

# FA-665B

Test Equipment Depot - 800.517.8431 - 99 Washington Street Melrose, MA 02176 - TestEquipmentDepot.com

## ADJUSTABLE DC REGULATED POWER SUPPLY



- 0 MI2066 -



## SAFETY NOTES

Read the user's manual before using the equipment, mainly "**SAFETY RULES**" paragraph.

The symbol  on the equipment means "**SEE USER'S MANUAL**". In this manual may also appear as a Caution or Warning symbol.

**WARNING AND CAUTION** statements may appear in this manual to avoid injury hazard or damage to this product or other property.

## USER'S MANUAL VERSION

Version	Date
1.1	July 2016

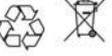
## SAFETY RULES

- \* Use this equipment connected **only to systems with their negative of measurement connected to ground potential.**
- \* This is a **Class I** equipment, for safety reasons plug it to a **supply line with the corresponding earth connection.**
- \* This equipment can be used in **Overvoltage Category II** installations and **Pollution Degree 1** environments.
- \* When using some of the following accessories **use only the specified ones** to ensure safety.

Power cord **CA-005**

- \* Observe all **specified rating** both of supply and measurement.
- \* Remember that voltages higher than **60 V DC** or **30 V AC rms** are dangerous.
- \* Use this instrument under the **specified environmental conditions.**
- \* **The user is only authorised to** carry out the following maintenance operations:
  - Replace the mains fuse that must be of the **type** and **value specified.**
  - On the Maintenance paragraph the proper instructions are given.
  - Any other change on the equipment should be carried out by qualified personnel.
- \* **Do not obstruct the ventilation system** of the instrument.
- \* Follow the **cleaning instructions** described in the Maintenance paragraph.

\* Symbols related with safety:

	DIRECT CURRENT		ON (Supply)
	ALTERNATING CURRENT		OFF (Supply)
	DIRECT AND ALTERNATING		DOUBLE INSULATION (Class II protection)
	GROUND TERMINAL		CAUTION (Risk of electric shock)
	PROTECTIVE CONDUCTOR		CAUTION REFER TO MANUAL
	FRAME TERMINAL		FUSE
	EQUIPOTENTIALITY		EQUIPMENT OR COMPONENT TO BE RECYCLED

### Descriptive Examples of Over-Voltage Categories

**Cat I** Low voltage installations isolated from the mains.

**Cat II** Portable domestic installations.

**Cat III** Fixed domestic installations.

**Cat IV** Industrial installations.

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# ADJUSTABLE DC REGULATED POWER SUPPLY

## FA-665B

### 1 INTRODUCTION

#### 1.1 Description

The model **FA-665B** high-precision DC regulated power supply has three ways output. Of which, two ways are adjustable and one way is fixed.

The two adjustable outputs can also be selected for constant voltage or constant current, designed in high stability and performance circuit. In constant voltage state, the output voltage can be arbitrarily adjusted from 0 V on in the nominal range; and in the state of constant current, the output current can be adjustable from 0 A on in the nominal range. The two outputs can be connected in parallel or in series, while the master used for voltage or current adjustment. The maximum output voltage in series is double of independent's, and the maximum output current in parallel is double too.

There are volt and Amp meters (LED) for indicating each of the two outputs with high accuracy.

The one fixed way outputs 5 V voltage. Due to the single chip integrated regulator, this output has good stability and ripple factor, and has reliable overload protection to protect the unit against being damaged whenever overload or short circuit.

The unit features in small size, good performance, novel appearance and etc, it is the ideal power supply unit for science investigation, college, factory, electronic appliance maintenance and etc.

## 2 OPERATION

### 2.1 Control and description of front panel



**Figure 1.** Front panel description.

- ① **Volt display:** indicating slave output voltage.
- ② **Amp display:** indicating slave output current.
- ③ **Slave constant-current indicator or two-ways parallel state indication:** the LED illuminates when the slave output is in current-regulated state or the two adjustable outputs is in parallel.
- ④ **Slave constant-voltage indicator:** the LED illuminates when the slave output is in voltage-regulated state.
- ⑤ **Slave constant voltage adjustment:** adjusting slave output voltage.
- ⑥ **Slave constant current adjustment:** adjusting slave output current value (adjusting the current-limit protection point).
- ⑦ **Output indicator:** when the output button is pressed, the indicator will light to show that the power supply has output.
- ⑧ **Output on/off button:** control the output state of the power supply.
- ⑨ **Slave output terminal (-):** connecting the negative terminal of load.

