

Real-Time Cycler RotorGene Q (Refurbished)

Description

The RotorGene Q is a real-time cycler with five channels (green, yellow, orange, red, and crimson). Its innovative performance delivers outstanding results.

The RotorGene Q is fully equipped for real-time amplification, endpoint analysis, high-resolution melting (HRM), autocall genotyping, and nucleic acid concentration measurement.

Specifications

- Excellent thermal and optical performance thanks to the rotational format
- An unmatched optical range from UV to infrared wavelengths
- Cutting-edge analysis with user-friendly software
- Low maintenance and maximum convenience thanks to a robust design
- High performance in a wide range of applications



RotorGene Q

Typical Applications

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

Minimal Maintenance effort

The Rotor-Gen Q is designed for minimal maintenance:

- Highly stable LEDs (no lamp or laser replacement, no gradual light source power loss)
- No optical calibration required during installation or transport
- No sample block to clean
- No condensation or bubbling in reactions due to rotation

Rotary Design

The unique centrifugal rotation design of the Rotor-Gen Q makes it a precise and versatile real-time PCR cycler. Each tube rotates in a chamber with moving air, keeping all samples at exactly the same temperature during rapid temperature cycling. Detection is consistent for each tube. When each tube is aligned with the detection optics, the sample is illuminated, and the fluorescent signal is quickly captured by a single, short optical path. This thermal and optical uniformity results in sensitive, precise, and fast real-time PCR analysis. It also eliminates sample-to-sample variations and edge effects, which are unavoidable with conventional block-based instruments due to temperature gradients across the block and multiple, complex optical paths.

Real-Time Cycler RotorGene Q

Temperature

Thermal uniformity, equilibration time uniformity (the time each well needs to reach a set temperature), and temperature accuracy are the thermal variables important for real-time analysis. Thanks to its rotary design, the RotorGene Q offers very good thermal uniformity.

Thermal accuracy, however, depends on correct instrument calibration, and this is where the RotorGene Q excels:

To ensure the repeatability and transferability of validated protocols, the RotorGene Q uses an OTV™ (Optical Temperature Verification) rotor that automates verification tests.

A printable report documents each test. In the unlikely event that the instrument needs recalibration, this is also automatically adjusted and documented. Each test takes only a few minutes and can be repeated at any time and as often as required.

Optics

The RotorGene Q uses a separate high-power light-emitting diode (LED) as the excitation source for each channel. Each LED delivers consistent power and is guaranteed for life. Optical calibration is a topic few vendors like to discuss. The RotorGene requires no optical calibration because the identical optical path reaches all samples. Other systems require complex optical alignment and calibration. For the same reasons, the RotorGene Q also does not require a reference dye (like ROX™). To verify performance, the OTV Rotor (see above) checks the optical system during every use. This ensures that your system is always performing at its peak.

Security

Data security is often neglected, but is essential for many laboratories. Each RotorGene result file receives a digital signature, which, if valid, ensures that the test data has not been manually altered or otherwise compromised. You also have the option to designate individual users as analyzer, operator, or administrator, each with different access rights. Permissions are integrated into the central Windows security modules, simplifying management

and integration into your current operational processes. Additionally, audit logs are stored with the run data to document changes to test files, their time of modification, and the author.

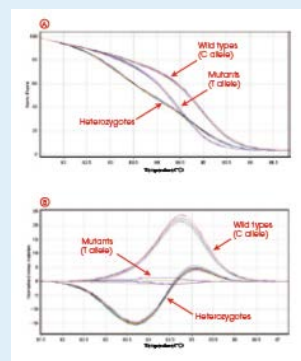
HRM – High Resolution Melt

The RotorGene Q features a specially tuned high-intensity optical channel, high-speed data acquisition (up to 1000 data acquisition points per °C transition), extreme thermal resolution ($\pm 0.02^\circ\text{C}$), and dedicated HRM analysis software.

HRM characterizes nucleic acid samples based on their dissociation (melting) behavior. Samples can be differentiated based on their sequence, length, GC content, or strand complementarity. Even single-base changes such as SNPs (single nucleotide polymorphisms) can be easily identified.

SNP Genotyping by HRM

Discrimination of human ACTN3 (R577X) SNP genotypes (C to T substitution) using SYTO® 9 intercalation dye (no probes). Homozygous wild type, mutation and heterozygote samples are shown on a standard normalized melt curve (A) and a difference plot normalized to T allele mutant samples (B). Amplification and HRM™ analysis was done using a RotorGene™ 6000 instrument and genotypes were automatically assigned by the RotorGene™ software. The fragment was pre-amplified using a 40-cycle fast protocol (about 40 min. run time).



