



Wealtec Corp.

ELITE 200
POWER SUPPLY
Service & Operation & Instruction
Manual

Version 2.0

Item # 0 2012

<http://www.wealtec.com>

E-mail : support@wealtec.com

Packing List

- _____ x 1 main body
- _____ x 1 power cable
- _____ x 1 manual
- _____ x 1 warranty card



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A. Important Notice

The instrument is designed for laboratory use only.

Before setting up and operating ELITE 200 power supply, please carefully read these instructions to get familiarized with installation and operation process. Instructions should be read by well-trained individuals or by technical people from Wealtec Corp. before operating the instruments.

Any improper usage of the instruments may cause damage, please refer to the safety notice.

The instruments shall not be modified or altered in any way. Any modification or alteration will void the warranty, void the regulatory certifications and create potential safety hazard. Wealtec is not responsible for any injury or damage caused by using the instruments for any non-intended purpose or by modifying the instruments by any person who is not authorized by Wealtec Corp.

A-1. Warranty

ELITE 200 power supply, is warranted to be free from defects in materials or workmanship for a period of one year from the original invoice date, under normal usage. Any defects occurring during warranty period, Wealtec Corp. will repair or replace defective products or parts without charge unless the defects arising from below conditions. The defects described below are specially excluded from Wealtec warranty policy.

1. Improper operation of the instrument.
2. Repair or modification by any person who is not authorized by Wealtec Corp.
3. Damage caused by any (in)-direct accident, neglect or misuse.

4. Damage caused by disaster.
5. Damage caused by any improper solvents or samples

A-2. Technical and Service Contact

Most of the operation details are described in the instruction manual and operator can find appropriate solutions according to these instructions. For any other technical/ service questions, please contact your local representative or contact Wealtec international technical/ service specialist by E-mail: support@wealtec.com.

A-3. Safety Notice

A-3-1. Certification

ELITE 200 power supply, is designed to meet the international electrical safety standards EN61010 and EMC regulations. This product holds CE marking and operation is according to the guidance of its instruction manual certificated safe. Any modification or alteration will void the warranty, void the regulatory certifications and create potential safety hazard.



A-3-2. Safety Information

Basic safety precautions must be observed when operating the centrifuge in order to avoid hazards of electrical shock or possible physical injuries.

ELITE 200 power supply, is not to be used in Class 1, Division 1, Group C hazardous location defined by the National Fire Protection Association, Bulletin No.56A (Inhalation Anesthetics), as extending upward to a level of 5 feet above the floor where flammable anesthetics are used.

CAUTION: Below information should be read before using ELITE 200 power supply to prevent possible injury.

To Avoid Electrical Shock:

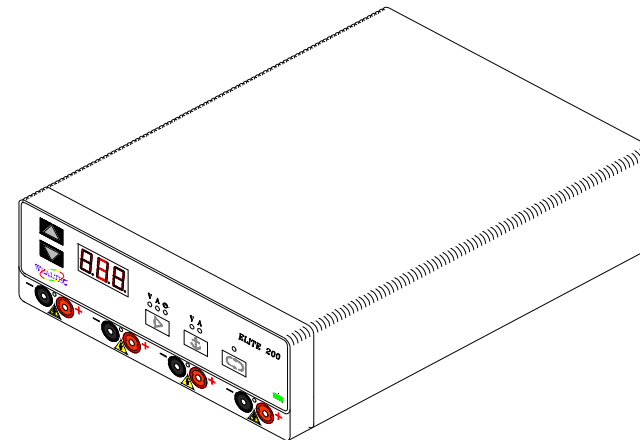
- Plug the power cord only into a grounded 3-wire receptacle.
- Do not remove the grounding prong from the power plug.
- Always unplug the power cord before attempting to service the ELITE 200 power supply.

To Avoid Damage to the Instrument:

- Operate the ELITE 200 power supply with the space at least 6cm around the unit.
- Do not operate ELITE 200 power supply in the environment of high humidity ($\geq 95\%$).
- When taking out ELITE 200 power supply from cold room, the condensation can short its internal electrical circuit. Do not operate the unit until it equilibrates to room temperature for 2 hours.

