

Real-Time PCR meets Automation

qTOWER³ *auto*

Real-Time PCR

A close-up photograph of the qTOWER³ *auto* real-time PCR machine. The device is white with a prominent red horizontal stripe across the top. A sample block, which is a multi-well plate, is partially inserted into a front-loading compartment. The machine's design is clean and professional, typical of laboratory equipment. The text 'qTOWER³ *auto*.' is printed on the front panel, accompanied by a small green vertical bar. The 'analytikjena' logo is visible in the bottom right corner of the machine's front panel.

qTOWER³ *auto*.

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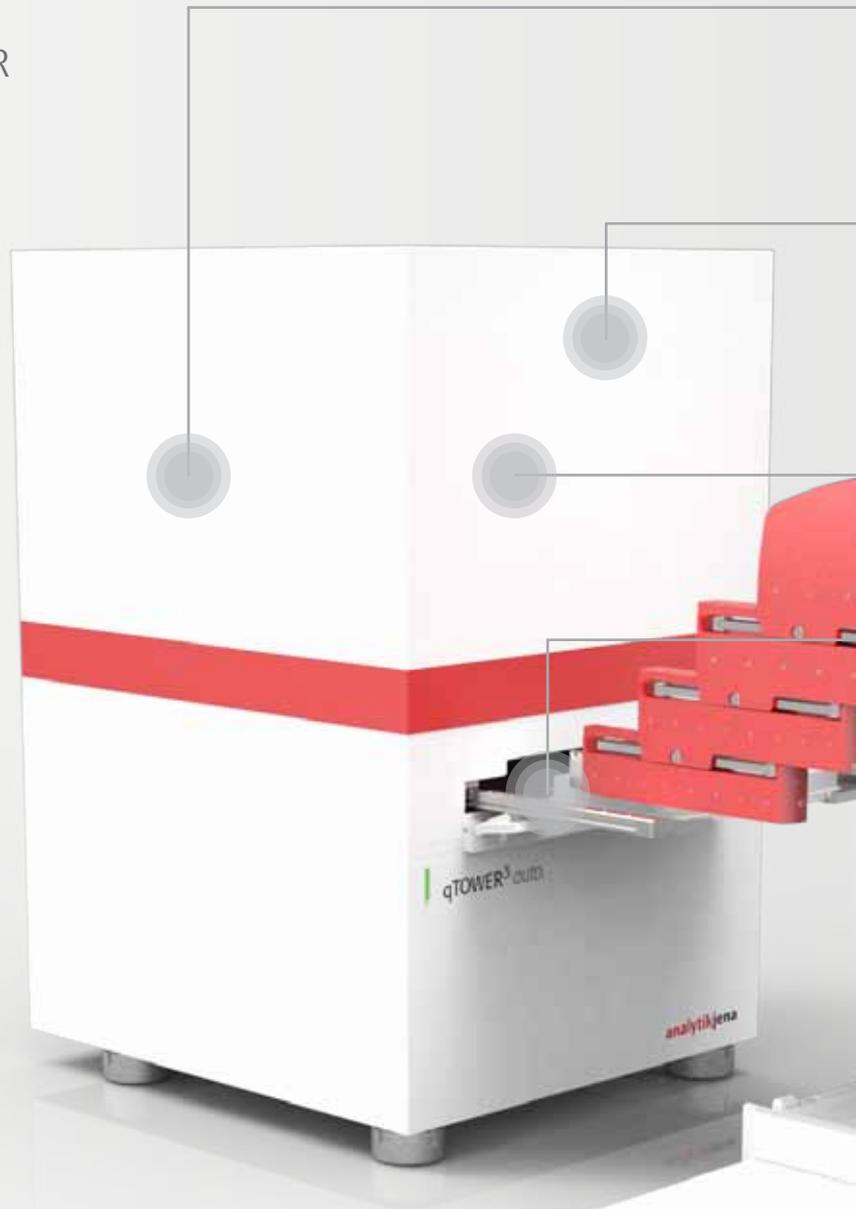
qTOWER³ *auto*

qTOWER³ *auto* is ideally suited for connecting quantitative real-time PCR with robotic systems.

Integration is simply a matter of a moving sample tray for automatically loading and unloading microplates.

The silver sample block delivers high heating rates of up to 8 °C/sec and outstanding temperature control accuracy of ± 0.1 °C across all 96 wells. The patented fiber-optic shuttle system ensures homogeneous detection of up to 6 different fluorescent dyes.

