EasyVert Mini Gel Electrophoresis Tank

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1.Product Introduction

1.1 Principle of Vertical Gel Electrophoresis

Vertical gel electrophoresis refers to charged particles migrate toward the opposite electrode in an electric field. Molecules differ in net charge, molecular weight and spatial conformation, leading to distinct migration velocities in the electric field, thereby achieving separation.This system is suitable for the separation and analysis of DNA, RNA, proteins and other biological samples, and is a widely used tool for separation, purification and analysis in biology, medicine, chemistry and other fields.

1.2 Product Features

This electrophoresis tank delivers excellent separation performance, simple operation and high operational stability.

1.3 Operating Conditions

Ambient temperature: approx. 25°C; relative humidity: 50-70%. Do not use in dusty environments or areas containing acidic or alkaline corrosive substances that may damage the electrophoresis tank.

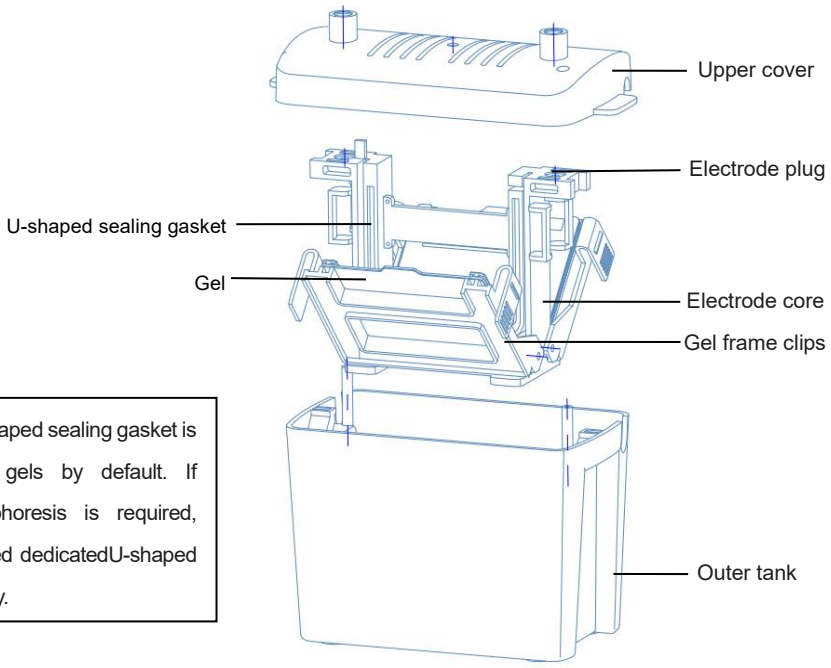
2.Structural Components

To achieve optimal performance of the EasyVert Mini Gel Electrophoresis Tank, please familiarize yourself with all accessories and assembly procedures before use (See Table 2.1 and Figure 2.1).

Table 2.1 Accessory List

Accessory	Quantity
Outer tank	1
Upper cover	1
Inner core (including electrode plug, electrode core, and gel frame clips)	1
Power cables	1 pair
Dummy plate (for single-gel run)	1
User Manual	1
Warranty Card	1
Certificate of Conformity	1

Figure 2.1 Assembly of EasyVert Mini Gel Electrophoresis Tank



Note: The matched U-shaped sealing gasket is applicable to precast gels by default. If hand-cast gel electrophoresis is required, please install the adapted dedicatedU-shaped sealing gasket separately.

3.Main Technical Parameters

Table 3.1 Main Technical Parameters

Name	Parameter
Model	FW0628
Dimensions（L×W×H）	21.5×10.5×13cm
Power Supply Type	Direct Current
Gel Position Quantity	2
Applicable Gel Plate Size（W×L）	10×8cm
Inner Tank Maximum Buffer Volume	150ml
Outer Tank Maximum Buffer Volume	850ml

4.Operating Instructions

4.1 Gel Assembly

4.1.1 Place the open gel frame on a clean, flat surface (Fig. 4A).

4.1.2 Place the first gel plate (short edge facing inward) onto gel supports. These stands are located at the bottom of the assembly, with two per side.The gel plate forms a 45° angle toward the center. Support the middle position with both index fingers, and gently push both sides of the gel frame inward with thumbs to fix the gel plate (Fig. 4B).