B. Introduction

ELITE 200 power supply is a settable power supplies with excellent quality. It is perfect for submerged horizontal, mini vertical gel electrophoresis and electro-blotting applications. The output of ELITE 200 power supply is controlled by timer and constant current/voltage, 4-set of apparatus can be connected to each power supply simultaneously for experiment convenience and its compact, light and stackable design offers space saving as well.



B-1. Specifications

Outputs: voltage	5-200VDC adjustable in 1V steps
current	0.01-2.00ADC adjustable in 0.01A step
power	200W max.
Input power	120/230, 50-60Hz
Output terminals	4 set in parallel
Timer control	1-999 minutes
Display	3 digit 7 seg LED
Panel control	Touch panel
Status alarm	Yes
Operation temperature	0-40°C
Operation Humidity	10% to 90% R.H. Non-condensing
Noise level	32dB
Regulation: Ripple	±0.3%@200V and 200W
Line regulation	±0.3%@200V and 200W from 90-132VAC or 198-264VAC
Load Regulation	±0.5%@200V for a 50% change in output load
Drift	±0.3% after 30min warm up @ 200V and 200W
Weight	2.6kg
Dimensions (LxWxH)	13x8.7x2.9inches

B-2. Product Descriptions

The front and rear panel keys are used to set up and run the ELITE 200 power supply. A beep sound will alarm to inform user when front panel key been pressed. A long beep sound will alarm after the run is complete or if an error occurs. This beep sound will continue to alarm every ten seconds until any key is pressed or the power is turned off.

Key descriptions

1 Power switch:

To turn on/off power supply

2  “CONST” key:

Select voltage or current to be constant

3  “MODE” key:

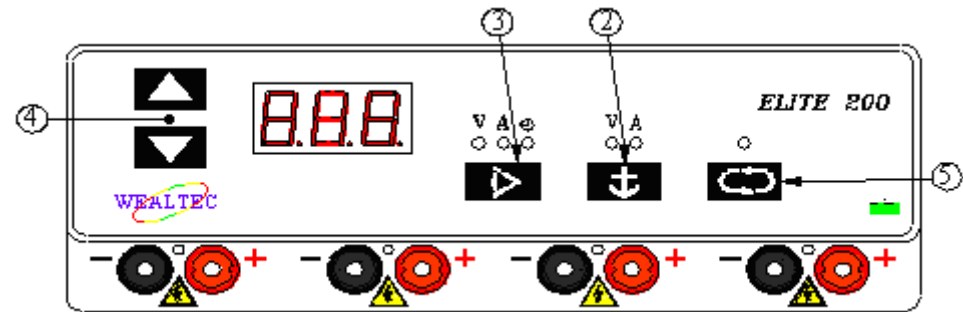
Select the volts, amps, or time to be displayed

4  &  “UP” & “DOWN” key:

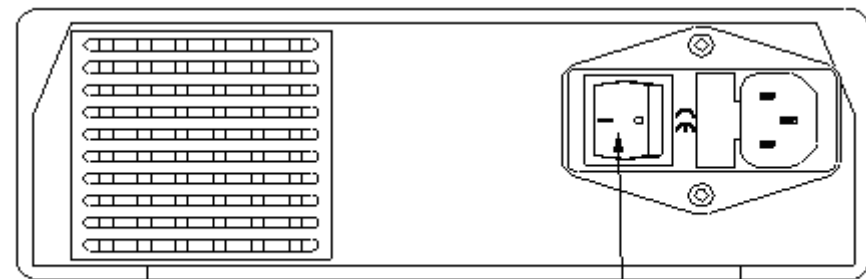
Changes the setting value of the selected parameter.

5  “RUN” key:

To start/stop the output of power from the power supply



Front View



Rear View

C. Installation

1. Carefully take out ELITE 200 power supply from the package box and place it at a stable, suitable place.
2. Connect power cable to correct power source and press the power switch to check ELITE 200 power supply is working properly.

