



Wealtec Corp.

**ELITE 300 /300 PLUS
POWER SUPPLY**

**Service & Operation & Instruction
Manual**

Version 1.3

Item # 02010

****This instrument is intended for laboratory use only.***

<http://www.wealtec.com>

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Packing List Power Supply

Model: Elite 300 Elite 300 Plus

_____ x1 power supply

_____ x1 power cable

_____ x1 instruction manual (Packing list & warranty card)



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Section 1 — General Information

1.1 Objective

This document is intended to define the Customer Support Department (CSD) service strategy for the ELITE 300 (300 PLUS) project.

1.2 Scope

This document will outline the strategic requirements necessary to support the ELITE 300 (300 PLUS) project for the CSD manager associated department staff and ELITE 300 (300PLUS) team members.

1.3 Conventions

The following conventions are used throughout this manual

- ※ Left and Right side of the unit are as viewed from the front operator position of the unit, unless otherwise stated.
- ※ Dimensions are in centimeters unless otherwise stated.

Section 2 - System Overview

2.1 Product Description

The 300V, 75W(90W), electrophoresis power supply is a micro controller based, fly back converter power supply. The component designations used in the functional description refer to fig. 2.1

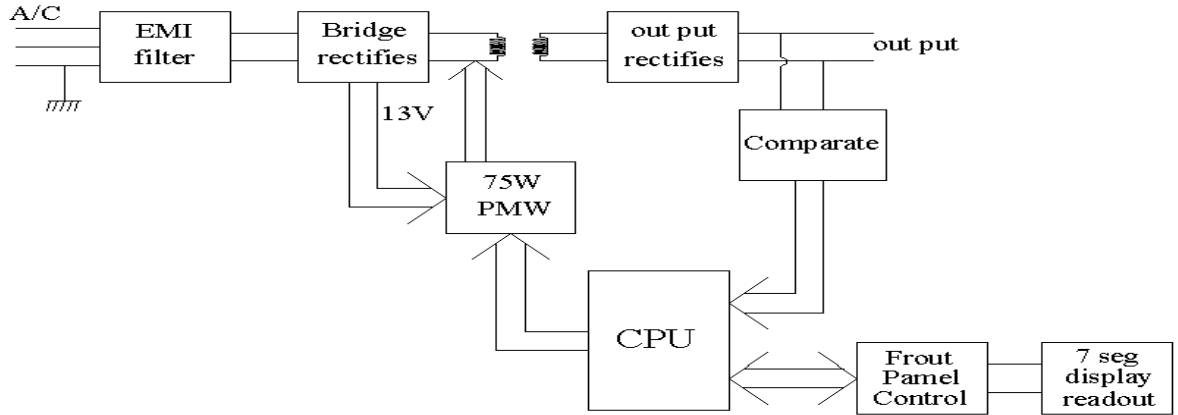


Fig 2.1

2.2 Specifications

Outputs : Voltage --- 10 - 300 VDC adjustable in 1 v steps.

Current --- 4 - 400 (4-500)mA DC adjustable in 1mA steps.

Power --- 75W (90W)max.

Input power. Three wire with ground

110±10 % 60 Hz

or 220±10 % 60 Hz

Operation Temperature

0-40°C

Humidity

10% to 90% R.H. Non-condensing

Noise Level

27dB

Regulation:

Ripple:

ELITE 300 ±0.5 % @ 200 V and 75 W

ELITE 300 PLUS ±0.5 % @ 200V and 90 W

Line Regulation:

ELITE 300	$\pm 0.5\%$ @ 200V and 75 W From 90 ~ 132 VAC or 198 ~ 264 VAC
ELITE 300 PLUS	$\pm 0.5\%$ @ 200V and 90 W From 90 ~ 132 VAC or 198 ~ 264 VAC

Load Regulation:

ELITE 300	$\pm 1.0\%$ @ 300V for a 50% change in output load
ELITE 300 PLUS	$\pm 1.0\%$ @ 300V for a 50% change in output load

Drift:

ELITE 300	$\pm 0.5\%$ after 30 min warm up at 200V and 75 W
ELITE 300 PLUS	$\pm 0.5\%$ after 30 min warm up at 200V and 90 W

Physical Dimensions:

Weight	1.9 Kg
Length	13 Inches
Width	8.7 Inches
Height	2.9 Inches

2.3 Certificate

The ELITE 300(300 PLUS) has a CE sticker on the back signifying that it has passed the European Directives for Product Safety EN61010 and EMC.