- 10 **Case ground:** connecting the case to ground.
- 11 **Slave output terminal (+):** connecting the positive terminal of load.
- 12 **Master output terminal (-):** connecting the negative terminal of load.
- 13 **Case ground:** connecting the case to ground.
- 14 **Master output terminal (+):** connecting the positive terminal of load.
- 15 **Control switch:** for selecting the two adjustable outputs independent, series, parallel.
- 16 **Fixed 5V output terminal (-):** connecting the negative terminal of load.
- 17 **Fixed 5V output terminal (+):** connecting the positive terminal of load.
- 18 **Power switch:** the unit is ON when this button switch is depressed, while CV LED (4) (22) or CC LED (3) (23) illuminating.
- 19 **Fixed output over current indicator:** the indicator will light if the fixed output is over current.
- 20 **Master constant voltage adjustment:** adjusting master output voltage.
- 21 **Master constant current adjustment:** adjusting master output current value (adjusting the current-limit protection point).
- 22 **Master constant-voltage indicator:** the LED illuminates when the master output is in voltage-regulated state.
- 23 **Master constant-current indicator:** the LED illuminates when the master output is in current- regulated state.
- 24 **Volt display:** indicating master output voltage.
- 25 **Amp display:** indicating master output current.

## 2.2 Operating method

### 2.2.1 Independence use of two adjustable output

- 1 Set switches (15) to spring out position.
- 2 When the adjustable output is used as CV output, first should rotate clockwise the CC adjustment (6) and (21) to maximum, then turn on power switch (18), adjust CV adjustment (5) and (20) till output voltage reach required voltage value. At this time, the CC state indicator (3) and (23) go out and the CV state indicator (4) and (22) light on.
- 3 Used as CC output, after turning on power switch (18), first rotate clockwise the CV adjustment (5) and (20) to maximum, while rotate counterclockwise the CC adjustment (6) and (21) to minimum, then connect the required load, again adjust clockwise adjustment (6) and (21) till output current reach the required current value. At this time, the CV state indicator (4) and (22) go out and the CC state indicator (3) and (23) light on.
- 4 Used as the CV output, in general the CC adjustment (6) and (21) should be set to maximum, but for this unit, the current-limiting protection point can also be set arbitrarily.

**Setting procedure:** turn on power, rotate counterclockwise the CC adjustment (6) and (21) to minimum, then make the positive and negative output terminal in short connection and rotate clockwise the CC adjustment (6) and (21) till output current equal to the required current-limiting protection point, so the current-limiting protection point is well set.

### 2.2.2 Series using of the two adjustable outputs

- 1 Set Switchs (15) in series mode according to the front panel. At this time, turn the master voltage adjustment (20) and the slave out voltage tracks strictly the master output voltage, and the output voltage can be up to double of independent's maximum voltage (voltage between terminal (14) and (9)).
- 2 Before the series connecting, it must be examined if the negative terminal of both master and slave output are connected to case grounded terminal, if they are, must be disconnect, otherwise, short-circuit will be caused in the slave output when the two outputs are connected is series.

- 3 When the two outputs are in series, the voltage is controlled by master output, but current adjustment of two outputs is still independent. Therefore, attention should be paid to the position of the CC adjustment (6). For example, knob (6) is at the position of counterclockwise to end or current of slave output exceeds current-limiting protection point, at this time, the voltage of slave output will not track the voltage of master. So knob (6) should be rotated clockwise to maximum then the two outputs are in series.
- 4 By series connection, if there is power output, proper leads corresponding to output power should be used to short connect the negative terminal of master output with positive terminal of slave output reliably. Since it is shorted by a switch inside the unit, current will pass on the shorted switch when there is power output. This will affect the reliability of the unit.