Depending on which of the available filter modules are selected, the system can detect all common dyes, up to and including the dark red. Like data acquisition, data analysis is also automatic, and encompasses an exceptionally wide variety of methods ranging from absolute quantification to multi plate analyses. A variety of export functions and a LIMS transfer file make all important data available for reliable sample tracking and documentation.





Maximum flexibility



Optimized thermal conductivity



Ideal signals



Easy integration



Extendable filter module system for maximum flexibility

- **Convenient:** 12 available Color, FRET and Protein Modules can be exchanged or reconditioned within 5 minutes
- **Future-proof:** Adaptable to new applications at any time
- **Robust:** Patented high performance optical system with a long-term warranty of 10 years

High quality silver block for maximum thermal conductivity

- **Fast:** Heating rates of 8 °C/sec and cooling rates of 6 °C/sec
- **Unrivaled:** Ideal homogeneity and temperature control accuracy (± 0.1 °C)

Easiest integration into robotic systems

- **Comfortable:** Automated plate handling by moveable sample tray
- **Intelligent:** Decoupled electronic module with 10 m cable for peripheral positioning
- **Universal:** Automatic data evaluation from a simple overview of Ct values up to ddCT method and multi plate analysis
- **Transparent:** Reliable data management based on different export functions and a LIMS transfer file

Patented fiber optic system for ideal real-time PCR signals

- **Efficient:** Short scan times of 6 seconds for the entire plate, regardless of the number of dyes detected
- **Innovative:** Novel light source with 4 robust LEDs – no preheating
- **Brilliant:** Ideal illumination and excitation of all 96 probe without fringe effect

qTOWER³ auto

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Automation Made Easy

qTOWER³ *auto* offers numerous functions and feature for easy, uncomplicated integration into various robotic systems or simple connection to liquid handling platforms.



In addition to the externally accessible sample tray, plate handling is also automated in qTOWER³ *auto*. The 96 well microplate is positioned precisely within the block and, following amplification, is unloaded just as efficiently. Visualizing a continuous workflow is easy and reliable. The concept of automated real-time PCR accommodates a variety of integration strategies. The length of the cable for the decoupled electronics module is up to 10 m, making it easy to integrate from a decentralized location.

The size of the rest of the instrument is then only just 27.5 cm x 46 cm x 31 cm (W x H x D), and the height of the sample tray (minimum = 12 cm) is easy to adjust. The cyclor unit can be positioned next to the liquid handling system to save space, in which case the plate is loaded using an external robotic arm (as used in the CyBi[®]-Carry) or by directly connecting the sample tray to the liquid handling station.

- Variety of integration strategies
- Sample tray for automated plate transport
- Decoupled electronic module for ideal use of space

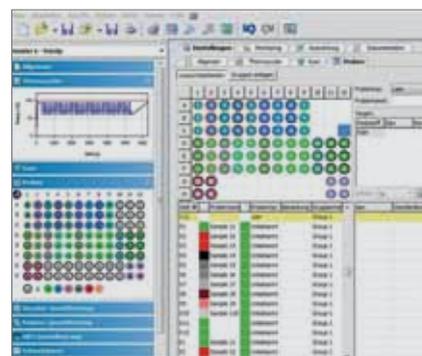
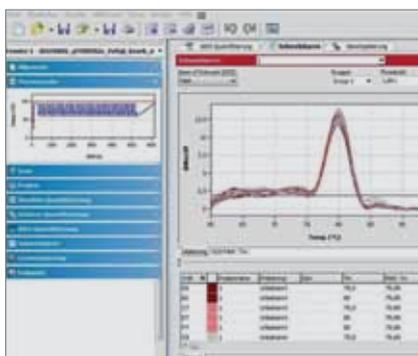
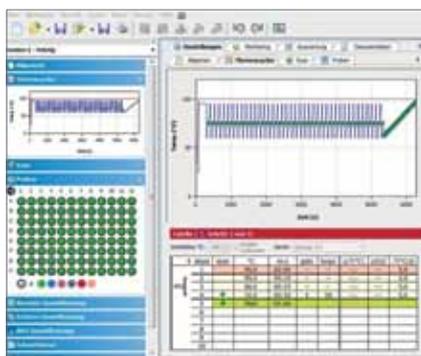
Optimum Data Handling

Because data management plays an equally important role in comparison to technical issues, qTOWER³ auto also provides a wide range of useable software tools. Thus data management is secure and intuitive.