2.4 Service Strategy Worldwide

The preferable service option is most of the service on the Instrument is performed by the customer. The customer can call for phone support after diagnosing the problem. Phone support personnel will ship the appropriate parts/unit to the customer to be installed by the user. The phone support personnel will determine if defective parts be discarded or returned to the repair center.

2.5 Prevention Maintenance

The design of the ELITE 300(300 PLUS) should allow for preventive maintenance to be performed by the customer. PM visits by service engineers will not be required.

2.6 Warranty Coverage

Coverage will include any service visits required during the warranty period and replacement of any failed parts or component during normal operation. Warranty period is one year.

Section 3 — Control and Operation

3.1 Control

The front and rear panel keys discussed in Fig-3.1 are used to set up and run the ELITE 300 (300 PLUS) 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	Description
1	ON/OFF	ON/OFF Power Supply
2	CONST	Select voltage or current to be constant
3	MODE	Select the volts, milli amps, or time to be displayed
4	△▽	Changes the displayed value of the selected parameter
5	RUN	Starts and Stops the output of power from the Power Supply

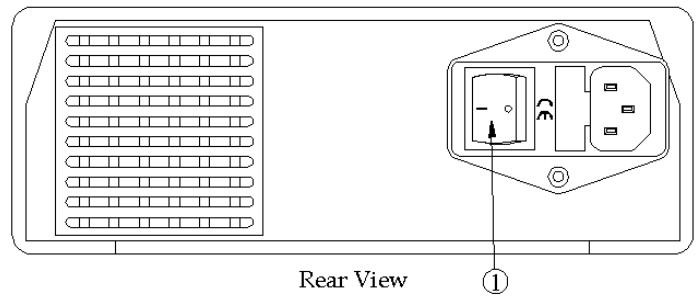
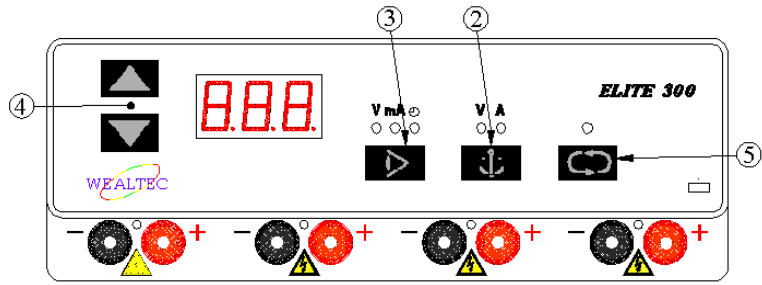


Fig 3.1

3.2 Setup and Operation

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 up or down keys to enter suitable value.
5	Change the default limit if desired.	Default current limit is 400mA. Default voltage limit is 300V.
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. The function of PFD is if a power failure occurred

during sample running, all operation parameters including time are retained in memory. The power supply automatically completes the run and E5 error code is displayed to alert the operator when power is restored.

To activate PFD , simultaneously press and hold up and down keys until PFD is displayed momentarily. PFD is deactivated automatically after each run, before starting the run set timer to 0 or turning the power supply off and on again.

7 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 press MODE key and then the \triangle ∇ keys.

8 Stop of run

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

Section 4 — ELITE 300 Function Description

The electrophoresis power supply is a micro controller based flyback converter power supply. The principle sections are the primary circuit, control circuit, 75W power converter and the front panel board.

4.1 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. BR2 rectifies the AC power to produce around 320VDC high voltages across C33 and C36. JP1 allows the line voltage selection for 110/220 VAC operation. T2, BR1, Q7, Q8 form a regulator for the control circuitry. A 13V DC regulator by D5 for the power converter circuitry. Q10 regulator for fan used only.

4.2 Power Converter

The electrophoresis power supply uses a 75W discontinuous mode flyback converter topology. When output is needed, the control circuitry forces the U7-1 to "LOW" to start the power converter. The voltage error signal is transmitted and isolated via U10 from the control circuitry to U11-9, U11

drives Q11 and Q12, which drive the switching transistor Q9. Q9 turns on; energy is stored in the T1 primary. At the same time, D1 conducts to charge up output storage capacitor C10. Filter L1 and C11 suppress voltage spikes when C10 is charged up. When Q9 turns off, snubber circuit R60 and C22 suppress the leakage inductance spike from the T1 primary winding.