D. Operation instruction:

Step	Action	Description
1	Connect the electrophoresis cell(s) to the power supply	The power leads are non-reverse and color coordinated to the output terminals.
2	Turn on power	The default display is constant voltage and 0V.
3	Select the constant parameter.	V and A are alternately selected by pressing the CONST key.
4	Enter value	Use \triangle / ∇ keys to enter suitable value.
5	Change the default limit if desired.	Default current limit is 2.00A. Default voltage limit is 200V.

- 6 If programming a timed run, press MODE to display Time and enter the minutes to be run. Time is in minutes and the maximum is 999 minutes. If running in time mode a power failure detects (PFD) special function can be activated.
- 7 Set PFD function (Optional) When PFD function is activated and a power failure occurred during sample running, all operation parameters including time are retained in memory. When power restored, the power supply automatically completes the run and E6 error code is displayed after running to alert the operator.
- To activate PFD, simultaneously press both \triangle and ∇ keys after timer setting and PF1 is displayed momentarily. To deactivate PFD before starting the run by following three methods:
1. Simultaneously press both \triangle and ∇ keys again, and PF0 is displayed momentarily.
 2. Set timer to 0.
 3. Restart power supply.
- PFD is deactivated automatically after each run.

8 Press RUN

Start the run.

During a run, you can view the run conditions just press the MODE key. You also can change the value of constant parameter or the length of a timed run by pressing MODE key and then the \triangle and ∇ keys.

9 Stop of run

When timer is timed or press the RUN key again to manually stop a run. Display will show "OFF".

E. Maintenance

ELITE 200 power supply can be cleaned by soft moisten tissue or cloth. Organic solvents or strong detergents may damage the instrument and should be avoided.

F. Trouble shooting

F-1. Instrument Service

If your ELITE 200 power supply is malfunction or operates unusually in any way. You may initially attempt to solve the problem by following the procedures in this section. All other servicing attempts will terminate the responsibility of the manufacturer under the forms of the warranty.

If you cannot repair a system malfunction, contact your local WEALTEC representative.

This section discusses error messages, which appear when the system has encounter, a known problem. These messages are listed in numerical order, along with possible causes of the message and corrective actions.

F-2. General Error

Pre-caution

Wait 10 seconds from time AC power is disconnected to allow high voltage discharge within the power supply.

Symptom	Action and possible causes
Fan is not spinning LED & Display do not light up Front panel power on indicator off	<ol style="list-style-type: none"> 1. Check source wall power. 2. Replace a new configure fuse and try again. 3. Check if power switch malfunction. 4. Check if line voltage select error. 5. Contact your local Wealtec representative.
Fan is spinning LED & Display do not light up Front panel power on indicator off	<ol style="list-style-type: none"> 1. Check source wall power. 2. Check if line voltage select error. 3. Contact your local Wealtec representative.
Fan is spinning LED & Display do not light up Front panel power on indicator on	<ol style="list-style-type: none"> 1. Contact your local Wealtec representative
Fuse F1 blow	<ol style="list-style-type: none"> 1. Change a new same configure fuse and try again. 2. Contact your local Wealtec representative.

F-3. Error Message

Error Code	Explanation	Possible Solution
E1	No load detected The electrophoresis cell(s) are not plugged in. During a run, load current chopped more than 0.01A.	* Check all connections * Check appropriate buffer volume. Press the RUN key to resume the run or any other key to clear the error code.
E2	Unacceptable Value(s) Entered * No value entered * Voltage below 5V * Current below 0.01A	Enter acceptable values and press run key to resume the run or any other key to clear the error code.
E3	Change in Load Resister * Electrophoresis cell(s) were added or removed during a run. * Buffer leakage * Loose connection in a connected cell	Check and correct any potential resistance problems. Then press RUN key to resume the run or any other key to clear the error code

E4	Power Failure During a Non-Timed Run	Press any key (other than RUN) to clear the error code. Then press the RUN key to resume the run.
E5	Power Failure During a Timed Run (PFD OFF)	Press any key (other than RUN) to clear the error code. Then press the RUN key to restart the run.
E6	Power Failure During a Timed Run (PFD ON)	Press any key (other than RUN) to clear the error code.
E7	Short Circuit Load current exceeded 2A.	<ul style="list-style-type: none"> * Check for any short circuit. * High buffer concentration * Press the RUN key to resume the run or any other key to clear the error code
CHC	Current differential alarm Difference current value (>0.1A) between start and final run.	* Check buffer volume
Any other error code		Contact your local Wealtec representative

