

# Universal Power Supply (600V)

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**Cat. No. BT408**

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## INTRODUCTION

The Universal Power supply (300V) has the following Technical specifications and Characteristic features:

### *Technical Specifications*

- Type of Output: Constant-Voltage, Current or Power
- Increment: 1V, 1mA, 1W
- Timer Range: 1min-99hr:59min
- $V_{hr}$  Range: 1-99999V-hr/ Increment 1V-hr
- Display: LCD display with backlight
- Output jacks: Four sets of output jacks

### *Characteristic features*

- Molding shell, touch keys, dual core microprocessor intelligent control;
- 0-9 digital button, make the operation more simple and convenient;
- Indicate the preset value and the actual output value at the same time;
- It can store 100 electrophoresis methods;
- With automatic memory function;
- With step-by-step control function (editable 10 groups, each group of up to make 10 program automatic connection operation);
- With a pause control function (including real-time tuning)
- With standard, timing, V-hr, step-by-step operation function;
- With constant voltage, constant current, constant power, incorrect operation, fault intelligent prompt functions;
- Automatic detection of no-load, over-load, short circuit, rapid resistance change, ground leak and system overheating

## SETUP AND OPERATION

1. Turn on power switch and enter to file setting:

<b>FILE [ 00 ]</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 3 0 0 W</b>	

2. Files saving: Press "EDIT/PAUSE" button to enter into file saving and choose the digit button that you need. Finally, press "ENTER" to save the current file under relative storage number.

<b>SAVE [00]</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

3. File call setup: Continue to press "EDIT/PAUSE" button under File Saving state, then come to file call setup, choose the button you need and press "ENTER", the file with relative storage number will come out as current file.

<b>LOAD [00]</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

4. Single-step/Step-by-step choosing:  
Power supply is under single step control in default after powering on, end running or pausing. Under state, continue to press "EDIT/PAUSE" button, then come to single-step/step-by-step state:
  - a. If press "ENTER", then come to step-by-step output;
  - b. If continue to press "EDIT/PAUSE", stay in single-step output return to file setting state.

<b>STEP</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

5. Return Choosing:
  - a. If press "ENTER", then come back to file modifying state;
  - b. If continue to press "EDIT/PAUSE" button, re-enter into file saving state

<b>QUIT</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

6. Single Step Running:

Press "RUN/STOP" button under file modifying state, come to single -step running

<b>R U N [ 0 0 ]</b>	<b>0 0 : 0 1</b>
<b>U = 3 0 0 0 V</b>	<b>→ 3 0 0 0 V</b>
<b>I = 4 0 0 m A</b>	<b>2 0 0 m A</b>
<b>P = 4 0 0 W</b>	<b>1 0 0 w</b>

It shows output electric field parameters and running time without V-h setting

<b>R U N [ 0 0 ]</b>	<b>0 0 0 0 1</b>
<b>U = 3 0 0 0 V</b>	<b>→ 3 0 0 0 V</b>
<b>I = 4 0 0 m A</b>	<b>2 0 0 m A</b>
<b>P = 4 0 0 W</b>	<b>1 0 0 w</b>

7. Step-by-step running

If step-by-step output has been chosen in former operation, press "RUN/STOP" button under file modifying state, then come to step-by-step running.

a. Choose original program numbering:

Press "Enter" , choose to end numbering.

Press "EDIT/PAUSE" button, return to file modifying state.

Press "RUN/STOP" button, it will run step-by-step according to current editing numbers.

<b>FILE [ 0 0 ] → [ 0 0 ]</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

b. Choose end program numbering:

Press "EDIT/PAUSE" button, reset the no. of original file.

Press "ENTER" or "RUN/STOP" button, it will start to run step-by-step.

<b>FILE [ 0 0 ] → [ 0 9 ]</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 9 9 : 5 9</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

Attn.: End number must be larger than start number or program will not work.

