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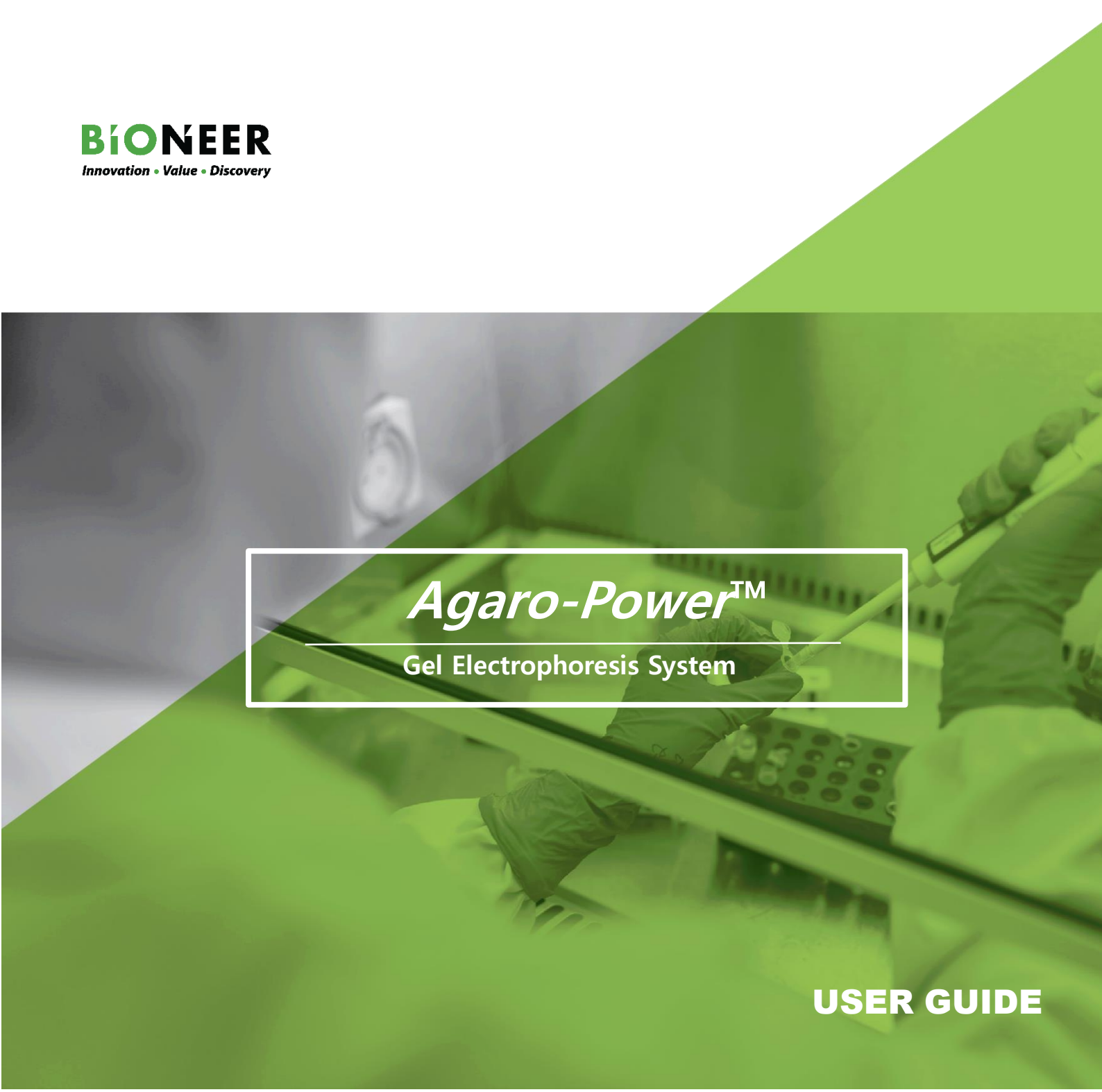

Agaro-Power™

Gel Electrophoresis System

USER GUIDE

REF A-7020

0 ℃ 40℃

Version 3.0 (2023-10-17)

For Research Use Only. Not for Use in Diagnostic Procedures.

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Tables

Please read the entire contents of this User Guide before operating the instrument.

INTENDED USE

Agaro-Power™ is an instrument for agarose-gel electrophoresis that can quickly load 96 samples. *Agaro-Power*™ is for research use only (RUO). Not for use in diagnostic procedures.

How in works

Agaro-Power™ is an electrophoresis instrument that makes agarose gel using a tray, puts the gel in a tank filled with buffer, loads DNA on the gel, and separates DNA through an electrode.
The principle of electrophoresis is that when DNA with negative charge is placed between two (-) and (+) electrodes, it moves to the (+) pole to separate DNA fragments.