G. Order Information

Item #	Description
1001001	ELITE 200 Power Supply, 120V, 50-60Hz
1001002	ELITE 200 Power Supply, 230V, 50-60Hz
1001003	ELITE 300 Power Supply, 120V, 50-60Hz
1001004	ELITE 300 Power Supply, 230V, 50-60Hz
1001005	ELITE 300 PLUS Power Supply, 120V, 50-60Hz
1001006	ELITE 300 PLUS Power Supply, 230V, 50-60Hz
1001007	mini ELITE Power Supply, 90-264V, 50-60Hz

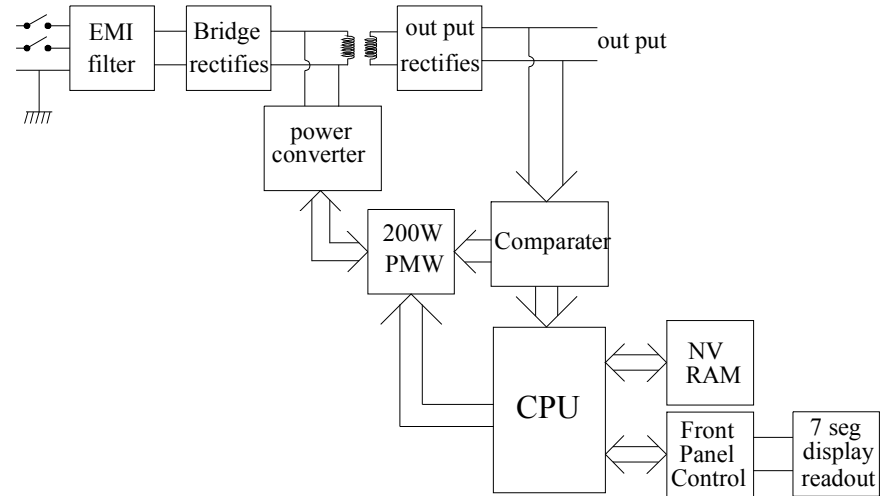
Accessories

Item #	Description
1000001	Power adapter
1000002	Power cable

Appendix: Service Manual

Section 1 — Product Description

The 200V, 200W, electrophoresis power supply is a micro controller based, fly back converter power supply. The component designations used in the functional description refer to fig. below.



Section 2 — ELITE 200 Function Description

The electrophoresis power supply is a micro controller based flyback converter power supply. The principle sections are the primary circuit, 200W power converter, control circuit and the front panel board.

Primary Circuit

AC power is applied through switch with EMI filter. When the switch is closed and AC power is applied, RT1 and RT2 limit the current into the supply. BR1 rectifies the AC power to produce around 320VDC high voltages across C3 and C4. JP1 allows the line voltage selection for 110/220 VAC operation. T4, BR2, Q4, Q5, U4 form a regulator for the control circuitry. Q6 regulator for fan used only.

Power Converter

The electrophoresis power supply uses a 200W discontinuous mode flyback converter topology. When output is needed, the control circuitry forces the shut down signal "LOW" to start the power converter. The voltage error signal is transmitted and from the control circuitry U6 to U2-9, U2 drives U1, which is a gate transformer driver for T3. The error signal magnitude is proportion to the T3 duty cycle. When Q1 & Q2 turns on, energy is stored in the T2 primary. At the same time, D6 and D7 conducts to charge up output storage capacitor C18. Filter L3 and C11 suppress voltage spikes when C18 is charged up. When Q9 turns off, snubber circuit R6 and C6 suppress the leakage inductance spike from the T2 primary winding. D4 and D5 help to divert current from the inductance spike. Current sense circuit CT1 active to turn off PWM if primary current exceeds 8A.

