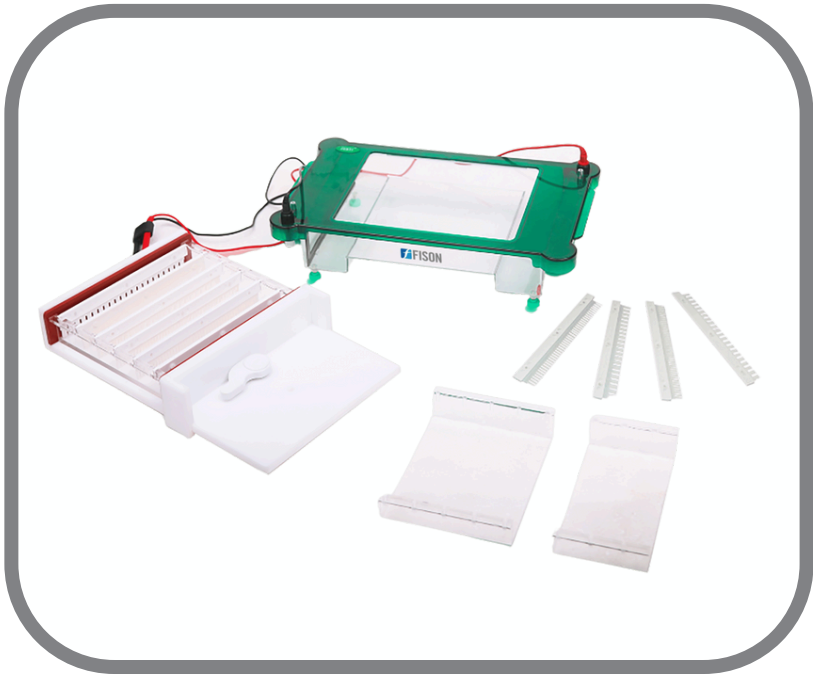

Horizontal Electrophoresis System

FM-HES-A100

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Index

1. Safety Measures

Health Risk Warning

When used properly, these units pose no health risk. However, they are capable of delivering dangerous levels of electricity and must only be operated by qualified personnel in strict accordance with the guidelines outlined in this instruction manual.

Important Safety Instructions:

1) **Read the Manual:** All users must read and fully understand the instruction manual before operating the equipment.
2) **Qualified Personnel:** Only individuals with proper training and qualifications should operate this unit.
3) **Inspect Before Use:** Carefully inspect the unit for any visible damage before each use.
4) **External Components:** Do not operate the unit if there is any damage to the external tank or the lid.
5) **Safety Lid Requirement:** Ensure the safety lid is correctly and securely in place before starting the unit.
6) **Bypass Safety Features:** Do not tamper with or disable any built-in safety mechanisms or interlocks.
7) **Controlled Environments:** Operate the unit in a clean, dry, and well-ventilated area, away from flammable materials.
8) **Disconnect After Use:** Always switch off and disconnect the unit from the power supply after use or before performing any maintenance.
9) **Report Issues Immediately:** If any malfunction or abnormal behaviour is observed, stop using the unit immediately and report it to a supervisor or technician.

2. Introduction

Horizontal Electrophoresis System FM-HES-A100 offers sample capacity ranging from 17 to 104 wells for efficient DNA/RNA separation. It has high buffer volume of 1800ml to ensure stable pH levels and efficient heat dissipation. It features removable electrodes and leak-proof gel caster simplify the maintenance. It has a transparent lid to enhance the safety and prevent buffer volatilization. Our electrophoresis system is designed for quick sample loading with multi-comb pipette compatibility to ensure precise results.

3. Features

1. Auto switch-off
2. Easy open lid buttons
3. Adjustable levelling
4. Lightweight and durable

4. Specifications

Model No.	FM-HES-A100
Gel size (W×L)	200×200mm, 200×150mm, 200×100 mm
Samples capacity	17 to 104
Total buffer volume	1800 ml
Dimension (L×B×H)	397×230×93 mm
Packaging dimension (L×B×H)	55×42×26 cm
Net weight	3.3 kg
Gross weight	5.0 kg

5. Power Supply Selection

Model No.	FM-HES-A100
Increment	1V, 1mA, 1W
Output range	10 to 600 V, 1 to 1000mA, 1 to 300W
Timer range	1 min to 99 hr, 59 min
Display	LCD Display
Dimension (L×B×H)	40×34×22 cm
Net weight	4.2 kg
Gross weight	5.1 kg

6. Applications

Our Horizontal Electrophoresis System is ideal for DNA, RNA and protein separation in molecular biology and genetics research labs.

7. Operations

7.1 Horizontal Gel Tanks

Instructions for fitting Electrode Cables

1) Note the position of the lid on the unit. This shows the correct polarity and the correct orientation of the cables, black is negative and red positive.
2) Remove the lid from the unit, note if the lid is not removed, fitting the cables may result in un-tightening of the gold plug and damage to the electrode.
3) Screw the cables into the tapped holes as fully as possible to that there is no gap between the lid and the leading edge of the cable fitting.
4) Refit the lid.

