CONTENTS:

1. SAFETY PRECAUTION AND PROCEDURES

The instrument is designed and tested in accordance with EN publication 61558-2-6:11.97.The instrument has been tested in accordance to the following EC Directives (EMC):

a. EN61204-3:12.2000
b. EN61000-3-2:04.95+A1:1998+A2:1998+A14:2000
c. EN61000-3-3:01.95

The instrument complies with the requirements of the European Council
Directive 89/336/EEC (EMC Directive) and 73/23/EEC (Low Voltage Directive).
To ensure that the instrument is used safety. Follow all safety and operating
Instructions in this manual. If the instrument is not used as described in this manual, the safety features might be impaired

WARNING
Non compliance with the warnings and/or the instructions for use may damage the instrument and/or its components or injure the operator.

Take extreme care under the following conditions when using the instrument:

- For your own safety and that of the instrument, you must follow the procedure described in this instruction manual.
- Do not use this instrument in a location where there is explosive gas in the vicinity. The use of this instrument in a location where there is explosive gas could result in explosion.
- If there is any smoke, abnormal odor, or abnormal sound coming from this instrument, immediately switch off the power and disconnect the power cord. Continuous using of this instrument under these conditions could result in electrical shock or fire. After disconnecting the power cord,
  Contact the service offices for repair the repair by the user is dangerous and should be strictly avoided.
- Take care not to allow water to get into this instrument .The use of this instrument in a wet state could result in electrical shock or fire. If water or other foreign matter has penetrated this instrument, switch the power off, then remove the power card and call for repair.
- Do not place this instrument on an unstable or slanting surface. The dropping or turning over this instrument could result in electrical shock, injury or fire. If this instrument has been dropped or its cover has damaged, switch the power off, remove the power cord and call for repair.
- Do not allow any foreign matter such as metal or inflammable substance to get into the instrument via the air holes. The penetration of any foreign matter from the ventilation holes could result in fire, electrical shock or power failure.
- Use this instrument with the rated AC power sources. Use of this instrument with a voltage other than specified could result in electrical shock, fire or power failure. The usable power voltage range is marked on the rear panel.
- Do not remove either the cover or panel.
- Do not modify this instrument
- Avoid use of damaged cables.

1.1 BEFORE USE

1. Make sure the POWER switch is pressed and connect the power cord to the power supply.
2. To set the constant voltage output: Power on the power supply. Adjust the VOLTAGE tune knob for adjustment. Once the voltage or current value is reached, the desired value will appear on the Display Panel.

1.2 DURING USE

1. Ensure the voltage and current is set to zero, prevent an undesired output for damaging the circuit.
2. The supplied voltage should be within 110V AC or 220V AC±10 %(50Hz) and the system is capable for supplying the maximum power consumption as indicated on section 3.3.
3. Keep a distance at least greater than 10cm between the power supply and other things for airy reason when usage. Do not place this power supply in a hot, dusty. Wet, corrosive gas stage or near the poison substance.
4. The power supply needs to warm up for 30 minutes, to meet the specification please refer to Section 3.4.
5. Keep hands and face away from the ventilation fan.
6. Do not touch the rear panel during operation.

1.3 AFTER USE

1. Once the operation completed, remove all connections from the power supply, especially the power source.
2. Wait for the power supply to cool down.
3. Store in a dry, well air and non-dusty environment.

2. GENERAL

M10-QD/ M10-QR series is a high performance and precision multi channels DC regulated power supply up to 2 channel outputs (M10-QR series provides one additional fixed output channel). M10-QD/ M10-QR series has constant voltage mode, constant current mode, auto current cut off protection function, overload protection and auto tracking mode .In auto tracking mode, M10-QD/ M10-QR series can auto connect CH1 and CH2 output either in parallel or in series internally to provide double current or voltage output.

With the extract stability and enhanced responsibility, this power supply is suitable for bench, laboratory, university, high school, and enterprise use or where needed a high performance and precision regulated DC power supply.