Advantages

- Tank/Lid
  The tank and lid are made with transparent polycarbonate, allowing not only to be durable, but also to see the electrophoresis process clearly.
- Loading Adaptor
  Multiple samples can be loaded quickly using a multi-channel pipette.
- 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 gel caster is marked with scales so that gels of the same thickness can be made, and large-capacity gels can be produced.
- Comb Set
  The comb consists of 4 types in various formats, and 96 samples can be loaded at once, which is convenient for large-scale experiments.

PRODUCT INFORMATION

Agaro-Power™ is an electrophoresis instrument and consists of a tank, a power supply, and a tray for making gel.

Figure 1. *Agaro-power*™ system

Product Specifications

Operating Specifications	
Distance between electrodes	22.8 cm
Buffer volume	700 mL
Gel tray size	16.3 (L) * 14.9 (W) cm
Comb (Number 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) * 15.6 (W) cm Length (4.7, 7.1) cm
Input Voltage	100/110/220/230 Vac 50/60 Hz (Factory preset to that country's voltage)
Output Voltage	High: 150 V±10% / Low: 75 V±10% (User selectable)
Operation temperature range	15 – 35 °C
Operation humidity range	20 – 80 % (relative humidity, non-condensed))
Transport and storage temperature	0 – 40 °C
Transport and storage humidity	20 – 80 % (relative humidity, non-condensed))

Product Components

Components of *Agaro-Power*™ are as follows.

Table 1. Product components

No.	Components	Cat.No	Qty.	Description
1	Power Supply	A-7020-1	1ea	Power supply, regulated at 75V and 150V
2	Agaro Tank/Lid	A-7020-2	1ea	Tank and lid for electrophoresis
3	Comb Set	A-7020-3	1ea	Consists of a set of combs for making gel wells
4	Gel Caster/Tray	A-7020-4	1ea	Tray for making gel

Functional Description

Do not modify the components mentioned in this User Guide, and do not use any components or accessories that are not mentioned in the Guide. We are not responsible for any problems arising therefrom.

Figure 2. Product view

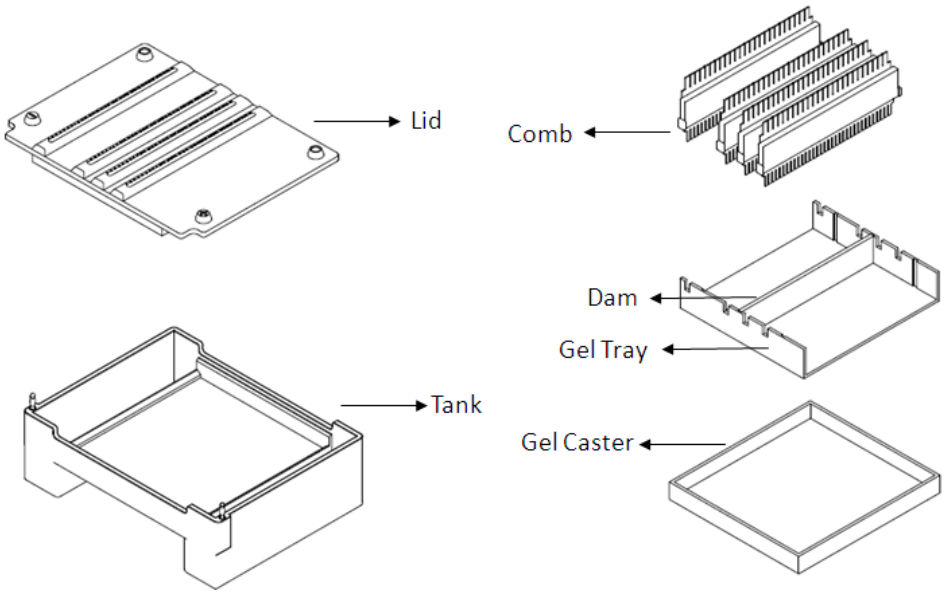


Figure 3. Part name

Tank/Lid

1) The running tray has a built-in loading adapter (96-sample loading adapter). Well numbers are written on the loading adapter to reduce errors and reduce loading time. For example, 96 samples can be loaded in 5 minutes.
2) The transparent lid allows you to see the progress of the electrophoresis
3) A large buffer volume reduces heat that may occur from prolonged electrophoresis and possibly cause experimental deviations.

Power Supply

1) The compact Power Supply supplies either low (75 V) or high (150 V) voltage, and is controlled by an ON/OFF system.
2) The electrophoresis of 96 samples on the high voltage (150V) setting takes about 30 minutes.

