Rotor-Gene Q

For outstanding performance in real-time PCR

- Outstanding thermal and optical performance due to rotary format
- An unmatched optical range spanning UV to infrared wavelengths
- State-of-the art analyses supported by user-friendly software
- Low maintenance and maximum convenience due to robust design
- High performance in multiple applications with QIAGEN kits and assays

Unique rotary design for outstanding performance

The unique centrifugal rotary design of the Rotor-Gene Q makes it the most precise and versatile real-time PCR cycler currently available (see figure "Cross-section of the Rotor-Gene Q"). Each tube spins in a chamber of moving air, keeping all samples at precisely the same temperature during rapid thermal cycling. Detection is similarly uniform. When each tube aligns with the detection optics, the sample is illuminated and the fluorescent signal is rapidly collected from a single, short optical pathway. This thermal and optical uniformity results in sensitive, precise, and fast real-time PCR analysis (see figure "Precise real-time PCR analysis"). It also eliminates sample-to-sample variations and edge effects. These are unavoidable in traditional block-based instruments due to temperature gradients across the block and multiple, complex optical pathways.

The rotary design delivers:

- Well-to-well variation ±0.02°C
- Uniform detection eliminating the need for ROX reference dye
- Fast ramping and negligible equilibration times for short run times
- Complete confidence in your results!

Unrivaled optical range enables multiple applications

Whether your assay is based on intercalating dyes such as SYBR Green, probes such as hydrolysis (TaqMan), hybridization (FRET), Scorpion probes, or other multiplex chemistries, the Rotor-Gene Q meets your requirements. With up to 6 channels spanning UV to infrared wavelengths, the cycler delivers the widest optical range currently available (see Table "Channels for optical detection"). In addition, the software allows you to create new excitation/detection wavelength combinations, which means that the Rotor-Gene Q is compatible with dyes you may use in the future.

Channels for optical detection

Channel	Excitation (nm)	Detection (nm)	Examples of fluorophores detected
Blue	365±20	460±20	Marina Blue, Edans, Bothell Blue, Alexa Fluor 350, AMCA-X
Green	470±10	510±5	FAM, SYBR Green I, Fluorescein, EvaGreen, Alexa Fluor 488
Yellow	530±5	557±5	JOE, VIC, HEX, TET, MAX, CAL Fluor Gold 540, Yakima Yellow
Orange	585±5	610±5	ROX, CAL Fluor Red 610, Cy 3.5, Texas Red, Alexa Fluor 568
Red	625±5	660±10	Cy5, Quasar 670, LightCycler Red640, Alexa Fluor 633
Crimson	680±5	712 high pass	Quasar 705, LightCycler Red705, Alexa Fluor 680
HRM	460±20	510±5	SYBR Green I, SYTO9, LC Green, LC Green Plus+, EvaGreen

Expand your research with HRM

High-resolution melting analysis (HRM) is a closed-tube, post-PCR analysis that has raised enormous scientific interest. HRM characterizes double-stranded PCR products based on their dissociation (melting) behavior. It is similar to classical melting curve analysis, but provides far more information for a wider range of applications. PCR products can be discriminated

according to sequence, length, GC content, or strand complementarity, down to single base-pair changes. Previously unknown and even complex sequence variations can be readily detected and characterized in a robust and straightforward way. The rotary design of the Rotor-Gene Q and its outstanding thermal and optical performance are highly suited to HRM.

The HRM option for the Rotor-Gene Q includes:

- A specially tuned high-intensity optical HRM channel
- Thermal resolution down to 0.02°C
- High data acquisition rates
- Comprehensive HRM software

The Rotor-Gene Q is the only real-time cycler currently capable of deciphering the most difficult class IV SNPs by HRM. Harness the power of HRM using dedicated QIAGEN HRM Kits for applications such as genotyping (see figure "HRM analysis of a class IV SNP with less than 0.1˚C difference between homozygote alleles" for data from the Type-it HRM PCR Kit), quantitative methylation analysis (see figure "Highly sensitive results with detection of even low percentages of methylated DNA" for data from the EpiTect HRM PCR Kit), gene scanning, and sequence matching. The Type-it HRM PCR Kit reliably and accurately detects gene mutations and SNPs. The EpiTect HRM PCR Kit enables fast screening and accurate detection of changes in CpG methylation status of bisulfite converted DNA.

