TSE-P400 Precast Gel Vertical Electrophoresis Cell

Instruction Manual

Content

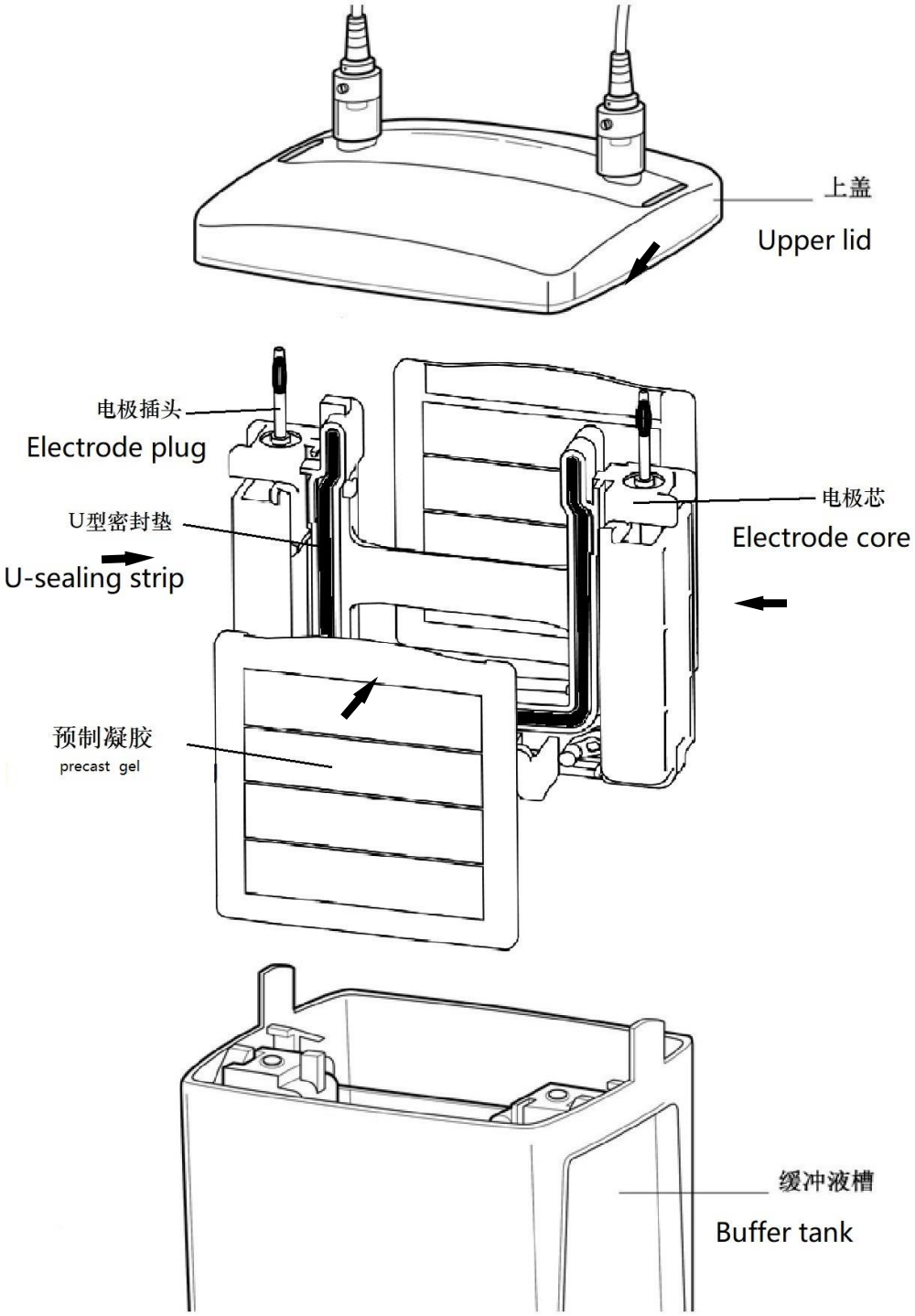

Fig 1 Precast Gel Vertical Electrophoresis Cell

Chapter 1 Generalization

1. Brief introduction

TSE-P400 Precast Gel Vertical Electrophoresis Cell is compatible with Biorad mini gel and ThermoFisher mini gel simultaneously. It can run gel at most of 4 pieces simultaneously.

2. Components

In order to achieve best performance, please read the instruction manual carefully and operate the instrument strictly according to the instruction manual (Please refer to Fig 1 and Fig 2).

