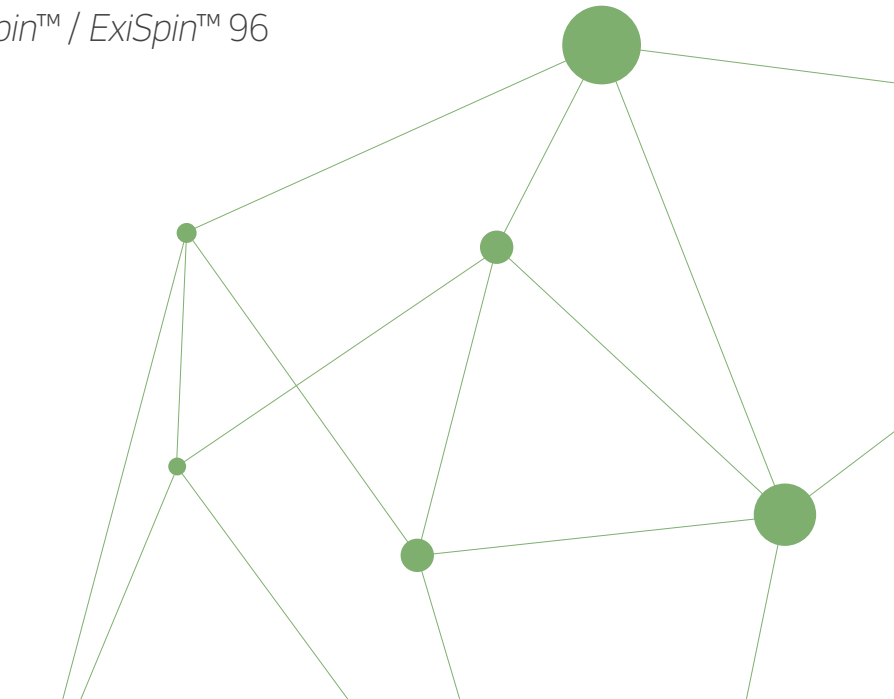
M Instruments & Devices

01. Conventional PCR: *AllInOneCycler*™
02. Real-Time PCR: *Exicycler*™ 96 / *Exicycler*™ 96 Fast / *Exicycler*™ 384 /
03. Protein Synthesis and Purification: *ExiProgen*™
04. DNA/RNA Preparation: *ExiPrep*™16 Plus / *ExiPrep*™96 Lite / *ExiCracker*™ / *ExiBeater*™
05. Electrophoresis: *Agaro-Power*™ / DUALED Blue/White Transilluminator
06. Vortexing & Spin-down: *ExiSpin*™ / *ExiSpin*™ 96



01. Conventional PCR

Description

AllInOneCycler™ is a gene amplification device that dramatically increases the ramp rate through a unique thermal block developed by bioneer and patented special temperature control algorithm (normal: 6.5℃/sec, fast: 9.5℃/sec). In addition, 8 types of blocks are provided according to the customer's experimental field and purpose, thereby greatly improving the user's convenience.

Features and Benefits

Fastest ramp rate

A standard thermal block provides maximum ramp rate at 6.5℃/sec and the novel alloy thermal block up to 9.5℃/sec. With this, researchers can save both time and energy. Such feature is based on the specific heat capacity of metal alloy that is used in the novel alloy thermal block, which is about 30% lower than common aluminum block. Thus, the ramp rate of the novel alloy thermal block can go up to 30% higher than that of aluminum block.

* Novel alloy thermal block:
The novel alloy material invented by Bioneer was patented in Korea and is patent-pending in the United States, Europe, Japan and China.

$$\Delta T = \frac{Q}{C*M}$$

※ When the amount of heat supplied is constant, the 'Heat capacity';'Specific heat (C) x Specific gravity (M)', should be decreased in order to increase temperature change (ΔT).

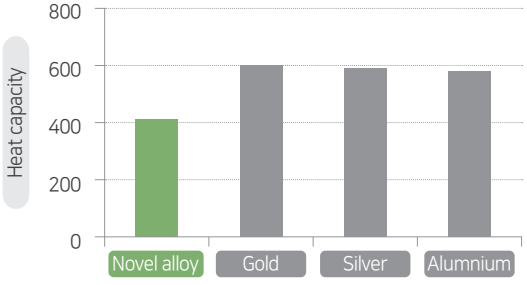


Figure 1. Comparison Heat capacity of the materials used in thermal block.

Through PCR experiments, we confirmed the effect of saving about 10% of running time compared to other equipment.

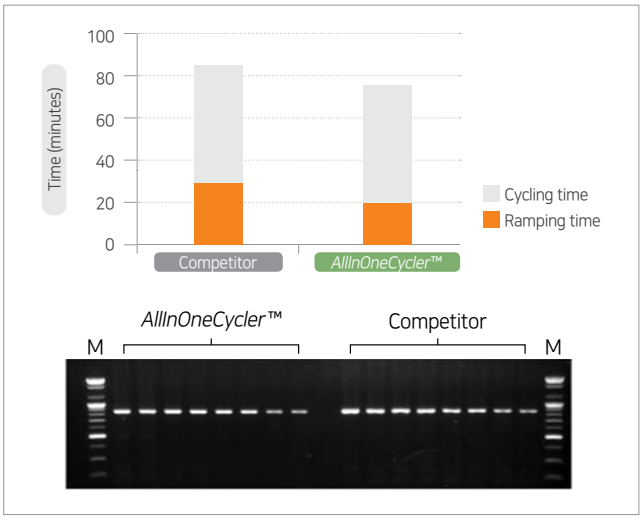


Figure 2. Comparison of operating times and amplification results between competitor and *AllInOneCycler*™ (Normal block).

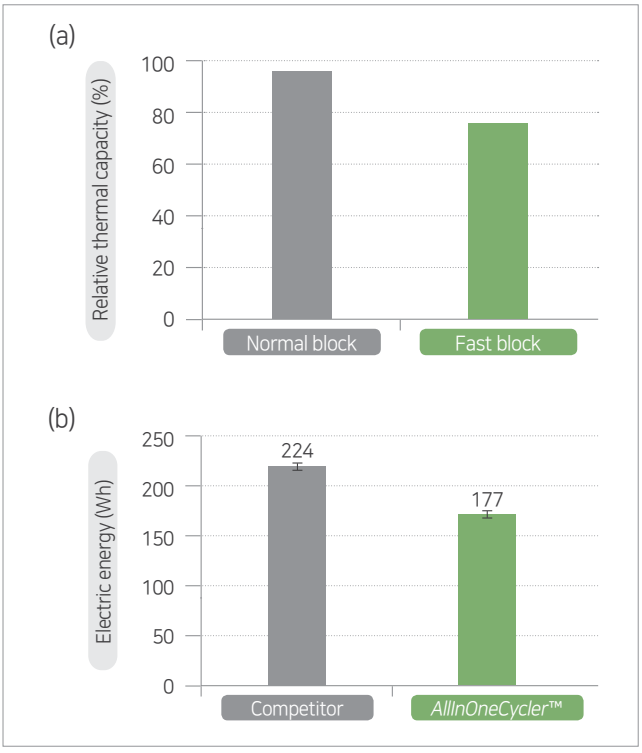


Figure 3. (a) Comparison of the relative thermal capacity between normal block and fast block (b) Comparison of electric energy consumption (Single PCR operation) between *AllInOneCycler*™ (Fast block) and competitor.

AllInOneCycler™ PCR System

Excellent temperature accuracy and uniformity

Reproducible results through improved temperature uniformity and accuracy using precise temperature control system.

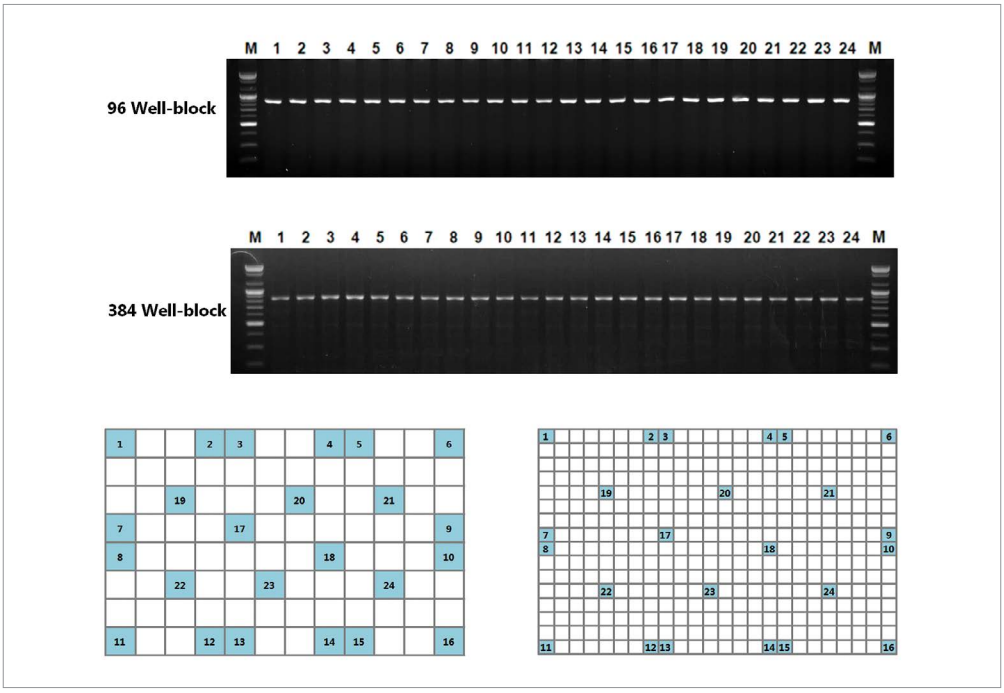


Figure 4. Comparison of PCR results in 24 wells of 96-well block and 384-well block.

Interchangeable thermal block

Selective use with interchangeable thermal blocks capable of choosing between 8 of those types depending on the purpose of the experiment. A total 8 types of thermal blocks (Normal/Fast type, 96/384 wells, slide PCR, digital PCR block) are provided to be used selectively depending on the experiment purposes.

Figure 5. Various interchangeable thermal blocks.

Thermal Gradient Function

The thermal gradient function can be used to find optimal conditions easily without wasting additional resources.

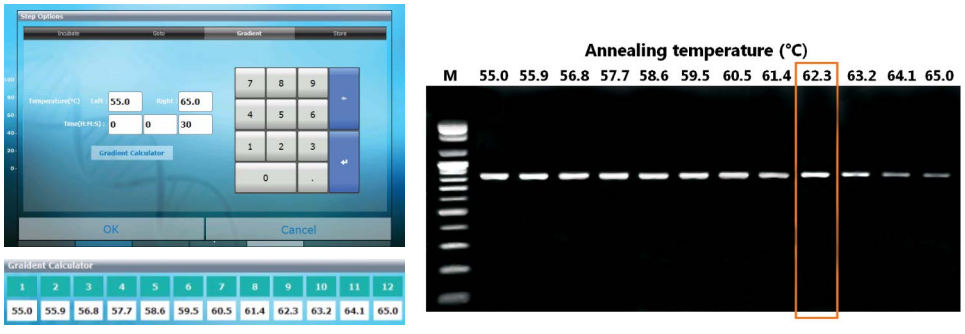


Figure 6. Setting the PCR condition using the thermal gradient PCR function in the *AllInOneCycler*™ (human genomic DNA, CFS2 gene, 830 bp).

