

**MULTI-OUTPUT  
DC REGULATED POWER SUPPLY**

This series include two-way and three-way DC regulated power supply. Three-way have high accuracy output, of which two way are adjustable and one way is fixed. The two adjustable outputs can be selected for constant voltage (C.V.) or constant current (C.C.), designed in high stability and performance circuit. In constant voltage operation mode, the output voltage can be arbitrarily adjusted from 0V on in the nominal range. In constant current operation mode, the output current can be adjusted from 0A on in the nominal range.

The two outputs can be connected in parallel or in series, while the master adjust controls the voltage and current setting. The fixed output voltage is 5V. This output features good stability and low ripple along with overload (e.g. short circuit) protection.

The unit features small size and excellent performance combined with an elegant design, being ideal for research, university, industry and appliance maintenance laboratories.

Rated output	Voltage(V)	0-20	0-30	0-30	0-30	0-40	0-50	0-50	0-50	0-60	0-60	0-60
	Current(A)	0-5	0-2	0-3	0-5	0-3	0-2	0-3	0-5	0-2	0-3	0-5
Weight(kg)		10.8	10	11.2	13	12.8	11.8	13.2	18.7	13	16.5	24.8

Table 1.

## 1. TECHNICAL SPECIFICATION:

1.1 Input voltage: 110VAC or 220VAC 60Hz or 50Hz

1.2 Two adjustable outputs

1.2.1 Output voltage: see Table 1 (adjustable continuously)

1.2.2 Output current: see Table 1 (adjustable continuously)

1.2.3 Source regulation: CV  $\leq 1 \times 10^{-4} + 0.5\text{mV}$

CC  $\leq 1 \times 10^{-3} + 6\text{mA}$

1.2.4 Load regulation: CV  $\leq 1 \times 10^{-4} \times 10^{-4} + 2\text{mV}$  ( $I_{\text{rated}} \leq 3\text{A}$ )

CV  $\leq 1 \times 10^{-4} \times 10^{-4} + 5\text{mV}$  ( $I_{\text{rated}} > 3\text{A}$ )

CC  $\leq 2 \times 10^{-3} + 6\text{mA}$

1.2.5 Ripple and noise: CV  $\leq 1\text{mV}$  (rms)

CV  $\leq 20\text{mV}_{\text{p-p}}$

CC  $\leq 3\text{mA}$  (rms)

$$CC \leq 50 \text{ mA}_{p-p}$$

- 1.2.6 Protection: current-limiting protection
- 1.2.7 Indication: Voltmeter & Ammeter;  
or 3-digit Volt-LCD(LED) & Amp-LCD(LED) .
  - a. Volt-indication: LCD (LED)  $\pm 1\% \pm 2$ digits; meter class of 2.5 (F.S.)
  - b. Amp-indication: LCD (LED)  $+2\% \pm 2$ digits; meter class of 2.5 (F.S.)
- 1.3 Fixed output:
  - 1.3.1 Output voltage:  $5V \pm 3\%$
  - 1.3.2 Output current: 3A
  - 1.3.3 Source regulation:  $\leq 1 \times 10^{-4} + 1\text{mV}$
  - 1.3.4 Load regulation:  $\leq 1 \times 10^{-3}$
  - 1.3.5 Ripple & noise:  $\leq 0.5\text{mV}$  (rms)  
 $\leq 10\text{mV}_{p-p}$
  - 1.3.6 Protection: current-limiting & short-circuit protection.
- 1.4 Operating ambient:
  - 1.4.1 Operating temperature: 0 to  $+40^{\circ}\text{C}$
  - 1.4.2 Relative humidity: less than 90%
- 1.5 Size: 360mm X 265mm X 165mm
- 1.6 Operating time: 8 hours continuously