7.2 Gel Preparation

1) For a standard 0.7% agarose gel, add 0.7grammes of agarose to 100ml of 1x TAE or TBE solution. The same 1x solution should be used in the tank buffer solution.
2) Add the agarose powder to a conical flask.
3) Add the appropriate amount of 1Xtae or TBE solution from the table above. To prevent evaporation during the dissolving steps below, the conical flask should be covered with parafilm.
4) Dissolve the agarose powder by heating the agarose either on a magnetic hot plate with a stirring bar or in a microwave oven. If using the microwave method, the microwave should be set an around a 400-watt or medium setting and the flask swirled every minute.
5) The solution should be heated until all crystals are dissolved. This is best viewed against a light background. Crystals appear translucent crystals.
6) These will interfere with sample migration if not completely dissolved. The gel must be cooled to between 50°C and 60°C before pouring.

7.3 Gel Pouring

1) Put the Gel Caster on the desk, make sure the process of the operating on the flat surface.
2) Insert the desired length tray into the Gel Caster such that one end of the tray is pushed up and seals against the silicone mat of the permanent end of the Gel Caster.
3) Inserted the cam into the appropriate hole according to the size of the tray, there are three sizes of trays to be choose.
4) Turn the cam so that the silicone mat tightly seals against the side of the tray. Placed the comb(s) on the tray. Pour in the agarose carefully so as not to generate bubbles. Any bubbles that do occur can be smoothed to the edge of the gel and dispersed using a pipette tip.
5) Allow the agarose to set, ensuring that the gel remains undisturbed.
6) Carefully remove the gel casting gates and comb and transfer the gel, including the tray, to the main tank.

7.4 Running the Gel

1) Mix the sample to be loaded with sample buffer- see solutions for common sample buffers. Usually, 3ul of sample buffer is adequate, but less may be used with sample volumes of less than 10ul.
2) Fill the unit with buffer until the gel is just flooded with buffer. This will give the fastest resolution times. For enhanced quality of resolution of the sample, fill the unit to 5mm above the gel.
3) Load the samples into the wells using pipettes. Multi-channel pipettes can be used for loading samples with MC compatible combs, see listing in accessories for identification of these.
4) Carefully place the lid on the tank and connect to a power supply.
5) Typically, gels are run at between 90 and 150 volts. However, maximum Voltages are indicated on the serial badge of each unit.
6) It should be noted that higher voltages generally give faster but poorer quality sample resolution.

7.5 Gel Staining and Viewing

1) Transfer the gel to a vessel containing the appropriate volume of 0.5ug/ml ethidium bromide stain for 15~30 minutes, see solutions for stock stain concentration and adjust to the volume used accordingly. The entire gel should be covered.
   NOTE: Ethidium bromide is a suspected carcinogen, and the necessary safety precautions should be undertaken.
2) De-stain the gel for 10~30 minutes in distilled water again, ensuring the gel is completely immersed.
3) Rinse the gel twice for a couple of seconds with distilled water.
4) Transfer the gel to a UV Transilluminator.
5) The samples will often appear as brighter, clearer bands when photographed or viewed using a gel documentation system. However, if the gel bands are too faint, then the staining procedure should be adjusted so that there is less de-staining.
6) If there is too much background, then the staining procedure should be adjusted so that there is more de-staining.

8. Maintenance

8.1 Cleaning Horizontal Units

1) **Recommended Cleaning Method:** Use warm water (not exceeding 60°C) mixed with a mild detergent to clean the unit. Avoid high temperatures, as water above 60°C can damage the unit and its components.
2) **Rinsing:** Rinse the tank thoroughly with warm or distilled water to prevent salt buildup. Avoid damaging the enclosed electrode; gentle cleaning is recommended, and vigorous scrubbing is not advised.
3) **Drying:** Allow the unit to air dry completely before reuse.
4) **Approved Cleaning Agents:** Warm water with mild soap or detergent, dishwashing liquid, Hexane, Aliphatic hydrocarbons
5) **Time Limit:** Do not soak the unit in detergent solutions for more than 30 minutes.
6) **Prohibited Cleaning Agents:** The following chemicals cause irreversible and cumulative damage and must never be used:
   - Acetone
   - Phenol
   - Chloroform
   - Carbon tetrachloride
   - Methanol
   - Ethanol
   - Isopropyl alcohol

8.2 RNase Decontamination

To effectively remove RNase contamination, follow this protocol:

1) **Initial Cleaning:** Wash the unit using a mild detergent as described above.
2) **Hydrogen Peroxide Treatment:** Soak the unit in 3% hydrogen peroxide (H_2O_2) for 10 minutes.
3) **DEPC Rinse:** Rinse with 0.1% DEPC-treated distilled water.
4) **Alternative RNase Decontaminant:** RNase ZAP™ (Ambion) may also be used. Go to the instructions when using this product, especially with acrylic gel tanks.
   Caution: DEPC is a suspected carcinogen. Always handle with proper safety precautions.

9. Accessories

- Lid With Cables × 1
- Gel Tray (200mm X 200mm) × 1
- Gel Tray (200mm X 150mm) × 1
- Gel Tray (200mm X 100mm) ×1
- Gel Casting stand × 1
- 17 Well Comb (1.0mm thickness) × 2
- 17 Well Comb (1.8mm thickness) × 2
- 22 Well Comb (1.0mm thickness) × 2
- 22 Well Comb (1.8mm thickness) × 2
- 36 Well Comb (1.0mm thickness) × 2
- 36 Well Comb (1.8mm thickness) × 2
- 44 Well Comb (1.0mm thickness) × 2
- 44 Well Comb (1.8mm thickness) × 2
- Level Adjusting Button × 4