▪ **Simple User Interface**

7-inch LCD touch screen provides user-friendly UI to be used easily. Eight different basic protocols can be selected to save time to set them up. In addition, a separate program that controls and monitors multiple devices from a PC can handle large volumes of samples at the same time.

(a) Start Screen (b) Protocol modification Screen (c) Template protocol selection screen

Figure 7. Screen composition of *AllInOneCycler*™.

▪ **Compact and simple design**

Simple, sophisticated design with a small size making it easy to be moved around and placed even in a small laboratory with a narrow space

Figure 8. Front, back, side design of *AllInOneCycler*™.

○ Specifications

Physical specifications		
Dimension (cm)	24.6(W) x 36.9(D) x 23.2(H)	
Weight	8.4 kg	
Display	7-inch Touch LCD screen	
Control	Embedded Board	
Power Consumption	100-240 V~, Max 8.5 A, 50/60 Hz, 630 VA	
Operating Temperature	15~35℃	
Operating Humidity	20~80%, no condensation	
Port	2 USB ports for data storage	
Operating specifications		
Method of Heating / Cooling	Peltier element	
Temperature Range	4.0~99.9℃	
Gradient Range	20~95℃	
Block Type	Fast Block	Normal Block
Max. Heating Ramp Rate	9.5℃/sec	6.5℃/sec
Max. Cooling Ramp Rate	7.7℃/sec	4.5℃/sec
Temperature Accuracy	± 0.3℃	
Temperature Uniformity	± 0.3℃	
Lid Temperature	90~110℃	
Ramp Rate Control	1~100%	

* Instrument specifications can be changed for performance upgrade without any prior notifications.

AllInOneCycler™ PCR System

Ordering Information

Cat. No.	Product Description
***AllInOneCycler*™ PCR System**	
A-2041-1N	*AllInOneCycler*™ 96 well PCR system
A-2041-2N	*AllInOneCycler*™ 384 well PCR system
A-2041-3N	*AllInOneCycler*™ Slide PCR system
***AllInOneCycler*™ Fast PCR System**	
A-2041-1F	*AllInOneCycler*™ Fast 96 well PCR system
A-2041-2F	*AllInOneCycler*™ Fast 384 well PCR system
A-2041-3F	*AllInOneCycler*™ Fast Slide PCR system
***AllInOneCycler*™ Thermal Block**	
A-2041-1-1	*AllInOneCycler*™ 96 well thermal block only
A-2041-2-1	*AllInOneCycler*™ 384 well thermal block only
A-2041-3-1	*AllInOneCycler*™ Slide thermal block only
A-2041-1-2	*AllInOneCycler*™ Fast 96 well thermal block only
A-2041-2-2	*AllInOneCycler*™ Fast 384 well thermal block only
A-2041-3-2	*AllInOneCycler*™ Fast Slide thermal block only
***AllInOneCycler*™ PC Control Software**	
A-2041-9	*AllInOneCycler*™ PC control software
DNA Polymerase & PCR PreMix	
K-2012	*AccuPower*® PCR PreMix, 96 tubes
K-2631	*AccuPower*® *ProFi Taq* PCR PreMix, 96 tubes
K-2111	*AccuPower*® Multiplex PCR PreMix, 96 tubes
K-2611	*AccuPower*® *PyroHotStart Taq* PreMix, 96 tubes
Reverse Transcriptase & RT-PCR PreMix	
K-2044	*AccuPower*® *CycleScript*™ RT PreMix, dT_{20}, 96 tubes
K-2201	*AccuPower*® *RocketScript*™ Cycle RT PreMix, 96 tubes
K-2501	*AccuPower*® *RocketScript*™ RT-PCR PreMix, 96 tubes

02. Real-Time PCR

Exicycler™ 96 (Ver.4) Real-Time Quantitative Thermal Block

Description

Exicycler™ 96 Real-Time Quantitative Thermal Block is a patented LT (Light Tunnel) technology that emits uniform excitation light, excitation light blocking method using polarization, and 96 well simultaneous detection technology using 2-D sensor. It is a real-time gene amplification equipment with minimum well variation. Thermal blocks are available in standard 96 well format (*Exicycler*™ 96) and low-profile 96 well format (*Exicycler*™ 96 Fast).

Features and Benefits

Superior Sensitive Optics by Light Polarization

Highly reproducible and accurate results by light tunnel (LT) technology (Korean Patent No. KR 0794703, US Patent No. 8139210, Japanese Patent JP 4751821, China Patent No. CN 1798969) irradiating uniform excitation light, excitation light interception method (Korean Patent No. 10-1089045 and US Pat. No. 8427643) using polarization, and a 96-well simultaneous detection technique using a 2-D sensor minimizing optical sensitivity and deviation between well.

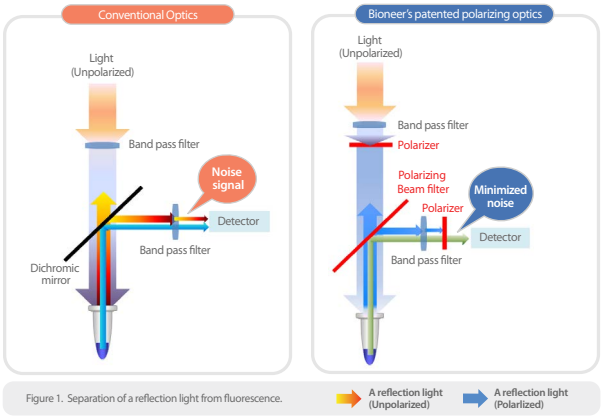


Figure 1. Separation of a reflection light from fluorescence.

* Noise caused by reflected light: The fluorescent materials used in qPCR create emission when the absorbed excitation energy excites them then falls to the ground state. In conventional qPCR instruments, part of excited light irradiated from the sample is reflected from the surface of the plate and the instrument, which may enter the detector to be also mistakenly read as part of the light from the sample. As the excited light has much more luminance than the fluorescent light, reflected light also contain high luminance, making it unable to be completely removed by the fluorescent light and creating noise in the process, deteriorating sensitivity and accuracy. However, by using our patented technology, excitation and fluorescence have different polarity, allowing the reflect light unable to be blocked by fluorescent filter to be filtered once again through polarizing filter. This allows drastic reduction of noise caused by reflected light compared with other qPCR instruments.

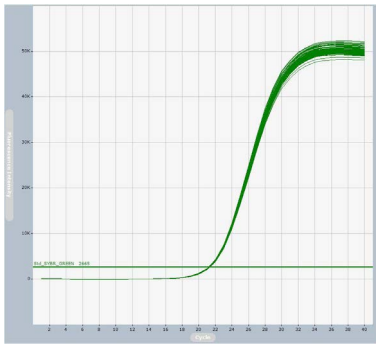


Figure 2. Fluorescence data using 10^6 copies of IRF3 gene (FAM labeled) in each of 96 well positions. The average Ct of 96 well is 21.8 and the Ct variation range is 0.19.

Reduce Reaction time

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

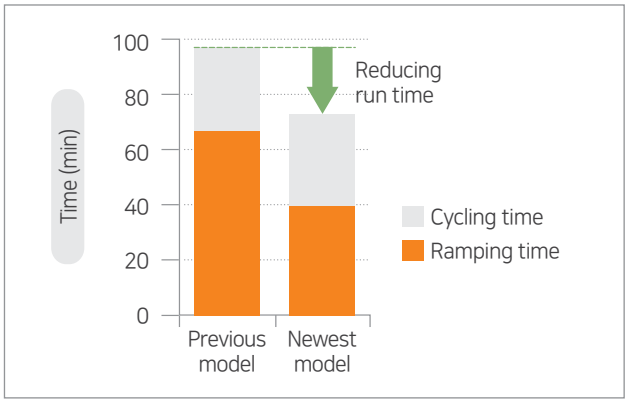


Figure 3. Comparison of operating time and ramping time between the previous model and the newest model of *Exicycler*™ 96.

5-color multiplexing system

Simultaneous detection of 5-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).

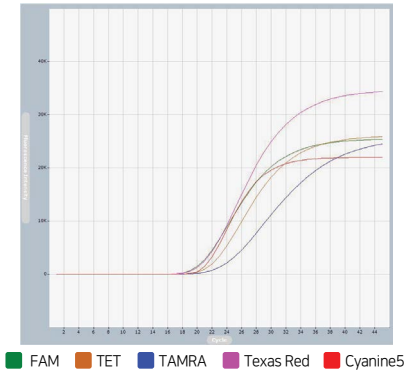


Figure 4. 5-target genes can be detected in a single tube.
(FAM:T. vaginalis, TET: M. Hominis, TAMRA: TMV, Texas Red: HSV type1, Cyanine5: HSV type2)

Convenience

Diverse choice of fluorescent dyes including the universal ones with wide excitation/emission wavelength detection range being 475 to 690 nm, unlike other traditional instruments designed for specific dyes.

Filter Sets

	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

Excellent uniformity and accuracy of temperature

Accurate temperature control improves the temperature accuracy and uniformity of the entire well. The temperature difference between the edge and the center is very small, with temperature deviations within ± 0.3°C (Figure 5).

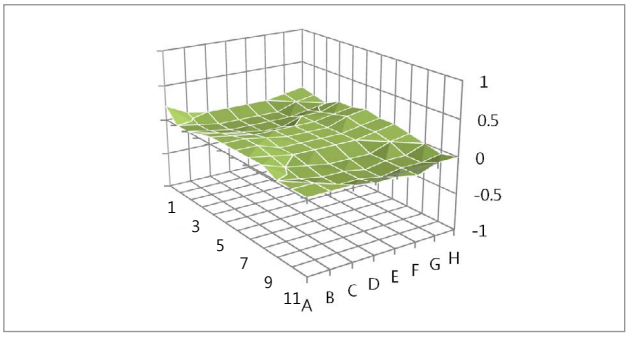


Figure 5. *Exicycler*™ 96 has superior well-to-well uniformity.

Wide dynamic range

Large 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.