Gel Caster/Gel Tray

1) The length of the gel can be adjusted, allowing you to adjust the time length of electrophoresis according to the sample to be analyzed.
2) The width of the gel is 16 cm, and the length can be adjusted to either 7.5 cm or 15 cm using the dam.
3) When inserting the comb into the gel caster, it can be fixed, so you can make gel accurately and conveniently.
4) Teeth on both inner sides of the caster prevent the formed gel from sliding.
5) The gel is made accurately and made it conveniently for users because position of the comb is fixed in gel caster.
6) The color of the sample loading part of the tray makes loading easy, and the grid line makes it easy to distinguish the moving distance of the sample.

Figure 4. Gel Caster marker

Comb

1) The Comb Set is composed of 4 types in the form that both sides can be used.
2) All 34 wells on one side and different number of wells on the other side.
   (25well + 34 well / 21well +34well / 15well + 34well / 13well +34well)
3) When using three 34 well combs, 96 samples can be loaded excluding markers.

⚠CAUTION

Platinum electrode

Platinum electrode is fragile, so be careful not to damage it by cleaning or polishing.

Technical drawing

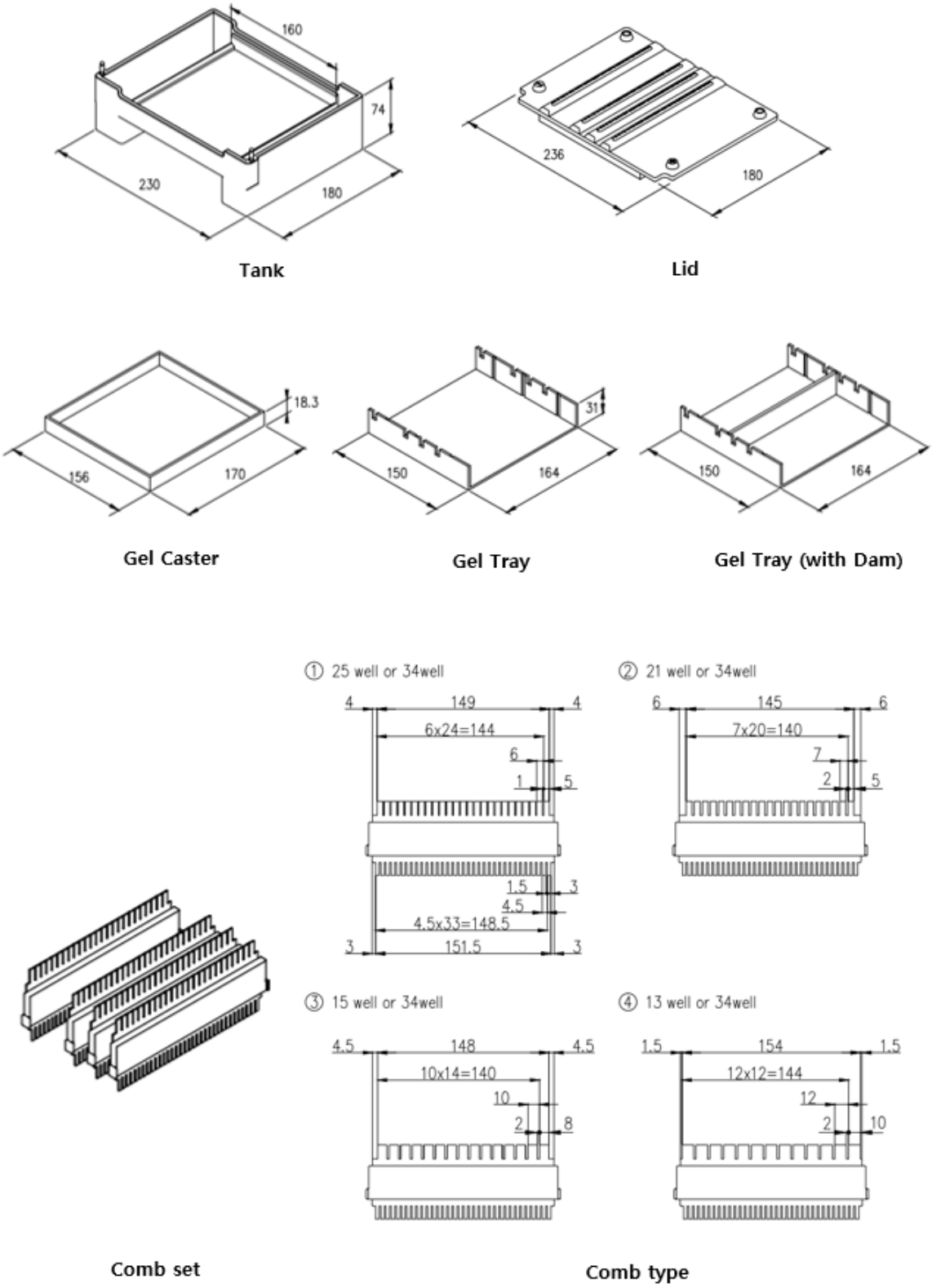


Figure 5. Technical drawing

WARNINGS AND PRECAUTIONS

Before use, please read the warnings and precautions for safety to ensure proper use. The precautions indicated here contain important information regarding safety and must be observed as they are intended to prevent accidents or danger by using the product safely and correctly. In this user guide, the degree of danger in the event of mishandling is classified into the following three grades. “Warnings and Precautions for Safety” are classified into five categories: “Danger”, “Warning”, “Caution”, “Electrical Hazard”, and “High Temperature Warning”, and their meanings are as follows.

