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# QIAscout™ User Manual

For affordable and efficient isolation and recovery  
of single cells for further downstream analysis



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# Introduction

Thank you for choosing the QIAScout. We are confident it will become an integral part of your laboratory.

Before using the QIAScout, it is essential that you read this user manual carefully and pay particular 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.

## About this user manual

This user manual provides information about the QIAScout in the following sections:

- Introduction
- Product Contents
- Safety Information
- General Description
- Operating Procedures
- Troubleshooting Guide
- Glossary
- Appendices

The appendices include the following:

- French (FR) translation of Safety Information
- German (DE) translation of Safety Information
- Release needle replacement information
- Cell tracking charts
- List of microscopes and objectives
- Downstream application information
- QIAScout technical data
- Legal information

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## General information

### 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 sample and assay technologies and the use of QIAGEN products. If you have any questions or experience any difficulties regarding the QIAscout 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 contact QIAGEN Technical Support at **[support.qiagen.com](http://support.qiagen.com)**.

For up-to-date information about the QIAscout, visit **[www.qiagen.com/QIAscout](http://www.qiagen.com/QIAscout)**.

### 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.

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

### Intended use of the QIAscout

The QIAscout instrument is for molecular biology applications. The product is not intended for the diagnosis, prevention, or treatment of a disease. The QIAscout instrument is designed to recover and isolate single cells from the QIAscout arrays for further downstream applications. The QIAscout instrument is intended for use by professional users, such as technicians or those trained in molecular biological techniques, and the operation of the system. The QIAscout instrument is intended to be used only in combination with the QIAscout arrays and as described in the kit handbooks.

# Product Contents

The QIAscout (cat. no. 9002733) consists of the QIAscout instrument platform as well as 5 QIAscout 12,000-Microcraft Arrays (cat. no. 928031).

Contents	Number#	Cat. no.
<b>QIAscout</b>	<b>1</b>	<b>9002733</b>
Magnetic Collection Plate	1	9025566*
Motorized Release Device	1	9025563*
Inserts for Release Device	4	9025571*
Additional Lid for Release Device	1	9025609*
Controller	1	9025564*
Power Supply for Controller	1	9025569*
Magnetic Wand	2	9025565*
<b>Replacement Parts</b>		
Replacement Needles	2	9025567*
Replacement Screws	6	9025570*
Screwdriver for mounting Replacement Needle	1	9025570*
<b>QIAscout 12,000-Microcraft Arrays</b>	<b>5</b>	<b>928031</b>

\*In case of damage, defect or loss, spare parts are available for the following components. Please contact QIAGEN Technical Support or QIAGEN Customer Care to order spare parts.

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## Shipping and Storage

### QIAscout arrays

The QIAscout arrays are shipped at room temperature. The QIAscout arrays should be stored at room temperature (15–25°C) in a dry location. When stored under these conditions and handled correctly, the arrays are stable until the expiration date stated on the kit label without a reduction in performance.

### QIAscout instrument

The QIAscout instrument is shipped at –25–60°C in manufacturer’s packaging. The QIAscout instrument should be stored at 5–40°C in manufacturer’s packaging. For detailed information, please refer to Appendix G.



# Safety Information

Before using the QIAscout, it is essential that you read this user manual carefully and pay particular attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation, maintenance and storage of the instrument as well as to protect the user from any harm.

Care and attention should be exercised when handling the products. It is recommended that all users of QIAGEN products adhere to the NIH guidelines that have been developed for recombinant DNA experiments, or to other applicable guidelines.

**Note:** Translations of the Safety Information in French and German are available in Appendix A and Appendix B.

The following types of safety information appear throughout this *User 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 instruments** 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.

## Proper use

### WARNING



#### **Risk of personal injury and material damage** [W1]

Improper use of the QIAscout may cause personal injuries or damage to the instrument.

Be aware of the sharp release needle on the QIAscout release device. It is strongly recommended to always close the lid of the release device when it is not in operation. Follow the regulations regarding the usage of needles/syringes according to the applied laboratory safety concept.

**WARNING****Risk of strong magnetic field**

[W2]

Strong magnetic field warning. Avoid close contact with sensitive devices (such as a pacemaker) to the magnetic collection plate.

**CAUTION****Risk of material damage**

[C1]

Avoid moving the microscope nosepiece when the release device is mounted during operation to prevent damaging the release needle.

**CAUTION****Risk of material damage**

[C2]

Do not place any items on top of the instrument.

**CAUTION****Damage to the instrument**

[C3]

Only use QIAGEN consumables with the QIAscout Instrument. Damage caused by use of other types of consumables will void the warranty.

**CAUTION****Damage to the instrument**

[C4]

Ensure that the release device is firmly mounted on the microscope objective in the correct position. Incorrect mounting of the release device can lead to damaging of the release needle.

In case of emergency, turn off the QIAscout by unplugging the power supply cable from the controller, which is located on the back panel.

## Electrical safety

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

**CAUTION****Damage to electronics**

[C5]

Ensure that the correct power supply adaptor is used before attaching the power supply cable to the instrument.

Incorrect use of supply voltage may cause damage to electronics.

See specifications indicated on the type plate of the instrument.

---

To ensure satisfactory and safe operation of the QIAscout, the user must adhere to the following instructions:

- The power cord must be connected to a power outlet that has a protective conductor (earth/ground).
- Place instrument in a location so that the power cord is accessible and can be connected/disconnected quickly.
- Use only the power cord delivered by QIAGEN.
- 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, turn 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 power cord appears to be damaged.
- It has been stored under unfavorable conditions for a prolonged period of time.
- It has been subjected to severe transport stresses.

## Biological safety

### Biological materials

When handling biological material, use safe laboratory procedures as outlined in publications such as *Biosafety in Microbiological and Biomedical Laboratories*, HHS ([www.cdc.gov/od/ohs/biosfty/biosfty.htm](http://www.cdc.gov/od/ohs/biosfty/biosfty.htm)).

**WARNING****Biological material containing infectious agents**

[W3]

Some cells used may contain infectious agents. Take care not to use such samples with this instrument, as the release needle is reusable and should be free of any contaminating, infectious agent.

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 infectious agents as defined in the applicable Safety Data Sheets (SDSs) or OSHA,\* ACGIH,† or COSHH‡ documents.

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).

## Chemical safety

### Waste disposal

Used plastic ware may contain hazardous chemicals, or contagious/biohazardous materials. Such wastes must be collected and disposed of properly according to local safety regulations.

For disposal of waste electrical and electronic equipment (WEEE), see page 53.

## Mechanical hazards

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

- Use only recommended consumables/components.

**WARNING****Moving parts**

[W4]

To avoid contact with moving parts during operation of the QIAscout, the release device must be operated only when mounted on a compatible microscope objective.

If there is a problem mounting the release device onto a compatible objective, contact QIAGEN Technical Services.

**CAUTION****Moving parts**

[C6]

The lifting platform of the release device will always go back to its mechanical home position (closing position) under following conditions

- When leaving calibration mode and entering release mode
- When a power cycle is done with the release device motor cable connected to the controller

**WARNING**



**Installation of the release device**

[W5]

The release device must be mounted onto a compatible microscope objective. To avoid contacting the release needle, the protective lid of the release device must always be on during device installation. Remove the protective lid as the last step of device installation.

**CAUTION**



**Damage to the instrument**

[C7]

Avoid objects coming into contact with the release needle to prevent damage from occurring.

**CAUTION**












**Damage to the instrument**

[C8]

Do not use bleach, solvents or reagents containing acids, alkalis or abrasives when cleaning the QIAscout.

## Symbols on the QIAscout

Symbol	Location	Description
	Type plate on the back of the instrument	CE mark for European Conformity
	Type plate on the back of the instrument	Legal manufacturer
	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	FCC mark of the United States Federal Communications Commission
	Type plate on the back of the instrument	RCM mark for Australia/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)
	On the instrument, Lid	Warning, mechanical hazard, avoid contact with moving parts
	On the instrument	Warning, sharp components, avoid contact with moving parts
	On the magnetic collection plate	Warning, strong magnetic field

## Quality Control

In accordance with QIAGEN's ISO-certified Quality Management system, each lot is tested against predetermined specifications in order to ensure consistent product quality.

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## General Description

The QIAscout provides a cost-effective method to isolate and recover single cells for direct analysis or for the generation of clonal subpopulations.

### Principle

The core of the QIAscout is the QIAscout array which is composed of 12,000 individual microwells (see Figure 1). Each microwell is 200  $\mu\text{m}$  in length and 200  $\mu\text{m}$  in width and is securely held within a micron-scale well of the QIAscout array. Within the QIAscout array, the microwells serve as releasable culture sites for individual cells or colonies. QIAscout arrays are mounted on inverted microscopes much like any tissue culture dish.