Real-Time Cycler RotorGene Q

Real-Time Quantification

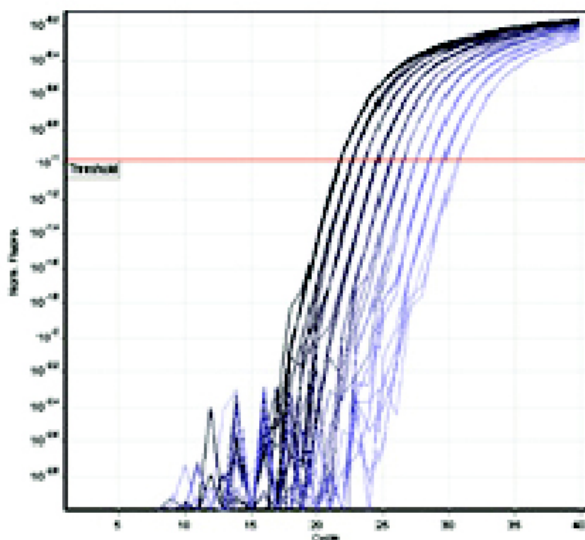
The RotorGene Q is a versatile real-time analyzer. With it you can work with dyes covering the entire spectrum, from infra-red to UV and up to 6-plex capability.

Results Tell the Story

Shown below is data you won't see elsewhere. We simultaneously challenged the Rotor-Gene Q with:

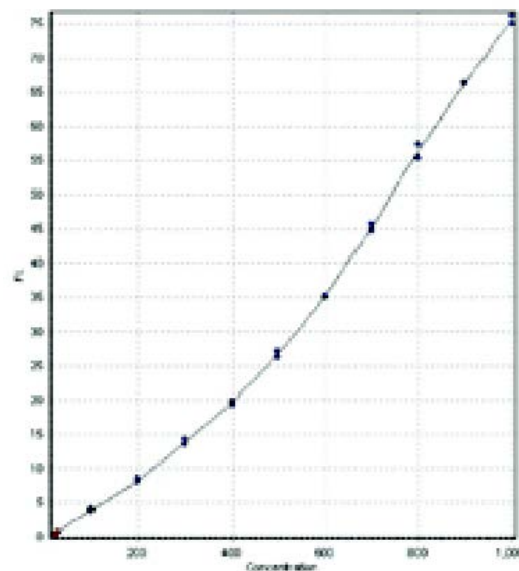
- 2-fold discrimination (1 cycle)
- 10 separate serial dilutions, each in triplicate
- Fast cycling
- Low probe concentration
- Standard commercial master-mix chemistry
- No passive reference (ROX) normalization
- Single-copy gene target amplification from a whole human genome

The figure shows the high accuracy of the replicas in a very short time.



Concentration Analysis

The RotorGene Q is fully equipped to do DNA concentration measurement using fluorescent dyes (see below). Comprising a standard run protocol and integrated analysis software, the concentration of unknown samples is easily determined from a standard curve.



DNA Concentration Measurement

A DNA standard curve with replicates is shown for concentrations of 1000, 900, 800, 700, 600, 500, 400, 300, 200 and 100 pg/μL. Red data points at origin are negative controls. Curve interpolated using a spline curve fit (RotorGene analysis software). Data was obtained using reagents in the Quant-iT™ PicoGreen® dsDNA Kit (Invitrogen Corp., Carlsbad CA/USA). Standard RotorGene™ concentration analysis run protocol was used. 10 μL PicoGreen (dilluted 1/200 in 1 x TE buffer) was combined with 10 μL of each standard (dilluted in 1 x TE buffer). Final volume 20 μL.

Real-Time Cycler RotorGene Q



Technical Data

Sample capacity	1 – 36 / 1 – 72 (depending on rotor)
Applicable consumables	0.2 ml, RotorGene strip-tubes 0.1 ml (4 strips)
Detection channels	5
Temperature adjustable range	35°C – 99°C
Operating temperature	18°C – 30°C
Rel. humidity	10–75% (noncondensing)
Protocols / main applications	Gene expression analysis, microRNA detection, virus detection, SNP genotyping, high-resolution melt analysis (HRM)
Temperature accuracy	±0.5°C
Temperature uniformity	±0.02°C
Repeatability of the fluorescence intensity test	CV ≤ 3%
Reaction volume	Strip tubes 0.1 ml: 0.1 ml x 72 well, 10-30 µl reaction volume, strips with 4 tubes with lid PCR tubes 0.2 ml: 0.2 ml x 36 well, 15-50 µl reaction volume, single tubes with lid
Typical run time	40 cycles in 45 min (assay dependent)
Continuous operation	Yes
Scan time	5.5 s
Operating system	Windows XP/Windows Vista/Windows 7/Windows 8
Operating voltage	100 – 240 V; 50/60 Hz
Power consumption	max. 520 W
Dimensions (W x D x H)	490 x 290 x 391 mm
Weight	12.5 kg

Real-Time Cycler - RotorGene Q

Channels for Optical Detection

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