Ignoring this sign and mishandling the instrument may cause death or serious injury.

Ignoring this sign and mishandling the instrument may cause death or serious injury due to an electric shock.

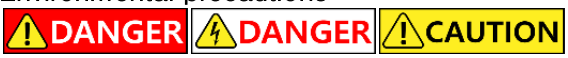
Ignoring this sign and mishandling the instrument may cause the possibility of death or serious injury.

Ignoring this sign and mishandling can result in death or serious injury due to high temperatures.

Ignoring this sign and mishandling the instrument may cause personal injury or property damage.

Usage environment and installation

Environmental precautions



1) Do not place objects around the product that may interfere with the use of the product.
2) Install the instrument away from dusty places. If not, it may cause an instrument malfunction or failure.
3) Install it away from fire hazards, such as electric heaters. If not, it may cause fire.
4) Install it away from splashing water or high humidity areas. If not, it may cause an electric shock, fire, or malfunction.
5) Do not install it in a place where inflammable or corrosive gas is generated. In case of a gas leak, open the windows to ventilate. Do not touch the power cable of the instrument. Sparks can cause an explosion or fire.
6) Do not disassemble or modify the instrument without permission. It may cause a fire, electric shock, and breakdown, and you cannot receive after-sales services.
7) This instrument should be used within the ambient temperature range of 15℃-35℃. If the external temperature is too high or too low, it may affect the operation of the instrument, and accurate test results cannot be guaranteed.
8) When operating, the recommended humidity (20-80%, no condensation of water) should be maintained. If the humidity is too high or too low, it may cause corrosion or malfunction of the instrument.
9) Since this instrument contains precision optical parts, do not subject it to severe impacts or drop it. It can cause instrument failure and safety concerns.
10) When the instrument is not in use for a prolonged period of time, turn off the power and unplug the cable to prevent fire hazards due to heat or ignition.

Electrical safety warnings, precautions, and dangers

DANGER WARNING CAUTION

1) The output voltage of this product varies depending on the input voltage. You must request the input voltage you want to use before ordering.
2) Make sure to use grounded power outlets. If it is not grounded, a lightning strike may cause personal injury, and the instrument cannot be used stably.
3) Do not use it when the power cable is loose. Overheating may damage the power cable and cause a fire or electric shock.
4) Do not connect more power than the rated capacity to a single outlet. It may cause a fire due to abnormal heating of the outlet due to the load.
5) Be sure to dry your hands before plugging in or unplugging the power cable. Otherwise, it may cause an electric shock.
6) Do not use damaged power cables. If not, overheating may cause a fire.
7) When plugging in or unplugging the power cable from the power outlet, use your hands for safety. A disconnection or short circuit of the power cable may cause an injury or fire.
8) If you find a damaged power cable, do not use it and contact us.
9) The power outlet and power cable should be installed at least 1.5 m away from a sink or faucet.
10) Do not use a damaged or stripped power cable even if it has been repaired with insulating tape, etc. There is a risk of electric shock due to short circuit.
11) If the electricity supply is unstable, use a UPS (Uninterruptible Power Supply) to be prepared for momentary power outages. Also, please check the charging status of the UPS before using the instrument.

Use and management precautions

Warnings, precautions and dangers during use, and care

DANGER WARNING CAUTION

1) *Agaro-Power*™ is for research use only (RUO). Not for use in diagnostic procedures.
2) Do not use the product for purposes other than electrophoresis.
3) Be careful not to turn off the power outlet or the instrument during operation.
4) Do not modify or delete the instrument-related information built into this instrument without permission.
5) Do not store the instrument in a place with high humidity for an extended period. Failures caused by this are classified as flooding, and free after-sales service is not available. In the case of severe instrument failure, even paid repairs may not be possible, and the instrument may not be usable.
6) If a burning smell or excessive heat is generated while using the instrument, stop using it immediately and contact our technical support.
7) Do not place paper or plastic pallets on the bottom of the instrument. It may cause a fire.
8) Do not cover the instrument with paper or plastic during operation. It may cause a fire or breakdown of the instrument.
9) If the instrument is disassembled or modified without permission, you cannot receive free after sale services and may be excluded from the scope of our services.
10) Do not forcibly separate the power supply while using the instrument. It may cause malfunction.
11) Do not drop the instrument or subject it to impact. It is a direct cause of failure, and in this case, free after-sales service may be excluded regardless of the warranty period.
12) Turn off the system before removing the gel. There is a risk of electric shock if the power is not turned off.