The motorized release device (see Figure 1) is mounted onto a 4x, 5x or 10x objective of common inverted lab microscopes to allow for selection and picking of individual microwells. Mounting of the release device onto a 4x, 5x or 10x objective is strongly recommended due to the minimum working distance required for successful release of the selected microwell from the QIAscout array. Refer to Appendix E for list of compatible microscopes.

To isolate target cells, simply press the button on the controller (see Figure 1), which makes the release needle pierce through the lower surface of the QIAscout array and dislodge an individual microwell with its cell(s) attached. The released microwell is then recovered using a magnetic wand (see Figure 1) and transported to a secondary vessel (e.g., reaction tube of downstream application).

This process achieves cell isolation and recovery with cells remaining viable. The QIAscout offers a high degree of flexibility as cells may be selected considering a wide range of criteria, including temporal and spatial characteristics, and requires only a very small sample size to conduct an experiment. The recovered cells can be used for direct analysis, or clonal expansion.



**Figure 1. Components of the QIAscout.**

1	Plastic Carrying Case	5	Controller
2	Magnetic Collection Plate	6	Inserts for Release Device
3	Magnetic Wand	7	Motorized Release Device
4	QIAscout Array	8	Power Supply for Controller

### QIAscout 12,000-Micraraft Arrays

A typical QIAscout array along with other components is shown in Figure 2. Seeding and cultivation of cells on the QIAscout array is comparable to standard cell culture vessels. Adherent cells are plated on the QIAscout array in the same manner as one would on a standard tissue culture dish, whereas suspension cells require an extra coating of the QIAscout array. Prepare a single-cell suspension following the conventional method for the cell line being used and determine the cell density using a standard cell counting method.





**Figure 2. The QIAscout 12,000-Microcraft Array with other components.**

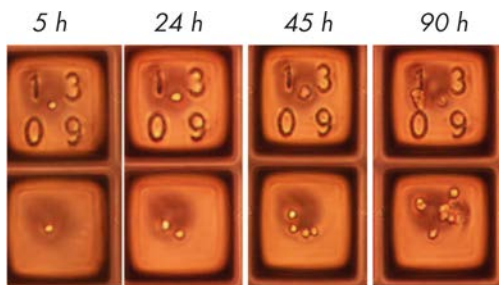
The cell distribution on the QIAscout array follows a Poisson distribution (Table 1). To achieve the maximum number of microcrafts on the QIAscout array containing a single cell and to minimize the number of microcrafts with no cell or more than one cell, it is suggested to plate cells at a cell : microcraft ratio of 1:2 or 1:3 (as highlighted in Table 1). A QIAscout array contains 12,000 individual microcrafts, and therefore plating 4,000–6,000 cells is generally recommended. Adjust the cell density of your suspension and add the desired number of cells to the QIAscout array in 2 ml of medium.

**Table 1. Cell distribution on the array follows a Poisson distribution**

Cell : Well ratio	% Empty wells	% Wells capturing a single cell	% Wells capturing $\geq 2$ cells
1:1	37	37	26
<b>1:2</b>	<b>61</b>	<b>30</b>	<b>9</b>
<b>1:3</b>	<b>72</b>	<b>24</b>	<b>4</b>
1:5	82	16	2
1:10	90	9	1

After adding cells to the QIAscout array, allow the cells to settle and wait until the cells have attached firmly enough to the microcraft surface to allow for release and collection. A waiting time of 6–10 hours in culture is generally adequate, but the length of this period will be cell line-dependent.

Once settled, cells cultured on the QIAscout array remain localized on the microcraft surface, and migration across the wall to adjacent microcrafts rarely occurs, the exception being when the cells reach confluence on the microcrafts. Figure 3 shows HT-29 cells cultured on the QIAscout array for up to 90 hours. The time window for cell isolation can be anywhere from a few hours to several days after cell plating. Several days of expansion is suitable if the objective is to isolate clonal colonies using QIAscout arrays.



**Figure 3. Viable cells on the QIAscout array.** Successfully cultivate single HT-29 cell to form subcolonies on the QIAscout array for up to 90 hours.

The QIAscout array can be imaged by brightfield, fluorescence and confocal microscopy. Once the cells are adhered to the microwells, the QIAscout array can be screened to identify target cells and colonies. The position of a target cell/colony can be recorded using the charts provided in Appendix D.

# Operating Procedure

This section describes the operation of the QIAscout. Before proceeding, you should familiarize yourself with the features of the QIAscout described in "General Description," page 15.

## Equipment and Reagents to Be Supplied by User

- Common inverted lab microscope (with 4x, 5x or 10x objective; see Appendix E for microscope and objective recommendations)  
**Note:** For the use of the release device an extra objective, microscope stage and/or holding frame may be necessary (for more detailed information, see Appendix E)
- Standard sterile cell culture hood and incubator
- Cell culture equipment (e.g., cell culture medium, sterile PBS, coating solutions if needed, pipettes)
- Equipment required for standard cell counting methods
- 70 % EtOH if sterilization of magnetic wand is required
- 1.5 ml reaction tube for pre-wetting of the magnetic wand and wash steps
- Reaction tubes for collection of microrrafts and downstream applications
- Downstream kits/buffers

## Important points before starting

- Before proceeding with QIAscout release procedure, cells must adhere to QIAscout array. The used cell line will adhere and grow on the QIAscout array as it would on a standard cell culture dish. Depending on the cell line used, characteristics such as time-to-adherence varies.
- It is strongly recommended not to pierce the outer 7 lines of the QIAscout array, as the microrrafts included in these lines are not made pierceable by the manufacturing process.
- Do ensure that the release device is not touching the objective revolver or other parts of the microscope, as any collision might affect the use and maintenance of the release device.
- Proceed with caution when using the release needle and the magnetic wand, as bending these items can affect the ability of the release needle to pierce the microrrafts or the effective transfer of microrrafts via the magnetic wand.
- To view the cells at a higher magnification of 20x or more, we recommend following the chart in Appendix D in order to first note the cell coordinates. Thereafter, ensure returning to a lower magnification for successful microrraft release.

## Things to do before starting

- Cultivate cell line of interest

## Protocol

### Preparation of the QIAscout array and seeding of cells

1. In a sterile cell culture hood, remove the QIAscout array from the sealed pouch.
2. Remove the lid and add 2 ml of sterile PBS to the QIAscout array.
3. Wait at least 3 minutes, and then remove the PBS.

**Note:** The QIAscout array is covered with a proprietary water-soluble biocompatible coating that effectively prevents air bubble formation when adding liquid to the array. These wash steps ensure the complete removal of this coating. Do not allow the QIAscout array to dry during preparation. This will cause air bubbles to form that will become trapped in the microwells.

4. Repeat steps 2–3.
5. If working with suspension cells or with cells that require an extracellular matrix (ECM) for culture (such as gelatin, collagen, fibronectin, matrigel, etc.), coat the QIAscout array using standard coating protocols in the same manner as one would coat standard cell culture dishes. For suspension cells it is recommended to use an adhesive solution that immobilizes the cells (e.g., Corning® Cell-Tak™).

If the cells do not require any coating, proceed to step 6.

**Note:** Ensure that the QIAscout array does not become dry during the coating process.

6. Repeat steps 2–3 with cell culture medium instead of sterile PBS.
7. Generate a single-cell suspension of 4,000–6,000 cells in 2 ml of desired culture medium.
8. Add cells in suspension evenly across the entire QIAscout array.

**Note:** It is also possible to first add 2 ml medium to the QIAscout array and then add the cells suspended in a smaller volume. When using this method, it is recommended to swirl the QIAscout array in the pattern of '8' in order to achieve an equal distribution of cells on the array.

9. Cultivate cells under the standard culture conditions for the cell line being used.

**Note:** Depending on the cell line used, cells will usually attach within 6–10 hours to the QIAscout array.

10. Once adhered, screen the QIAscout array using brightfield, fluorescence or confocal microscopy to identify target cells.

**Note:** Location of cells of interest can be recorded by using the provided cell tracking chart (see Appendix D).

### QIAscout instrument installation\*

\*To watch a video on how to install the QIAscout instrument, visit [www.qiagen.com/QIAscout](http://www.qiagen.com/QIAscout).

1. Remove the magnetic wand from its containment tube.

**Note:** If the magnetic wand must be sterilized, clean it with 70% ethanol and dry it with a lint-free tissue.

2. Rinse the magnetic wand by briefly immersing it in a 1.5 ml reaction tube containing 200  $\mu$ l sterile PBS.

**Note:** The above mentioned reaction tube can also act as a temporary holder for the magnetic wand between microwell transfers.

3. Place the magnetic collection plate on a level surface on the lab bench next to the microscope.
4. Take the release device, controller and power supply from the case. Do not remove the protective lid from the release device at this time.