Superior new software available for genotyping and mutation detection using HRM analysis

Rotor-Gene ScreenClust HRM Software is the most powerful tool currently available for analysis of HRM data from the Rotor-Gene Q or Rotor-Gene 6000 cycler. Rotor-Gene ScreenClust HRM Software is an extension to the Rotor-Gene operating software. By grouping samples into clusters, Rotor-Gene ScreenClust HRM Software opens a new dimension in HRM analysis for applications such as genotyping and mutation screening.

Flexible formats match your workflows

The Rotor-Gene Q supports multiple PCR tube formats to suit a range of needs. Changing the format, by simply switching the snap-fit metal rotor that holds the tubes, takes just seconds. As well as tubes, Rotor-Discs are available, which offer accelerated setup and higher throughput. Rotor-Discs are circular plates of vertically oriented reaction wells. The Rotor-Disc 100 is the equivalent of a 96-well plate with an additional 4 reference wells. These extra wells can be conveniently used for more reactions or additional controls. Alternatively, the Rotor-Disc 72 has 72 wells. Rotor-Discs can be quickly and easily sealed with plastic film using a Rotor-Disc Heat Sealer. For all you need to run reactions using Rotor-Discs, choose the Rotor-Disc 100 Starter Kit or the Rotor-Disc 72 Starter Kit.

You can perform manual reaction setup, or take advantage of QIAGEN's automated solutions for reaction setup. The QIAgility is cost-effective and delivers rapid, high-precision PCR setup, while the QIAsymphony AS is ideal for laboratories performing routine PCR tests on a day-to-day basis. Both instruments perform automated reaction setup in Rotor-Gene formats, allow

direct transfer of sample lists, and are supplied with verified protocols for real-time PCR master mixes.

Software enables quantification and enhances data security

The comprehensive Rotor-Gene Q software package supports all current state-of-the art real-time analysis procedures from basic to advanced algorithms. This provides complete freedom to analyze your valuable experimental data and increases the reliability of your results. Data security is assured and all process steps are trackable from starting the run to exporting the results. See figure "Analysis procedures supported by Rotor-Gene Q software". (For highly sophisticated analysis of HRM data, an extension to the Rotor-Gene operating software is available: Rotor-Gene ScreenClust HRM Software).

Minimum maintenance, maximum convenience

The Rotor-Gene Q is engineered to reduce the need for maintenance and to maximize ease of use. This saves time and costs and allows you to focus on your research, not on keeping the cycler up and running.

Convenient features of the Rotor-Gene Q include:

- Lifetime guarantee on highly stable LEDs, no expensive lamps or lasers to change, no gradual performance loss of light source
- No optical calibration needed at installation or when the instrument is moved
- No sample block to clean
- No condensation or bubbles in reactions due to rotation
- Small, light, and robust, simply place the instrument wherever you like!

Easy routine verification

Laboratories may often want to verify thermal accuracy. For most cyclers, this requires interaction with a service engineer. With the Rotor-Gene Q, this is not necessary. Instead, the easy-to-use, cost-effective Rotor-Disc OTV (Optical Temperature Verification) Kit automates accuracy testing. The full procedure takes only a couple of minutes.

Reliable support for your peace of mind

In the unlikely event of any service issues with your Rotor-Gene Q, QIAGEN Instrument Service provides comprehensive support services to ensure the continued success of your PCR applications.

Applications

A range of QIAGEN kits for the Rotor-Gene Q enables reliable quantification in all your real-time PCR applications without the need for optimization of reaction and cycling conditions. Find out more about kits for real-time PCR and HRM applications, including:

- Gene expression analysis
- Pathogen detection
- DNA methylation analysis
- Genotyping
- Gene scanning
- miRNA research