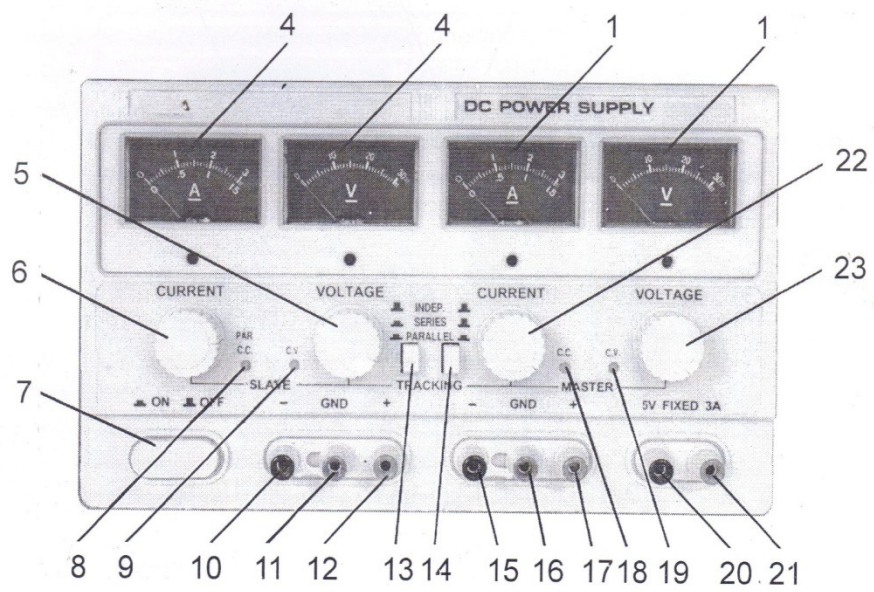
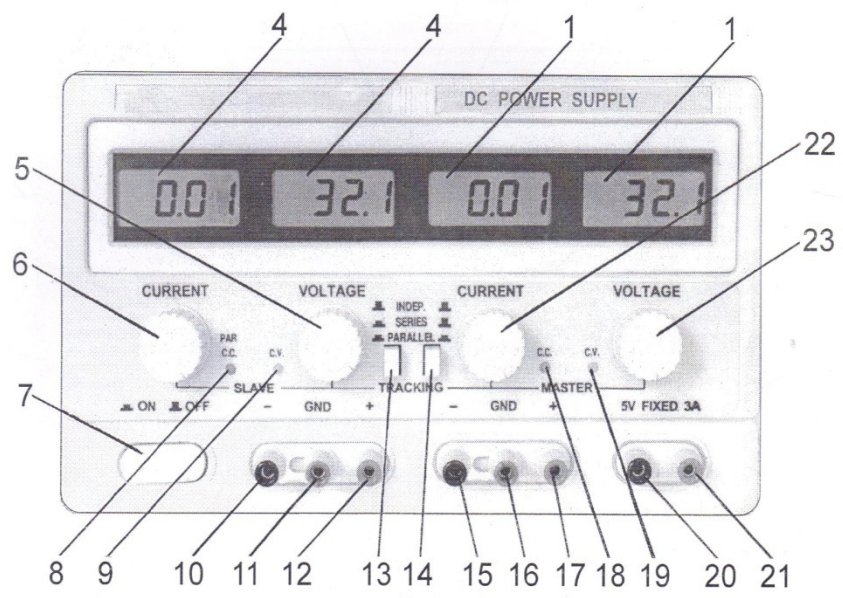
## 2. OPERATION

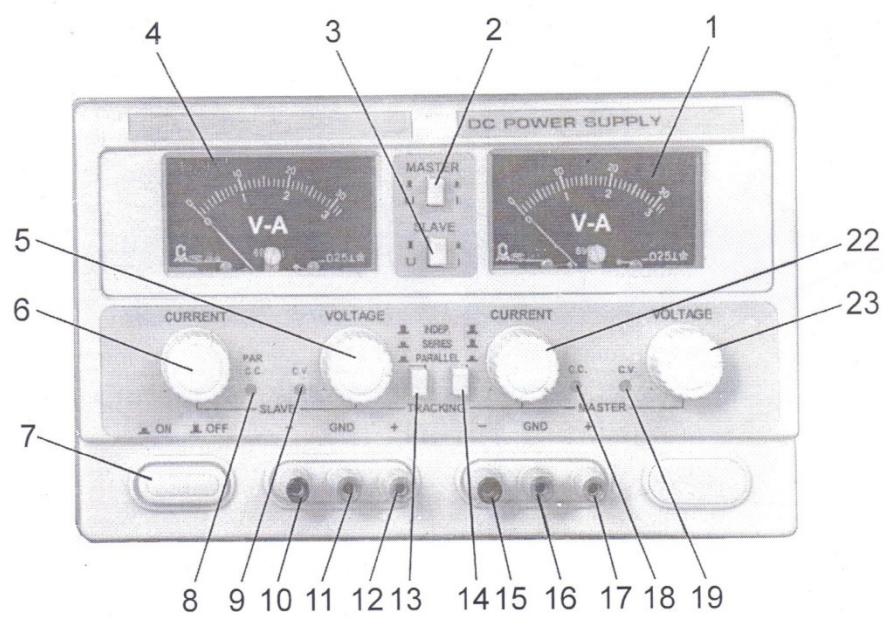
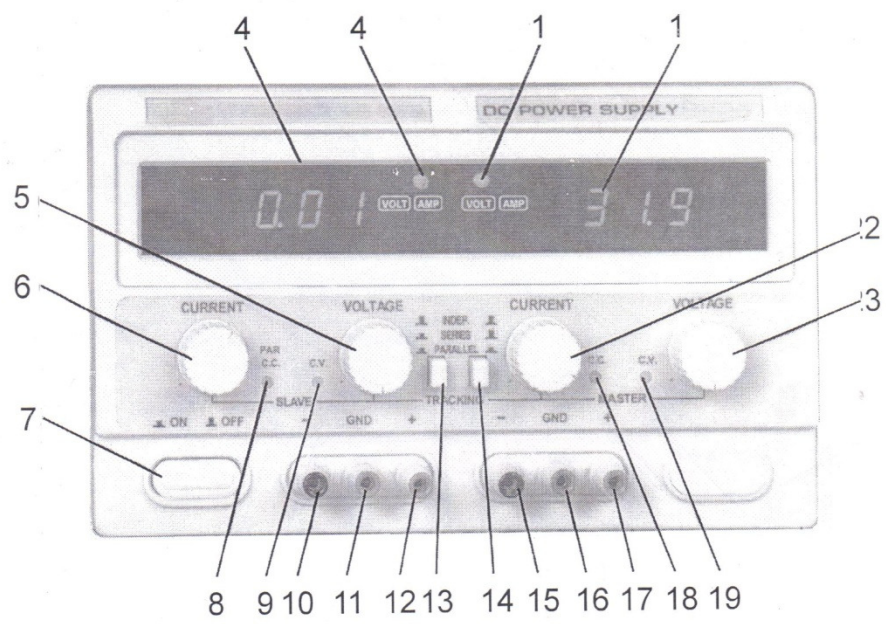
### 2.1. Controls and description of front-panel