**Note:** Do not plug in power supply at this time.

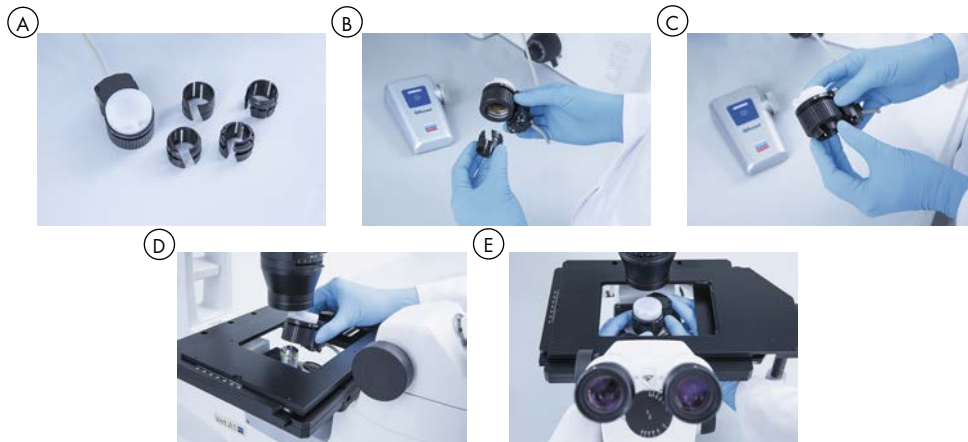
5. Place the controller on a flat surface near the microscope.
6. Lower the turret on the microscope to the lowest possible position and remove any stage inserts present.
7. Check if the release device fits on the objective (4x, 5x or 10x; for a list of recommended objectives see Appendix E) or if one of the 4 available inserts must be added to the release device (see Figure 4A–C; for more information see Appendix E). If an insert is required, add the relevant insert into the release device (with the number on the insert in the upright position) before mounting the release device onto the objective (see Figure 4D).

Mount the release device on the microscope objective by gently turning the device downwards, while at the same time avoiding any contact with the revolver or microscope parts.

**Note:** Ensure that the release device does not touch the objective revolver or other parts of the microscope, as any collision might affect the use and maintenance of the release device. It is also highly recommended to remove the microscope objectives present on either side of your objective in use (i.e. objective with your release device mounted) in order to avoid any damage due to collision.

8. Tighten the release device by turning the outer-ring counter-clockwise, ensuring that the release device is firmly installed (see Figure 4E). To check if the release is securely fastened, try gently lifting the release device upwards. If the release device can still be raised up, it is not installed

correctly. In this case, continue turning the outer ring to further tighten it or perhaps use a different insert with the release device.



**Figure 4. Release device installation.** A. Release device with 4 inserts. B. Choose the right insert for your objective. C. Fit the insert inside the release device. D. Mount the release device on the objective. E. Tighten the outer ring.

9. Connect the wire from the release device to the controller.
10. You may now take the protective cover off the release device (see Figure 5A).

**Note:** Care must be taken not to touch or bend the release needle (see Figure 5B–C). In the event that the release needle must be replaced, see Appendix C.



**Figure 5. Release device installation.** A. Carefully remove the protective lid. B. The needle is delicate, do not touch or bend it. C. Ensure there is no collision of the release device with other microscope parts.

11. Plug in the power supply into a standard wall outlet and switch the controller on by pressing the button on the controller. A blue indicator light on the controller will turn on (see Figure 6).



**Figure 6. Operating parts of the controller.** 1. Button 2. Indicator light 3. Wheel

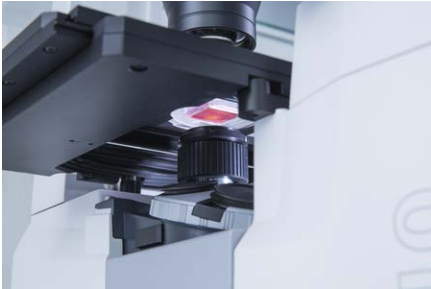
12. Press the button down for 2 seconds to enter calibration mode (see Figure 7A). The indicator light will begin to blink when the controller has entered calibration mode.
13. If available, turn on the camera and computer monitor attached to the microscope (a camera and monitor are highly recommended for cell identification and microraft release).
14. To calibrate the release device, the release needle tip must be on the focal plane.  
Observe the focal plane while gradually raising the release needle tip up into the focal plane by turning the wheel on the controller upwards (see Figure 7B).  
Continue until the tip of the release needle (small bright dot) is visible (see Figure 7C).



**Figure 7. Calibration of the QIAscout instrument.** A. Long (2 s) press the button to set up calibration mode. B. Turn the wheel to adjust release needle height. C. Turn the wheel up until the small bright dot (indicative of the tip of the release needle) is visible.

15. Mark the position of the release needle on the monitor screen by using a crosshair or on the microscope by using an ocular grid reticle.
16. Press the button on the controller once to leave calibration mode and enter working mode. The indicator light will stop blinking but will stay on.
17. Place the QIAscout array on the microscope stage (see Figure 8). Ensure that the arrow head  $\Delta$  inscribed within the cassette is pointing downwards.

**Note:** If further cultivation of cells on the QIAscout array is planned, the array lid may be kept in place to help prevent contamination during release operations. However, it must be removed prior to collecting dislodged micrafts.

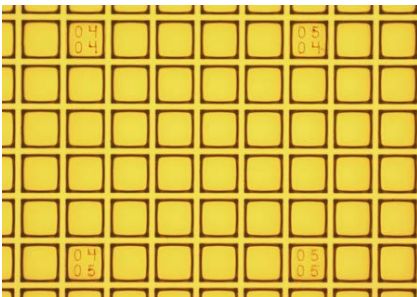


**Figure 8. QIAscout array on the microscope stage.** Ensure that the array sits directly above the release needle tip.

## Micraft release

1. Focus on the QIAscout array.

Ensure that the array is in the appropriate orientation as mentioned in step 17 of section “QIAscout instrument installation” in order to be able to read the numbered locations that are visible on every 5x5 micraft block on the array (see Figure 9).



**Figure 9. Numbered micrafts on the QIAscout array.** Focus on the array to read the numbered locations on a 5x5 micraft block on the array.

2. Once a micraft containing the cell of interest has been chosen, move the QIAscout array to position the micraft of interest directly over the release needle (as previously marked) (see Figure 10A).

**Note:** It is recommend to first pierce an empty “test” micraft to verify the release needle position and to determine if the travel distance of the release needle requires adjustment.

3. Once the micraft containing the cell of interest has been positioned over the release needle tip, press the button on the controller once.

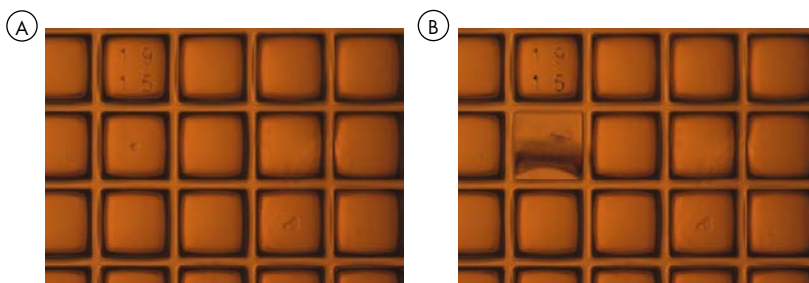


Examine the QIAscout array to determine if the desired micraft has been released (see Figure 10B). If the micraft has not been released, slightly **increase** the release needle travel distance by turning the wheel up.

If the release device collides with any part of the microscope during piercing, slightly **decrease** the release needle travel distance by turning the wheel downwards.

Repeat the release process and examine once more for micraft release. If the micraft has not been released, repeat the release needle adjustment step until the micraft has been successfully released. Once the micraft is released, the travel distance should no longer require adjustment.

**Note:** After piercing, it is recommended that the previously marked position of the release needle (on the computer monitor or ocular reticle) be re-adjusted to accurately reflect the actual release needle position.



**Figure 10. Micraft release.** A. View the array before piercing. B. View the array after piercing.

### Transfer of released micraft

1. Upon the successful release of a micraft, take off the array lid.
2. Lower the tip of the magnetic wand into the medium contained in the QIAscout array.  
**Note:** Make sure that the magnet contained in the magnetic wand is at the bottom before lowering the magnetic wand into the QIAscout array. This small magnet is required to pick up the dislodged micraft.
3. Bring the magnetic wand tip in proximity to the released micraft (see Figure 11A).  
**Note:** It is strongly recommended to observe the QIAscout array to ensure that the micraft is effectively picked up by the magnetic wand. A successful retrieval of the micraft of interest will cause the micraft to disappear from view when the magnetic wand is placed over it and the micraft can be seen migrating toward the magnetic wand before its shadow comes into the view of the microscope.  
**Note:** Be careful not to scratch the micrafts with the magnetic wand. The micrafts that neighbor the pierced one can detach in case too much pressure is applied to the surface of the micrafts.