3. FEATURES AND SPECIFICATIONS

3.1 MAIN FEATURES

- 2 Adjustable Channels Output (M10-QR series provides one additional fixed output channel)
- 0-30V Linear Voltage and Current Output Display
- 4 LED displays for Voltage and Current Output Display
- Low Noise and Ripple ; Less than 1mV (5Hz-1mHz)
- Voltage and Current Pre-set Feature
- Current Output Protection
- CV/CC Mode Automatic Changer
- Auto Tracking Output
- Auto Parallel or Series connection
- Doubling Voltage with Series connection
- Doubling Current with Parallel connection
- 16 Hours Continuous Operation with Full Loading
- Rugged Metal Cabinet

3.2 GENERAL SPECIFICATIONS

Model	Channels	CH1		CH2		CH3
		Voltage	Current	Voltage	Current	Voltage/ Current
M10-QD302	2	0～30V	2A	0～30V	2A	N/A
M10-QD303			3A		3A	
M10-QD305			5A		5A	
M10-QD3010			10A		10A	
M10-QD3020			20A		20A	
M10-QD6010		0～60V	10A	0～60V	10A	
M10-QR302	3	0～30V	2A	0～30V	2A	5V/1A
M10-QR303			3A		3A	
M10-QR305			5A		5A	

3.3 OPERATION CONDITIONS

Environmental Condition	Operating altitude <2000m.pollution degree □		
Input Voltage	110VAC/220VAC±10% at 50/60Hz		
Fuse Protection: (Fuse Blow Type)	M10-QD series/ M10-QR series	220V	110V
		T3A/250V	T6A/250V
Power Consumption:	60V/10A output model		2400W
	20A output model		2400W
	10A output model		1200W
	5A output model		600 W
	3A output model		380 W

	2A output model	260 W
Operating Condition	Temperature	0～40□
	Relative Humidity	≦80％RH
Storage Condition	Temperature	- 1□～70□
	Relative Humidity	≦80％RH