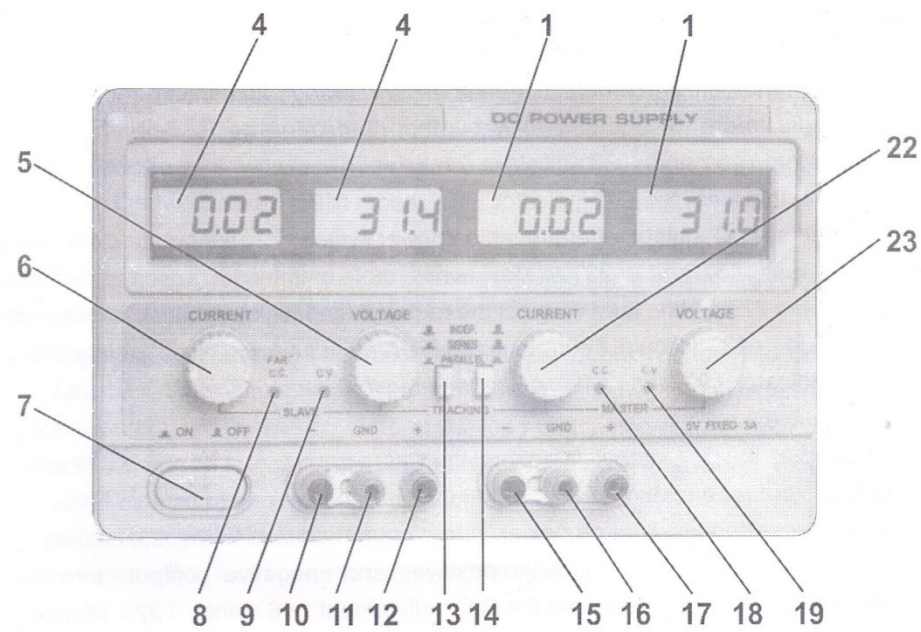
- (1) Meter or LCD (LED): indicates master output voltage and current value.
- (2) Master output selector: select the voltage or current of the master.
- (3) Slave output selector: select the voltage or current of the slave.
- (4) Meter or LCD (LED): indicates slave output voltage and current value.
- (5) Slave constant voltage adjustment: adjust slave output voltage value.
- (6) Slave constant current adjustment: adjust slave output current value,  
(adjust the current-limiting protection point)
- (7) Power switch: It is set to "ON" state (the switch is pressed in) , the unit is switched on, at this time, the constant voltage (C.V.) or constant current (C.C.) indicator is on, otherwise, the unit is in "OFF" state (the switch is

sprung out) .

- (8) Slave constant current state or two-way parallel state indicator: When slave output is in constant current state or the two adjustable is in parallel, this indicator is on.
- (9) Slave constant voltage indicator: When slave output is in constant voltage state, this indicator is on.
- (10) Slave output negative binding post: Negative polarity of output voltage is connected to negative terminal of load.
- (11) Case grounded terminal: The case is connected to the earth.
- (12) Slave output positive binding post: positive polarity of output voltage is connected to positive terminal of load.
- (13/14) The control switch for selecting the two adjustable outputs independent, series or parallel.