4. Remove the magnetic wand from the medium, making sure to always hold it firmly with the silver cap on top and the magnetic end at the bottom. This is to ensure that the internal magnet will remain in the lowest possible position during this transfer step.  
Replace the lid on the QIAscout array.
5. If washing of the microraft is needed, rinse the magnetic wand with the microraft attached by slowly dipping it in a 1.5 ml reaction tube containing 200 µl sterile PBS buffer. Avoid any contact with the tube wall such that you do not lose the microraft on the wall of the tube.  
**Note:** At this point, the need for a washing step depends on the downstream application or further cultivation of single cell. For use with REPLI-g® Kits, see Appendix F.
6. For the release of the microraft, lower the magnetic wand carefully into a secondary vessel or a reaction tube containing sterile PBS or buffer for the selected downstream reaction (see Figure 11B). Volume of the liquid and type of secondary vessel depends on your downstream application (see Appendix F).  
**Note:** For further cultivation, release the microraft into a 96-well plate containing 200 µl of culture medium (see Appendix F).  
**Note:** To ensure that the target cell is deposited into the reaction tube or 96-well plate, it is recommended to hold the magnetic wand firmly inside the tube or well until the end of the workflow. Avoid any contact with the tube wall such that you do not lose the microraft on the wall of the tube.  
**Note:** Ensure to use PBS or buffer that is free of amplifiable nucleic acids.
7. Place the reaction tube, in which the magnetic wand is still inserted, onto the center of the magnetic collection plate, where marked (see Figure 11C).  
**Note:** The strong magnetic field on the collection plate attracts the microraft attached to the magnetic wand allowing it to fall to the bottom of the reaction tube.
8. When the magnet inside the wand has moved upwards, withdraw the wand from the reaction tube while keeping the reaction tube in constant contact with the marked center of the magnetic collection plate.
9. Place the wand in the temporary storage tube (containing 200 µl sterile PBS, see step 2 of section "QIAscout instrument installation").  
**Note:** Once the wand is removed from the vicinity of the magnetic collection plate, the wand magnet should be visible once more at the bottom of the magnetic wand. If the magnet does not move to this position automatically, gently shake the wand but by keeping a firm grip on wand handle at all times.
10. Proceed to pierce the next chosen microraft.
11. To switch off the instrument, press the button on the controller for 5 seconds until the indicator light switches off.

12. The release device can either remain on the objective or can be removed and stored in the carrying case.

**Note:** In either case it is strongly recommended to cover the release needle with the protective lid.



**Figure 11. Transfer of released microraft.** A. Bring the magnetic wand close to the released microraft. B. Depending on your downstream experiment, place the wand in a suitable reaction tube (here a 1.5 ml reaction tube) or any other secondary vessel of your choice. C. Place the tube, in which the magnetic wand is still inserted, onto the center of the magnetic collection plate and hold firmly.

# Troubleshooting

## General troubleshooting

This section provides information about what to do if an error or problem occurs while using the QIAscout instrument.

If you need to contact QIAGEN Technical Services at any step, make note of the steps leading up to the error or problem and the information contained in any dialog boxes. This will help the QIAGEN Technical Service Specialist to resolve the issue.

Errors and Issues	Comments and Suggestions
Release needle does not return to its mechanical home position	Switch off and on the instrument while the release device is connected to the controller. If the problem persists, unplug and plug in the power cable from the instrument while the release device and controller are still connected.
Bent or broken release needle	Exchange the release needle assembly with the spare needle (see Appendix C).
Indicator light on controller is rapidly blinking (error mode)	Check if release device cable is connected to the controller. Press button to leave error mode.
Release device does not fit on microscope	See Appendix E for the objective reference guide. Please contact the microscope manufacturing company representative to help identify the most suitable objective for your application.
Microscope objective is shorter than the length of the release device	Release device can be tightened higher up on the objective. Use caution when testing release device in this position.
Microrrafts are not releasable	Ensure that the QIAscout array has been washed with PBS and is filled with medium. Check if the release needle reaches the array when piercing. If not, carefully increase

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**Errors and Issues****Comments and Suggestions**

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Release needle is not visible in the field of view

the travel distance by scrolling the wheel on the controller upwards.  
Check if release needle is bent.

If the release needle is not bent or broken, loosen and tighten the 3 screws attached to the window containing the release needle until it sits level on the release device.  
Check once more if the release needle is visible in the field of view.

# Glossary

<b>Term</b>	<b>Description</b>
QIAscout	A cost-effective device to isolate and recover single cells for direct analysis or for the generation of clonal populations. The QIAscout includes 5 QIAscout 12,000-Microraft Arrays and the QIAscout instrument platform.
QIAscout array	A microstructured PDMS array that contains 12,000 individual microrafts, each 200 x 200 µm in dimension. The array is coated with magnetic microrafts.
QIAscout instrument platform	The QIAscout instrument platform is used in conjunction with the array and a standard inverted cell culture microscope to identify and isolate single cells as an early step in a single cell workflow. The instrument includes the controller, release device with the needle, magnetic wand and magnetic collection plate. The specific purpose of the instrument is to dislodge a single microraft from the array, retrieve the microraft and transfer it to a separate collection vessel such as a PCR tube.
Microraft	A structure composed of polystyrene and magnetic nanoparticles that can be released from the PDMS array by the release device needle.
Release device	Combination of the needle housing with a protective lid and 4 inserts. The release device has an interface with the microscope and fits on the objective of an inverted microscope upon tightening its outer ring.
Replacement needles	2 replacement needles are included in the QIAscout to use in the case the existing release needle bends or breaks.
Controller	The controller is connected to the release device. Pushing the button on the controller triggers the release of the microraft from the array by the release device. The release button sits on the wheel present on the side of the controller and adjusts release needle travel distance.
Magnetic wand	A plastic wand that contains a magnet to attract the released magnetic microraft and facilitates its transfer to the reaction tube for downstream processing.
Magnetic collection plate	A white plate with a cylindrical magnet in the center which facilitates the transfer of the microraft from the magnetic wand into a collection tube.
Indicator light	Blue light to indicate the current mode of the instrument.
Calibration mode	Allows for the calibration of the release needle travel distance. The blinking indicator light means that the device is in calibration mode.
Working mode	Pressing the button now triggers the release needle to pierce the array.
Error mode	Rapid blinking of the indicator light.

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<b>Term</b>	<b>Description</b>
Travel distance	The distance that the release needle moves upwards when triggered.


## Appendix A – Informations de sécurité

Avant d'utiliser le QIAscout, il est impératif de lire attentivement ce manuel et de porter une attention particulière aux informations de sécurité. Afin de garantir un fonctionnement, une maintenance et un stockage sûrs de l'instrument et de protéger l'utilisateur de toute blessure, il est impératif de suivre les instructions et les informations de sécurité fournies dans le présent manuel d'utilisation.


Soin et attention doivent être portés lors de la manipulation des produits. Il est recommandé que tous les utilisateurs des produits QIAGEN suivent les directives du NIH mises en place pour les expériences d'ADN recombinant ou d'autres directives applicables.

Le présent *manuel d'utilisation* comporte les types d'informations de sécurité suivants.

<b>AVERTISSEMENT</b>	Le terme AVERTISSEMENT est utilisé pour indiquer des situations pouvant entraîner des blessures personnelles pour vous ou d'autres personnes. Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.
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<b>MISE EN GARDE</b>	Le terme MISE EN GARDE est utilisé pour indiquer des situations pouvant entraîner un endommagement des instruments ou d'autres équipements. Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.
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Les conseils dispensés 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.

### Utilisation appropriée


<b>AVERTISSEMENT</b>	<b>Risque de blessures personnelles et de dommages matériels</b> [W1]
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Une utilisation inappropriée du QIAscout peut entraîner des blessures personnelles ou un endommagement de l'instrument. Le système de libération du QIAscout comporte une aiguille pointue qu'il convient de manipuler prudemment. Il est vivement recommandé de toujours refermer le couvercle de l'appareil de libération lorsque celui-ci n'en pas en opération. Suivre les règlements concernant l'usage d'aiguilles/seringues selon le concept de sécurité de laboratoire appliqué.




**AVERTISSEMENT** **Risque champ magnétique fort** [W2]




Avertissement de champ magnétique fort. Tenir à distance de la plaque de collection tout appareil sensible (comme les stimulateurs cardiaques).

**MISE EN GARDE** **Risque de dommages matériels** [C1]




Éviter de déplacer la tourelle du microscope lorsque l'appareil de libération est monté pendant les opérations, afin de prévenir tout dommage à l'aiguille.

**MISE EN GARDE** **Risque de dommages matériels** [C2]




Ne pas placer ou fixer d'objets sur l'instrument.