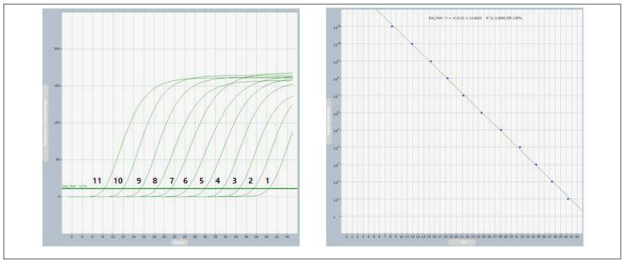


Figure 6. Graph shows standard curve of tenfold serial dilutions of 10 copies to 10^{11} copies MMP9 gene (FAM labeled). The PCR efficiency generated by the standard curve is 103%.

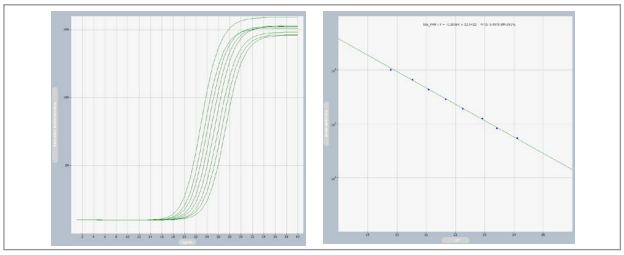


Figure 7. Fluorescence data from a series of 1.33-fold dilutions of TMV gene (10^6 copies) amplified using reporter dyes to check one target: FAM/TMV. The PCR efficiency generated by the standard curve is 101%.

Temperature gradient function

Simplified search of optimal PCR annealing temperature with temperature gradients from 1~20°C available in the range of 20~95°C.

Various application

Wide applications such as touch down PCR through time increment and temperature increment adjustment functions.

User-friendly software

It has a self-diagnosis function that checks the system for failure before the experiment, which can prevent problems during the experiment and the loss of the sample. The automatic door opening and closing function makes it easy to operate and is suitable for application to the fully automated system. In addition, *Exicycler*™ 96 analysis software is provided for easy analysis of melting curve, absolute quantification, relative quantification, existence/nonexistence, and SNP genotyping results (Figure 7).

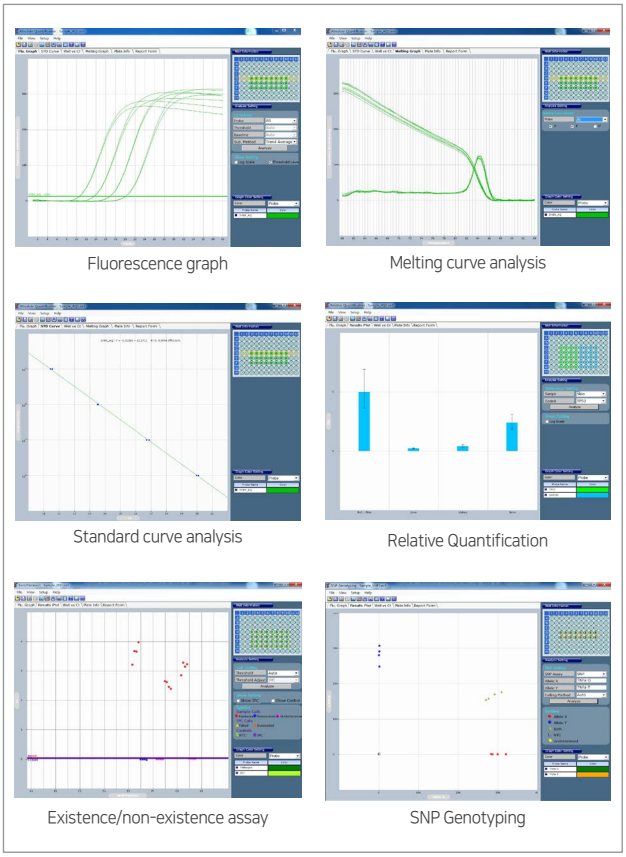


Figure 8. *Exicycler*™ 96 Analysis Software.

Exicycler™ 96 (Ver.4) Real-Time Quantitative Thermal Block

Application

- Gene expression analysis
- MicroRNA expression analysis
- Gene copy number analysis
- Pathogen detection
- Genetic mutation test
- GMO quantitative and qualitative test

Specifications

Physical Specifications		
Dimension (cm)	35.5(W) x 54(D) x 47(H)	
Weight	39 kg	
Sample Capacity / Size	Fast Block	Opaque White 96-well Low Profile PCR Plate/0.1 ml Opaque White 8-strip Low profile PCR Tube
	Normal Block	Opaque White 96-well PCR Plate/0.2 ml Opaque White 8-strip PCR Tube
Sample Volume (µl)	Fast Block	10~50 (20 recommended)
	Normal Block	20~100 (50 recommended)
Power Consumption	100-240 VAC, 50/60 Hz, Max 800 VA (Fuse: 250 V, F10AL, 2 ea)	
Optical Specifications		
Light Source	Short Arc lamp	
Wattage	120 W	
Sensor	16-bit 2D CCD	
Excitation Filter / Emission Filter	5 sets	
Operating Specifications		
Method of Heating / Cooling	Peltier element	
Temperature Range	4.0~99.9℃	
Temperature Accuracy	± 0.3℃	
Temperature Uniformity	± 0.3℃	
Max. Ramping Rate	Fast Block	5.0℃/sec
	Normal Block	4.5℃/sec
Lid Temperature	90~120℃	
Gradient Range	20~95℃	
Temperature Increment Range	0.1~2.0℃	
Time Increment Range	1~60 sec	
Ramp Rate Control Range	1~100%	
Operating Temperature	15~35℃	
Operating Humidity	20~80%, no condensation	
Computer Specifications		
Operating System	Windows 7 & 10 (32/64-bit OS)	
Processor Speed	Intel Dual Core E2160 (1.8 GHz) or higher	
Memory	1 GB or higher	
Communication Port	USB 2.0 high speed	
Screen Resolution	1280X1024 or higher	

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-2060-1	*Exicycler*™ 96 (Ver.4) Real-Time Quantitative Thermal Block
A-2060-2	*Exicycler*™ 96 (Ver.4) Fast Real-Time Quantitative Thermal Block

Related Products

Cat. No.	Accessories
A-2060-A1	*AccuPower*® Fluorescence Test Kit for *Exicycler*™ 96
A-2060-A2	*AccuPower*® Fluorescence Test Kit for *Exicycler*™ 96 Fast

Cat. No.	Reagent
K-6600	*AccuPower*® Plus *DualStar*™ qPCR PreMix, 50 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™96 optical film included
K-6210	*AccuPower*® *GreenStar*™ qPCR PreMix, 20 µl/rxn, 8-tube strips, 96 rxn, *Exicycler*™96 optical film included
K-6251	*AccuPower*® 2X *GreenStar*™ qPCR Master Mix with 80X ROX Dye, 50 µl/rxn, 100 rxn
K-6704	*AccuPower*® *Dual-HotStart*™ RT-qPCR PreMix, 50 µl/rxn, 96-well plate, 96 rxn, *Exicycler*™96 optical film included

Cat. No.	Plastic Consumables
3111-4110	Adhesive Optical Sealing Film, 100 sheets
3111-50	Opaque White 0.2 ml PCR 8-tube strip Tube, 250 Strips
3111-52	Opaque White 96-well Semi-skirted PCR Plate, 25 Plates
3111-53	Opaque White 96-well Full-skirted, Low Profile PCR Plate, 25 Plates

Exicycler™ 384 Real-Time Quantitative Thermal Block

Description

Exicycler™ 384 Real-Time Quantitative Thermal Block utilizes 384-well plate which uniformly detects excited light, excitation light blocking technology and a 2-D sensor. Those allow minimized optical sensitivity and deviation between wells during the real-time gene amplification. Furthermore, 384 samples can be tested even with a miniscule volume of 5 µl, making it an excellent competitive instrument for analyzing many samples.

Features and Benefits

- **Economical usage of samples and reagents**
  Enables large-scale analysis at minimum cost and time with accurate results from 5 µl of reaction solution.
- **Superior Sensitive Optics by Light Polarization**
  Highly reproducible and accurate results by light tunnel (LT) technology (Korean Patent No. KR 0794703, US Patent No. 8139210, Japanese Patent JP 4751821, China Patent No. CN 1798969) irradiating uniform excitation light, excitation light interception method (Korean Patent No. 10-1089045 and US Pat. No. 8427643) using polarization, and a 384-well simultaneous detection technique using a 2-D sensor minimizing optical sensitivity and deviation between well.

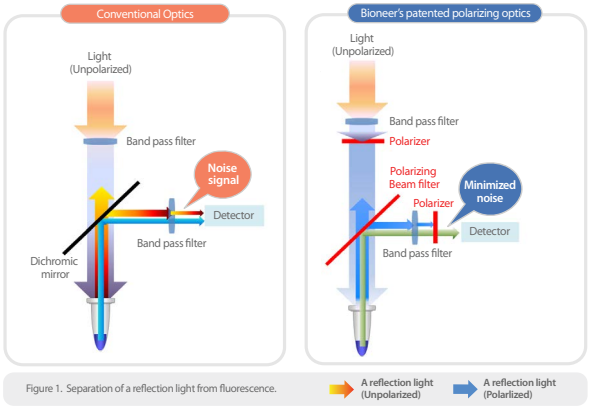


Figure 1. Separation of a reflection light from fluorescence.

* Noise caused by reflected light: The fluorescent materials used in qPCR create emission when the absorbed excitation energy excites them then falls to the ground state. In conventional qPCR instruments, part of excited light irradiated from the sample is reflected from the surface of the plate and the instrument, which may enter the detector to be also mistakenly read as part of the light from the sample. As the excited light has much more luminance than the fluorescent light, reflected light also contain high luminance, making it unable to be completely removed by the fluorescent light and creating noise in the process, deteriorating sensitivity and accuracy. However, by using our patented technology, excitation and fluorescence have different polarity, allowing the reflect light unable to be blocked by fluorescent filter to be filtered once again through polarizing filter. This allows drastic reduction of noise caused by reflected light compared with other qPCR instruments.

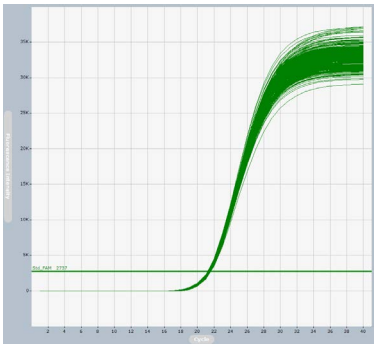


Figure 2. qPCR result using $1x10^6$ copies of Lambda DNA (FAM labeled) in each of 384 well positions. The average Ct of 384 well is 21.36, the Ct variation range is 0.39, the CV value is 0.3%.