The system automatically carries out the following steps as a basis for all further analyses: performs threshold and Ct determinations on each sample, generates standard curves, and determines PCR efficiency. Depending on the assay and the desired level of information, these are followed immediately by the below shown methods:

- Absolute or relative quantification
- ddCt method with or without efficiency
- Determination of point mutations using probe based, allelic discrimination (genotyping)
- POS/NEG analysis by endpoint determination
- Melting curves and protein analysis
- Multi gene or multi plate analysis respectively

A variety of export formats and a LIMS transfer file support users' external databases to ensure that each individual sample can be reliably and precisely tracked. How the data are made available can be adapted to customer specifications upon request.



qPCRsoft - Control and analysis software



High-Performance Optical System

The integrated high-performance optics guarantees for a homogeneous excitation and reliable detection of emitted fluorescence signals. Data are ideal reproducible and shows maximum integrity.

The automated cycler is every bit as powerful as the comparable stand-alone version of qTOWER³. The heart of the high-performance optical system (**FOS** - **Fiber Optic System**) is the patented, optical shuttle with 8 optic fibers, which optimizes excitation for each individual sample, while detecting the emitted fluorescence signals with extraordinary homogeneity. The system is rounded out by its novel light source, which consists of 4 long-lasting, intense LEDs in red, green, blue and white (**RGBW**), delivering highly selective extinction as a function of the selected dye.



- Patented fiber optics with 4-color LED light source: low maintenance and long-lasting
- Up to 6 filter modules can be installed
- Can be upgraded to meet future needs
- Homogeneous excitation and detection with no visible edge effects

qTOWER³ *auto* is equipped with supporting filter modules that include a finely tuned set of excitation and emission filters. Depending on the application, customers can choose from 6 Color Modules, 5 FRET Modules and one Protein Module, up to 6 of which can be installed in the instrument. This allows the system to carry out highly sophisticated multiplex applications, from the blue to near infrared range.



The system reads out the 96 well plate in just 6 seconds, regardless of the number of filter modules. This makes qTOWER³ *auto* ideal for a variety of different applications, such as the use of intercalating dyes, hydrolysis or hybridization probes, and protein-binding dyes.

Special BONUS: All of the high-performance fiber-optic components are under a 10-year warranty.

Modern Silver Sample Block

Amplification of PCR products plays a central role also in real-time Experiments. Therefore the high-quality silver sample block used in qTOWER³ *auto* is invented on the basis of more than 25 years experience in thermal cyclers.

The sample block is the foundation of any PCR or real-time PCR system. qTOWER³ *auto* uses a combination of high-quality silver and a gold coating to generate heating rates of up to 8 °C/sec. At the same time, the system also delivers excellent control accuracy to within just ± 0.1 °C of the target temperature. The optimized temperature control algorithm makes the thermocycler the ideal system for quantitative and qualitative real-time PCR applications.