Electrophoresis core, including electrode head electrophoresis core and mushroom head electrophoresis core, long U-sealing strip for running ThermoFisher precast gel and short- U-sealing strip for running Bio-Rad precast gel. Different size of precast gel is matched with different precast gel. Anode is marked by red while the cathode is marked by black.
Buffer tank and upper lid. The buffer tank and upper lid can be connected so as to ensure the normal operation of electrophoresis. The power is cut off once the upper lid is lifted.

Compatibility of chemical reagent:
All the components should be kept clear of acetone and ethyl alcohol. The damage caused by using the organic reagent is not covered by the guarantee policy.

3. Safety instruction

The power is off when the upper lid is opened, never try to operate the electrophoresis when there is no upper lid.

Note: The safety standard is applied to the TRANS product from design stage to production stage, and it would be safe in case of proper and right operation. Please do not improve or mend it by any means.

Chapter 2 Installation and basic operation

Installation of electrophoresis module and adding sample
Clean and dry TSE-P400 electrophoresis buffer tank and electrophoresis core.
Buffer liquid volume (700ml is for 1-2 gels, 1000ml is for 3-4 gels)

1. Installation

Note: The electrode head electrophoresis core should be used in case of running 2 gels. The electrode head electrophoresis core and mushroom head electrophoresis core should be used together in case of running 4 gels.

a. Place the opened electrophoresis core on the clean and flat desk (Refer to fig 4a).

b. Install the first precast gel into the electrophoresis core with the short glass plate toward inside. There are 4 supporters of electrophoresis core connecting to the bottom with each side 2 pieces respectively. At this time, there is a 30 degree angle between gel plate and middle part of electrophoresis core.

Please be sure that the electrophoresis core is in balanced and stable position when installing the first precast gel and then, please install the second precast gel on other side of electrophoresis core, the two precast gels should be slanted to the middle part of electrophoresis core (Please refer to fig 4b).

