

Exicycler™96

Real-Time Quantitative PCR System



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Bioneer's Real-Time Quantitative PCR System

Exicycler™ 96 is a superior 96-well qPCR system designed for real-time qPCR applications demanding the highest performance. In addition, *in vitro* diagnostic software packages have also been developed (MFDS, CE-IVD certified versions), which allows the instrument to be used for molecular diagnostic purposes.

- Superior Sensitive Optics by Light Polarization
- Improved Thermal Block Ramp Rate
- Minimization of Ct variation
- Wide Dynamic Range
- True 5-color Multiplexing
- Excellent Accuracy and Uniformity
- Intuitive & Convenient Software



Applications

- Quantification of Gene Expression
 - MicroRNA expression analysis
 - Gene detection
 - Virus load analysis
- Pathogen Detection
- Genotype Analysis
 - SNP (Single nucleotide polymorphism) detection
 - Drug resistance analysis
- Genetic Disease Detection
- Oncology
- DNA Methylation Study

Sensitive Optics by Light Polarization

Bioneer's imaging technique based on polarization of light provides sensitive detection for robust and reliable results. Patented polarizing optical apparatus mitigates the common problem of a reflection light*, allowing precise quantification and target discrimination.

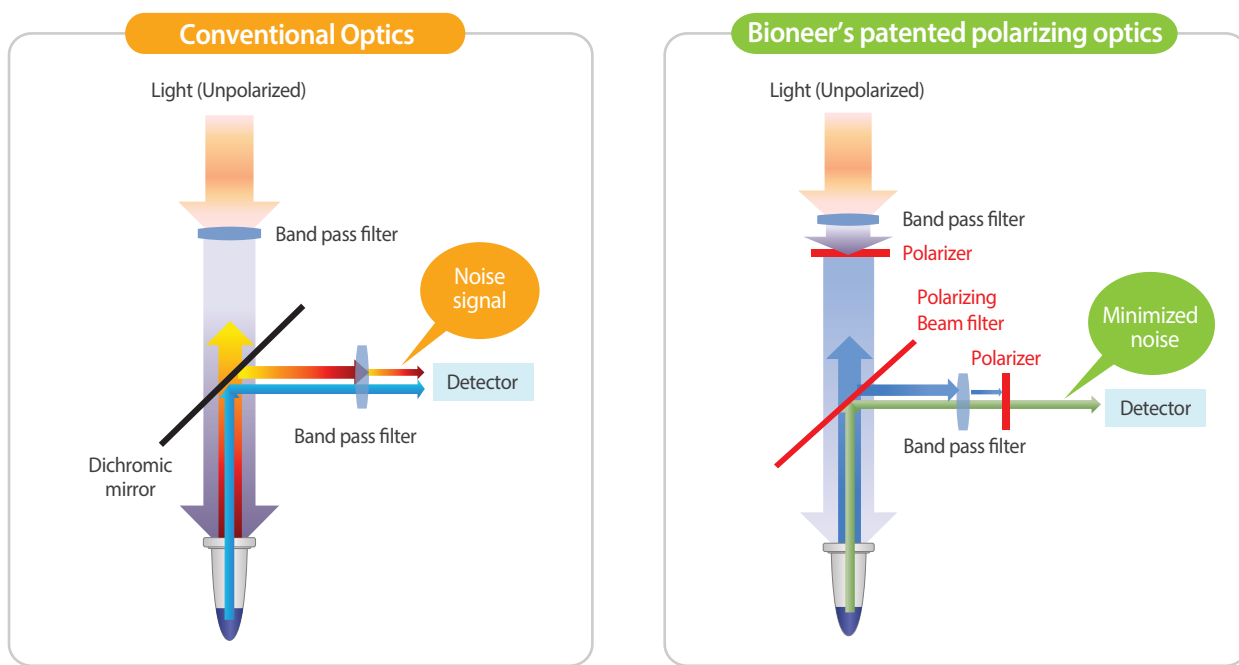


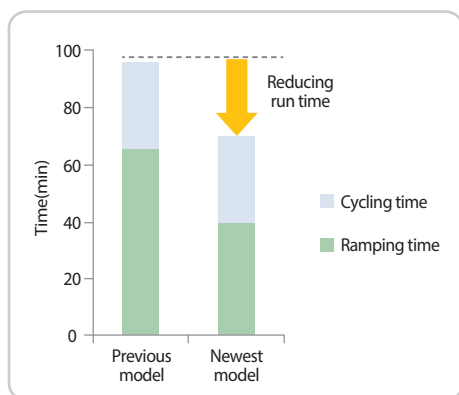


Figure 1. Separation of a reflection light from fluorescence.

 A reflection light (Unpolarized)
  A reflection light (Polarized)

* Problem of a reflection light: In the conventional technology, excitation light is generally brighter than fluorescence generated from the sample. Therefore, light reflected from an optical component interferes with the fluorescence generated from the sample. Furthermore, it is hard to completely distinguish one from the other. This can cause imprecise and unreliable results.

