegelung beschädigt ist. Stellen Sie sicher, dass sich während des Betriebs kein loses Material in der Zentrifuge befindet. Stellen Sie sicher, dass der Rotor korrekt installiert ist und dass sämtliche Zentrifugenbecher ordnungsgemäß montiert sind, ungeachtet der Anzahl der zu verarbeitenden Proben. Beladen Sie den Rotor nur gemäß den Softwareanweisungen. Benutzen Sie ausschließlich Rotoren, Zentrifugenbecher und Verbrauchsmaterialien, die für die Verwendung mit dem QIAcube Connect konzipiert sind. Kommt es bei der Verwendung anderer Verbrauchsartikeln anderer Hersteller zu Geräteschäden, erlischt Ihre Garantie. Wir empfehlen, den Zentrifugenrotor und die Zentrifugenbecher nach 20.000 Zyklen zu ersetzen. Bei 2 Läufen am Tag an 220 Tagen im Jahr entspricht dies einer Betriebsdauer von 9 Jahren. Weiterführende Informationen erhalten Sie beim Technischen Service von QIAGEN.

In case of breakdown, caused by power failure, the centrifuge lid can be manually opened to remove the samples (see section 7.3.2).

WARNUNG 	**Sich bewegende Geräteteile** **[W19]** Bei einem durch Stromausfall entstandenen Ausfall des Gerätes das Stromkabel entfernen und 10 Minuten warten bevor der Zentrifugendeckel manuell geöffnet werden kann.

ACHTUNG 	**Beschädigung des Geräts** **[C8]** Bewegen Sie den Roboterarm nach einem Stromausfall nicht manuell vor das Gerät. Beim Schließen der QIAcube Connect Haube kann es zu Schäden kommen, wenn diese mit dem Roboterarm kollidiert.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W20]** Den Zentrifugendeckel vorsichtig anheben. Der Deckel ist schwer und kann Verletzungen verursachen falls er herunter fällt.

ACHTUNG 	**Überhitzung des Gerätes** **[C9]** Zur Sicherstellung einer ausreichenden Belüftung des QIAcube Connect muss ein Mindestabstand von 10 cm an den Seiten und an der Rückseite des Gerätes eingehalten werden. Lüftungsschlitze und –öffnungen des Gerätes nicht abdecken.

12.8 Hitzegefahr

Die Arbeitsplattform des QIAcube Connect enthält einen beheizten Schüttler.

WARNUNG 	**Heiße Oberfläche** **[W21]** Der Schüttler kann Temperaturen bis zu 70°C (158°F) erreichen. Vermeiden Sie es den Schüttler zu berühren, solange er heiß ist.

12.9 Sicherheitshinweise – Wartungsarbeiten

WARNUNG/ ACHTUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W22]** Führen Sie nur Wartungsarbeiten durch, die ausdrücklich in dieser Gebrauchsanweisung beschrieben sind.

WARNUNG 	**Explosionsgefahr** **[W23]** Beim Reinigen des QIAcube Connect mit einem auf Alkohol basierenden Desinfektionsmittel muss die Tür des QIAcube Connect offengelassen werden, damit die brennbaren Dämpfe entweichen können. Den QIAcube Connect nur reinigen, sobald die entsprechenden Module auf der Arbeitsfläche abgekühlt sind.

WARNUNG 	**Brandgefahr** **[W24]** Achten Sie darauf, dass keine Reinigungsflüssigkeit oder Dekontaminationsmittel in Kontakt mit den elektrischen Kontakten des QIAcube Connect kommen.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W25]** Die Rotorschraube muss zur Sicherheit mit dem Rotorschlüssel angezogen werden, der zusammen mit dem QIAcube Connect geliefert wird. Sollte die Schraube nicht fest genug angezogen sein, kann sie sich während der Zentrifugation lösen.

WARNUNG 	**Gefahr durch UV-Strahlung** **[W26]** Eine mechanische Verriegelung gewährleistet, dass die Haube während des Betriebs der UV LED geschlossen bleibt. Sollten der Haubensensor oder die Haubenverriegelung nicht ordnungsgemäß funktionieren, kontaktieren Sie bitten den Technischen Service von QIAGEN.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W27]** Stellen Sie sicher, dass die Deckel von den Spin-Säulen und den 1.5 mL Mikrozentrifugationsröhrchen in der korrekten Position angebracht sind und bis zum Boden des Deckelschachts an den Seiten des Rotor-Adapters durchgedrückt sind. Falsch positionierte Deckel können während der Zentrifugation abgerissen werden.