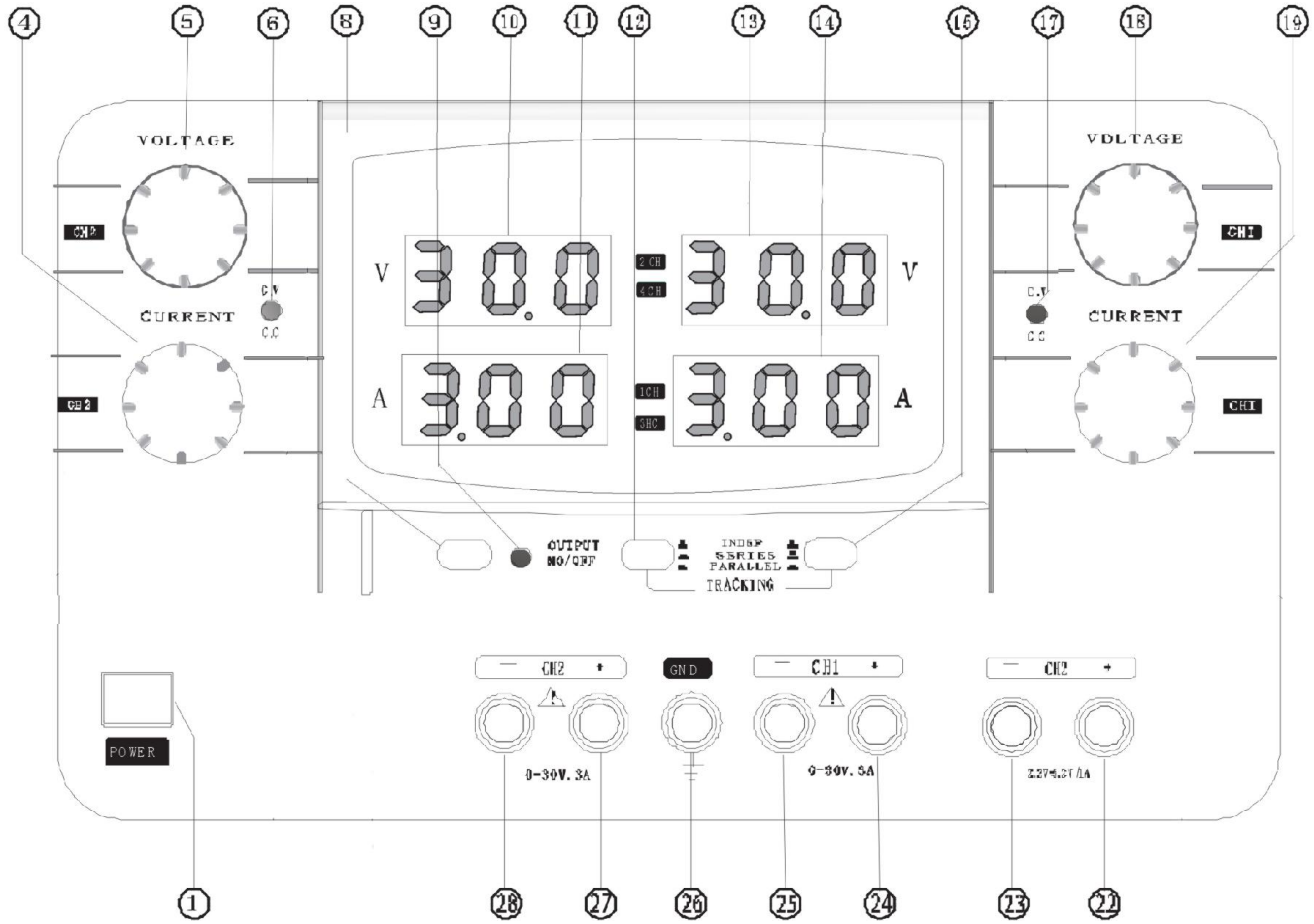
3.4 TECHINICAL SPECIFICATIONS

Channel 1and 2 Characteristic	
Constant Voltage Mode(CV)	
Voltage Range	0 to maximum rated current
Line Effect	≤5×10^{-4} +3mV (M10-QD3010, M10-QD3020, M10-QD6010)
	≤1×10^{-4}+3mV (other models)
Loading Effect	≤5×10^{-4} +3mV (output current≤10A) ≤1×10^{-3}+3mV (output current＞10A) (M10-QD3010, M10-QD3020, M10-QD6010)
	≤1×10^{-4}+3mV (output current≤3A) ≤2×10^{-4}+3mV (3A≤output current＜10A) (other models)
Noise and Ripple	1.5mV（rms）(M10-QD3010, M10-QD3020, M10-QD6010) 1mV（rms）(other models)
Recovery Time	≤100u sec (50% of loading effect with min. loading of 0.5A)
Temperature Coefficient	≤300ppm/□
Constant Current Mode (CC)	
Current Range	0 to maximum rated current
Line Effect	≤4×10^{-3} +3mA (M10-QD3010, M10-QD3020, M10-QD6010)
	≤2×10^{-3} +3mA (other models)
Loading Effect	≤4×10^{-3} +3mA (M10-QD3010, M10-QD3020, M10-QD6010)
	≤1×10^{-3}+3mA (output current≤3A) ≤2×10^{-3}+3mA (3A≤output current＜10A)
Noise and Ripple	≤3mAms
Channel 3 Characteristic (M10-QR series only)	
Voltage Range	5.0V (±8%)
Current Range	Fixed 1A
Line Effect	≤5mV
Loading Effect	≤15mV
Noise and Ripple	≤2mVms (5Hz-1MHz)
Display Accuracy	
Digital Display	3 Digital Display (±0.5%+2d)
Insulation	
Chassis and Terminal	≤20MΩ,at DC500V
Chassis and Power Cord	≤30MΩ,at DC500V
Mechanical Specification	
Weight (kg):	7.5 approximately, 12 (M10-QD3010), 16 (M10-QD3020, M10-QD6010)
Dimension (mm):	255X150X305