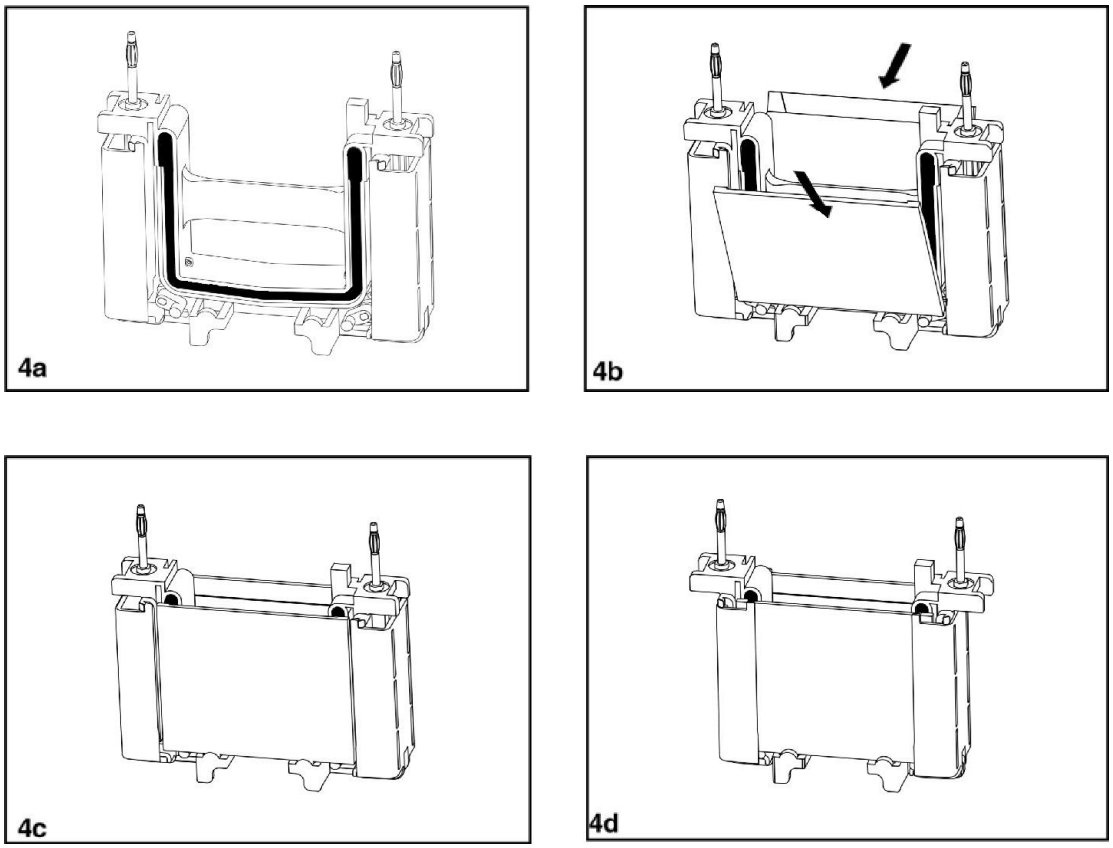

Fig4 Installing electrophoresis modules of TSE-P400

Note: The 2 gel plates on two sides of electrophoresis core respectively must be installed with the short glass plate towards inside. The electrophoresis core needs 2 gel plates in order to form a functional module (Refer to fig 4b).

c. Tightening the 2 gel plates toward the middle of electrophoresis core by single hand, making the gel plate as close to sealing strip as possible, make sure that the short glass plate is blocked by the little step in the bottom.

d. Pushing the two side fasteners inward until they are locked in the right position tightly (Refer to the fig 4c). The short glass plate is driven by side fastener so as to make it close to the groove for U-sealing strip, thus it can avoid the leakage. At this moment, it is available to wash the holes of sample by buffer and then the sample can be loaded (Refer to the fig 4d).

Instructions: Please don't push the two sides fasteners inward until the gel glass plate is closed to the steps of U-sealing strip.

Note: Please don't install the mushroom head electrophoresis core into the cell when only running 1-2 gel(s), otherwise, extra heat will be generated and the electrophoresis efficiency will be affected.

2. Sample adding

a. Inject the buffer into the tank,from the outside of outer tank and follow lower part of glass plate, just flood the short glass plate slightly.

b. Add the sample before or after the electrophoresis core is put in the electrophoresis cell, both of two methods are available to obtain the satisfied result.

c. Add the sample into the hole by syringe and sample adding pipette.

Note: make the sample falls onto the bottom of hole slowly and evenly. Be sure not to puncture the bottom.

Note: Anode and cathode should be flooded by the buffer and on the same level.

3. Put the electrophoresis module in the buffer tank.

Note: The required volume, 2 pieces of gels with 700ml, 4 pieces of gels with 1000ml.

There are two places of buffer tank for two modules: electrode head electrophoresis core is in front of the mushroom head electrophoresis core.

a. Put the TSE-P400 buffer on the smooth desk, make the front side (The side indicating with 2 gels and 4 gels) forward. If the direction is correct, the red mark of edge of tank should be on the right side and the black left.

b. If running 2 pieces of gels, please use the electrophoresis core with plug. Put it on the back and make the red (+) corresponding to the red mark on the right side of tank.

c. If running 4 pieces of gels, please use not only the electrophoresis core with plug but also the mushroom head electrophoresis core that should put in the front. Make the red (+) of the two corresponding to the red mark on the right side of tank. Note:the wrong direction and position will make the upper lid impossible to be closed.

d. Put the buffer into the tank until reach the marker.

4. TSE-P400 installation of buffer tank

Put the upper lid on the buffer tank, and make sure the plug and socket match to obtain the right location, the protruded part of upper lid can help avoid the error. Note: The two protruded parts of buffer tank should go through the slot of upper lid in order to make it open and close smoothly. At this time, please compress the upper lid continuously with thumb until is is done.

5. Power condition

a. Insert the plug into the socket correctly.

b. Power on the TSE-P400, the constant voltage is 200V is recommended to SDS-PAGE and most of native PAGE. 200V voltage can be used to run 2 pieces of gels and 4 pieces of gels. The customer choose the voltage according to the real situation. SDS-PAGE needs around 35 minutes under the condition of the 200V voltage.

6. Take out the gel

a. Power off and take out the plug when the elextrophoresis is done.

b. Open the upper lid, take out the electrophoresis core carefully, and remove the buffer. Please pour out the buffer before open the clamp.

c. Take out the gel plate.

d. Separate the two glass plates carefully and take out the gel.

e. Put the gel downward and immerse the gel and glass plate in the buffer and make them separated.

f. Cleanse the TSE-P400 electrophoresis core and buffer tank by the ion-removing distilled water.