13) Do not touch the lid while the power is on. Do not touch, especially with wet hands. It may cause electric shock.
14) Do not touch the cathode and anode of the agaro-tank with your hands during electrophoresis. It may cause electric shock. Do not touch, especially with wet hands.
15) Be careful not to move the agaro-tank during electrophoresis.
16) Do not put your fingers in the agaro-tank buffer during electrophoresis. There is a risk of electric shock.
17) After using the staining dye and buffer, wash thoroughly so that there are no remaining impurities.
18) When experimenting and washing, you must use it after wearing a lab coat, safety goggles, gloves, and a mask.
19) Be careful not to damage the platinum wire when cleaning the agaro-tank.

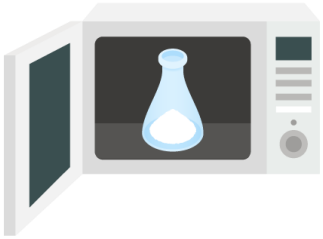
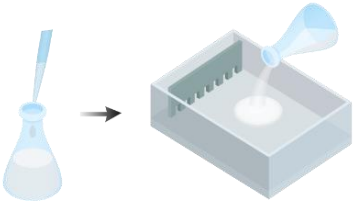
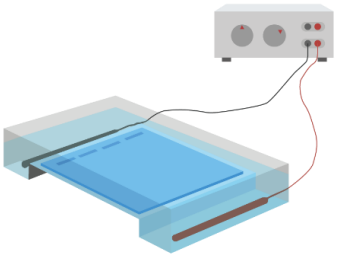
Operation

Before using the instrument, please read the user's guide thoroughly and pay attention to the precautions to operate the instrument.

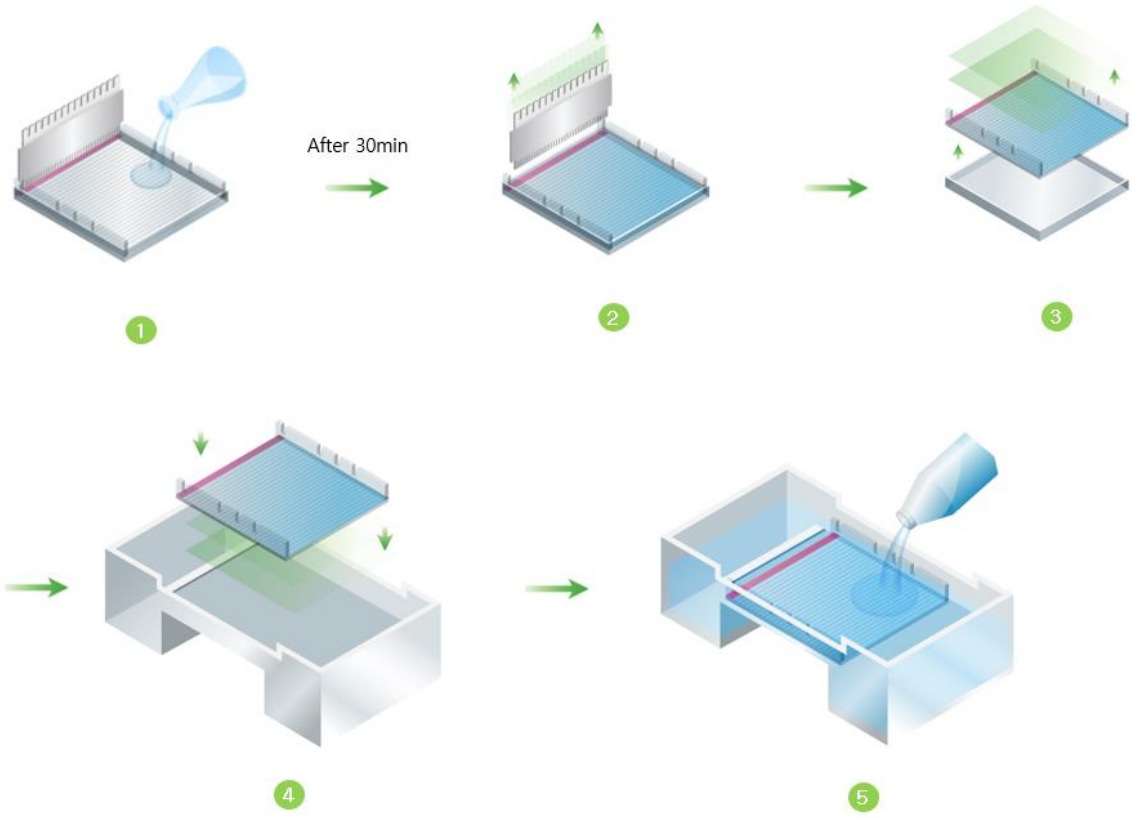
Gel Electrophoresis Step

- For detailed staining methods, refer to the manual of *GreenStar*™ Nucleic Acid Staining Solution.
- For band analysis, refer to the manual of the DUALED Blue/White Transilluminator.