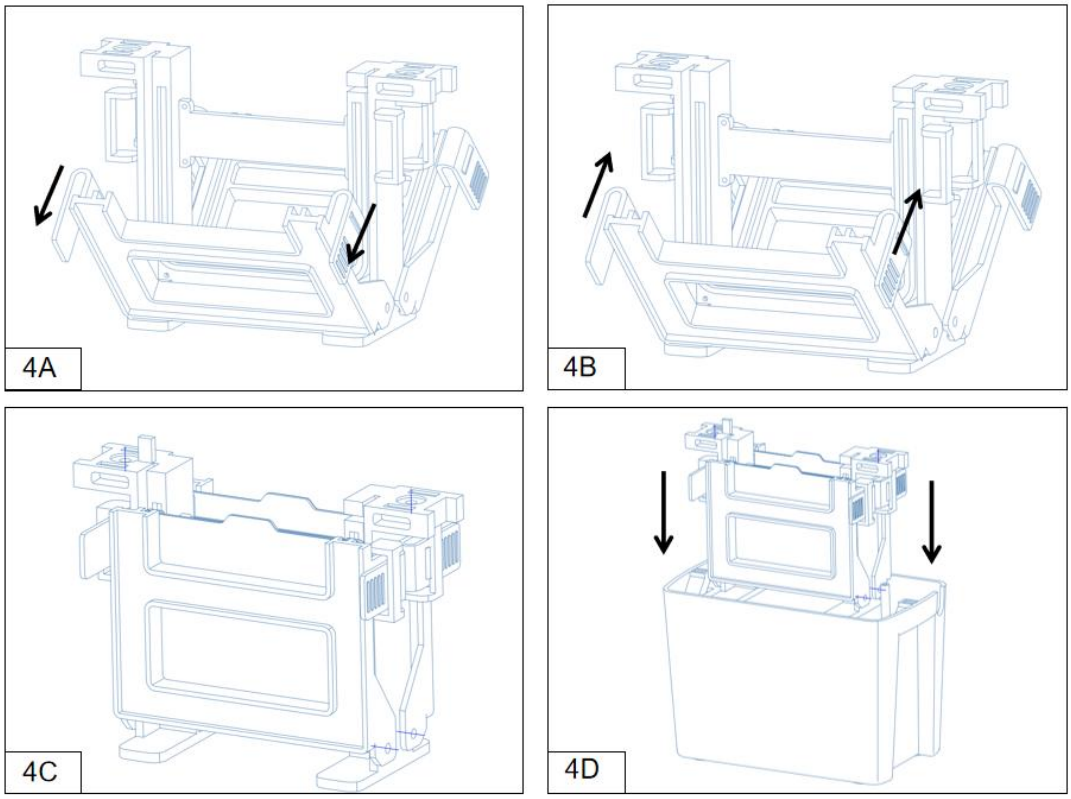
4.1.3 Fix the other gel plate in the same way (Fig. 4C).

Only place gel plates with the short edge facing inward on both sides of the gel frame. The gel frame requires two gel plates to form a functional unit. If running only one gel, fit the dummy plate on the opposite side.

4.1.4 Put the assembled gel module into the outer tank (Fig. 4D).

The electrode plug is color-coded: red = positive, black = negative; align the colors with the marks on the outer tank.

Figure 4.1 Assembly of the Electrophoresis Module



4.2 Tank Assembly and Sample Loading

4.2.1 Slowly pour buffer into the inner tank (the area between the two fixed gel plates) until until the liquid level is flush with the top edge of the long gel plate.

4.2.2 Slowly pour buffer into the outer tank to 0.5-1 cm below the sample wells.

4.2.3 Load samples into the sample wells with a pipette.

4.2.4 Cover the outer tank with the upper cover, keep the red-black polarity marking of the electrode plug consistent with that on the upper cover, and press the upper cover firmly into place.