**MISE EN GARDE** **Endommagement de l'instrument** [C3]



Utiliser seulement des consommables QIAGEN avec l'instrument QIAscout. Les détériorations causées par l'utilisation d'autres types de consommables annulent la garantie.

**MISE EN GARDE** **Endommagement de l'instrument** [C4]




Veiller à ce que l'appareil de libération soit correctement et solidement monté sur l'objectif du microscope. Un montage incorrect de l'appareil de libération ou son détachement sont susceptibles d'endommager l'aiguille.

En cas d'urgence, mettre hors tension le QIAscout en débranchant le câble d'alimentation du régulateur, situé sur le panneau arrière.

## Sécurité électrique

**Remarque:** avant l'entretien, débrancher le câble d'alimentation de la prise de courant.

**MISE EN GARDE** **Endommagement des composants électroniques** [C5]



Veiller à utiliser le bon adaptateur d'alimentation électrique avant de brancher le câble d'alimentation électrique à l'instrument.  
Une tension d'alimentation incorrecte peut endommager les composants électroniques.  
Voir les spécifications indiquées sur la plaque signalétique de l'instrument.

Afin que le QIAscout fonctionne de manière satisfaisante et en toute sécurité, respecter les instructions suivantes:

- Le câble d'alimentation doit être relié à une prise d'alimentation disposant d'un conducteur de protection (terre).
- Placer l'instrument de manière à laisser le câble d'alimentation facilement accessible pour le brancher et le débrancher rapidement.
- Utiliser uniquement les cordons d'alimentation fournis par QIAGEN.
- Ne pas modifier ou remplacer des composants internes de l'instrument.
- Ne pas faire fonctionner l'instrument en ayant retiré des capots ou des composants.
- En cas d'écoulement de liquide à l'intérieur de l'instrument, mettre celui-ci hors tension, le débrancher de sa source principale d'alimentation électrique et contacter les services techniques QIAGEN.
- Si l'instrument présente un danger électrique, empêcher le reste du personnel de s'en servir et contacter les services techniques de QIAGEN.


L'instrument 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.
- L'appareil a subi des chocs sévères durant le transport.

## Sécurité biologique

### Matériel 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](http://www.cdc.gov/od/ohs/biosfty/biosfty.htm)).

<b>AVERTISSEMENT</b>	<b>Matériel biologique contenant des agents infectieux</b> [W3]
	Certaines cellules utilisées peuvent contenir des agents infectieux. Veiller à ne pas utiliser ces échantillons avec cet instrument, car l'aiguille est réutilisable et ne devrait contenir aucun agent infectieux ou contaminant. La personne responsable (par exemple le chef de laboratoire) doit prendre les précautions nécessaires pour s'assurer que l'espace de travail environnant est sûr et que les opérateurs travaillant sur l'instrument ne sont pas exposés à

des quantités dangereuses d'agents infectieux décrit dans les fiches de données de sécurité (FDS) ou dans les documents de l'OSHA\*, de l'ACGIH† ou du COSHH‡.

La mise au rebut des déchets doit être conforme à toutes les réglementations et lois de sécurité sanitaire nationales, régionales et locales.

\*OSHA: Occupational Safety and Health Administration (Administration de la sécurité et de la santé au travail, États-Unis).

†ACGIH: American Conference of Government Industrial Hygienists (Conférence américaine des hygiénistes industriels gouvernementaux, États-Unis).

‡COSHH: Control of Substances Hazardous to Health (Contrôle des substances dangereuses pour la santé, Royaume-Uni).

## Sécurité chimique

### Élimination des déchets


Le matériel en plastique usagé peut contenir des produits chimiques dangereux ou du matériel contagieux/infectieux. Ces déchets doivent être convenablement collectés et mis au rebut conformément aux réglementations de sécurité locales.


Pour la mise au rebut des déchets d'équipements électriques et électroniques (DEEE), voir page 53.

## Dangers mécaniques

Afin que le QIAscout fonctionne de manière satisfaisante et en toute sécurité, suivre ces instructions:

- Utiliser exclusivement les consommables/composants recommandés.

<b>AVERTISSEMENT</b>	<b>Parties mobiles</b>	[W4]
	Afin d'éviter tout contact avec les parties mobiles pendant l'utilisation du QIAscout, l'appareil de libération ne doit être utilisé que lorsqu'il est monté sur un objectif de microscope compatible. En cas de problème de montage de l'appareil de libération avec un objectif compatible, contacter les services techniques QIAGEN.	

<b>MISE EN GARDE</b>	<b>Parties mobiles</b>	[C6]
	La plate-forme élévatrice de l'appareil de libération retourne toujours à sa position initiale (position de fermeture) aux conditions suivantes : - Lors du passage du mode de calibration et au mode de libération - À la fin d'un cycle, le câble moteur de l'appareil connecté au régulateur	

**AVERTISSEMENT****Installation de l'appareil de libération**

[W5]



L'appareil de libération doit être monté sur un objectif de microscope compatible. Afin d'éviter tout contact avec l'aiguille, le couvercle protecteur de l'appareil de libération doit toujours être en place pendant l'installation de l'appareil. Ne retirer le couvercle de protection qu'à la dernière étape de l'installation de l'appareil.

**MISE EN GARDE****Endommagement de l'instrument**

[C7]



Éviter tout contact de l'aiguille avec des objets pouvant l'endommager.










**MISE EN GARDE****Endommagement de l'instrument**

[C8]



Ne pas utiliser d'eau de Javel, de solvants ou de réactifs contenant des acides, alcalins ou abrasifs pour nettoyer le QIAscout.

## Symboles sur le QIAscout

Symbole	Emplacement	Description
	Plaque signalétique à l'arrière de l'instrument	Symbole CE pour la conformité européenne
	Plaque signalétique à l'arrière de l'instrument	Fabricant légal
	Plaque signalétique à l'arrière de l'instrument	Marquage de déchets d'équipements électriques et électroniques (DEEE) pour l'Europe
	Plaque signalétique à l'arrière de l'instrument	Marquage FCC de la Federal Communications Commission (USFCC, commission fédérale des communications des États-Unis)
	Plaque signalétique à l'arrière de l'instrument	Marquage RCM pour l'Australie/la Nouvelle-Zélande
	Plaque signalétique à l'arrière de l'instrument	Marquage RoHS pour la Chine (restriction de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques)
	Sur l'instrument, couvercle	Avertissement, danger mécanique, éviter le contact avec les parties mobiles
	Sur l'instrument	Avertissement, composants pointus, éviter le contact avec les parties mobiles
	Sur la plaque de collection	Avertissement, champ magnétique fort

## Appendix B – Sicherheitshinweise

Vor der Inbetriebnahme des QIAscout sollten Sie dieses Handbuch sorgfältig durchlesen – beachten Sie insbesondere die Sicherheitshinweise. Die Anweisungen und Sicherheitsinformationen in diesem Handbuch müssen vom Anwender befolgt werden, um einen sicheren Betrieb des QIAscout zu gewährleisten, das Gerät in einem sicheren Zustand zu erhalten und Verletzungen des Anwenders zu vermeiden.

Bei der Handhabung der Produkte ist mit angemessener Umsicht und Aufmerksamkeit vorzugehen. Es wird allen Anwendern von QIAGEN-Produkten empfohlen, die für die Analyse von rekombinanter DNA entwickelten NIH-Leitlinien oder andere relevante Leitlinien zu befolgen.

Dieses *Benutzerhandbuch* enthält folgende Arten von Sicherheitshinweisen:

### **WARNUNG**



Der Begriff „WARNUNG“ weist Sie auf Situationen hin, in denen eine Verletzungsgefahr für Sie und andere Personen besteht. Nähere Einzelheiten über diese Situationen werden in einem Textfeld wie diesem beschrieben.

### **VORSICHT**



Der Begriff „VORSICHT“ 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 sollen die im jeweiligen Land des Anwenders geltenden Sicherheitsbestimmungen nicht ersetzen, sondern lediglich ergänzen.

## Sachgemäße Handhabung

### **WARNUNG**



**Gefahr von Verletzungen und Beschädigung des Geräts** [W1]  
Die unsachgemäße Anwendung des QIAscout kann zu Verletzungen des Benutzers oder zur Beschädigung des Geräts führen. Achten Sie besonders auf die scharfe Nadel des Objektivaufsatzes zum Ausstechen. Es ist dringend anzuraten, immer den Schutzdeckel auf den Aufsatz aufzusetzen, wenn er nicht in Gebrauch ist. Folgen Sie den Anforderungen und Bestimmungen für den Gebrauch von Nadeln/Spritzen entsprechend den geltenden Sicherheitsbestimmungen für Labore.

**WARNUNG****Gefährdung durch starkes Magnetfeld**

[W2]

Warnhinweis für starkes Magnetfeld. Bei empfindlichen Geräten (wie z. B. Herzschrittmachern) ist die unmittelbare Nähe zur Sammelplatte zu vermeiden.