- c. Step-by-Step Limit:

<b>FILE [00]</b>	
<b>U = 3 0 0 0 V</b>	<b>T = 0 0 : 0 0</b>
<b>I = 4 0 0 m A</b>	<b>V H = 0 0 0 0 0</b>
<b>P = 4 0 0 W</b>	

File for step-by-step running needs to be set as Timing or V-h, otherwise will end running and alarm after calling out file without Timing and V-h setting.

- d. Step-by-Step display

It will display output electric field parameters and running time when there is no V-h setting.

<b>R UN [00] → [09]</b>	<b>0 0 : 0 1</b>
<b>U = 3 0 0 0 V</b>	<b>→ 3 0 0 0 V</b>
<b>I = 4 0 0 m A</b>	<b>2 0 0 m A</b>
<b>P = 4 0 0 W</b>	<b>1 0 0 w</b>

It will display output electric field parameters and V-h when there is with V-h setting.

<b>R UN [00] → [09]</b>	<b>0 0 0 0 1</b>
<b>U = 3 0 0 0 V</b>	<b>→ 3 0 0 0 V</b>
<b>I = 4 0 0 m A</b>	<b>2 0 0 m A</b>
<b>P = 4 0 0 W</b>	<b>1 0 0 w</b>

8. Pause: In running process, press "EDIT/PAUSE" to check or modify setting parameters.

<b>R UN [00]</b>	<b>PAUSE</b>
<b>U = 3 0 0 0 V</b>	<b>→ 3 0 0 0 V</b>
<b>I = 4 0 0 m A</b>	<b>2 0 0 m A</b>
<b>P = 4 0 0 W</b>	<b>1 0 0 w</b>

- Press "EDIT/PAUSE" button, renounce to check and modify, quit pause state directly.
- Press "RUN/STOP" button, to re-save updated file. (Except for step-by-step running).
- If there is no return or update operation, it will quit pause state automatically in approximately 10s.

**NOTE:** Files without Timing or V-h setting can be added Timing or V-h setting.  
Files with Timing setting, cannot be added V-h setting. Setting time  $\geq$  Running time.  
Files with V-h setting, cannot be added Timing setting, setting V-h  $\geq$  Running V-h

9. End Run:

<b>FILE [00] → [00]</b>	<b>END!</b>
<b>U = 3 0 0 0 V</b>	<b>0 V</b>
<b>I = 4 0 0 m A</b>	<b>0 m A</b>
<b>P = 4 0 0 W</b>	<b>0 w</b>

If the running time or V-h get to setting Time or V-h that set in advance, it will turn off output automatically and hint by buzzer for 6 times.

It will re-enter start state by pressing any button.

**ERROR ALARM**

<b>FILE [00] → [00]</b>	<b>ERROR 3!</b>
<b>U = 3 0 0 0 V</b>	<b>0 V</b>
<b>I = 4 0 0 m A</b>	<b>0 m A</b>
<b>P = 4 0 0 W</b>	<b>0 w</b>

If there is breakdown or wrongly operated, the unit will turn off high-voltage output automatically and the buzzer will alarm with “du...du...”and display “ERROR!”

If it displays ERROR, user should turn off the power at no time and check it follow below faults list.

<b>ERROR</b>	<b>CAUSES</b>	<b>ANALYSIS</b>
ERROR 1	OVER-LOAD	a. Short circuit of electrophoresis cell b. Buffer is incorrect.
ERROR 2	NO-LOAD	a. No-load ; b. Filling buffer not enough; c. Platinum silk is cut off or not connected
ERROR 3	COMMUNICATION FAULT	Internal components damaged.

If the ERROR cannot be eliminated, please contact us and do not dismantle the unit by yourself or handover it to any maintenance agency that without our authorization.

## WARNING



Electrophoresis power supplies use high output voltages that are electrically isolated from earth ground through a protective impedance to minimize the risk of electrical shock to the user. The following guidelines should be observed and followed when using a power supply.



Electrophoresis power supplies have passed test for operation at temperatures between 0° and 40°C, with relative humidity between 0 and 95% non-condensing. Operating the power supply outside these conditions is not recommended by our company and will void the warranty.