### 2.2.3 Parallel using of the two adjustable outputs

- 1 Press in switches (15), at this time, the two outputs are in parallel, adjust voltage adjustment (20) of master output, the voltage of two ways keep same, and slave output CC indicator (3) lights on.
- 2 When the two outputs are in parallel, the CC adjustment (6) of slave output does not work. When used as CC supply, simply adjust the CC adjustment (21) of master output, at this time, output current of both master and slave are controlled by it and are same, output current is up to double of independent's maximum current.
- 3 While the two outputs in parallel, proper leads corresponding to output power should be used to short reliably the two positive terminals and the two negative terminals of master, slave output separately, so as to make load connected reliably with the two parallel outputs. If the load is only connected to one of the output terminals, unbalance may be caused to current of the two outputs, this may also damage the series/ parallel switches (15).

**NOTE:** The LED display is in three digits. To get more accurate measuring value, you should calibrate by external circuit with precision measuring instrument.

**CAUTION:**

This unit has excellent protection function, 5 V output has reliable protection for current-limit and short. The two adjustable outputs have current-limit protection. As there is controlling circuit for regulating transistor's power loss in the circuit, when short-circuit occurs, the power loss on large power transistors is not very high, it can't cause any damage to the unit. But there is still power loss when short-circuit, in order to reduce aging and energy consumption, so this situation should be found as soon as possible and turn off power, then exclude the faults.

When operating is finished, put it in a dry place of good ventilation, and keep it clean. If it is not in use for a long period, pull off the power supply plug for storage.

For maintenance, input voltage must be cut off.

### 3 SPECIFICATIONS

Specifications	
<b>Input voltage</b>	110 VAC~127 VAC x 10 % / 60 Hz 220 VAC~240 VAC x 10 % / 50 Hz (switchable)
<b>Output voltage</b>	2 x 0 to 30 V
<b>Output current</b>	0 to 5 A
<b>Line regulation</b>	
<b>Two adjustable output</b>	CV = $1 \times 10^{-4} + 3$ mV CC = $2 \times 10^{-3} + 3$ mA
<b>Fixed output</b>	10 mV
<b>Load regulation</b>	
<b>Two adjustable outputs</b>	CV = $1 \times 10^{-4} + 2$ mV CV = $1 \times 10^{-4} + 5$ mV CC = $2 \times 10^{-3} + 3$ mA CC = $2 \times 10^{-3} + 5$ mA
<b>Fixed output</b>	10 mV
<b>Ripple and noise</b>	
<b>Two adjustable output</b>	CV = 0.5 mV rms CV = 1.0 mV rms CC < 3mA rms
<b>Fixed output</b>	10 mV rms
<b>Protection</b>	Current-limit
<b>Display accuracy</b>	
<b>Volt-indication</b>	(0.2%Rdg+2 digits), 2.5% Full Scale
<b>Amp-indication</b>	(1.0%Rdg+2 digits), 2.5% Full Scale
<b>Mechanical features</b>	
<b>Dimensions W. x H. x D.</b>	260 x 160 x 340
<b>Weight</b>	10 kg
<b>Accessories</b>	
1 x Quick Reference Guide	
2 x Fuses	

**Note:** Equipment specifications are set in these environmental operating conditions. Operation outside these specifications are also possible. Please check with us if you have specific requirements.

#### RECOMMENDATIONS ABOUT THE PACKING

It is recommended to keep all the packing material in order to return the equipment, if necessary, to the Technical Service.

## 4 MAINTENANCE

### 4.1 **Instructions for returning by mail**

Instruments returned for repair or calibration, either within or out of the warranty period, should be sent with the following information: Name of the Company, name of the contact person, address, telephone number, receipt (in the case of coverage under warranty) and a description of the problem or the service required.

### 4.2 **Cleaning Recommendations**

**CAUTION:** To clean the cover, take care the instrument is disconnected.

**CAUTION:** Do not use scented hydrocarbons or chlorized solvents. The cover should be cleaned by means of a light solution of detergent and water applied with a soft cloth. Dry thoroughly before using the system again.

**CAUTION:** Do not use for the cleaning alcohol or its derivatives, these products can attack the mechanical properties of the materials and diminish their useful time of life.



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**PROMAX ELECTRONICA, S. L.**