**VORSICHT****Gefahr von Materialbeschädigungen**

[C1]

Vermeiden Sie es, sobald der Objektivaufsatz zum Ausstechen installiert ist, den Mikroskoprevolver zu bewegen, um eine Beschädigung der Nadel zu verhindern.

**VORSICHT****Gefahr von Materialbeschädigungen**

[C2]

Stellen Sie keine Gegenstände auf das Gerät.

**VORSICHT****Beschädigung des Geräts**

[C3]

Verwenden Sie nur QIAGEN Verbrauchsartikel für den QIAscout. Kommt es bei der Verwendung von Verbrauchsartikeln anderer Hersteller zu Geräteschäden, erlischt die Garantie.

**VORSICHT****Beschädigung des Geräts**

[C4]

Stellen Sie sicher, dass der Aufsatz zum Ausstechen fest und in der korrekten Position auf dem Mikroskop-Objektiv montiert ist. Ein nicht korrekt montierter Aufsatz kann zu Beschädigungen der Ausstechnadel führen.

Schalten Sie den QIAscout im Notfall aus, und ziehen Sie den Netzstecker (rückseitig) aus der Steckdose.

## Schutz vor Stromschlag

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

**VORSICHT****Beschädigung von elektronischen Bauteilen**

[C5]

Stellen Sie sicher, dass Sie den für Ihr Land bestimmten Netzteiladapter verwenden, bevor Sie das Netzteil mit dem Controller verbinden. Der Betrieb mit falscher Netzspannung/-Frequenz kann zu Schäden in der

Elektronik führen.  
Bitte beachten Sie auch die entsprechenden Spezifikationen auf dem  
Typenschild des Geräts.

Um einen zufriedenstellenden und sicheren Betrieb des QIAscout zu gewährleisten, sind bei der Anwendung die nachstehenden Anweisungen zu befolgen:

- Das Netzkabel muss an eine Steckdose mit Schutzleiter (Erdungs-/Masseleiter) angeschlossen werden.
- Sorgen Sie dafür, dass die Netzstecker jederzeit frei zugänglich sind, für den Fall, dass das Gerät einmal schnell vom Stromnetz getrennt werden muss.
- Es darf nur das von QIAGEN mitgelieferte Netzkabel verwendet werden.
- Nehmen Sie im Geräteinneren keine Einstellungen an Geräteteilen 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 hineinläuft, schalten Sie es sofort aus, ziehen Sie den Netzstecker 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 Benutzung durch darüber nicht informiertes Personal gesichert werden. Kontaktieren Sie anschließend den Technischen Service von QIAGEN.

Die elektrische Sicherheit des Geräts ist nicht mehr gegeben, wenn:

- das Gerät oder das Netzkabel beschädigt erscheint;
- das Gerät für längere Zeit unter ungünstigen Bedingungen gelagert wurde;
- das Gerät unsachgemäß transportiert worden ist.

## Biologische Sicherheit

### Proben

Wenden Sie sichere Laborpraktiken an wie beschrieben in „*Biosafety in Microbiological and Biomedical Laboratories, HHS*“ ([www.cdc.gov/od/ohs/biosfty/biosfty.htm](http://www.cdc.gov/od/ohs/biosfty/biosfty.htm)).

**WARNUNG**      **Proben, die infektiöse Erreger enthalten**      [W3]  
Einige Proben, die mithilfe dieses Geräts verarbeitet werden, können





infektiöse Erreger enthalten. Verwenden Sie dieses Gerät auf keinen Fall in Zusammenhang mit infektiösem Material, da die Nadel wiederverwendbar ist und frei von jeglicher Kontamination und Infektionserregern sein muss.

Die verantwortlichen Personen (z. B. Laborleiter) müssen sicherzustellen, dass der Arbeitsplatz sicher ist und die Bediener der Geräte nicht gefährlichen Konzentrationen infektiöser Erreger ausgesetzt werden. Das bedeutet, dass die Grenzwerte in Bezug auf infektiöse Erreger, die in den entsprechenden Sicherheitsdatenblättern oder den Vorschriften der OSHA\*, ACGIH† oder COSHH‡ festgelegt sind, nicht überschritten werden dürfen.

Bei der Entsorgung von Abfallstoffen müssen alle nationalen und regionalen Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz 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)

## Chemikalien-Sicherheit

### Abfallentsorgung

Benutzte Verbrauchsmaterialien könnten gefährliche Chemikalien oder infektiöse Erreger bzw. biologisch gefährliches Material enthalten. Derartige Abfälle müssen gesammelt und gemäß den geltenden kommunalen Sicherheitsbestimmungen entsorgt werden.

Hinweise zur Entsorgung von Elektro- und Elektronik-Altgeräten (WEEE) finden Sie auf Seite 53.

### Gefahren durch mechanische Teile

Um einen zufriedenstellenden und sicheren Betrieb des QIAscout zu gewährleisten, befolgen Sie bitte die nachstehenden Hinweise:

- Verwenden Sie nur die empfohlenen Verbrauchsartikel/Komponenten.

#### **WARNUNG**



#### **Sich bewegende Geräteteile**

[W4]

Um einen Kontakt mit sich bewegenden Geräteteilen des QIAscout zu vermeiden, darf der Objektivaufsatz zum Ausstechen nur in Betrieb genommen werden, wenn er auf ein passendes Mikroskopobjektiv montiert ist.

Setzen Sie sich umgehend mit dem Technischen Service von QIAGEN in Verbindung, wenn beim Montieren des Aufsatzes auf ein passendes Objektiv Probleme auftauchen.

**VORSICHT****Sich bewegende Geräteteile**

[C6]

Die sich hebende Plattform des Objektivaufsatzes zum Ausstechen senkt sich unter den folgenden Bedingungen immer auf die mechanische Ausgangsposition (Schlussposition) ab:

- wenn der Kalibrierungsmodus verlassen wird und der Ausstech-Modus beginnt;
- wenn mit dem Objektivaufsatz zum Ausstechen ein Einschaltzyklus/Durchlauf gemacht wurde und sein Motorkabel mit der Kontrollbox verbunden ist.

**WARNUNG****Installation des Objektivaufsatzes zum Ausstechen**

[W5]

Der Objektivaufsatz zum Ausstechen ist ausschließlich auf kompatible Objektive zu montieren. Bei der Montage des Aufsatzes ist unbedingt sicherzustellen, dass seine Schutzkappe aufsitzt, um einen Kontakt mit der Nadel zu vermeiden. Die Schutzkappe darf erst nach erfolgter Montage des Aufsatzes entfernt werden.

**VORSICHT****Beschädigung des Geräts**

[C7]










Vermeiden Sie unbedingt, dass Gegenstände die Ausstechnadel berühren, um etwaige Beschädigungen der Nadel zu verhindern.

**VORSICHT****Beschädigung des Geräts**

[C8]

Verwenden Sie zur Reinigung des QIAscout keine Bleich- oder Lösungsmittel und keine säure-, laugen- oder scheuermittelhaltigen Reagenzien.

## Symbole auf dem QIAscout

Symbol	Ort	Beschreibung
	Typenschild an der Geräterückseite	CE-Markierung der EU-Konformität
	Typenschild an der Geräterückseite	Hersteller i.S.d. Gesetzes
	Typenschild an der Geräterückseite	WEEE-Markierung (Zertifizierung gemäß Richtlinie über Elektro- und Elektronik-Altgeräte) für Europa
	Typenschild an der Geräterückseite	FCC-Markierung der Federal Communications Commission der Vereinigten Staaten
	Typenschild an der Geräterückseite	RCM-Zeichen für Australien/ Neuseeland
	Typenschild an der Geräterückseite	Markierung gemäß RoHS-Richtlinie für China (Einschränkungen in Bezug auf den Gebrauch bestimmter Gefahrstoffe in Elektro- und Elektronikgeräten)
	Auf dem Gerätedeckel	Warnung, Verletzungsgefahr durch mechanische Teile, Kontakt mit sich bewegenden Teilen vermeiden
	Am Gerät	Warnung, Verletzungsgefahr durch scharfe Geräteteile, Kontakt mit sich bewegenden Teilen vermeiden
	Auf der magnetischen Sammelplatte	Warnzeichen „Achtung vor magnetischem Feld“

---

## Appendix C – Release Needle Replacement

In the event that the release needle comes into contact with an object or hard surface, it is recommended that the needle be replaced. Minor damage to the release needle could result in the inability to consistently puncture the QIAscout array and consequently dislodge the micrafts.