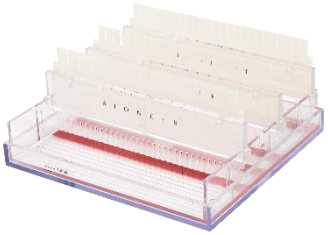
⚠CAUTION
Electrophoresis should be performed while wearing appropriate personal protective instrument, such as safety glasses, masks, lab coats, and gloves.

Step		Instrument
	**Dissolve agarose** • Dissolve agarose in 0.5X TBE or 1X TAE buffer.	
	**Making the Gel** • Let the agarose solution stand until it cools to 60–70 °C • After mixing GreenStar™ Nucleic Acid Staining Solution I with the gel, pour it into the tray	*Agaro-Power* ™
	**Gel Electrophoresis** • Transfer the hardened gel to the agaro-tank. • After loading the DNA sample, start electrophoresis.	
	**Analyze the bands** • After electrophoresis, the gel is analyzed using a UV or blue light transilluminator.	DUALED Blue/White Transilluminator

Preparing for Gel Making



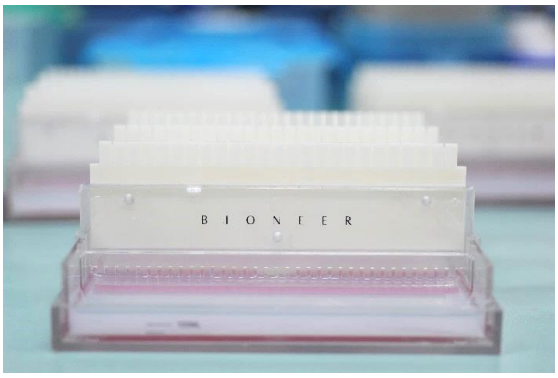
Preparing the Gel Caster



1) Place the Gel Tray on a flat, level surface.
2) Fit the Gel Caster into the Gel Tray.
3) After deciding the length of the gel, place each comb in the proper positions.
4) When making two 7.5 cm long gels, align the dam to the center of the gel caster.

⚠CAUTION
The role of dam is to separate and manufacture one tray into two gels, and the minimum gel. requirement is 100 mL

Preparing the Gel



1) Dissolve the proper amount of agarose (according to the % gel you are making) in 100 ㎖ of 0.5X TBE or 1X TAE buffer and boil, then let cool to about 60-70℃.
2) Add *GreenStar*™ Nucleic Acid Staining Solution I to the gel solution and mix well.
3) Slowly pour the gel solution into the assembled gel caster. Be careful as bubbles may form if poured quickly.
4) Leave at room temperature for 20 to 30

⚠CAUTION

- Agarose gel with a concentration of less than 1% is easy to tear, so be careful when handling the gel.
- Thermal deformation may occur in the tray and comb when hot uncooled gel is poured.