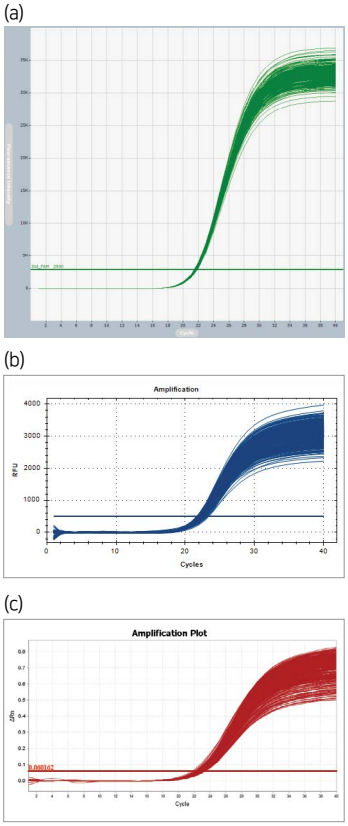


Figure 3. qPCR results using $1x10^6$ copies of Lambda DNA (FAM labeled) in each of 384 well positions. (a) Bioneer's *Exicycler*™ 384; Ct average is 21.65, Ct variation is 0.43 and CV value is 0.28%. (b) competitor A; Ct average is 22.16, Ct variation is 1.79 and CV value is 1.13%. (c) competitor B; Ct average is 22.74, Ct variation is 1.69 and CV value is 1.09%.

- **Reduce reaction time**

  Maximum ramping rate of 4.5℃/sec decreases reaction time by using a unique thermal block and temperature control technology.

- **5-color multiplexing system**

  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).

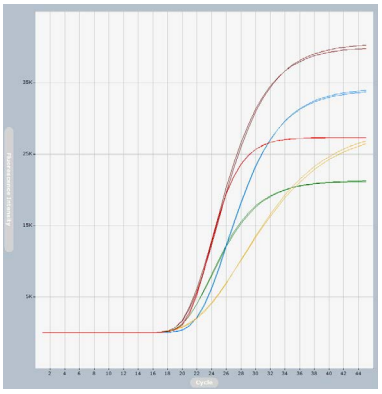


Figure 4. 5 target genes can be detected in a single tube with a minimum volume of 5 μl (FAM: T. vaginalis, TET: M. Hominis, TAMRA: TMV, Texas Red: HSV type1, Cyanine5: HSV type2).

- **Various fluorescent dyes applicable**

  Diverse choice of fluorescent dyes including the universal ones with wide excitation/emission wavelength detection range being 475 to 690 nm, unlike other traditional instruments designed for specific dyes.

Filter Sets

	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

- **Excellent uniformity and accuracy of temperature**

  Accurate temperature control improves the temperature accuracy and uniformity of the entire well. The temperature difference between the edge and the center is very small, with temperature deviations within ± 0.3℃ (Figure 5).

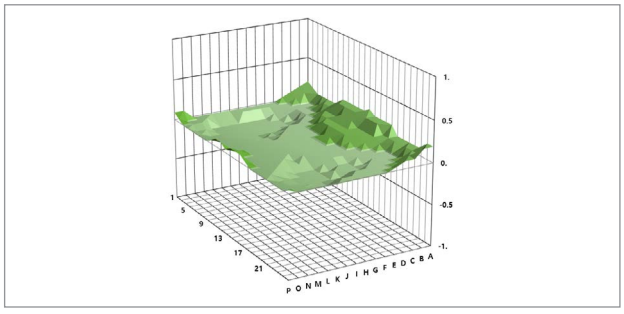


Figure 5. *Exicycler*™ 384 has superior well-to-well uniformity.

- **Wide dynamic range**

  Large 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.

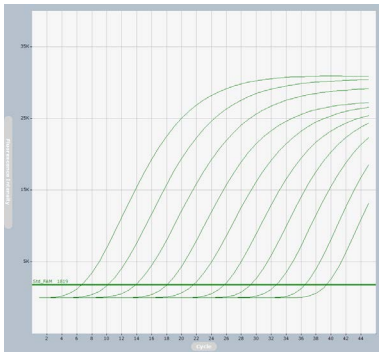


Figure 6. Ct values of 10-fold diluted samples show a wide dynamic range of quantification. Fluorescence data from a series of 10-fold dilution of PGK1 DNA(10^{10} copies) amplified using reporter dyes to check on target: FAM/PGK1.

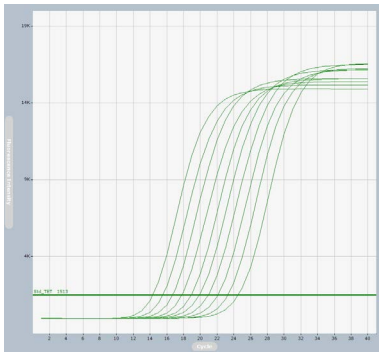


Figure 7. *Exicycler*™ 384 provide sensitive detection and precise target discrimination down to 2-fold differences Fluorescence data from a series of 2-fold dilution of CSF2 DNA(10^{8} copies) amplified using reporter dyes to check one target: TET/CSF2.

Application

- Gene expression analysis
- MicroRNA expression analysis
- Gene copy number analysis
- Pathogen detection
- Genetic mutation test
- GMO quantitative and qualitative test

Exicycler™ 384 Real-Time Quantitative Thermal Block

Specifications

Physical Specifications	
Dimension (cm)	35.5(W) x 54(D) x 47(H)
Weight	41 kg
Sample Capacity/ Size	384-well plate
Sample Volume (µl)	5~20 (10 recommended)
Power Consumption	100-240 VAC, 50/60 Hz, 800VA Max
Optical Specifications	
Light Source	Short Arc lamp (120W)
Sensor	16-bit 2D CCD
Excitation Filter / Emission Filter	5 sets
Operating Specifications	
Method of Heating / Cooling	Peltier element
Temperature Range	4.0~99.9℃
Temperature Accuracy	± 0.3℃
Temperature Uniformity	± 0.3℃
Max. Ramping Rate	4.5℃ /sec
Lid Temperature	90~120℃
Gradient Range	20~95℃
Temperature Increment Range	0.1~2.0℃
Time Increment Range	1~60 sec
Ramp Rate Control Range	1~100%
Operating Temperature	15~35℃
Operating Humidity	20~80%, no condensation
Computer Specifications	
Operating System	Windows 7 & 10 (32/64-bit OS)
Processor Speed	Intel Dual Core E2160 (1.8 GHz) or higher
Memory	1 GB or higher
Communication Port	USB 2.0 high speed
Screen Resolution	1280X1024 or higher

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-2061	*Exicycler*™ 384 Real-Time Quantitative Thermal Block

Related Products

Cat. No.	Premix & Reagent
K-6253	*AccuPower*® 2X *GreenStar*™ qPCR Master Mix, 50 µl/rxn, 100 rxn
K-6603	*AccuPower*® Plus *DualStar*™ qPCR Master Mix (2X), 2.5 ml

Cat. No.	Plastic Consumables
3111-4110	Adhesive Optical Sealing Film, 100 sheets

03. Protein Synthesis and Purification

ExiProgen™

Description

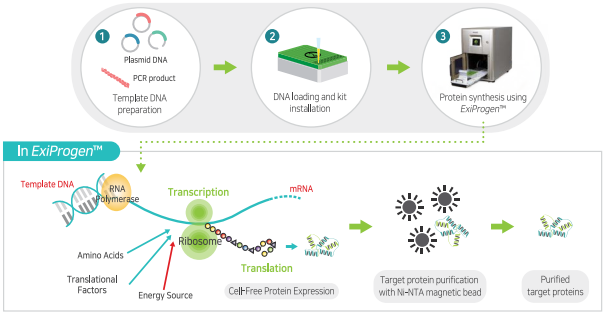
ExiProgen™ is an instrument that automatically synthesizes protein from DNA. This product performs *in-vitro* transcription and translation automatically when loaded with DNA coding a protein and a protein synthesis kit. By purifying this protein through affinity chromatography method, more than 90% pure protein can be obtained within 6 hours and up to 16 species can be produced at one time. In addition, highly expressed affinity tagged proteins can be purified in cell lines with high purity.

Features and Benefits

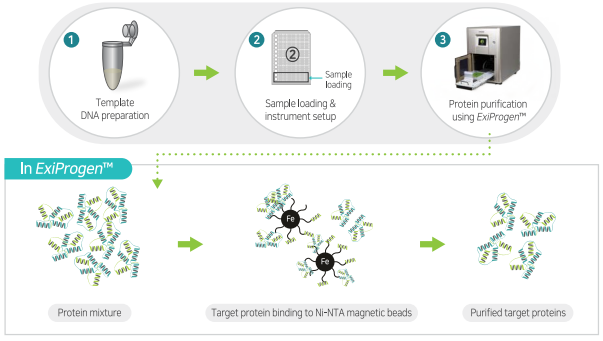
- **Protein synthesis and purification**
  Simply use *ExiProgen*™ kits and template DNAs to synthesize 16 different types proteins within 6 hours and purify the proteins with 90% purity using Ni-NTA Purification System.
- **Antibody & Protein Purification**
  His-tagged proteins and antibodies can be purified in a fully automated system using Ni-NTA bead, Protein A, Protein L and microbeads.
- **DNA/RNA Extraction**
  DNA/RNA extraction can be done in fully automated system with a high yield and purity using AccuNano-Silica bead. Moreover, Proteinase K can be processed automatically in the instrument using the heating blocks (Korean patent number 10-1025135).
- **Optimized protocols installed**
  Various protocols for protein synthesis and purification optimized for many types of samples, such as whole blood, tissue, cell, bacteria, plant, etc., are installed. A touch screen is available for the users to easily start and check its process in real-time.
- **Temperature control for preventing denaturation**
  A cooling block is installed to keep the temperature of the elution tube rack under 10℃ to avoid denaturation through heat.

Procedure

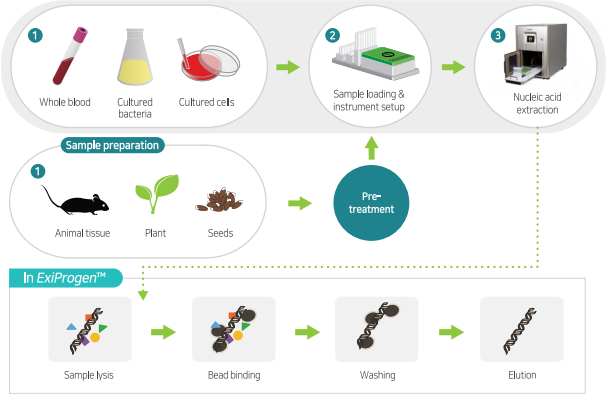
Protein synthesis



Protein purification



Nucleic Acid Extraction



Experimental Data

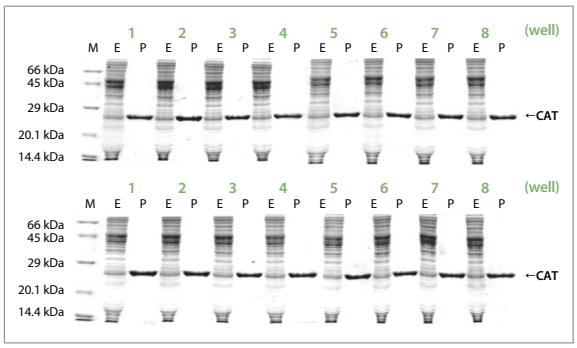


Figure 1. GFP protein (His-tagged protein)'s expression/purification with *ExiProgen*™.