4. OPERATING INSTRUCTIONS

4.1 INSTRUMENT DESCRIPTION

4.1.1 Front panel description

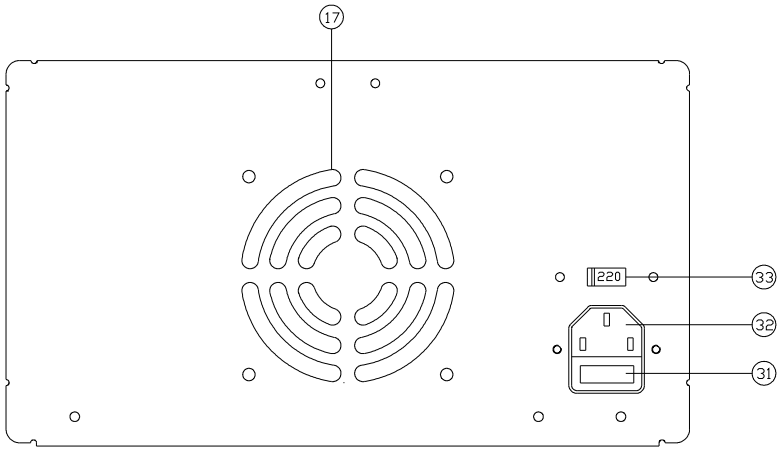


Legend:

Item	Description
1	**POWER SWITCH:** Press it to power on/off the power supply
4	**CH2 CURRENT tune knob:** Turn clockwise for increasing the current value; turn anti-clockwise for decreasing the current value.
5	**CH2 VOLTAGE** tune knob: Turn clockwise for increasing the voltage value; turn anti-clockwise for decreasing the voltage value.
6	**CH2 CV/CC(CONSTANT VOLTAGE/CURRENT MODE)** **INDICATOR:** When CH2 is at the constant voltage mode, this LED light will be on as green color. When CH2 is at the current mode and in Parallel Tracking Mode, this LED light will be on as red color.
8	**AUTO CURRENT CUT OFF PROTECTION KEY:** After power ON .the power supply will at protection state (no voltage output at all terminals and OUTPUT indicator [9] is OFF); however, the voltage DISPLAY. Panel [10, 11] will still show the pre-set voltage value .When the Auto Current Cut off protection key is pressed, all terminals will output the voltage as indicated on the voltage display panel and the OUTPUT indicator [9] is ON. Repress the key to cut off the output again .After cut off, it takes 3 seconds interval to return normal.