Improved Thermal Block Ramp Rate



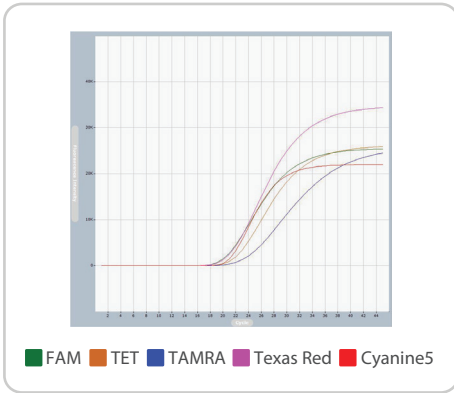
Reduced reaction time

Maximum ramping rate of 4.5°C/sec (*Exicycler™ 96 Fast*: max 5.0°C/sec) decreases reaction time by using a unique thermal block and temperature control technology.

Figure 2. Comparison of operating time and ramping time between the previous model and the newest model of *Exicycler™ 96*.

| True 5-color Multiplexing

- 5-target genes can be detected in a single tube



Simultaneous detection of five targets capable of being used in multiplex PCR without the need of reference dyes, used for the compensation of light quantity deviation, through the uniform optical system patent technology (Korean Patent KR 0794703, US Patent US 8139210, Japanese Patent JP 4751821, China Patent CN 1798969).

Figure 3. 5-target genes can be detected in a single tube.
(FAM : *T. vaginalis*, TET : *M. Hominis*, TAMRA : TMV, Texas Red : HSV type1, Cyanine5 : HSV type2)

- Diverse choice of fluorescent dyes

Excyclor™ 96 is a flexible, 5-color system with advanced optical features (Light Tunnel technology), which eliminates use of a reference dye. No need to reserve one channel for a reference dye, 5-color multiplexing is available.

Filter	Excitation	Emission	Fluorescence dye
1	475 nm	530 nm	FAM, SYBR Green I
2	520 nm	560 nm	JOE, TET
3	550 nm	590 nm	TAMRA, Cyanine3
4	570 nm	630 nm	Texas Red, ROX
5	630 nm	690 nm	Cyanine5

| Wide Dynamic Range

The dynamic range of detection is wide at over 10⁹.

Wide detection range being more than 9 log allowing DNA detection and qualitative analysis even at low and high concentration samples using a short arc lamp, a powerful excitation light source.

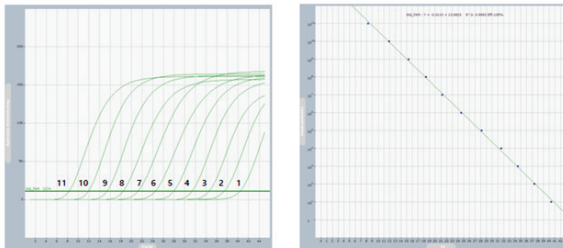


Figure 4. Graph shows standard curve of 10-fold serial dilutions of 10 copies to 10¹¹ copies MMP9 gene (FAM labeled). The PCR efficiency generated by the standard curve is 103%.

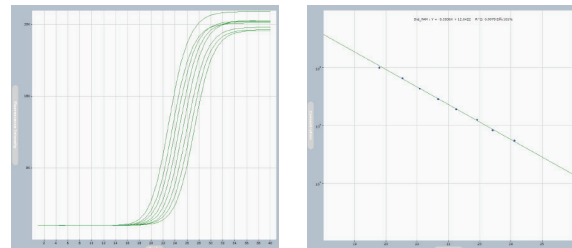


Figure 5. Fluorescence data from a series of 1.33-fold dilutions of TMV gene (10⁶ copies) amplified using reporter dyes to check one target: FAM/TMV. The PCR efficiency generated by the standard curve is 101%.

Excellent Accuracy and Uniformity

1. Precise temperature control with cutting-edged algorithm for reproducibility

Precise temperature control system improves temperature accuracy and uniformity throughout the entire wells of thermal block. The temperature deviation is less than $\pm 0.3^{\circ}\text{C}$ between center and border wells.

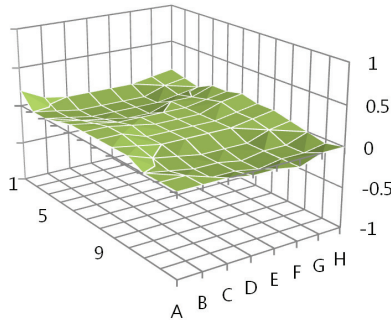


Figure 6. *Exicycler*[™] 96 has superior well-to-well uniformity.

2. Excellent homogeneity of amplification

With implementation of LT technology in the optics module, well-to-well signal variation is minimized and well-to-well optical homogeneity is improved. No matter in which well the reaction occurs, the Ct variation will be within 0.3.