Control Circuit

R17 and R18 divide high voltage output to be a voltage sample signal. The voltage applies to A-D converter U13 CH0. At the same time the R21 current sense resistor converts the output current to a voltage. U7 condition this voltage and apply it to U13 CH1. Micro controller U11 samples U13 to determine if increase or decrease the output voltage. If necessary to increase, U11-33 is pulled " LOW" to turn Q8 on. Compactor U6B generates an error signal, which drives U2 to vary the duty cycle of T3 according to the output voltage required. To decrease U7-32 is pulled " HIGH" to turn off Q8, Compactor U6B generates an error signal which drives U2 to vary the duty cycle of T3 according to the output voltage required.

Shut down signal turn off power converter when:

Output power is not required, U11-5 pulls to " HIGH" to turn off the power converter (U9A).

U12B no longer detects that the first digit on the LED display is updated within about 40ms. (U9B)

When output short-circuit, R16 limits the current to current sense resistor R21. R20 limits the voltage to U6D to prevent high voltage damage. Comparator U5D detect output short-circuit or over current conditions over 4A.

D12, C23 and R22 rectify the isolated AC power from T4 to produce a pulsing analog signal. U3B

converts the pulsing to a digital signal. This digital signal is applied to missing pulse detector U12A. Once power failure is detected. The micro controller turns off the power converter and LED to conserve power and stores the users running information in non-volatile memory U14.

If the primary current exceeds 8A peak current. Current limit signal active Q3 to turn PWM off.

When output voltage over 220 volts U3A turn off PWM.

When ground leak detected. U5C travels the acknowledge signal to U8B to turn on shutdown signal and to U11 as a priority interrupt signal.

Display and Front Panel Board

Micro controller U7 scans pins 1-4 for the up, down, Voltage/Current/Timer and constant Voltage/Current. Pins 6-8 and 34 to update the LED digits. Pin 15 for the Start/Stop key. Pins 21-28 are used to determine the LED pattern. All signals enter J1 to the display board and key commands enter J2 from the front panel board.

Section 3 — Service Parts List

E000001	Up husk	E000017	2x7mm squa green LED
E000002	Down husk	E308952	AT89C52-20PC
E000003	Fundus	E309346	BR93C46
E000004	Foudroyant housing	E203527	SG3527AN
E000005	Foudroyant jacketing Red	E301298	LTC1298
E000006	Foudroyant jacketing Black	E201054	LT1054
E000007	Foudroyant copperplate	E200007	OP07CP
E000008	Rubber	E203907	UC3907N
E000009	DC12V fan	E374014	74HCT14N
E000010	Filter	E274032	74HCT32N
E000011	Power cord	E374123	74HCT123N
E000012	Cable red	E374541	74ACT541N
E000013	Cable black	E300339	LM 339
E000014	Cable 3pin	E200393	LM 393
E000015	7 seg display	E200347	LF347BN
E000016	3mm green LED	E215080	MOSFET N-channel
E200001	200 main board PCB	E200200	Transformer 1:1 200V
E200002	ELITE 200 membrane panel	E298498	Transformer 3 groups
E200003	5A250V 3mm fuse	E204037	Current sensor
E200004	2.5A resume fuse	E311015	Transformer 110-15V
E300005	DC5V buzzer		
E300002	Panel PCB		

Section 4 — Circuit Diagram:

As special request.



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Warranty Card

THANK YOU FOR ORDERING AWEALTEC PRODUCT.

Wealtec Corp. warrants all Wealtec instruments to be free from defects in design, workmanship, and material under normal use for a period of one year from the date of initial shipment.

This warranty covers all parts and components of the instrument except those normally requiring frequent replacement, such as tubing, gasket, O-rings, etc. Wealtec will not be liable for any personal injury, bodily injury, misuse, improper maintenance, negligence or accident.

This warranty is in lieu of all other warranties, expressed or implied, but not limited to, the implied warranties of merchantability or fitness for a particular purpose.

PLEASE KEEP THE WARRANTY CARD FOR FUTURE USE.

Instrument Model : **ELITE 200**

Item Number :

Serial Number :

Initial Shipping:

Packager
Identification

02012 Printed in Taiwan

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