Note
ex) 1.5% gel preparation 1.5g Agarose power /100 mL buffer

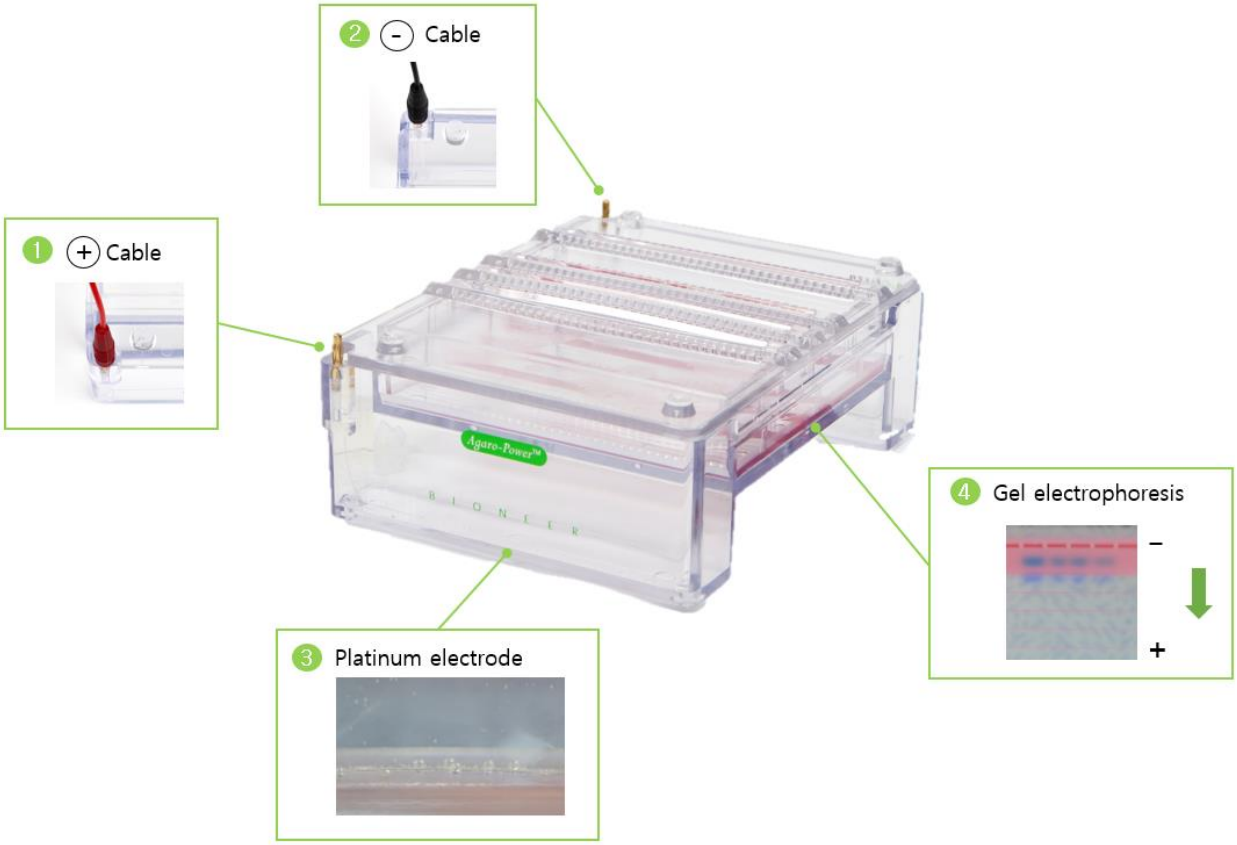
Preparing the Running tank

1) Place the tank over a flat, level surface.
2) Carefully fill the agaro-tank with 700 ㎖ of gel running buffer. If too much buffer is added, it may overflow when the gel is added and electrophoresis is started.
3) Check that the gel in the caster does not slide, and that the gel is fully submerged in the buffer after being fitted in the agaro-tank.
4) Place the lid so that the (-) sign faces up, and the (+) sign faces down.

Sample loading

1) When using the Loading Adaptor, a gel made with a 34 well comb must be used, and a 10 ㎕ long tip is recommended.
2) Load the prepared sample using a multi-channel pipette.
3) Determine the amount of sample according to the well size of each comb and load it
4) Carefully check that there are no wells with missing loading and no wells with holes.

Electrophoresis



1) Insert the cable according to the positions of the (+) and (−) poles and connect the power. (①, ②)
2) Select a voltage and proceed with electrophoresis. (low button is 75V, high button is 150V)
3) When electrophoresis starts, air bubbles start to rise from the platinum wire (③).
4) After about 10 minutes, you can see the dye move from (−) electrode to (+) electrode (④).
5) The time required for electrophoresis is about 30 to 60 minutes, and may vary depending on the experimental conditions such as voltage, gel concentration, and buffer concentration.
6) When electrophoresis is finished, turn off the power switch.
7) After removing the gel from the agaro-tank, analyze the band through the DUALED Blue/White Transilluminator.

MAINTENANCE

Cleaning Agaro-tank & Tray

- Do not leave the buffer for a long time after electrophoresis.
- Do not use a brush around the platinum wire when cleaning the agaro-tank.
- Be sure to proceed with the cable removed when discarding the buffer.
- After preparing the gel, clean the tray and comb so that there is no gel residue.
- Do not clean the electrode with a brush or wash it with water.
- After washing, dry naturally. When using an oven, there may be thermal deformation.

⚠CAUTION
Before cleaning the tank, turn off the power and disconnect the cable.

Storage Condition

1) Temperature: 0-40℃ (32 -104°F)
2) Humidity: 20-80% (non-condensed)

Storing the instrument

1) When the instrument is not in use, store it according to the precautions specified in the User Guide.
2) It must be stored following all of the storage conditions specified above.

TROUBLESHOOTING

In case of abnormal operation, please check the followings or contact us or your dealer.

Problem	Measures
Cannot turn on power	1. Make sure the power switch is pressed. 2. Make sure the power plug is plugged in. 3. Request service.
The power LED is on but the sample is not moving.	1. Check that the agaro-tank and cable are firmly connected. 2. Make sure you use the recommended buffer and appropriate concentration. 3. Make sure the amount of buffer is sufficient to cover the gel. 4. Request service.
Bands are faintly observed or not visible.	1. Load a sufficient amount of sample. 2. Check if the density of the stain is too low 3. Increase the staining time. 4. A longer running time may cause the sample to migrate out of the gel.
Migration is slow	1. Make sure you use a suitable buffer. 2. Check if the buffer is reused.

