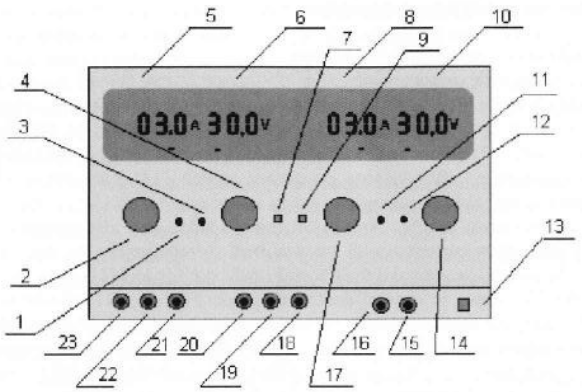
CONTENTS

■ TECHNICAL DATA

- **Input voltage:** 110VAC±10% - 220VAC±10% - 50/60Hz (SWITCHABLE)
- **Output voltage:** 0 ~ 30V x2 / (5V fixed)
- **Output current:** 0 ~ 5A x2 / (3A fixed)
- **Source regulation:**
  1. Two adjustable outputs: CV ≤ 1 x 10^{-4} + 1mV
     CC ≤ 2 x 10^{-3} + 1mA
  2. Fixed output: ≤ 1x 10^{-4} + 1Mv
- **Load regulation:**
  1. Two adjustable outputs: CV ≤ 1 x 10^{-4} + 2 mV (I ≤ 3 A)
     CV ≤ 1 x 10^{-4} + 5 mV (I > 3 A)
     CC ≤ 2 x 10^{-3} + 3 mA (I ≤ 3 A)
     CC ≤ 2 x 10^{-3} + 5 mA (I > 3 A)
- **Fixed output:** ≤ 1 x 10^{-3}
- **Ripple and noise:**
  1. Two adjustable outputs: CV ≤ 0.5 mV rms (I ≤ 3 A)
     CV ≤ 1.0 mV rms (I > 3 A)
     CC < 3mA rms
  2. Fixed output: ≤ 0.5 mV rms
- **Protection:** current-limit
- **Indication accuracy:**
  a. Volt-indication: LED (LCD) ±1%+2 digits
  b. Amp-indication: LED (LCD)±2%+2 digits

■ CONTROL AND DESCRIPTION OF FRONT PANEL



1. 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.
2. Slave constant current adjustment: adjusting salve output current value (adjusting the current-limit protection point)
3. Slave constant-voltage indicator: the LED illuminates when the slave output is in voltage-regulated state.
4. Slave constant voltage adjustment: adjusting salve output voltage.
5. Amp display: indicating slave output current by analog meter or LED (LCD).
6. Volt display: indicating slave output voltage by analog meter or LED (LCD).
7. Control switch: for selecting the two adjustable outputs independent, series, parallel.
8. Amp display: indicating master output current by analog meter or LED (LCD).
9. Control switch: for selecting the two adjustable outputs independent, series, parallel.
10. Volt display: indicating master output voltage by analog meter or LED (LCD).
11. Master constant-current indicator: the LED illuminates when the master output is in current-regulated state.
12. Master constant-voltage indicator: the LED illuminates when the master output is in voltage-regulated state.
13. Power switch: the unit is "ON" when this button switch is depressed, while CV LED (3) (12) or CC LED (1) (11) illuminating.
14. Master constant voltage adjustment: adjusting master output voltage.
15. Fixed 5V output terminal (+): connecting the positive terminal of load.
16. Fixed 5V output terminal (-): connecting the negative terminal of load.
17. Master constant current adjustment: adjusting master output current value (adjusting the current-limit protection point).
18. Master output terminal (+): connecting the positive terminal of load.
19. Case ground: connecting the case to ground.
20. Master output terminal (-): connecting the negative terminal of load.
21. Slave output terminal (+): connecting the positive terminal of load.
22. Case ground: connecting the case to ground.
23. Slave output terminal (-): connecting the negative terminal of load.

■ OPERATING METHOD

- **Independence use of two adjustable output**

1. Set (7) and (9) switch to spring out position.
2. When the adjustable output is used as CV output, first should rotate clockwise the CC adjustment (2) and (17) to maximum, then turn on power switch (13), adjust CV adjustment (4) and (14) till output voltage reach required voltage value. At this time, the CC state indicator (1) and (11) go out and the CV state indicator (3) and (12) light on.
3. Used as CC output, after turning on power switch (13), first rotate clockwise the CV adjustment (4) and (14) to maximum, while rotate counter clockwise the CC adjustment (2) and (17) to minimum, then connect the required load, again adjust clockwise adjustment (2) and (17) till output current reach the required current value. At this time, the CV state indicator (3) and (12) go out and the CC state indicator (1) and (11) light on.
4. Used as the CV output, in general the CC adjustment (2) and (17) 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 counter clockwise the CC adjustment (2) and (17) to minimum, then make the positive and negative output terminal in short connection and rotate clockwise the CC adjustment (2) and (17) till output current equal to the required current-limiting protection point, so the current-limiting protection point is well set.

- **Series using of the two adjustable outputs**

1. Switch (9) is set to spring out and press in switch (7). At this time, turn the master voltage adjustment (14) 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 (18) and (23)).
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 (2). For example, knob (2) is at the position of counter clockwise to end or current of slave output excesses current-limiting protection point, at this time, the voltage of slave output will not track the voltage of master. So knob (2) 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.

- **Parallel using of the two adjustable outputs**

1. Press in switch (9) as well as switch (7), at this time, the two output are in parallel, adjust voltage adjustment (14) of master output, the voltage of two ways keep same, and slave output CC indicator (1) lights on.
2. When the two outputs are in parallel, the CC adjustment (2) of slave output does not work. When used as CC supply, simply adjust the CC adjustment (17) 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 terminal 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 switch(7)(9).

- The LED(LCD) display is in three digits (analog meter is 2.5 class). To get more accurate measuring value, you should calibrate by external circuit with precision measuring instrument.

■ CAUTION

- This unit has excellent protection function, 5V 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.