### Protocol

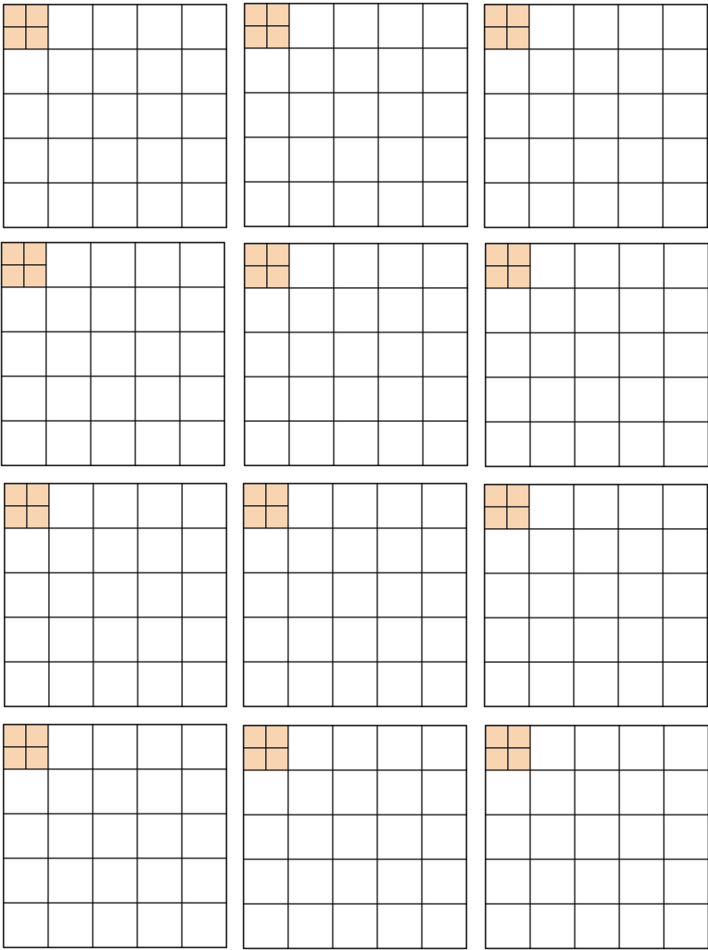
1. Disconnect the release device from the controller and remove it from the objective.  
**Note:** Ensure that the controller is disconnected from the wall outlet prior to disconnecting the release device.
2. Place the release device on a flat surface.
3. Use the screwdriver provided to loosen the 3 mounting screws which attach the clear plastic release needle window to the release device (see Figure 12A).  
**Note:** In order to ensure that you do not lose the screws, leave the loosened screws in the screw holes on the release device.  
**Note:** Additional screws (6) are included should you lose any during the release needle replacement process.
4. Gently apply pressure to the underside of the clear window to dislodge the release needle from the release device. Dispose the release needle in a suitable waste container.
5. Use tweezers to remove the replacement window from its container. Handle the window containing the release needle by the edges (see Figure 12B).  
**Note:** Use caution to avoid contact with the release needle.
6. Gently place the replacement window containing the needle on the release device (see Figure 12C).
7. Carefully tighten the 3 screws until the window sits at a correct level in the release device.  
**Note:** To ensure that the window doesn't crack, stop tightening the screws as soon as the screws touch the window. Cracks should be avoided; however, the release device is still usable if small cracks appear.



**Figure 12. Replace release needle.** A. Loosen the screws from the release device using the screw driver. B. Handle the replacement window containing the needle by the edges. C. Gently place the replacement window containing the needle on the release device.

# Appendix D – Cell Tracking Charts

For 200 × 200 μm QIAscout arrays



# Appendix E – List of Microscopes and Objectives

Please refer to the following objective guide to check for compatibility and to find a suitable microscope or objective for the QIAscout release device.

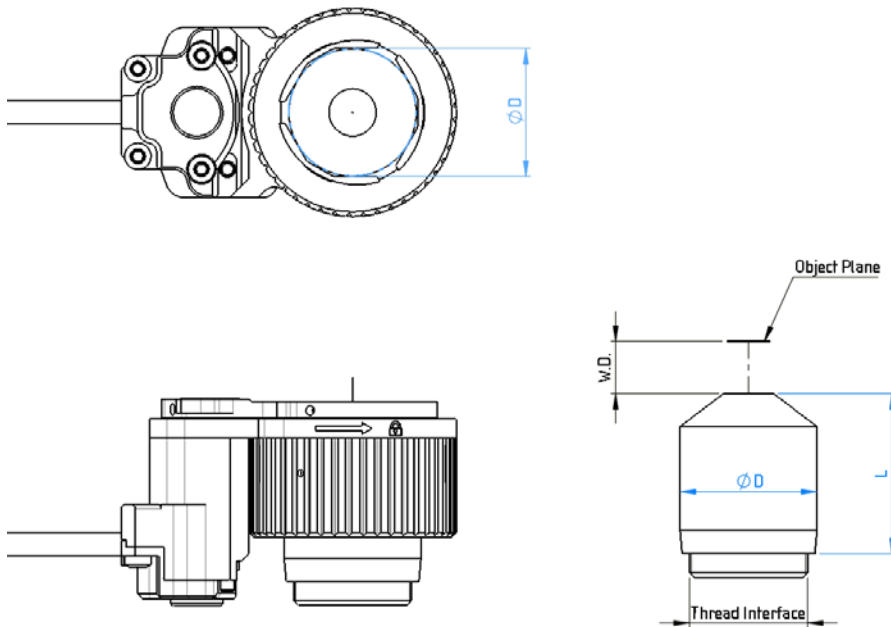
## Objective Sizing Guide

If your objective is not listed in the Table 3 below, please refer to the following instructions to check if your objective can be used with the QIAscout device.

### Measuring objective diameters to check for compatibility

Determine the outermost diameter of the desired objective ( $\varnothing D$ ). The diameter should be between 18 and 30 mm to be compatible with the QIAscout release device.

The minimum objective length (L) is the required length of an objective to ensure firm mounting of the release device to that objective. If the length is shorter, please refer to the section “Troubleshooting” on page 28.



The following table also shows which insert to use based on the diameter of your objective (Table 2).

**Table 2. Objective dimensions compatible with QIAscout release device**

Parameters	Dimensions	Insert required			
		#1	#2	#3	#4
W.D.(mm) Working Distance	10–19				
ØD (mm) Objective Diameter	18–30	18–20	21–23	23–25	25 –27
L (mm) Objective Length	Min.28				
Objective Magnification	4x, 5x or 10x				

In addition to the fit with the objective please also ensure that there are no additional collision points with the revolver, or with the stage of the microscope.

More detailed microscope objective specifications can be provided by the vendor or manufacturer of the given objective. We recommend the user to contact the local representative of their specific microscope manufacturing company to request for a suitable objective for their application.

The following microscopes and objectives have been tested and verified for fit and compatibility with the QIAscout instrument.



**Table 3. Objective compatibility list for release device**

Manufacturer	Microscope model	Objective	Cat. No.	Magnification	Insert release device	Stage*	Holding frame <sup>†</sup>
Zeiss®	Primovert	Plan-Achromat 4x/0.10 for Primo	415500-1600-001	4x	4 (3) <sup>††</sup>	Change of stage might be necessary due to required stage opening size	Universal mounting frame
		Plan-Achromat 4x/0.10 Ph0 for Primo	415500-1619-000	4x	4 (3)		
	Axio Vert.A1/Axio Observer	A-Plan 5x/0.12 M27	421030-9900-000	5x	w.o.	Change of stage might be necessary due to required stage opening size	Universal mounting frame
		A-Plan 5x/0.12 Ph0 M27	421031-9910-000	5x	w.o.		
		A-Plan 5x/0.12 Pol M27	421033-9900-000	5x	w.o.		
		EC Plan-Neofluar 5x/0.16 M27	420330-9901-000	5x	w.o.		
		EC Plan-Neofluar 5x/0.16 Ph1 M27	420331-9911-000	5x	w.o.		
		EC Plan-Neofluar 5x/0.16 Pol M27	420333-9901-000	5x	w.o.		
		EC Epiplan 10x/0.25 M27	422040-9902-000	10x	w.o.		
		Objective LD A-Plan 5x/0.15 Ph1 M27	421231-9910-000	5x	w.o.		
		EC Epiplan 5x/0.13 M27	422030-9901-000	5x	w.o.		
		Epiplan 10x/0.23 W0.8"	442030-9903-000	10x	3		
Leica®	DMi1, DMIL LED or DMi8	N PLAN 5x/0.12 PH0	11506303	5x	1	DMi1 and DMIL LED: microscope specific stage compatible. It is recommended to install an object guide for fixed stages	Universal holding frame
		N PLAN 5x/0.12	11506302	5x	1		
		HI PLAN 10x/0.25	11506228	10x	2		
		HI PLAN 10x/0.25 PH1	11506230	10x	2		
		HI PLAN 10x/0.25 POL	11556061	10x	2		
		HI PLAN 10x/0.25 SL	11506229	10x	2		
		HI PLAN EPI 10x/0.25	11506229	10x	2		
		HC PL Fluotar 5X/0.15	11566069	10x	2		
		HC PL Fluotar 10X/0.30	11506504	5x	w.o.		
		HC PL Fluotar 10x/0.32	11506505	10x	w.o.		
			11506521	10x	w.o.		
Nikon®	EclipseTS2/Ti-U/Ti-S	Plan Fluor, 4x	MRH 20041	4x	w.o.	Additional rectangular mechanical stage stroke might be necessary	Terasaki Holder (for 65 mm dish)
		Plan Fluor, 10x	MRH 20101	10x	w.o.		