TECHNICAL SUPPORT

Request for Repair

1) Before requesting a repair, please refer to the 'TROUBLESHOOTING' in this user guide.
2) Contact BIONEER Technical Support for further details on how to submit the form. (APPENDIX A)
3) Please email the completed Service Request Form to the Customer Service Center (instrument-support@bioneer.co.kr).

Shipping & Return for Service

1) Send the completed Service Request Form to BIONEER Technical Support.
2) Our technical support team will guide you on how to return.
3) The repair process will take approximately 1-3 weeks depending on the condition of the instrument.

Note
Once your package is received by BIONEER, service may take up to three weeks depending on the instrument condition.

ORDERING INFORMATION

Instrument

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

Related Product

Cat No.	Product
A-2041	*AllInOneCycler*™ PCR system
A-6020	DUALED Blue/White Transilluminator
C-9036	*GreenStar*™ Nucleic Acid Staining Solution I
C-9100	Agarose (100g)
C-9002	5X TBE (1 gal)

LEGALINFORMATION

Usage and Compatibility

Agaro-Power™ is an instrument for agarose-gel electrophoresis that can quickly load 96 samples. *Agaro-Power*™ is developed and supplied for research purposes only.

Trademark

Disclaimer

BIONEER Co., Ltd reserves the right to change product specifications and services at any time for technical improvement of products. If technical problems related to product quality and test results occur, contact the customer service center (instrument-support@bioneer.com) with analysis information or relevant test data.

User Guide Amendments

This user guide is subject to change without prior notice due to continuous revision. BIONEER Corporation is not responsible for any errors, issues or damages caused by misuse of customers. This guide supersedes all previous versions.

WARRANTY

This instrument is warranted by BIONEER against manufacturing defects in materials and quality for a limited warranty period of one (1) year from the date the product is received by the customer. BIONEER will either (1) repair the product at no charge if a hardware defect is found or (2) exchange the product if the same hardware defect arises more than three times during the limited warranty period. Any other components other than the instrument itself are considered consumables and warranted for three months. Spare parts for the instrument will be available for five years from the initial instrument release date. If a defect arises after the limited warranty period, shipping and handling charges may apply to any repairs or exchanges of the product undertaken by BIONEER.

Exclusions and Limitations

This warranty does not apply: (a) to cosmetic damage, including but not limited to scratches, dents, or broken plastic on ports; (b) to damage caused by accident, abuse, misuse, flood, fire, earthquake, or other external causes; (c) to a product or component modified in any way without explicit written consent of BIONEER; or (d) to damage caused by any services performed by unauthorized engineers or service providers.

Agaro-Power™, is warranted by BIONEER against manufacturing defects in materials and quality for a limited warranty period of one year. BIONEER will charge customers for:

- Repairing damaged products caused by customers.
- Repairing damaged products after the warranty period.

KEY TO SYMBOLS

	Temperature limits
	Humidity limits
	Manufacturer
	Date of Manufacture
	Catalog number
	Ignoring this sign and mishandling will result in death or serious injury
	Ignoring this sign and mishandling, will result in death or serious injury due to electric shock.
	Ignoring this sign and mishandling may result in death or serious injury.
	Ignoring this sign and mishandling may result in death or serious injury due to heat.
	Ignoring this sign and mishandling may result in death or serious injury due to fire.
	Ignoring this sign and mishandling may result in minor injury or property damage.
	Do not turn off the application during operation. It will affect the result.
	Do not run any other applications during operation. It will cause malfunction or affect the result.
	Keep a safe distance from the moving parts of the instrument. Moving parts may cause injuries.
	Biohazard Exposure may cause infection.
	Keep away from sunlight
	Indicates the **On** position of the main power switch.
	Indicates the **Off** position of the main power switch.
	Indicates the on/off position of the main power switch.
	Indicates ground terminal for the main protective ground of the instrument.
	Indicates a terminal that receives or supplies alternating current or voltage.
	Indicates a terminal that receives or supplies direct current or voltage.

APPENDIX A: Service Request Form

Service Request Form				
Product	*Agaro-Power*™ System			
Catalog No.	A-7020	Serial No.		
Date of Request				
Date of Purchase				
Problem	Date			
	Part			
	Description			
	Additional Information (if needed)			
Customer	Name of Institution			
	Address			
	Department			
	Contact Information	Name		
		Phone	Fax	
		E-mail		

BIONEER Corporation
Address Bioneer Global Center, 71, Techno 2-ro,
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Website www.bioneer.com

Visit our international website to view all contact information under the 'Help' menu.

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REF A-7020

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