- (15) Master output negative binding post: Negative polarity of output voltage is connected to negative terminal of load.
- (16) Case grounded terminal: The case is connected to the earth.
- (17) Master output positive binding post: Positive polarity of output voltage is connected to positive terminal of load.
- (18) Master output constant current state indicator: When master output is in constant current state, this indicator is on.
- (19) Master output constant voltage state indicator: When master output power is in constant voltage state, this indicator is on.
- (20) Fixed 5V DC output negative binding post: Negative polarity of output voltage is connected to negative terminal of load.
- (21) Fixed 5V DC output positive binding post: Positive polarity of output voltage is connected to positive terminal of load.
- (22) Master output constant current adjustment: Adjust master output current value. (Adjust current-limiting protection point)
- (23) Master output constant voltage adjustment: Adjust master output voltage value.

## 2.2 Operating procedure:

### 2.2.1 Independence use of two adjustable outputs.



2.2.1.1 Set the (13) and (14) switch to spring out position (  position).

2.2.1.2 When the adjustable output is used as C.V. output, first should rotate clockwise the C.C. adjustment (6) and (22) to Max., then turn on power switch (7) , adjust C.V. adjustment (5) and (23) till slave & master DC output voltage reach required voltage value, at this time, the C.C indicator (9) and (19) light on.

2.2.1.3 Used as C.C. output, after turning on power switch (7), first rotate clockwise the C.V. adjustment (5) and (23) to Max., while rotate counterclockwise the C.C. adjustment (6)and (22)to Min., then connect the required load, again rotate clockwise adjustment (6) and (22) till output current reach the required current value. At this time, the C.V. state indicator (9) and (19) go out and the C.C. state indicator (8) and (18) light on.

2.2.1.4 Used as the C.V. output, in general the C.C. adjustment (6) and (22) should be set to Max., but for this unit, the current-limiting protection point can also be set arbitrarily. Setting procedure is: Turn on power, rotate counterclockwise the C.C. adjustment (6) and (22) to Min., then make the positive and negative output terminal in short connection and rotate clockwise the C.C. adjustment (6) and (22) 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

2.2.2.1 Press in switch (13) (  position) .switch (14) is set to "OUT" position (  position). At this time, turn the master voltage adjustment (23) and the slave output voltage tracks strictly the master output voltage, and the output voltage can be up to 60V (voltage between terminal of (10) and (17) ) .

2.2.2.2 Before the series connecting, it must be examined if the negative terminals of both master and slave output are connected to GND terminal, if they are, it must be disconnected, otherwise, short-circuit will be caused in the





slave output when the two outputs are connected in series.

2.2.2.3 When the two outputs are in series, the output 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 C.C 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 Max. When the two output are in series.

2.2.2.4 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

2.2.3.1 Press in switch (13) (  position) as well as switch (14) (  position) , at this time, the two outputs are in parallel, adjust voltage adjustment (23) of master output, the voltage of two ways keep same, and slave output C.C. indicator (8) lights on.

2.2.3.2 When the two outputs are in parallel, the C.C. adjustment (6) of slave output does not work. When used as C.C. supply, simply adjust the C.C. adjustment (22) of master output, at this time, output current of both master and slave output are controlled by it and are same, output current is up to 6A.

2.2.3.3 While the two outputs in parallel, proper leads corresponding to output power 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 terminal, unbalance may be caused to current of the two outputs, this may also damage the series/parallel switch.

2.3 The digital display is in 3-digit. If you need more accurate indication, please use more precise measuring instrument to calibrate it in outer

circuit.

## 2.4 Cautions

- 2.4.1 The unit has perfect protection function, 5V output has reliable protection for current-limiting and short circuit. The two adjustable outputs have current-limiting protection. As there is controlling circuit for regulating transistor's power loss in the circuit, when short circuit occurs, power loss on large power transistor is not very high, it can not 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 find as soon as possible and turn off power, then exclude the faults.
- 2.4.2 After operating, put the unit 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.
- 2.4.3 For maintenance, input voltage must be cut off.
- 2.4.4 The faults may be caused by the improper operation or abnormal operating ambient and component failure inside the unit. When the faults occur, the output voltage maybe exceed max. rated output voltage. TAKE CARE WHEN OPERATION AND AVOID UNNECESSARY DAMAGE OF LOAD.
- 2.4.5 For safety operation, the 3-pin ground terminal of power cord must be grounded securely.