Chapter 3 Trouble shooting

Problem	Cause	Solution
Smile effect – band pattern curves upward at both sides of the gel	◆ Center of the gel running hotter than either end ◆ Power conditions excessive	◆ Buffer not mixed well or buffer in upper chamber too concentrated ◆ Remake buffer, ensuring thorough mixing, especially when diluting 5x or 10x stock ◆ Decrease the power setting from 200 V to 150 V or fill lower chamber to within 1 cm of top of short plate
Vertical streaking of protein	◆ Sample overloaded ◆ Sample precipitation	◆ Dilute sample, selectively remove predominant protein in sample, or reduce the voltage about 25% to minimize streaking ◆ Centrifuge sample before addition of SDS sample buffer, or decrease %T of the gel* ◆ The ratio of SDS to protein should be enough to coat each protein molecule with SDS, generally 1.4:1. ◆ It may require more SDS for some membrane protein samples
Lateral band spreading	◆ Diffusion of the wells prior to turning on the current ◆ Ionic strength of the sample lower than that of the gel	◆ Minimize the time between sample application and turning on the power start-up ◆ Use same buffer in sample as in the gel or the stacking gel

Problem	Cause	Solution
Skewed or distorted band	◆ Poor polymerization around wells ◆ Salts in sample ◆ Uneven gel interface	◆ Degas stacking gel solution completely prior to casting; +C2:C5 increase ammonium persulfate and TEMED concentrations by 25%, for stacking gel or low %T, leave APS the same and double the TEMED concentration ◆ Remove the salts by dialysis, desalting, column, etc. ◆ Decrease the polymerization rate. ◆ Overlay gels very carefully
Lanes constricted at the bottom of the gel	◆ Ionic strength of sample higher than the surrounding gel	◆ Desalt sample and neighboring samples
Run taking unusually long	◆ Running buffer too concentrated ◆ Excessive salt in sample	◆ Check buffer protocol, dilute if necessary ◆ Desalt sample
Run too fast	◆ Running or reservoir buffer too dilute ◆ Voltage too high	◆ Check buffer protocol, dilute if necessary ◆ Decrease voltage by 25–58%
Doublets observed where single protein species is expected (SDS-PAGE)	◆ A portion of the protein may have been reoxidized during the run or may not have been fully reduced prior to the run	◆ Prepare fresh sample buffer solution if over 30 days old ◆ Increase concentration in the sample buffer ◆ Substitute DTT for BME

Problem	Cause	Solution
Fewer bands than expected and one heavy band at the dry front	◆ Protein(s) migrating at the dye front ◆ Protein degradation ◆ Protein(s) migrating at the dye front ◆ Protein degradation	◆ Increase the %T of the resolving gel ◆ Use protease inhibitors, e.g., PMSF, etc ◆ Increase the %T of the resolving gel* ◆ Use protease inhibitors, e.g., PMSF, etc.
Upper buffer chamber leakage	◆ Upper buffer chamber overfilled ◆ Improper assembly	◆ Keep buffer level below the top of the spacer plate ◆ Be sure U-shaped electrode core gasket is clean, free of cuts, and lubricated with buffer ◆ Be sure short plate is under the notch on the gasket, not on top of it
Leaking during hand casting	◆ Chipped glass plates ◆ Spacer plate and short plate not level ◆ Casting stand gasket is dirty, flawed, or worn out	◆ Ensure glass plates are free of flaws ◆ Ensure plates are aligned correctly ◆ Wash the gasket if it is dirty, replace casting stand gaskets if flawed or worn out
Poor end well formation	◆ Incorrect catalyst formation ◆ Monomer solution not degassed. ◆ Oxygen inhibits polymerization	◆ Prepare fresh catalyst solution, or increase the catalyst concentration of the stacking gel to 0.06% APS and 0.12% TEMED ◆ Degas monomer solution immediately prior to casting the stacking gel

Problem	Cause	Solution
Webbing/excess acrylamide behind the comb	◆ Incorrect catalyst concentration	◆ Prepare fresh catalyst solution, or increase the catalyst concentration of the stacking gel to 0.06% APS and 0.12% TEMED
The pressure cams on the casting frame are difficult to close or make noise when closed	◆ Powder residue has built up at the pivot of the pressure cams	◆ Rinse or wipe off the powder residue before each use

Chapter 4 Quality guarantee

(1) The warranty is 2 years since the date of sales.

(2) The warranty excludes the following situations otherwise it is charged.

a. No presentation of warranty card and invoice.

b. The invoice is revised.

c. Improper operation or accident factors.

d. The damage is caused by the user's repair.

e. Exceed the the period of warranty, the instrument is still in usage after repair.

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