M; *AccuLadder*™ Protein Size Maker (Low), (Cat. No. D-2020, Bioneer)
E; expression sample
P; purification sample

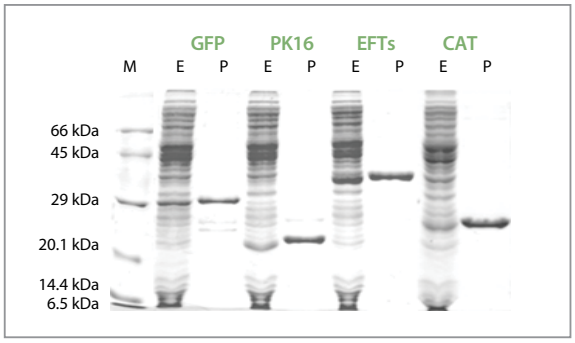


Figure 2. Simultaneous expression/purification of different kinds of proteins.

His-tagged proteins expression/purification with *ExiProgen*™
M: *AccuLadder*™ Protein Size Marker (Low) (Cat. No. D-2020, Bioneer)
Lane E: Expression sample
Lane P: Purification sample

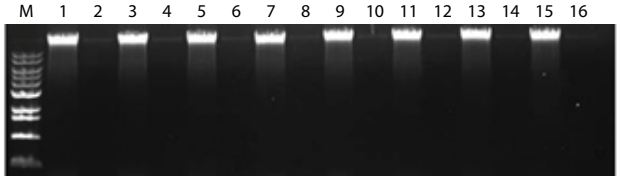


Figure 3. Genomic DNA from cultured mammalian cell (HeLa).

Lanes 1, 3, 5, 7, 9, 11, 13, 15 were extracted with $1X10^6$ cells of cultured HeLa cell and lanes 2, 4, 6, 8, 10, 12, 14, 16 were extracted with ddH_2O as a negative control in DNA extraction. Note all samples have similar yields. Purity was also tested and was consistently between 1.8 and 2.0 (not shown).

Application

- Enzyme engineering
- Protein evolution
- Synthetic biology
- Bio-energy R&D
- Protein drug R&D

Available Experiments with Bioneer's Kits

- Protein Synthesis/Purification Kit
- Genomic DNA Extraction Kit
- Total RNA Extraction Kit
- Viral DNA/RNA Extraction Kit
- Fragment DNA Purification Kit

Function

Protein Expression	○
Protein Purification	○
TFT Touch Screen	○
Sample Number	16 samples
UV Sterilization	○
Heating Block & Magnetic Block	○
Cartridge Contamination Shield	○
TCP/IP Network Connection	○
Temperature Controlled System	○
Automatic Dispensing	○

Specifications

Dimension (cm)		32(W) x 53.5(D) x 50(H)
Weight		27 kg
Temperature Range		15~35℃
Humidity Range		20~80%, no condensation
Operating System		Stand alone (Built-in)
User Interface		320 x 240 touch screen graphic LCD
Adaptor	AC Input	100–240 VAC, 2.3~0.8 A, 50/60 Hz
	DC Output	24 VDC, 7.5 A
Instrument	DC Input	24 VDC, 7.5 A
UV Sterilization		15-minute cycle
Communications		TCP/IP
Heating Temperature		40~90℃

*Instrument specifications can be changed for performance upgrade without any prior notifications.

ExiProgen™

Ordering Information

Cat. No.	Product Description
A-5041	*ExiProgen*™
Cat. No.	**Accessories**
A-5041-A	Accessories Set for *ExiProgen*™ (A2,3,4,5,6,7,10)
A-5041-A1	Multi Puncher (option)
A-5041-A2	Setup Tray
A-5041-A3	Disposable Tip Rack
A-5041-A4	Elution Tube Rack
A-5041-A5	Reaction Block (For Protein synthesis)
A-5041-A6	Waste Tray
A-5041-A7	Hole Puncher (6-hole)
A-5041-A9	AC Adapter for *ExiProgen*™, *ExiPrep*™16 Dx
A-5041-A10	Contamination Shield
Cat. No.	**Protein synthesis and Purification Kits for *ExiProgen*™**
K-7300	*ExiProgen*™ EC Protein Synthesis Kit, 16 rxns
K-7301	*ExiProgen*™ EC Protein Synthesis Kit, 32 rxns
K-7302	*ExiProgen*™ EC Protein Synthesis Kit, 96 rxns
K-7310	*ExiProgen*™ EC-Maxi Protein Synthesis Kit, 8 rxns
K-7320	*ExiProgen*™ EC-Tagfree Protein Synthesis Kit, 8 rxns
K-7330	*ExiProgen*™ EC-Disulfide Protein Synthesis Kit, 8 rxns
K-7220	*ExiProgen*™ His-tagged Protein Purification Kit, 16 rxns
K-7221	*ExiProgen*™ His-tagged Protein Purification Kit, 32 rxns
K-7240	*ExiProgen*™ Dialysis Kit, 16 rxns
Cat. No.	**Nucleic Acid Extraction Kits for *ExiProgen*™**
K-3200-CB	*ExiPrep*™ Beef Genomic DNA Kit
K-3200-CR	*ExiPrep*™ Rice Genomic DNA Kit
K-4212	*ExiPrep*™ Plus Tissue Genomic DNA Kit, 96 reactions
K-4214	*ExiPrep*™ Plus Bacteria Genomic DNA Kit, 96 reactions
K-4215	*ExiPrep*™ Plus Plant Genomic DNA Kit, 96 reactions
K-4244	*ExiPrep*™ Plus Plant total RNA Kit, 96 reactions
K-4271	*ExiPrep*™ Plus Viral DNA/ RNA Kit, 96 reactions
K-4272	*ExiPrep*™ Plus Viral DNA Kit, 96 reactions
K-4273	*ExiPrep*™ Plus Viral RNA Kit, 96 reactions

04. DNA/RNA Preparation

ExiPrep™16 Plus

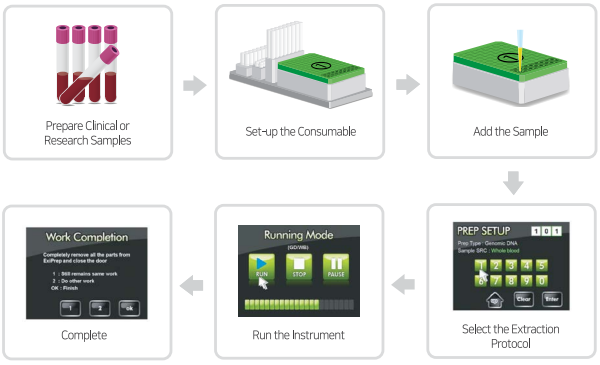
Description

ExiPrep™16 Plus is a compact and versatile feature developed by Bioneer. *ExiPrep*™ 16 Plus is an economical automatic purification device that can extract nucleic acid or affinity protein from various samples such as whole blood, tissue, cell, bacteria, and plant. *ExiPrep*™ 16 Plus can extract nucleic acids reproducibly by optimized experimental protocols from up to 16 samples.

Features and Benefits

- **Built-in optimized nucleic acid extraction protocol**
  Simplified usage and reproducible results with built-in nucleic acid extraction and protein purification protocols optimized for various samples and targets.
- **High-purity nucleic acid extraction**
  Extraction of highly pure nucleic acids by attaching magnetic particles to the bottom of each well equally and rapidly by magnetic blocks attached to the instrument. Increased elution efficiency allowing complete evaporation of alcohols by its heating block.
- **Prevention of contamination**
  Substantial blocking of cross-contamination, which may occur in other wells by the aerosols generated from the tip, through the sophisticated designs drop-contamination prevention device located at the bottom of the filter tip.
- **Automatic UV-lamp Sterilization**
  The UV sterilization lamp can be set to sterilize the instrument chamber before and after the extraction, eliminating inter-assay cross-contamination.
- **Convenient**
  The 3.5" touch screen offers an intuitive interface for operation such as selecting protocols and controlling the UV sterilization lamp. In addition, the progress of the experiment can be checked in real time, making it easier to use.
- **Excellent Precision**
  Minimized error range, that may occur during the automatic dispensing of the solution, through installment of an adjustable syringe motor up to 0.1 mm capable of stably distributing in a volume of 25~1,000 µl for application to various protocols and obtaining of experimental results.

Workflow



Experimental Data

Genomic DNA extraction from cultured mammalian cell (HeLa)

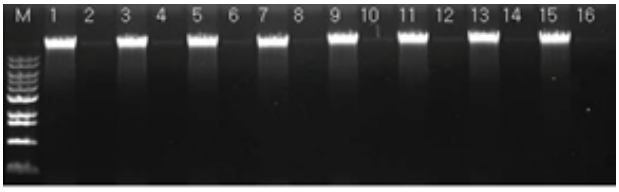


Figure 1. Lanes 1, 3, 5, 7, 9, 11, 13, 15 were extracted with $1X10^6$ cells of cultured HeLa cell and lanes 2, 4, 6, 8, 10, 12, 14, 16 were extracted with ddH_2O as a negative control in DNA extraction.
Note all samples have very similar yields. Purity was also tested and was consistently between 1.8 and 2.0 (not shown).

Genomic DNA extraction from bacteria (*E.coli*)

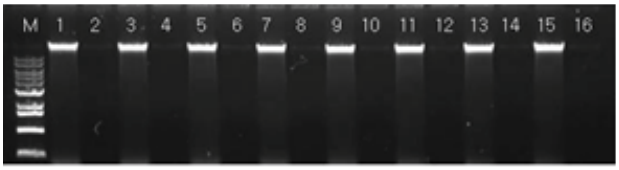


Figure 2. Lanes 1, 3, 5, 7, 9, 11, 13, 15 were extracted with $1X10^9$ cells of *E.coli* cells and lanes 2, 4, 6, 8, 10, 12, 14, 16 were extracted with ddH_2O as a negative control in DNA extraction.
Note all samples have very similar yields. Purity was also tested and was consistently between 1.9 and 2.0 (not shown).