9	**OUTPUT INDICATOR:** see[8]
10,13	**CH1/CH2 VOLTAGE DISPLAY PANEL:** This display will indicate CH1 or CH2 voltage value that will be applied to the circuit
12	**TRACKING MODE SELECTION KEY:** this key is operated with key [5], to select INDEPENDENT MODE, SERIES TRACKING MODE and PARALLEL TRACKING MODE for CH1and CH2 output. a) To select INDEPENDENT MODE: Release these two keys; CH1and CH2 will operate separately. b) To select SERIES TRACKING MODE : press Key[12] and release key[15],CH2 output voltage will be followed by CH1,connect the circuit to CH1 "+" terminal and CH2 "-"terminal to get double rated voltage output. c) To select PARALLEL TRACKING MODE: Press Key [12] and key [15], CH2 output voltage and current will be followed by CH1, parallel connect the circuit to CH1 output will get 0-30v and double rated current output.
11,14	**CH1/CH2 CURRENT DISPLAY PANEL**: This display will indicate CH1 or CH2 current value that will be applied to the circuit
15	TRACKING MODE SELECTION KEY: see[12]
17	**CH1 CV/CC(CONSTANT VOLTAGE/CURRENT MODE)** **INDICATOR:** When CH1 is at the constant voltage mode, this LED light will be on as green color. When CH1 is at the current mode and in Parallel Tracking Mode, this LED light will be on as red color.
18	**CH1 VOLTAGE** tune knob: Turn clockwise for increasing the voltage value; turn anti-clockwise for decreasing the voltage value. When in SERIES/PARALLEL TRACKING MODE, use this knob to adjust CH2 voltage.
19	**CH1 CURRENT** tune knob**:** Turn clockwise for increasing the current value; turn anti-clockwise for decreasing the current value. When in SERIES/PARALLEL TRACKING MODE, use this knob to adjust CH2 current.
22	**CH3 "+"TERMINAL:** Positive terminal of fixed 5v output **(M10-QR series only)**
23	**CH3 "-" TERMINAL:** Negative terminal of fixed 5v output **(M10-QR series only)**
24	**CH1 "+"TERMINAL:** Positive terminal of 0-30 (60)V adjustable output.
25	**CH1 "-"TERMINAL:** Negative terminal of 0-30 (60)V adjustable output.
26	**GND** grounding terminal: This terminal is connecting to the casing and the Earth.
27	**CH2 "+"TERMINAL:** Positive terminal of 0-30 (60)V adjustable output.
28	**CH2 "-"TERMINAL:** Negative terminal of 0-30 (60)V adjustable output.

4.1.2 Rear panel description

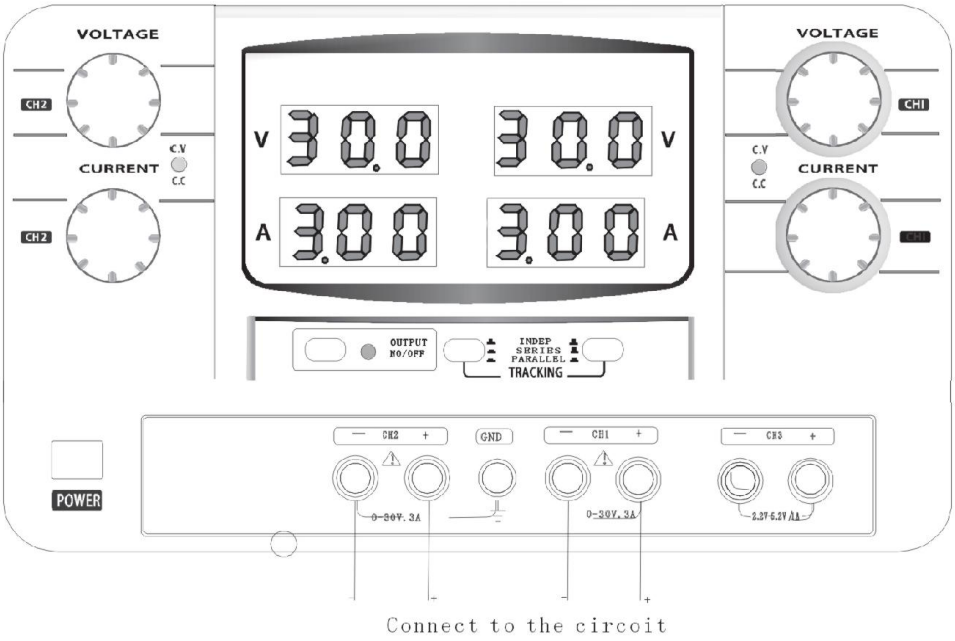


Legend:

ITEMS	Description
31	FUSE SOCKET: Use suitable fuse which is stated in Section3.3
32	POWER INPUT SOCKET :Input AC220V/AC110V ±10%50/60Hz
33	INPUT VOLTAGE SELECTOR: For 110V AC power system, please switch the INPUT VOLTAGE SELECTOR switch to the top for 110V AC power system selection. For 220V AC power system, please switch the INPUT VOLTAGE SELECTOR switch to the top for 220V AC power system selection.
34	VENTILATION FAN: This fan is used to exhaust heat air from internal heat sink.