1. To ensure adequate cooling of the power supply, be sure that there is at least 6 cm clearance around the power supply. Do not block the fan vents at the rear of the unit.
2. Always connect the power supply to a 3-prong, grounded AC outlet, using the 3-prong AC power cord provided with the power supply.
3. Do not operate the power supply in extreme humidity (>95%) or where condensation can short the internal electrical circuits of the power supply.
4. When taking the power supply into a cold room, the unit can be operated immediately. However, when removing the power supply from the cold room, let the unit equilibrate to room temperature for a minimum of 2 hours before using it.
5. Never connect a high voltage output lead to earth ground. This defeats the floating electrical isolation of the power supply and exposes the user to potentially lethal high voltages.

## IMPORTANT

This instrument is intended for laboratory use only. This product conforms to the class A standards for Electromagnetic Emissions, intended for laboratory equipment applications. It is possible that emissions from this product may interfere with some sensitive appliances when placed nearby or on the same circuit as those appliances. The user should be aware of this potential and take appropriate measures to avoid interference.

## ENVIRONMENTAL CONDITIONS

Ensure the instrument is installed and operated strictly under the following conditions:

1. Indoor use only
2. ≤95% RH
3. 75-106 kPa
4. Altitude must not exceed 2000 meters
5. 4-40°C operating temperature
6. Pollution degree: 2
7. Mains supply voltage fluctuations up to ±10% of the normal voltage



## AVOIDING ELECTRICAL SHOCK

Follow the guidelines below to ensure safe operation of the unit.

The Basic Power Supply has been designed to utilize shielded wires thus minimizing any potential shock hazard to the user. BT Lab Systems recommends against the use of unshielded wires.

To avoid electrical shock:

1. In the event of solution spilling on the instrument, it must be dried out for at least 2 hours and restored to NORMAL CONDITION before each operation.
2. Never connect or disconnect wires loading from the power jacks when the red indicator light of power switch is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or any connected apparatus.
4. ALWAYS make sure that your hands, work area, and instruments are **clean** and **dry** before making any connections or operating the power supply.
5. ONLY connect the power cord to a properly grounded AC outlet.

## AVOIDING DAMAGE TO THE INSTRUMENT

1. Do not attempt to operate the device if damage is suspected.
2. Protect this unit from physical damage, corrosive agents and extreme temperatures (direct sunlight, etc.).
3. For proper ventilation and safety concerns, keep at least 10 cm of space behind the instrument, and at least 6 cm of space on each side.
4. Use high level of precaution against the damages on the unit.
5. Do not operate the unit out of environmental conditions addressed above.
6. Do not operate the power supplies in high humidity environments (> 95%), or where condensation may occur.
7. To avoid condensation after operating the power supply in a cold room, wrap the unit in a plastic bag and allow at least 2 hours for the unit to equilibrate to room temperature before removing the bag and operating the unit.
8. Prior to applying any cleaning or decontamination methods other than manufacturer's recommendation, users should check with the manufacturer's instruction to see if the proposed method will damage the equipment.

## EQUIPMENT OPERATION

Follow the guidelines below to ensure safe operation of the unit:

1. NEVER access dangerous chemicals or other materials to prevent possible hazard of explosion and damage.
2. Do not operate the unit without lids or covers to prevent possible hazards.
3. A temporary conductivity caused by condensation might occur even though this series is rated Pollution Degree 2 in accordance with IEC 664.

## WARRANTY

BT Lab Systems warrants apparatus of its manufacture against defects in materials and workmanship, under normal service, for ***one year from the shipping date to purchaser***. This warranty excludes damages resulting from shipping, misuse, carelessness, or neglect. BT Lab Systems' liability under the warranty is limited to the receipt of reasonable proof by the customer that the defect is embraced within the terms of the warranty. All claims made under this warranty must be presented to BT Lab Systems within one year following the date of delivery of the product to the customer.

## TECHNICAL SUPPORT

BT Lab Systems offers technical support for all of its products. If you have any questions about the product's use or, operation, please contact BT Lab Systems at the following info.

E-Mail: [info@BTLabSystems.com](mailto:info@BTLabSystems.com)