RNA extraction

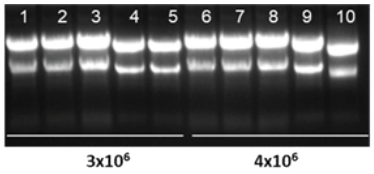


Figure 3. Comparison of Total RNA extracted from HeLa cell (~ 4 x 10^6) using *ExiPrep*™ Plus Total RNA Kit (Bioneer, automatic) and a competitor's kit (Competitor Q, manual/single column). DNase was not treated.
1-3: Bioneer *ExiPrep*™ Plus Total RNA Kit, mean yield; 38.6 µg, mean purity; 2.06
4-5: Competitor Q Total RNA Extraction Kit, mean yield; 39.7 µg, mean purity; 2.05
6-8: Bioneer *ExiPrep*™ Plus Total RNA Kit, mean yield; 46.1 µg, mean purity; 2.03
9-10: Competitor Q Total RNA Extraction Kit, mean yield; 49.7 µg, mean purity; 2.06

ExiPrep™16 Plus

Application

- Gene Expression Study
- Genetic Engineering
- GMP & Food poisoning test
- Biological terror detection

Function

DNA/RNA Extraction	○
TFT Touch Screen	○
Sample	16 samples
UV sterilization	○
Heating Block & Magnetic Block	○
Contamination shield of cartridge	○

Specifications

Dimension (cm)	32(W) x 53.5(D) x 48.7(H)
Weight	22 kg
Temperature Range	15~35℃
Humidity Range	20~80%, no condensation
Operating System	Stand alone (Built-in)
User Interface	320 x 240 touch screen graphic LCD
Electrical (Voltage/Frequency)	100-240 V, 50/60 Hz
UV Sterilization	15 minute cycle
Communications	TCP/IP
Heating Temperature	40~95℃

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-5030	*ExiPrep*™ 16 Plus
Cat. No.	**Nucleic Acid Extraction Kits for *ExiPrep*™ 16 Plus**
K-4211	*ExiPrep*™ Plus Blood Genomic DNA Kit, 96 rxns
K-4214	*ExiPrep*™ Plus Bacteria Genomic DNA Kit, 96 rxns
K-4215	*ExiPrep*™ Plus Plant Genomic DNA Kit, 96 rxns
K-4217	*ExiPrep*™ Plus Seed Genomic DNA Kit, 96 rxns
K-4241	*ExiPrep*™ Plus Total RNA Kit, 96 rxns
K-4244	*ExiPrep*™ Plus Plant Total RNA Kit, 96 rxns
K-4271	*ExiPrep*™ Plus Viral DNA/ RNA Kit, 96 rxns

ExiPrep™96 Lite

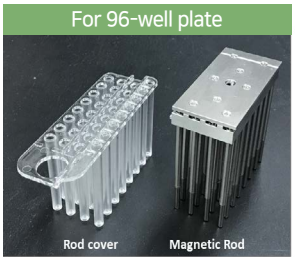
Description

ExiPrep™96 Lite can extract nucleic acids automatically from maximum of 96 samples using magnetic rods. Nucleic acids can be extracted from diverse sample volumes from small-scales of 0.4 ml to large-scales of 4 ml in a single run.

Features and Benefits

Extraction of nucleic acids from 8 to 96 samples

Magnetic rods can be selected from 8, 32 units to minimize waste of solutions while the extraction can be done simultaneously from maximum of 96 samples in one run.



Mini-scale nucleic acid extraction

Midi-scale nucleic acid extraction

Large-scale extraction from maximum of 4 ml

Nucleic acid extraction can be done from large scale samples such as cell-free DNAs.

Rapid nucleic acid extraction and protein purification

Nucleic acid extraction can be done within 40 minutes, while protein can be done within 60 minutes.

Compatible with various types of samples

Types of samples that can be used for nucleic acid extraction includes blood, bacteria, tissues, cells and plants.

Optimized protocols

Kit that are optimized for extracting nucleic acids or purifying proteins from various samples are available while the protocols for each of them are installed the machine, allowing to simply select the correct one without the need of setting them from the start.

Contamination Prevention

A UV lamp and a contamination prevention shield are installed.

Efficient Spatial Usage

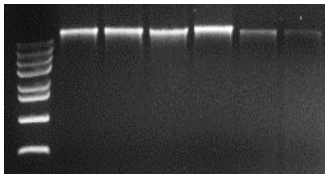
The compact size of the instrument allows users to install it in their labs without worrying about the space capacity.

Experimental Data

Genomic DNA Extraction

M: 1 kb DNA Ladder (Cat. No. D-1040, Bioneer)
Lane 1: *MagListo*™ (Manual type, Bioneer)
Lane 2: *ExiPrep*™96 Lite
Lane 3: Company Q (Manual type)

Animal tissue (Beef)

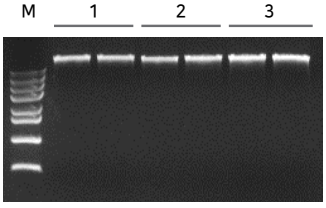


	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	30.28	1.78	1.18
	29.41	1.71	1.14
2	36.88	1.83	1.06
	34.96	1.82	1.07
3	26.70	1.97	1.16
	21.66	1.98	1.77

* Elution Volume: 100 μl

Figure 1. Animal tissue genomic DNA extraction using *MagListo*™ Genomic DNA Extraction Kit. DNA extraction from 30 mg of Beef.

Human Whole blood



	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	22.49	1.77	0.97
	22.17	1.83	0.96
2	23.03	1.78	0.67
	29.95	1.71	0.52
3	30.34	1.84	1.60
	32.34	1.71	0.93

* Elution Volume: 100 μl

Figure 2. DNA Extraction from 200 μl of human whole blood.

Plasmid DNA Extraction

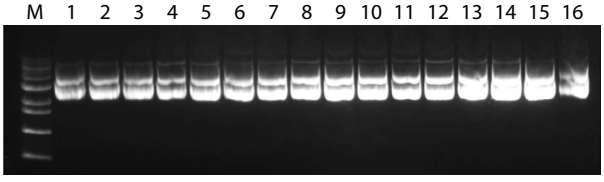


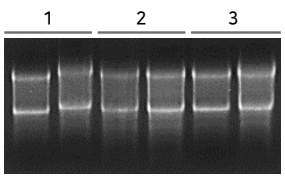
Figure 3. Plasmid DNA extraction using *ExiPrep*™96 Lite.

Lane 1-12: *MagListo*™ 5M Plasmid DNA Extraction kit with *ExiPrep*™96 Lite.
Lane 13-14: *AccuPrep*® Plasmid Extraction kit
Lane 15-16: Competitor's kit
Average yield: 8 μg of pBlueScript plasmid in DH5α (OD_{600}=2.7) using *ExiPrep*™96 Lite

RNA Extraction

M: 1 kb DNA Ladder (Cat. No. D-1040, Bioneer)
Lane 1: *MagListo*™ (Manual type, Bioneer)
Lane 2: *ExiPrep*™96 Lite
Lane 3: Company Q (Manual type)

Mouse kidney

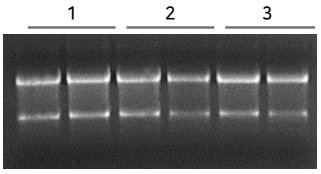


	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	511.0	2.08	2.26
	510.9	2.05	2.24
2	690.2	2.03	2.41
	694.4	2.07	1.91
3	461.7	2.12	1.89
	490.1	2.10	2.01

* Elution Volume: 100 μl

Figure 4. Animal tissue RNA extraction using *MagListo*™ Universal RNA Extraction Kit. RNA extraction from 20 mg of *Mus musculus* liver. DNase was not treated.

Cultured Cell (HeLa)



	Conc. (ng/μl)	$A_{260/280}$	$A_{260/230}$
1	249.9	2.08	2.19
	282.8	2.05	2.24
2	188.2	2.04	1.86
	250.8	2.03	1.98
3	228.6	2.07	2.17
	205.2	2.08	1.54

* Elution Volume: 100 μl

Figure 5. Cultured cell RNA extraction using *MagListo*™ Universal RNA Extraction Kit. RNA extraction from 1×10^6 of HeLa cell. DNase was not treated.

Application on cfDNA extraction, *MagListo*™ cfDNA Extraction kit

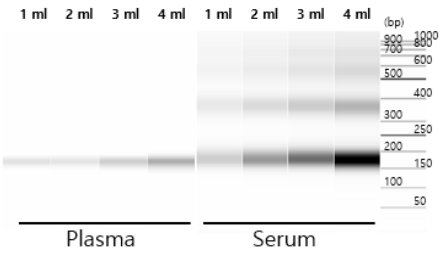


Figure 6. Cell-free DNA extracted using *MagListo*™ cfDNA Extraction kit and *ExiPrep*™96 Lite. Cell-free DNA was isolated from various volume of plasma and serum using *ExiPrep*™96 Lite. DNA was visualized using Agilent 5200 Fragment Analyzer System.

Specifications

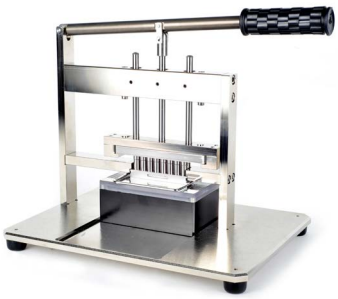
Physical specifications	
Dimension (cm)	40(W) x 57.5(D) x 54.6(H)
Weight	46 kg
Voltage / Frequency	100-240V~, 50/60 Hz
Power	500 VA Max (Fuse: 250V, F6:3AL, 2 ea)
Operating specifications	
Heating Block	30~90℃
Temperature Controlled Block	4~90℃
Operating Temperature	15~35℃
Operating Humidity	20~80%, no condensation
Operating System	Built-in
Communication	TCP/IP
User Interface Display	7-inch Touch Screen
Data Storage	USB 2.0 (x2)

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-5250	*ExiPrep*™ 96 Lite
Cat. No.	**List of Kits for *ExiPrep*™96 Lite**
K-4611	*ExiPrep*™ 96 Genomic DNA Kit
K-3601	*MagListo*™ 5M Plasmid Extraction Kit
K-3603	*MagListo*™ 5M Genomic DNA Extraction Kit
K-3613	*MagListo*™ 5M Tissue Total RNA Extraction Kit
K-7200	*MagListo*™ His-tagged Protein Purification Kit
K-7710	*MagListo*™ Protein G Kit
K-7720	*MagListo*™ Protein A Kit
K-7730	*MagListo*™ Protein L Kit

ExiCracker™



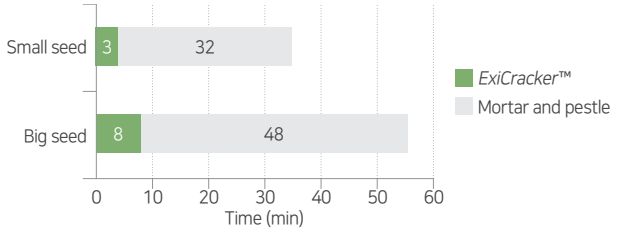
Description

ExiCracker™ can crush samples such as plants or solid tissues like seeds, leaves, roots. 16 samples can be crushed simultaneously with minimized loss, making it a better choice for sample preparation then conventional mortars and pestles in terms of time and efficiency.

Features and Benefits

- **Process 16 samples in one run**

  Sample racks can contain maximum of 16 samples.
  The handle on the upper part of the instrument can move the crushing pestle to grind them together, allowing to prepare them with quick and ease.