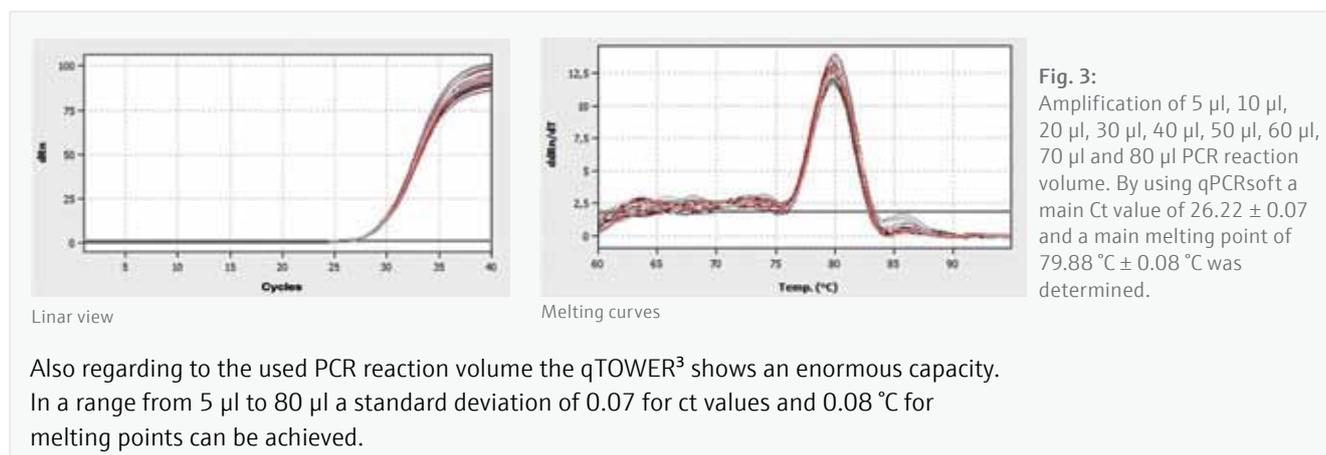
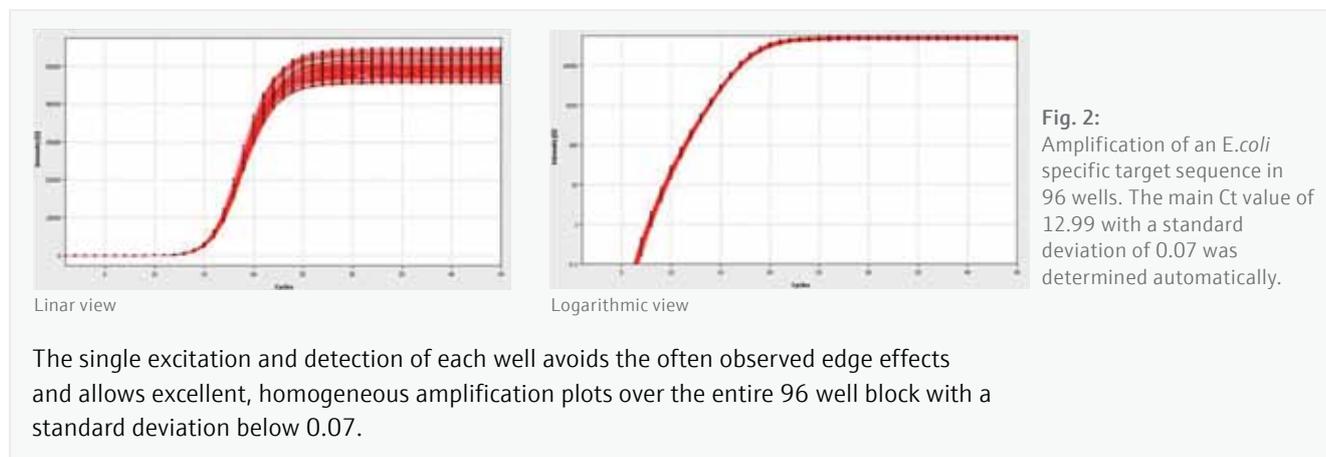
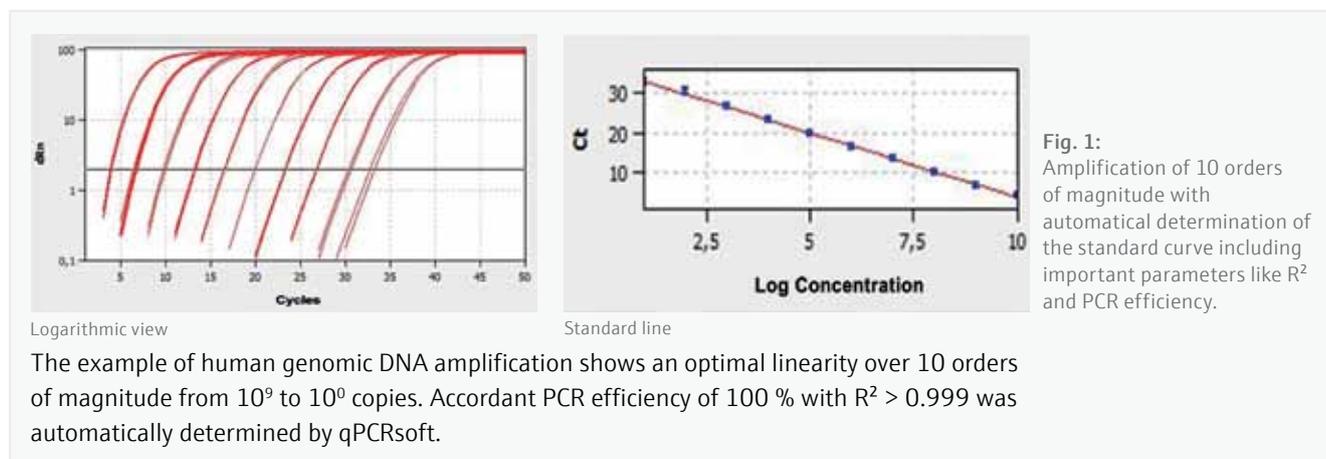
- Automated real-time PCR in 96 wells (0.2 ml)
- Modern silver block with outstanding ramping rates of up to 8 °C/sec
- Excellent temperature control accuracy: ± 0.1 °C
- Integrated heated lid to protect samples

In addition, qTOWER³ *auto* also comes equipped with a motorized heating lid that can be set to temperatures of up to 110 °C. The optimum, automatic contact pressure of the heating lid perfectly seals the PCR plates used.



Convincing Performance

Ideal amplification results are guaranteed due to the combination of a unique optics and a high-quality silver sample block with matchless temperature control accuracy.