4.3 Electrophoresis Condition Settings

Connect the power cables with correct positive and negative polarity into the electrophoresis power jack to power on and start electrophoresis. Users can set different voltage, current and time parameters according to different experimental requirements. Generally, SDS-PAGE runs for about 30-60 minutes under a constant voltage of 160V.

4.4 Gel Removal Procedure

4.4.1 Turn off the power and disconnect the power cables after electrophoresis.

4.4.2 Remove the upper cover, take out the electrode assembly carefully, and discard the used running buffer. To prevent buffer leakage, pour off the buffer before opening the gel frame.

4.4.3 Gently squeeze the gel frame clip inward with the thumb and forefinger to release one side of the gel frame and take out the gel; operate the same way to take out the gel on the other side.

4.4.4 Rinse the electrode core, gel frame and outer tank of the electrophoresis tank thoroughly with distilled or deionized water, then place them in a clean and dry place to air dry.

5.Troubleshooting

Some possible problems encountered in electrophoresis together with their cause analysis and solutions are shown in Table 5.1.

Table 5.1 Problems, Cause Analysis and Solutions

Problem	Cause	Solution
Edge Effect (uneven band migration at gel edges)	1. Improperly prepared or exhausted running buffer. 2. Insufficient buffer volume in outer tank. 3. Overly high applied voltage. 4. Uneven loading volume between marker and samples.	1.Prepare fresh fully mixed buffer. 2.Add an appropriate amount of buffer to the outer tank. 3.Reduce the voltage properly if the voltage is set too high. 4.Use 1× loading buffer to balance the sample volume of each lane if the marker and sample volumes are inconsistent.
Vertical band smearing/tailing	Sample overloading.	Dilute the sample and decrease the amount loaded appropriately.
	Sample precipitation prior to electrophoresis	Centrifuge samples before adding SDS loading buffer; ensure sufficient SDS-to-protein ratio (generally 1.4:1; more SDS may be needed for membrane proteins)
Horizontal band spreading	Sample diffusion before electrophoresis starts.	Minimize the interval between sample loading and electrophoresis start
	Low ionic strength of sample buffer relative to gel matrix.	Use buffer matching the gel/resolving gel system in samples.
Distorted or skewed bands	Inner tank buffer leakage.	Install gel correctly to ensure inner tank sealing.
	High salt content in samples.	Desalt samples by dialysis or desalting column.
Lane shrinkage at gel bottom	Sample ionic strength higher than surrounding gel.	Desalt adjacent samples.
Excessively long electrophoresis time	Incorrect running buffer used.	Use correct running buffer; e.g. FuturePAGE™ precast gel requires matched MOPS buffer instead of Tris-glycine buffer.
Electrophoresis runs too fast	Wrong running buffer.	Use correct running buffer.
	Overly high applied voltage.	Lower voltage appropriately.
Single protein appears as double bands (SDS-PAGE)	Incomplete protein reduction or re-oxidation during electrophoresis.	Prepare fresh sample buffer; increase β-mercaptoethanol concentration.
Fewer bands than expected, with a dense band at the dye front	Protein degradation.	Add protease inhibitors such as PMSF.
No electrophoresis current/no air bubbles	Bottom protective sealing tape of precast gel not removed; poor electrode contact.	Completely peel off bottom tape of precast gel; ensure normal positive/negative electrode connection.
Sample disappears or runs upward	Reversed electrode polarity causing backward migration and run out of the gel into the buffer.	Connect power supply poles correctly.
High-molecular-weight marker bands missing	Protease contamination in tank/buffer; marker degradation.	1.Thoroughly clean electrophoresis tank, gaskets, baffle, pipette tips and bench surface. 2. Prepare fresh buffer. 3. Replace with new marker.

6.Precautions

6.1 Read the manual carefully before operation to understand the working principle and operation method of the vertical electrophoresis tank.