5. POWER SUPPLY DESCRIPTION

5.1 SETTING THE CH1 AND CH2 OUTPUT VOLTAGE



1. Connect the power supply to the power source.
2. Press the **POWER SWITCH [1]** to turn on the power supply.
3. To setting CH1, use the **CH1 VOLTAGE TUNE KNOB [18]** to adjust **CH1** voltage to give a desired output voltage.
4. Connect the circuit to the **TERMINALS [24,25]**
5. Press **AUTO CURRENT CUT OFF PROTECTION KEY [8]** to activate output and the **OUTPUT INDICATOR [9]** will on.
6. When the **CH1 CV/CC INDICATOR [17]** is in red color, adjust the **CH1 CURRENT TUNE KNOB [19]** to give a suitable current.
7. To setting CH2 voltage, repeat the above steps use **CH2 VOLTAGE TUNE KNOB [5]**, short **MAIN TERMINAL [26, 27]** and **CH2 CV/CC INDICATOR [6]** instead.

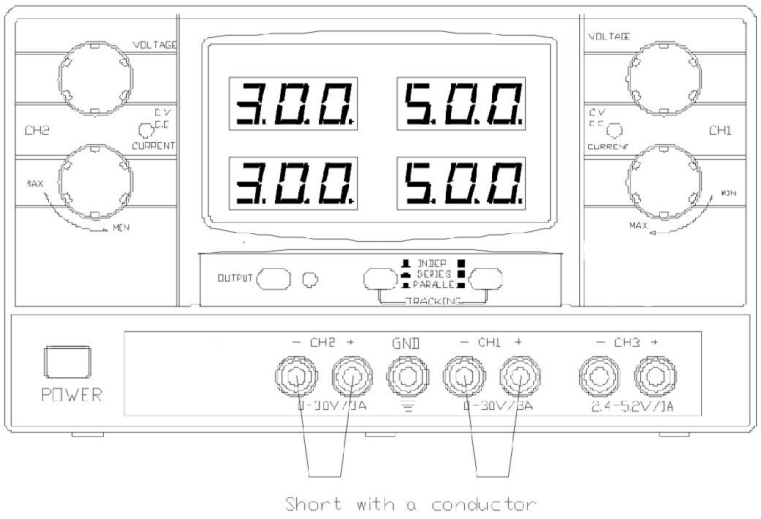
Remarks:

1. If CH2 cannot be adjusted, check the **TRACKING MODE SELECTION KEY [12, 15]** is not pressed.
2. If want to preset a desired current output before connecting to the circuit, read Section 5.2 first.

Caution:

- Make sure the **INPUT VOLTAGE SELECTOR [33]** set to a correct position Otherwise; it will damage the power supply.
- Do not short the **MAIN TERMINALS** over 1 minute; it will damage the power supply.

5.2 SETTING THE CH1 OR CH2 OUTPUT CURRENT



1. Turn to the power supply
2. Refer to Section 5.1 step 1-4 to give the voltage around 2-5V
3. For CH1, turn the **CH1 CURRENT TUNE KNOB [19]** anticlockwise reach the minimum current value.
4. Short the + and the - **MAIN TERMINAL [24, 25]** with a conductor which is cross section area not less than 0.5mm^2.
5. Ensure the output indicator is on. Otherwise, press the **AUTO CURRENT CUT OFF PROTECTION KEY [8].**Then the **CH1 CV/CC INDICATOR [17]** will turn to red color.
6. Adjust the **CH1 CURRENT KNOB [19]** to give a desired output current.
7. Repress the **AUTO CURRENT CUT OFF PROTECTION KEY [8]** to Cut off the output.
8. Then the **CH1 CV/CC INDICATOR [17]** will turn to green color.
9. Remove the conductor the **MAIN TERMINA [24,25]**
10. Set to desired voltage.
11. Connect the circuit to the **MAIN TERMINA [24,25]**
12. To setting CH2 current, repeat the above steps, use **CH2 CURRENT TUNE KNOB [4],** short **MAIN TERMINAL [26, 27]** and **CH2 CV/CC INDICATOR [6]** instead.