\*Check with microscope manufacturer for appropriate stage. <sup>†</sup>Check with microscope manufacturer for suitable holding/mounting frames and object guides. <sup>††</sup> Either of the 2 sizes of the clamp inserts is usable. Note: w.o. stands for without.

**Note:** This is not a complete list of all objectives. If the objective needed is not listed above, please refer to Table 2.

## Appendix F – Downstream Application

### Amplification of nucleic acids

When using REPLI-g® Kits for the amplification of pierced samples, release the micraft with the single cell into the required reaction tube containing the buffer and volume described in the corresponding handbook. It is recommended to start the REPLI-g protocol immediately after isolation of single cell or to store the sample at  $-20^{\circ}\text{C}$  (for whole transcriptome amplification place the sample on dry ice to speed up the freezing).

Detailed information for downstream use of REPLI-g WTA Single Cell and REPLI-g Single Cell is listed in Table 4.

**Table 4. Recommended liquid and volume in secondary vessel when performing downstream REPLI-g reactions**

Downstream application	Kit	Washing of micraft required?	Liquid in second vessel	Volume	Link to protocol
WGA	REPLI-g Single Cell	No	PBS sc (provided in REPLI-g Kit)	4 $\mu\text{l}$	<a href="http://www.qiagen.com/REPLI-gWGA">www.qiagen.com/REPLI-gWGA</a>
WTA	REPLI-g WTA Single Cell	Yes	Sterile PBS*	7 $\mu\text{l}$	<a href="http://www.qiagen.com/REPLI-gWTA">www.qiagen.com/REPLI-gWTA</a>

\*Ensure to use PBS that is free of amplifiable nucleic acids.

### Cultivation of pierced cells

If further cultivation of single cells is desired, it is recommend releasing the micraft with the single cell attached in a 96-well plate with 200  $\mu\text{l}$  cell culture medium. The use of conditioned medium can support growth of cells. Alternatively, single cells can first be cultivated on the micraft and pierced when a subcolony has been formed.

The position and orientation of the micraft in the 96-well does not affect cell survival or growth rate; therefore, the raft does not have to be positioned with the cell on top. During cultivation, the single cell or cell colony can migrate within the 96-well and even leave the micraft. In this case the micraft is empty and the cell (colony) can be found apart from it.

If changing the medium is needed, it is recommended to place the 96-well on the magnetic collection plate to ensure that the micraft (with cell) stays in the well. After several days of culture (depending on the cell line) the growth can be optimized by plating the cells onto a larger cell culture dish.

## Appendix G – Technical Data\*

\*Only valid for the instrument.

QIAGEN reserves the right to change specifications at any time.

### Mechanical Data and Hardware Features

#### Release Device

Dimensions	Width: 44 mm (1.7 in.) Depth: 73 mm (2.9 in.) Height: 51 mm (2.0 in.)
Weight	0.2 kg (0.44lb)
Dislodging action	1 needle with moving platform
Release needle size	Diameter 0.1 mm in the body Diameter 0.01 mm at the needle tip
Motor actuator speed	400 steps/sec.
Connection to the controller	Connect motor cable connector of the release device onto the controller until a snap-click sound is heard To disconnect the motor cable, hold on to the connector and pull out the cable
Mechanical characteristics of motor connection	Snap and lock connector Insertion force 4.5 kgs max. Withdrawer force - 0.5 –3.0 kg
Device temperature	30°C ± 10°C

#### Controller

Input voltage	12 VDC
Power	6 W
Dimensions	Width: 94 mm (3.7 in.) Depth: 132 mm (5.2 in.) Height: 46 mm (1.8 in.)
Weight	0.3 kg (0.66 lb)

## AC Power Adapter

Input voltage	100–240 VAC Mains supply voltage fluctuations are not to exceed $\pm 10\%$ of the nominal supply voltages
Frequency	50–60 Hz
Input current	0.45–0.2 A
Dimensions	Width: 39 mm (1.5 in.) Depth: 76 mm (3.0 in.) Height: 56 mm (2.2 in.)
Weight	140 g (0.31 lb)

## Magnetic Collection Plate

Dimensions	Width: 100 mm (5.9 in.) Depth: 150 mm (3.9 in.) Height: 19 mm (0.7 in.)
Weight	0.3 kg (0.66 lb)

## Magnetic Wand

Dimensions	Size: $\varnothing 8$ mm (0.3 in.) Height: 55 mm (2.2 in.)
Weight	2.2 g (0.005 lb)

## Operating conditions

Overvoltage category	II
Air temperature	18–30°C (64–86°F)
Relative humidity	10–80% (noncondensing)
Altitude	Up to 2000 m (6500 ft.)
Place of operation	For indoor use only
Pollution degree	2
Environmental class	3K2 (IEC 60721-3-3)*

3M2 (IEC 60721-3-3)\*

\*Unless otherwise specified herein.

## Transport conditions

Air temperature -25°C to 60°C (-13°F to 140°F) in manufacturer's packaging

Relative humidity Max. 75% (noncondensing)

Environmental class 2K2 (IEC 60721-3-2)\*  
2M2 (IEC 60721-3-2)\*

\*Unless otherwise specified herein.

## Storage conditions

Air temperature 5°C to 40°C (41°F to 104°F) in manufacturer's packaging

Relative humidity Max. 85% (noncondensing)

Environmental class 1K2 (IEC 60721-3-1)\*  
1M2 (IEC 60721-3-1)\*

\*Unless otherwise specified herein.

## General

Workflow Manual isolation of cells from a unique array on a petri-dish.  
Manual microrraft-of-interest selection → microrraft dislodged →  
dislodged microrraft collection → microrraft transfer to output vessel.

Consumable QIAscout array with dimensions of 0.2 mm x 0.2 mm for each microrraft.

Applications Single cell isolation

## 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.

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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.

## 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-003.

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. 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 interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the

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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.

## 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 Support.

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## Appendix H – Legal Information

### Warranty statement

Thank you for your purchase of QIAGEN instrumentation. Your instrument has been carefully tested to ensure optimum operating efficiency and reproducibility of results. QIAGEN warrants that all new instrumentation manufactured by QIAGEN will correspond to the product specifications and be free from defects in workmanship and materials for a period of twelve (12) months from the original date of shipment. Repair or replacement of defective parts will be provided to the purchaser during this time period provided the QIAGEN instrumentation is operated under conditions of normal and proper use, but not for damage caused by the customer. If any part or subassembly proves to be defective, it will be repaired or replaced at QIAGEN's sole option, subsequent to inspection at the factory, or in the field by an authorized factory representative, provided that such defect manifested under normal and proper use.

### **Limitation of warranties and remedies**

THE FOREGOING WARRANTY IS QIAGEN'S SOLE AND EXCLUSIVE WARRANTY, AND REPAIR OR REPLACEMENT OF DEFECTIVE PARTS IS THE SOLE AND EXCLUSIVE REMEDY. THERE ARE NO OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED, TO THE FULLEST EXTENT PERMITTED BY LAW. (NOTE: SOME STATES DO NOT PERMIT DISCLAIMERS OF IMPLIED WARRANTIES SO THIS LIMITATION MAY NOT APPLY TO YOU). WITH THE EXCEPTION OF THE ABOVE-REFERENCED REPAIR OR REPLACEMENT REMEDY, QIAGEN SHALL HAVE NO OBLIGATION OR LIABILITY OF ANY NATURE WHATSOEVER WITH RESPECT TO THE QIAGEN INSTRUMENTATION, WHETHER ARISING IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE, INCLUDING BUT NOT LIMITED TO, LIABILITY FOR INDIRECT, CONSEQUENTIAL, INCIDENTAL AND/OR SPECIAL, PUNITIVE, MULTIPLE AND/OR EXEMPLARY DAMAGES AND/OR OTHER LOSSES (INCLUDING LOSS OF USE, LOST REVENUES, LOST PROFITS AND DAMAGE TO REPUTATION), EVEN IF SUCH DAMAGES WERE FORESEEN OR FORSEEABLE, OR WERE BROUGHT TO QIAGEN'S ATTENTION. IN NO EVENT SHALL QIAGEN'S LIABILITY TO YOU EXCEED THE PURCHASE PRICE OF THE PRODUCT.

### 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



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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.

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