6.2 Wear a lab coat, gloves and other personal protective equipment (PPE) during operation.

6.3 Ensure the power voltage and current are within the specified range to avoid overload or equipment damage.

6.4 Do not open the cover, touch live components or place items into the electrophoresis tank when powered on. Cut off the power before opening or moving the cover.

6.5 The power supply of the electrophoresis tank must be reliably grounded to prevent electric leakage.

6.6 Place the electrophoresis tank on a flat desktop for use.

6.7 Avoid splashing running buffer onto the power supply unit of the electrophoresis tank.

6.8 The red wire of the electrophoresis power supply is positive pole and the black is negative pole; do not reverse the connection.

6.9 Do not hot-plug the output cable temporarily after the electrophoresis power supply is turned on, so as to avoid short circuit and equipment damage.

6.10 Adjust voltage, current and time reasonably according to different gel types, concentrations and supporting buffers.

6.11 Do not overfill or underfill the inner and outer tanks with buffer.

6.12 For some special cases, check the input of the electrophoresis power supply; no-load startup is allowed under voltage stabilization, while load connection is required before startup under current stabilization, otherwise it may cause damage due to improper operation.

6.13 Protect the upper cover, outer tank and all accessories from dropping and impact during packaging, transportation and use.

6.14 The platinum wire electrode inside the electrode core is fragile; handle with care during use and cleaning.

6.15 The U-shaped sealing gasket may deform after a period of use; replace it in time to ensure use effect.

6.16 Cut off the power supply immediately for maintenance if abnormal noise, electric discharge or peculiar odor occur during use to avoid accidents.

6.17 Do not leave the electrophoresis tank unattended during operation.

6.18 Turn off the power in time and complete equipment cleaning and maintenance after electrophoresis.

7.Maintenance

7.1 Regularly check the inspect power plug tightness and the integrity of power lines.

7.2 Clean regularly to keep the inside of the equipment clean and dry.

7.3 Avoid long-term continuous operation to prevent overheating or damage of equipment.

7.4 If the equipment is not used for a long time, power on regularly for inspection and keep it dry.

7.5 Blot moisture from wet electrode tips with absorbent paper as soon as possible to prevent rust.

7.6 Do not expose the electrophoresis instrument to acid or alkali solution to prevent corrosion and damage.

8.Warranty

8.1 Product service life: 3 years; the whole machine enjoys 1-year free warranty from the date of purchase.

8.2 The following situations are not covered by free warranty after one year of sale or under special circumstances; paid maintenance is available with reasonable material fee and repair fee:

8.2.1 Natural loss or artificial damage of platinum wire.

8.2.2 Rust of both ends of power line caused by corrosive gas evaporation, resulting in circuit failure.

8.2.3 Artificial damage or natural aging of U-shaped sealing gasket.

8.2.4 Damage to electrophoresis tank cover, electrode core and outer tank caused by non-compliant operation or accidental factors.

8.2.5 Products beyond service life that can still be used after repair.

8.2.6 Failure to provide warranty card and invoice or altered invoice records.

9.Important Safety Operation Information

This manual contains important operation and safety guidelines! Please read and understand carefully before use.

9.1 Disconnect the instrument and power supply when not in use to avoid electric shock hazard, and keep the power supply powered off.

9.2 Check the outer tank for cracks before use to avoid buffer leakage and electric leakage during electrophoresis.

9.3 Check wires and plugs for loose connections, insulation damage and corrosion disconnection before use to avoid personal injury.

9.4 Complete preparation before use, check the function and operation essentials of each part one by one, and operate only after mastering the usage; tidy up properly after use.

9.5 Disconnect the power supply before moving the instrument.

9.6 Check for buffer leakage during electrophoresis; stop electrophoresis immediately if leakage occurs.

9.7 The company shall not be liable for any consequences caused by non-compliant operation not following this manual.

9.8 This product is only for scientific research, not for clinical diagnostic applications.

10.Ordering Information

Product Name	Model	Unit
EasyVert Mini Gel Electrophoresis Tank	FW0628	Set