Remarks:

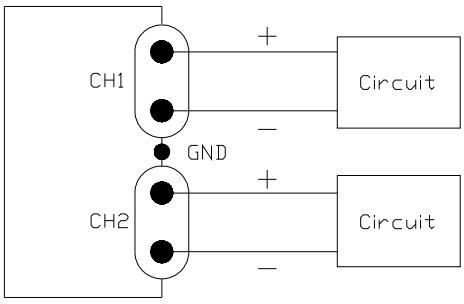
The conductor is not provided

Caution:

- Ensure the current is set to zero before shorting the MAIN TERMINALS. Otherwise it will damage the power supply.
- Do not short the MAIN TERMINALS over 1 minute; it will damage the power supply.

5.3 SETTING INDEPENDENT MODE

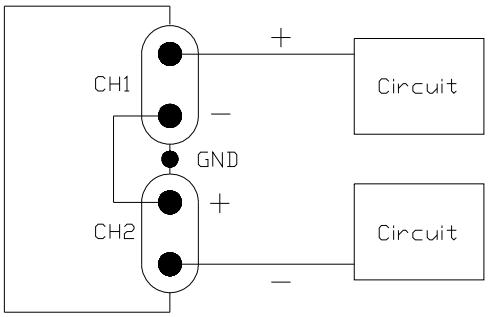
1. Release both **TRACKING MODE SLECTION KEY [12, 15]**.
2. In independent mode, CH1 and CH2 is two independent power supply unit, voltage or current can be adjusted separately.
3. Adjust **CH1 or CH2 VOLTAGE/CURRENT KNOB [19, 20/4, 5]** to set the desired value.
4. Connect the circuit to the CH1 or CH2 terminals.



Regulated
DC Power Supply
Illustration of independent mode

5.4 SETTING SERIES TRACKING MODE

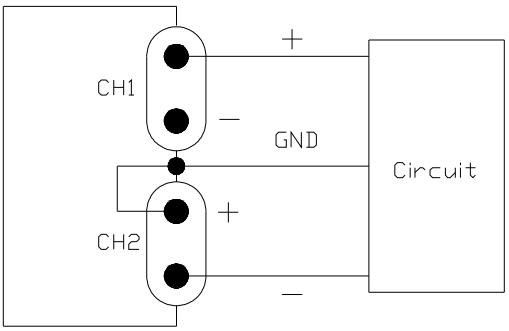
1. Press **TRACKING MODE SLECTION KEY [12]** and release **TRACKING MODE SLECTION KEY [15]** to enable series tracking mode .In series tracking mode, CH2 output voltage and current value follows CH1 setting. The output voltage is double to the CH1 display value.



Regulated
DC Power Supply
Illustration of series tracking mode

2. Turn **CH2 CURRENT KNOB[4]** clockwise to maximum current output, and then use CH1 CURRENT KNOB[19] adjust the desired current output value.(Reference to Section 5.2)
3. Use **CH1 VOLTAGE KNOB [18]** to adjust the desired voltage output value.