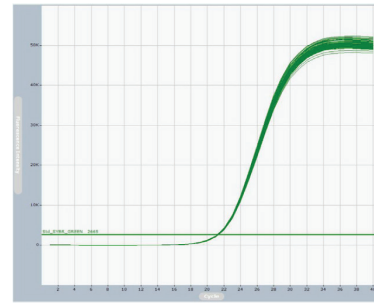


Figure 7. qPCR result using 10^6 copies of IRF3 gene in each of 96 well positions.

Intuitive Software

User-friendly interface provides convenience for every step of qPCR process including protocol setup, data analysis and result storage.

Analysis software on *Exicycler*[™] 96 has 4 diVerent tools. Data analysis modules include Absolute Quantification, Relative Quantification, Existence/Nonexistence, SNP Genotyping and melting curve analysis (Figure 8).

Simply choose an appropriate tool for your experimental purposes.

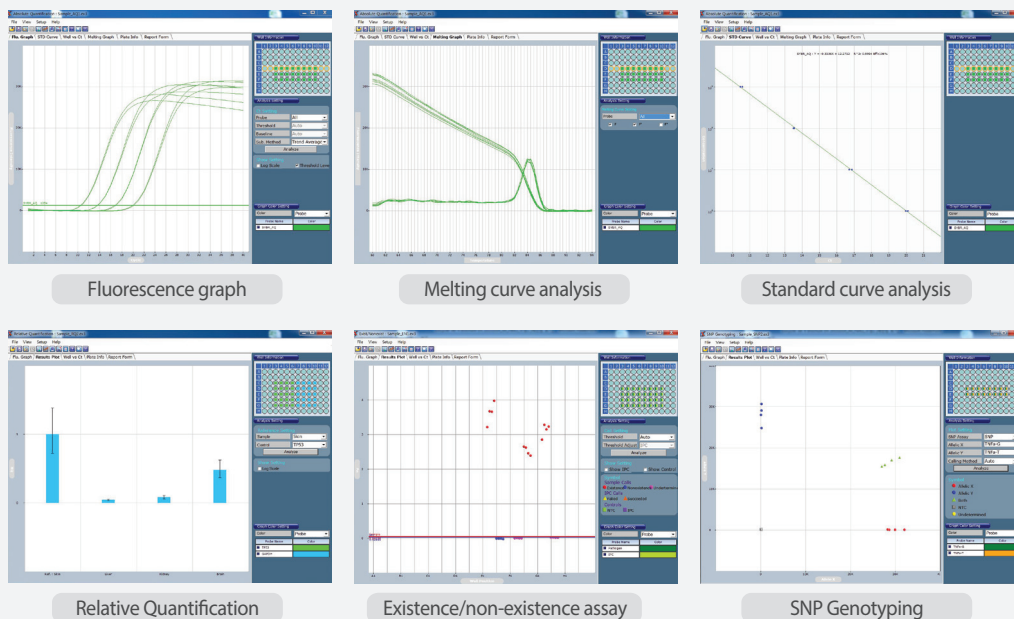


Figure 8. *Exicycler*[™] 96 Analysis Software.

Specifications

A-2060-1	Exicycler™ 96 V4 Real-Time Quantitative Thermal Block		
Dimension(cm)	35.5(W) x 54(D) x 47(H)	Weight	39 kg
Power Consumption	100 - 240 VAC, 50/60 Hz, Max 800 VA	Operating Temperature	15~35°C
		Operating Humidity	20~80%, no condensation
Method of Heating/Cooling	Peltier element	Temperature Range	4.0~99.9°C
Ramp Rate Control	1~100%	Gradient Operation Range	20~95°C
Lid Temperature	90~120°C	Temperature Accuracy/Uniformity	± 0.3°C/± 0.3°C
Optical Specifications	Light source	Sensor	Excitation/Emission filter
	Short Arc lamp (120W)	16 bit 2D CCD	5 sets
Block Type	Fast Block	Normal Block	
Sample Capacity/Size	Opaque White 96-well Low Profile PCR Plate / 0.1 ml Opaque White 8-strip Low Profile PCR Tube	Opaque White 96-well PCR Plate / 0.2 ml Opaque White 8-strip PCR Tube	
Sample Volume	10~50 µl	20~100 µl (recommended 50 µl)	
Max. Ramp Rate	5.0 °C/sec	4.5°C/sec	

Ordering Information

Cat. No.	Product Description
A-2060-1	Exicycler™ 96 Real-Time Quantitative PCR System
A-2060-2	Exicycler™ 96 Fast Real-Time Quantitative PCR System

Related Products

Category	Product Description
Plastic consumables	Adhesive Optical Sealing Film (100 sheets)
	Opaque White PCR Tube
Premix & Reagent	AccuPower® GreenStar™ qPCR PreMix
	AccuPower® 2X GreenStar™ qPCR Master Mix
	AccuPower® Plus GreenStar™ qPCR PreMix & Master Mix
	AccuPower® Dual-HotStart™ RT-qPCR PreMix & Master Mix

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