WARNUNG 	**Gefahr von Verletzungen und Sachbeschädigungen** **[W28]** Stellen Sie sicher, dass der Deckel von der Spin-Säule abgetrennt ist. Spin-Säulen mit unvollständig entfernten Deckeln lassen sich nicht korrekt aus dem Rotor entnehmen, was einen Protokollabbruch zur Folge hätte.

ACHTUNG 	**Beschädigung des Geräts** **[C10]** Verwenden Sie keine Bleichmittel, Lösungsmittel oder Reagenzien, die Säuren, Laugen oder Abrasivstoffe enthalten, um den QIAcube Connect zu reinigen.

ACHTUNG 	**Beschädigung des Geräts** **[C11]** Verwenden Sie keine Sprühflaschen, die Alkohol oder Desinfektionsmittel enthalten, um die Oberflächen des QIAcube Connect zu reinigen. Sprühflaschen sollten nur zum Besprühen von Gegenständen benutzt werden, die zuvor von der Arbeitsplattform entfernt wurden.

12.10 Strahlensicherheit

WARNUNG 	**Verletzungsgefahr** **[W29]** Die Haut nicht dem UV-C-Licht von der UV-Lampe aussetzen.

WARNUNG 	**Verletzungsgefahr** **[W30]** Laserlicht der Gefahrenklasse 2: Schauen Sie bei Verwendung des Bar code-Handscanners nicht in den Laserstrahl.

12.11 Symbols on the QIAcube Connect

Symbol	Location	Description
	Schüttler	Verbrennungsgefahr — die Temperatur des Schüttlers kann bis zu 70°C (158°F) heiß werden
	Nahe der Zentrifuge; nahe des Roboterarms	Mechanische Gefahr — Kontakt mit beweglichen Geräteteilen vermeiden
	Im Gerät, in der Nähe des Flaschengestells	Feuergefahr – Verwendung von Ethanol im Flaschengestell
	Vor der Arbeitsfläche	Biologische Gefährdung – Manche Proben, die mit diesem Gerät verwendet werden, können infektiöse Erreger enthalten und dürfen nur mit Laborhandschuhen angefasst werden
	Innerhalb des Abfallbehälters	Biologische Gefährdung — der Abfallbehälter kann durch biologisch gefährliches Material kontaminiert sein und muss mit Handschuhen angefasst werden.
	Plakette auf der Rückseite des Gerätes	CE-Kennzeichen (Zertifizierung gemäß europäischer Richtlinien)
	Plakette auf der Rückseite des Gerätes	Plakette auf der Rückseite des Gerätes
	Plakette auf der Rückseite des Gerätes	FCC Markierung der Federal Communications Kommission der USA
	Plakette auf der Rückseite des Gerätes	RCM-Mark-Zeichen für Australien und Neuseeland
	Plakette auf der Rückseite des Gerätes	RoHS Markierung für China (Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten)
	Plakette auf der Rückseite des Gerätes	WEEE-Zeichen für Europa
	Plakette auf der Rückseite des Gerätes	Hersteller i.S.d. Gesetzes
	Arbeitsplattform	Lesen Sie die Gebrauchshinweise im Handbuch

13 Revision history

Document	Date	Description of changes
HB-2594-007	January 2023	Updated a statement in Section 6.7.1, UV run.
HB-2594-006	January 2022	Updated a procedure in Section 4.4, Configuration of the QIAcube Connect. Updated a procedure in Section 6.5, Monthly maintenance. Updated the USB flash drive specifications in Section 9.4, Mechanical data and hardware features. Updated the USB flash drive catalog number in the Ordering Information section.
HB-2594-004	September 2020	Updated the steps in Section 4.3.1, Removal of the QIAcube Connect accessories and shipping material.

Index

Trademarks: QIAGEN®, Sample to Insight®, QIAcube®, Qproteome® (QIAGEN Group); DNA-ExitusPlus™ (AppliChem); RNaseZap® (Ambion, Inc.); Microsoft®, Windows® (Microsoft Corporation); Gigasept®, Lysetol®, Mikrozid® (Schülke & Mayr GmbH); DECON-QUAT® (Veltek Associates, Inc.). Registered names, trademarks, etc. used in this document, even when not specifically marked as such, are not to be considered unprotected by law.

HB-2594-007 01/2023 © 2023 QIAGEN, all rights reserved.