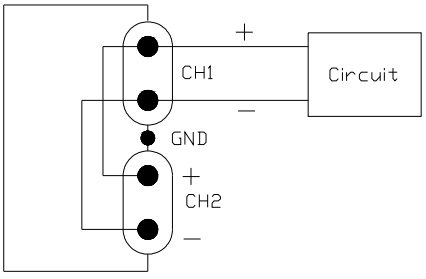
4. Connect the circuit to the **CH1 "+"TERMINAL [24]** and **CH2"-"TERMINAL [28]** to get double voltage output.
5. For the bi-polar DC power supply with common ground, connect **CH2 "+" TERMINAL [27]** to **"GND" GROUNDING TERMINAL [26]**. **CH1 "+"TERMINAL [24]** is the positive output and **CH2 "-"TERMINAL [28]** is the negative output.



Regulated
DC Power Supply
Illustration of Bi-Polar Tracking Mode

5.5 SETTING PARALLEL TRACKING MODE

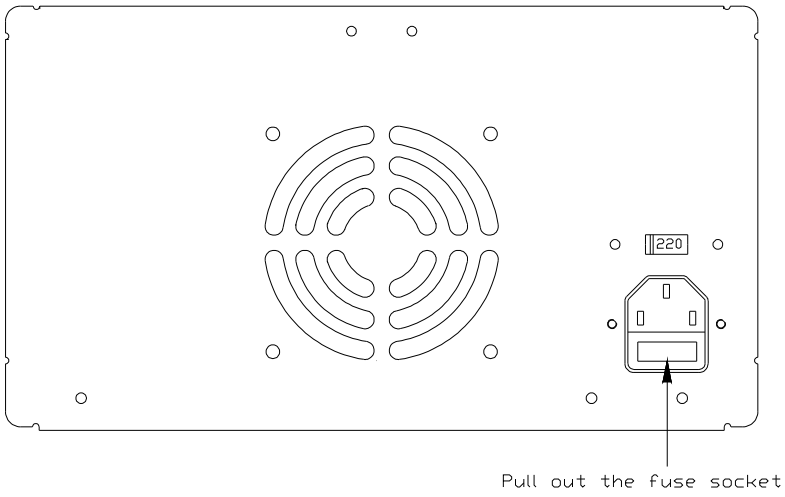
1. Press both **TRACKING MODE SLECTION KEY [12, 15]** to enable parallel tracking mode .In parallel tracking mode, CH2 output voltage and current value follows CH1 setting. The output current is double to the CH1 display value.



Regulated
DC Power Supply
Illustration of Parallel Tracking Mode

2. Use **CH1 VOLTAGE KNOB [18]** to adjust the desired voltage output value.
3. **CH1 CURRENT KNOB[19]** adjust the desired current output value.(Reference to Section 5.2)
4. Connect the circuit to the **CH1 TERMINAL [24, 25**] to get double current output.

5.6 FUSE REPLACEMENT



1. Disconnect all power connection.
2. Locate the fuse socket at the rear panel power socket.
3. Pull out the fuse socket from the power socket.
   Replace the fuse with identical rating .Refer to section 3.3
4. Reinstate the fuse socket. (Re-push the fuse socket to the power socket.)

Caution:

- Ensure no power is connected to the power supply; otherwise, electrical shock may occur.
- Do not over push the fuse socket, or the fuse socket may be damaged.

6. PACKAGE

1. Power supply X 1
2. Power cord X 1
3. Instruction manual X 1
4. Fuse X 2

7. TROUBLESHOOTNG

Problem	Solution
The power supply cannot start up (NO DISPLAY)	1. Ensure the power source or power cord is working properly 2. Check the fuse .if the fuse broken, disconnect from the power source then replace with identical rated fuse.
While operating in the CV mode, the voltage suddenly drop down and the CC indicator turns	This power supply is current protected. The desired current range is under the circuit gain; therefore, the power supply is switched to CC mode, Adjust the current knob clockwise to increase the current range.
The power supply output unstable.	1. The power supply needs at least 30minutes to warm up and reach the specification. 2. The power source (voltage)is under the minimum requirement.

If the above solution cannot solve the problem, please contact the local dealer, distributor or the manufacturer listed at the back.