Technical Data

Thermal block			
Sample block	Silver sample block with gold-coating	Adjustable temperature range	4 °C to 99 °C
Block capacity	96 Well Microplates (0.2 ml)	Temperature uniformity	55 °C ± 0.15 °C after 15 sec
Sample size	10 – 60 µl	Temperature control accuracy	± 0.1 °C
Heating	Up to 8 °C/sec (max.)		
Cooling	Up to 6 °C/sec (max.)		
Heated lid		qPCR application	
Lid temperature	30 °C to 110 °C	Sensitivity	Detects 1 copy of target sequence in human genomic DNA
Contact pressure	30 kg, automated	Dynamic range	10 orders of magnitude
		Multiplex analysis	Up to 6-fold
Optics			
Measuring principle	Fiber optic shuttle system with 8-fold scanner and color modules for excitation and emission filters	Color modules	<ul style="list-style-type: none"> ▪ 12 Color-, FRET- and Protein Modules ▪ 6 positions inside device
Light source	4 longlife, high-power LED's (RGBW)	Read out time	6 sec for 96 wells independent of the number of dyes
Detector	High sensitive PMT (Photo Multiplier Tube)	Configuration	Free configuration in device
		Upgradeability	Possible without service
Control		Dimensions	
Control	qPCRsoft or optional interface for automation software	Weight	Approx. 30 kg
Export function	Excel, *.csv, LIMS, qBase+, GeneIO, GenEx	Dimension (W x H x L)	<ul style="list-style-type: none"> ▪ Closed tray: 275 mm x 463 mm x 308 mm ▪ Open tray: 275 mm x 463 mm x 420 mm ▪ Electronic module: 275 mm x 186 mm x 275 mm
		Recommended footprint	10 – 15 cm behind rear side of device
Additional technical data			
Interface	USB, RS232	Noise emission	Max. 45 dB
Power supply	100 – 240 V	Warranty	<ul style="list-style-type: none"> ▪ 2 warranty on device system ▪ 10 years long-term warranty of high performance optics
Power consumption	Max. 850 W		

Order Information

Order number	Description
844-00603-2	qTOWER ³ <i>auto</i> , 220 V Instrument system, without PC, including qPCRsoft, electronic module with 10 m cable, thermal block and detection module* for quantitative real-time PCR
844-00603-4	qTOWER ³ <i>auto</i> , 115 V Instrument system, without PC, including qPCRsoft, electronic module with 10 m cable, thermal block and detection module* for quantitative real-time PCR
844-00603-5	qTOWER ³ <i>auto</i> , 110 V Instrument system, without PC, including qPCRsoft, electronic module with 10 m cable, thermal block and detection module* for quantitative real-time PCR

Parameters color module

Name	Excitation	Emission	Example fluorescent dyes*
Color module 1 , Order number: 844-00520-0	470 nm	520 nm	FAM TM , Sybr [®] Green, Alexa488 [®]
Color module 2 , Order number: 844-00521-0	515 nm	545 nm	JOE TM , HEX TM , VIC [®] , YakimaYellow [®]
Color module 3 , Order number: 844-00522-0	535 nm	580 nm	TAMRA TM , DFO TM , Alexa546 [®] , NED TM
Color module 4 , Order number: 844-00523-0	565 nm	605 nm	ROX TM , TexasRed [®] , Cy3.5 [®]
Color module 5 , Order number: 844-00524-0	630 nm	670 nm	Cy5 [®] , Alexa633 [®] , Quasar670 TM
Color module 6 , Order number: 844-00525-0	660 nm	705 nm	Cy5.5 [®] , LightCycler Red [®]
FRET module 1 , Order number: 844-00526-0	470 nm	580 nm	FAM TM (Donor) / TAMRA TM (acceptor)
FRET module 2 , Order number: 844-00527-0	470 nm	670 nm	FAM TM (Donor) / Cy5 [®] (acceptor)
FRET module 3 , Order number: 844-00528-0	470 nm	705 nm	FAM TM (Donor) / Cy5.5 [®] (acceptor)
FRET module 4 , Order number: 844-00529-0	515 nm	670 nm	JOE TM (Donor) / Cy5 [®] (acceptor)
FRET module 5 , Order number: 844-00531-0	470 nm	605 nm	FAM TM (Donor) / ROX TM (acceptor)
Color modul Protein 1 , Order number: 844-00530-0	490 nm	580 nm	SYPRO [®] Orange

* The Color or FRET modules can be ordered separately. The qTOWER³ *auto* can be equipped with up to 6 modules.

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Subject to changes in design and scope of delivery as well as further technical development.