- **Prepare plant tissues and seeds**

  This instrument is capable of crushing hard seeds and leaf tissues, such as pumpkins, sunflowers, wheats, broccolis and cabbages.

- **Semi-permanent**

  The sample rack and the crushing pestle are constructed. with alloys that have went through special treatments to not only increase durability, but also to provide more resistance to corrosions for semi-permanent use.

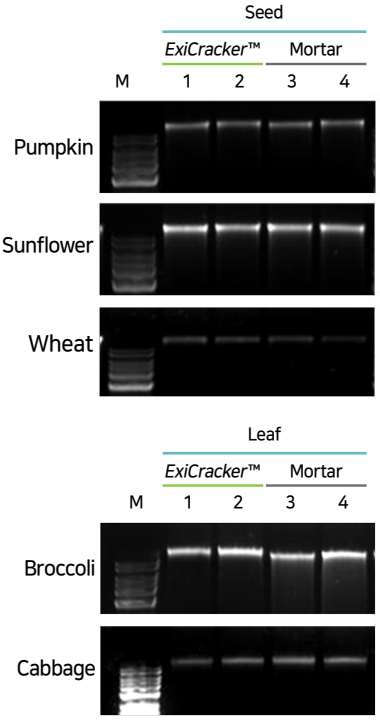



Specifications

Dimensions (cm)	30(W) x 23(D) x 28(H)
Weight	6.5 kg
No. of wells	16 wells
Diameter of wells	8 mm

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Experimental Data



* 1% Agarose gel electrophoresis in 1x TBE (M; 1kb marker)

Figure 1. Comparison of sample extraction efficiency between *ExiCracker*™ and the conventional mortar & pestle.

Ordering Information

Cat. No.	Product Description
A-5030-A21	*ExiCracker*™
Cat. No.	**Product Description**
K-3605	*MagListo*™ 5M Plant Genomic DNA Extraction Kit
K-4215	*ExiPrep*™ Plus Plant Genomic DNA Kit
K-4217	*ExiPrep*™ Plus Seed Genomic DNA Kit
K-4244	*ExiPrep*™ Plus Plant Total RNA Kit

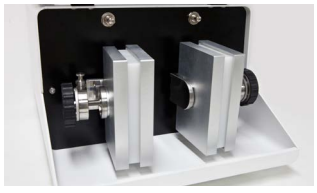
ExiBeater™

Description

ExiBeater™ can quickly smash 192 (96 x 2) samples in a single run. This instrument can crush those that are difficult to undergo lysis, such as plant tissues (seeds, stems and leaves), animal tissues, cells.

Features and Benefits

- **Prepare maximum of 192 samples in a single run**
  Two 96 sample racks can be loaded in the instrument for fast and efficient homogenization & pulverization.
- **Crush various samples**
  Samples such as plant tissues, animal tissues, and cells can be crushed and homogenized. Those that are sensitive to heat can also be pulverized by freezing the rack beforehand. Both wet and dry samples can be used.



Specifications

Dimension (cm)	30(W)X42(D)X18(H)
Power	400W
Power supply	220V / 50 Hz
Travel	35 mm
Vibration Frequency Setting	10~2100 times / minute
Sample Capacity	1~2 ml
Sample Size	≤ 8 mm
Output Particle Size	~ 3 μm
Typical Crushing time	2 min
Weight	~ 20 kg
Number of grinding platforms	2
Grinding tank type	Milling tank with screw-on screw cap 1.5-50 ml, optional
Grinding kit material	Hard steel, Teflon nylon 0.5 / 1.5 ml / 2 ml (centrifuge tube / PCR tube)
Grinding kit size	25 ml / 50 ml (grinding tank)
Grinding ball material	Agate, stainless steel, zirconia, tungsten carbide, ceramic
Grinding adapter	Adapter 2 × 48 holes; 5ml adapter 2 × 24 holes.
Crushing time setting	Digital display 0 seconds-9999 minutes

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-6040	*ExiBeater*™

05. Electrophoresis

Agaro-Power™

Description

Agaro-Power™ is an instrument for agarose-gel electrophoresis that can quickly load 96 samples. The loading adaptor that can insert multi-channel pipettes is equipped with a cover that can load 96 samples within a minute. The main body of the electrophoresis system and the gel casting tray is made of polycarbonate, increasing the durability. A power supply capable of controlling two voltage levels is also included.

Features and Benefits

Tank/Lid

The tank is made with transparent polycarbonate, allowing not only to be durable, but also to see the electrophoresis process clearly.

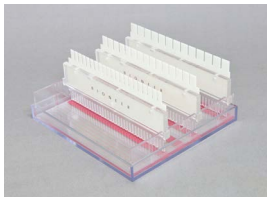
Loading adaptor

The self-developed loading adap tor is capable of fixing the well in the correct position for the samples to load quickly and accurately.

Power supply

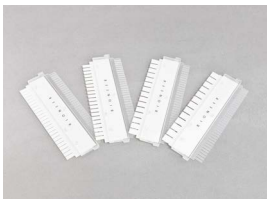
Our power supply can supply low (75 V) or high (150 V) voltage which can be controlled with ON/OFF system.

Gel caster & tray



The combs and the dam allows the users to easily create the gel with their same depths and isolate it.

Comb set



The set consisting of 4 combs having 34/25/21/15/13 wells per line will be provided together after purchasing the *Agaro-Power*™ System.

Specifications

Distance Between Electrodes	22.8 cm
Buffer Volume	700 ml
Gel Tray Size (cm)	16.3(L) x 14.9(W)
Comb (No. of teeth)	25 well or 34 well/line x 1ea
	21 well or 34 well/line x 1ea
	15 well or 34 well/line x 1ea
	13 well or 34 well/line x 1ea
Caster Size (cm)	17(L) x 15.6(W)
Input Voltage	110 VAC 50/60 Hz, 220 VAC 50/60 Hz
Output Voltage	High : 150V±10% / Low : 75V±10% (User selectable)

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-7020	*Agaro-Power*™ System
Cat. No.	**Plastic Consumables**
A-7020-1	*Agaro-Power*™, Power Supply
A-7020-2	*Agaro-Power*™, Agar Tank/Lid
A-7020-3	*Agaro-Power*™, Comb Set
A-7020-3-1	*Agaro-Power*™, Comb (25 / 34 well)
A-7020-3-2	*Agaro-Power*™, Comb (13 / 34 well)
A-7020-3-3	*Agaro-Power*™, Comb (15 / 34 well)
A-7020-3-4	*Agaro-Power*™, Comb (21 / 34 well)
A-7020-4	*Agaro-Power*™, Gel Caster/Tray
A-7020-5	*Agaro-Power*™, Cable Jack

DUALED Blue/White Transilluminator

Description

DUALED Blue / White Transilluminator is designed innovatively with highly sensitive dual light sources to observe nucleic acids stained fluorescently with dyes such as *GreenStar*™ Nucleic Acid Staining Solution I (Cat. No. C-9036, Bioneer) using 470 nm blue LED light. This product can be also used for visualizing proteins on SDS-PAGE gel stained with Coomassie Brilliant Blue staining solution using white LED light. Furthermore, with the use of LED light harmless to human health, it can provide safe lab environment during agarose gel cutting and data imaging analysis.

Features and Benefits

- **Dual LED light sources**
  - Blue LED light: Check the fluorescence dyed nucleic acids on an agarose gel under the blue light.
  - White LED light: Check the protein dyed with Coomassie Blue Staining Solution on the dyed SDS-PAGE gel and western blot X-ray film under the white light.
- **Safety**
  See the dyed nucleic acids safer by using *GreenStar*™ Nucleic Acid Staining Solution I (Cat. No. C-9036, Bioneer), unlike the conventional EtBr having carcinogenic properties. Moreover, *GreenStar*™ Nucleic Acid Staining Solution I provide clearer image than the latter.
- **Removable Excitation Light filter**
  Move the excitation light filter in 0° and 60° while being removed for better sample observation and convenient gel cutting.
- **3-Lavel Light Control System**
  Control its light intensity in 3 levels.
- **Convenience**
  Freely move and place the instrument with its light weight and compact size.

Experimental Data

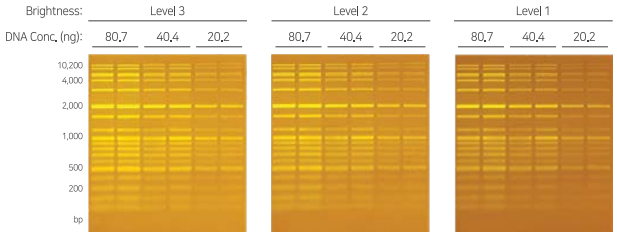


Figure 1. A gel image showing a clear photo of nucleic acids dyed with *GreenStar*™ Nucleic Acid Staining Solution I (Cat. No. C-9036, Bioneer), viewed under three different light intensity levels.

Application

- **Identifying nucleic acid**
  Cloning, PCR, gel cutting, purification, sequencing
- **Identifying proteins**
  SDS-PAGE, western blot X-ray film

Specifications

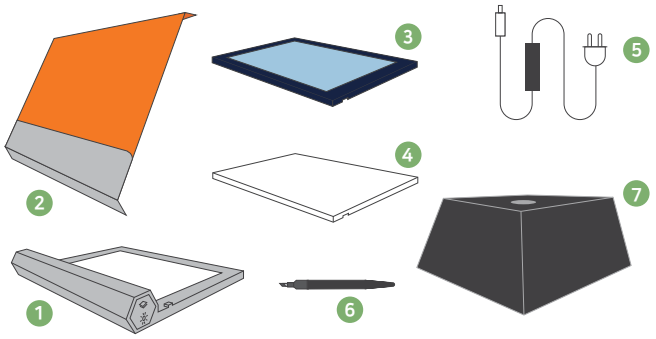
Dimension (cm)	18.5(W) x 22(D) x 3(H)
Viewing Surface Dimension (cm)	12(W) x 18(D)
LED wavelength (nm)	470 nm
Lid / Filter	Amber (580 nm)
LED life (hours)	> 30,000
Cetrifications	CE/ETL
Input Voltage	100-240 Vac
Input Current	2.0 A
Automatic Power-off	5 min
Weight	2.27 kg
The number of LED lamps	36 blue-light LED lamps/ 24 white-light LED lamps
Package Set	Gel-cutting knife, replacement blade, mini darkroom

*Instrument specifications can be changed for performance upgrade without any prior notifications.