4.3 Control Circuit

R8 and R21 divide high voltage output to be a voltage sample signal. The voltage applies to A-D converter U3 CH0. At the same time the R38 current sense resistor converts the output current to a voltage. U2B condition this voltage and apply it to U3 CH1. Micro controller U7 samples U3 to determine if increase or decrease the output voltage. If necessary to increase, U7-33 is pulled "LOW" to turn Q1 on and charge up C8. Compactor U1B generates an error signal and R6 convert the error signal into current, which drives U10. To decrease U7-32 is pulled "HIGH" to discharge C27, U1B generates an error signal. The error signal is feed into U11-9 to vary the duty cycle according to the output voltage required.

Shut down signal turn off power converter when :

- i. Output power is not required, U7-5 pulls to " HIGH" to turn off the power converter (Q3).
- ii. U9B no longer detects that the first digit on the LED display is updated within about 40ms. (Q4)
- iii. When output short-circuit, R38 limits the current to transistor Z1. Z1 limits the voltage to U2B to prevent high voltage damage. R3 and U5B detect output short-circuit or over current conditions over 500mA.(Q6)
- iv. D4, C21 and R57 rectify the isolated AC power from T2 to produce a pulsing analog signal. U5D converts the pulsing to a digital signal. This digital signal is applied to missing pulse detector U9A. 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 U6.

4.4 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 5 — Trouble-Shooting

5.1 Instrument Service

If your ELITE 300(300 PLUS) 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 that 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.

5.2 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

1. Check source wall power.

Front panel power on, indicator off

1. Change a new, same configure fuse and try again.

2. Check if power switch malfunction.

3. Contact your local Wealtec representative.

Fan is spinning

LED & Display do not light up

Front panel power on indicator off

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

1. Contact your local Wealtec representative

Fuse F1 blow

1. Change a new same configure fuse and try again.

2. Contact your local Wealtec representative.

5.3 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 4mA.	* 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 10v * Current below 4mA	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 400mA.	<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 (>100mA)between start and final run.	* Check buffer volume

Any Other Error Code

Contact you local Wealtec representative.

Section 6 — Service Parts list

E000001	Up husk	E000017	2x7mm squa green LED
E000002	Down husk	E308952	AT89C52-20PC
E000003	Fundus	E309346	BR93C46
E000004	Fundroyant Housing	E303524	LM3524 DN
E000005	Fundroyant jacketing Red	E301298	LTC1298
E000006	Fundroyant jacketing Black	E374014	74HCT14N
E000007	Fundroyant copperplate	E374123	74HCT123N
E000008	Rubber	E374541	74ACT541N
E000009	DC12V FAN	E300339	LM 339
E000010	Filter	E300358	LM 358
E000011	Power Cord	E317003	QTCNY17- 3
E000012	Cable red	E300040	MOSFET N-channel for 300
E000013	Cable black	E506100	MOSFET N-channel for 300 plus
E000014	Cable 3pin	E300300	Transformer 1:1 300V
E000015	7 SEG DISPLAY	E311015	Transformer 110-15V
E000016	3mm green LED	E300005	DC5V BUZZER

E300003

ELITE 300 Membrane panel

E500002

ELITE 300 PLUS Membrane panel

E300001

300 Main Board PCB

E500001

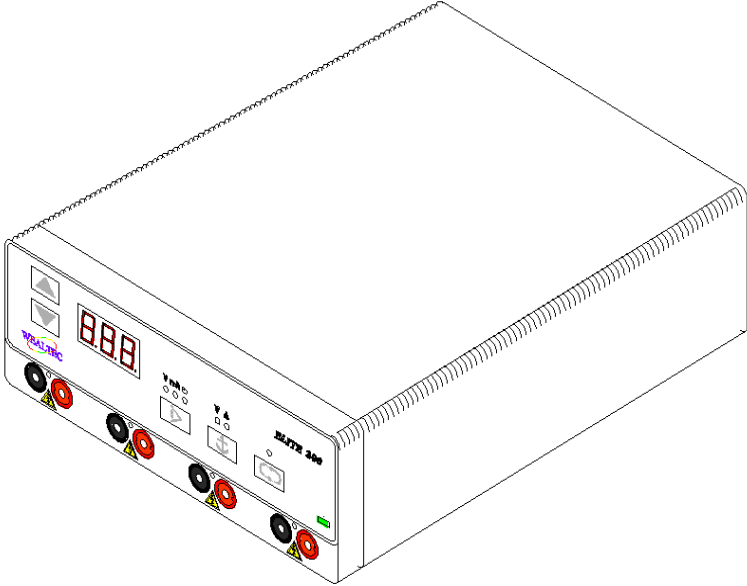
300PLUS Main Board PCB

E300002

PANEL PCB

Section 7 — 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 300 Elite 300Plus

Item Number :

Serial Number :

Initial Shipping

Packager
Identification

02010

Printed in Taiwan

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