DUALED Blue/White Transilluminator

Components

Number	Components
①	DUALED Blue/White Transilluminator base
②	Amber filter cover
③	Blue uniform plate
④	White uniform plate
⑤	Power cord
⑥	Gel-cutting knife and replacement blade
⑦	Mini darkroom



Experimental Method

Blue Light Mode		White Light Mode
Agarose Gel Cutting	Agarose Gel Imaging	SDS-PAGE Gel Imaging

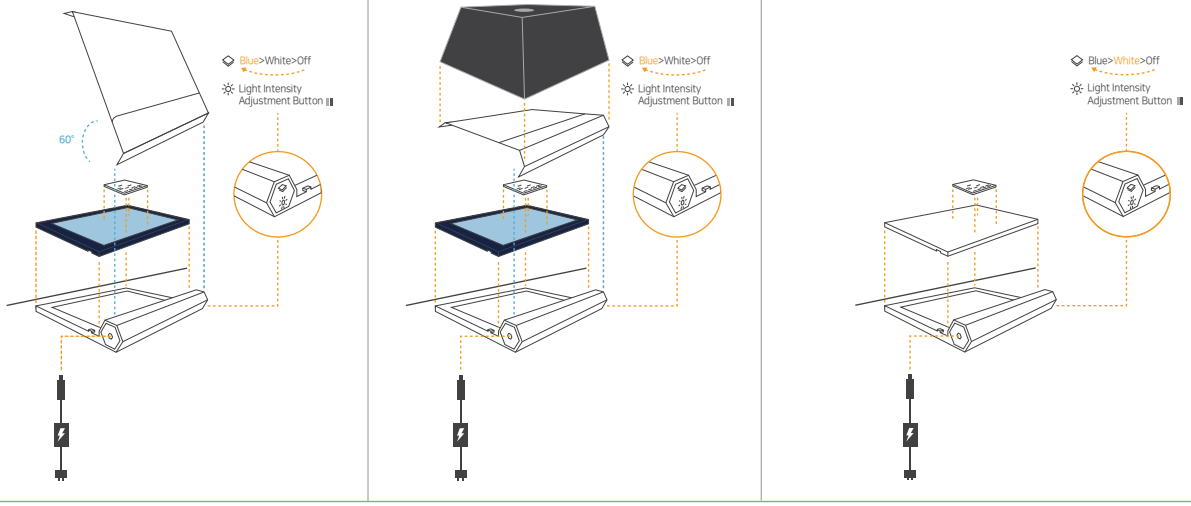


Figure 2. Experimental method of DUALED Blue/White Transilluminator (Left: Blue Light Mode / Right: White Light Mode).

Ordering Information

Cat. No.	Product Description
A-6020	DUALED Blue/White Transilluminator
Cat. No.	**Product Description**
C-9036	*GreenStar*™ Nucleic Acid Staining Solution I

DUALED Blue/White Transilluminator FAQs

Checking nucleic acids

1. How do I set this equipment for DNA verification?

Set this equipment in this following order. You can film with your smartphone afterwards.

DUALED Blue/White Transilluminator base → Blue uniform plate → Agarose gel → Amber filter cover → Mini darkroom

2. Are the blue uniform plate and the amber filter cover crucial when checking the DNA bands?

Yes, those must be used. While the blue uniform plate is used for filtering LED light to 470 nm wavelength bands for excitation of fluorescent dye components attached to the DNA samples, the amber filter cover is for blocking the excitation spectrum for clear visualization of fluorescent without any light interference.

3. Is the mini darkroom necessary during DNA observation?

It's not essential, but it allows more clear observation through blocking reflected ambient light.

4. Can I cut the DNA bands directly from an agarose gel on the blue uniform plate?

Yes, its upper part where the blade touches is made with scratch-resistant materials. However, it is advised to handle with care as the blade may crack the glass if pressed too hard.

5. The intensity of DNA stained with fluorescent dyes seems to be low.

1. Make sure that the fluorescent dyes have an excitation wavelength of 400~500 nm
2. Try increasing the sample concentration as its insufficiency may hinder the DNA visualization
3. Adjust the sample fluorescent intensity by using the 3-step brightness control button on the main unit of transilluminator base
4. Change brightness, contrast, and exposure time to adjust the fluorescence intensity when taking images using smartphones.
5. Use Mini Darkroom which can provide more clear visualization of DNA by blocking the reflected ambient light

Checking proteins

1. How do I set this equipment for DNA verification?

Set this equipment in this following order. You can film with your smartphone afterwards.

DUALED Blue/White Transilluminator base → White uniform plate → SDS-PAGE gel → Mini darkroom.

2. What is the purpose of the white uniform plate?

It protects the DUALED Blue/White Transilluminator base from staining by dye and seeping of moisture through the base. Furthermore, it enhances the visualization of SDS-PAGE data.

3. Can the protein bands on the SDS-PAGE gel dyed with Coomassie blue staining be visible without destaining?

Yes, those can be seen easily without the staining process by adjusting the camera brightness, contrast, and exposure time.
Using the mini darkroom allow clear visualization through protection from the surrounding light.

Regarding the customer service / warranty (A/S)

1. How does the warranty work on the defective machines?

1. The warranty lasts for one year from the purchase date. During this period, any faulty products or parts will be repaired or replaced for a free of charge. Please contact our customer service center by calling +82-42-930-8777 or sending an email to sales@bioneer.com for details.
2. However, free warranty will not be supported under those circumstances:
   - In the case of disassembling, changing, or breaking the device user's own will (in such cases, the repair may be charged or denied)
   - In the event of natural disaster
   - In the case of machine failure caused by user's carelessness or mishandling
   - In the case of repair by a person other than an authorized agent or a BIONEER employee
   - In case of using accessories supplied by people from other than BIONEER
   - In case of being damaged by replacement of spare parts
3. If the warranty period has expired, there will be charges for repairs or replacement of defective products. Please call customer service at Tel. +82-42-930-8777 or email at sales@bioneer.com and specify the details. We will contact you back after our inspection.

If you have any additional questions, please contact us at sales@bioneer.com

06. Vortexing & Spin-down

ExiSpin™

Description

ExiSpin™ is instrument for protocols requiring repetitive vortexing and spin-down. Furthermore, up to four 8-strip tubes can be held to not only save time, but also mix the solutions for reproducible results. Those instruments are essential for researches of all the fields utilizing microtubes, including but not limited to molecular diagnostics, biochemistry, molecular chemistry, etc.

Features and Benefits

- **Fully Automated Spin-Mix-Spin Technology**

  Duration and speed can be selected for every spin-mix-spin procedure. The spin-down and mixing parts can be selectively adjusted depending on the types of samples and conditions for each steps. The instrument will run and undergo the set steps automatically in efficient and reproducible ways.

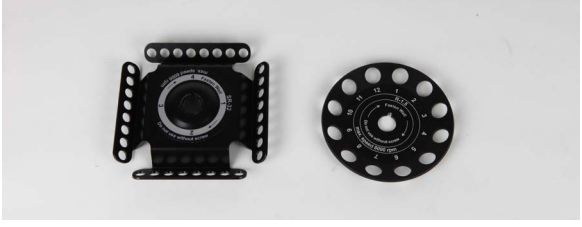
  1st spin: Spin down sample
  Vortexing of samples
  2nd spin: Spin down mixed sample

- **Convenience & High reproducibility**

  Optimized protocols provided depending on the sample types to reduce the error rate with reproducible conditions. Minimized experimental time capable of loading four 8-well strips simultaneously to produce 32 PCR/qPCR mixtures or twelve 1.5 microtubes for cell lysis. Easy replication of inputted protocols remaining during the power-on by just pressing few buttons.

- **Economical Efficiency**

  ExiSpin™ has both the ability to centrifuge and vortex and is very economical as it is not necessary to buy all two devices. Both rotors for 8-strip PCR tube and 1.5 ml microcentrifuge tube provided for *ExiSpin*™, along with ones for PCR tubes to reduce cost to buy additional accessories.



<Rotors for 8-strip PCR tube [left] and 1.5 ml microtube [right]>

Application

- Bacterial Cell lysis
- PCR/qPCR reaction
- Restriction enzyme, kinase/ligation reaction
- Experiments requiring repeated mixing and spin-down

Specifications

Dimensions (cm)	19(W) x 12.5(D) x 12.5(H)
Weight	2.7 kg
Spin Regulation	1,000~3,500 rpm (increment 100 rpm)
Spin Timer	1 sec~30 min
Vortexing Strength	Soft, Medium, Hard
SMS- Cycle Regulation	1~999 cycles
Power Supply	AC 24 V, 1,250 mA

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-7040	*ExiSpin*™

ExiSpin™96

Description

ExiSpin™96 is instrument for protocols requiring repetitive vortexing and spin-down. *ExiSpin*™96 consists of three types of rotors and is a large-capacity processing unit that can process up to 96 samples at the same time, which can reduce experiment time in molecular biology research including PCR. Those instruments are essential for researches of all the fields utilizing microtubes, including but not limited to molecular diagnostics, biochemistry, molecular chemistry, etc.

Features and Benefits

- **Fully Automated Spin-Mix-Spin Technology**

  Duration and speed can be selected for every spin-mix-spin procedure. The spin-down and mixing parts can be selectively adjusted depending on the types of samples and conditions for each step. The instrument will run and undergo the set steps automatically in efficient and reproducible ways.

  1st spin: Spin down sample
  Vortexing of samples
  2nd spin: Spin down mixed sample

- **Convenience & High reproducibility**

  Optimized protocols provided depending on the sample types to reduce the error rate with reproducible conditions. Easy replication of inputted protocols remaining during the power-on by just pressing a button. Up to 96 samples (twelve 8-strip tube, eight 12-strip tube, 96 well plate) can be used simultaneously to quickly produce a PCR/qPCR mixture.

- **Economical Efficiency**

  ExiSpin™ has both the ability to centrifuge and vortex and is very economical as it is not necessary to buy all two devices. Both rotors for 8-strip PCR tube and 1.5 ml microcentrifuge tube provided for *ExiSpin*™, along with ones for PCR tubes to reduce cost to buy additional accessories.

Application

- Bacterial cell lysis
- PCR/qPCR reaction
- Restriction enzyme, kinase/ligation reaction
- Experiments requiring repeated mixing and spin-down

Specifications

Overall Dimensions (cm)	28.5(W) x 35(D) x 19(H)
Weight	6.1 kg
Speed Regulation	300~1,500 rpm
Min. RCF at 1500 rpm	175 xg
Vortex Regulation Range	300~1,200 rpm
Setting Resolution	100 rpm
Display	LCD, 2 x 16 signs
Centrifugation Mode Time Range	0-30 min (increment 1 sec)
Vortex Mode Time Range	0~60 sec (increment 1 sec)
Number of Cycles	1~999 cycles
Chamber Diameter	210 nm
Input current/ Power Consumption	21 V, 1.5A / 18 W
External Power Supply	Input AC 100-240 V 50/60 Hz; Output DC 12 V

*Instrument specifications can be changed for performance upgrade without any prior notifications.

Ordering Information

Cat. No.	Product Description
A-7140	*ExiSpin*™ 96
A-7140-1	Rotor for 96 well plate
A-7140-2	Rotor for 8-strip tubes / 96 tubes
A-7140-3	Rotor for 12-strip tubes / 96 tubes