



JINAN HONGYUAN ELECTRIC CO., LTD.

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First of all, thanks a lot for you to choose our laser power supply products. To make good use of our product, please read this manual carefully in advance. Model of this product is HY-T50.

## **50W Power Supply for CO<sub>2</sub> Laser Tubes**

**Model:HY-T50**



### **I . Main Features**

- 1) **Good compatibility:** It can be applicable to 40W and 30W laser tube manufactured by different Factory.
- 2) **Quick response speed and good effect.**
- 3) Dramatically lengthen the life of laser machine.
- 4) **Easy Control:** The start and stop of laser can be easily controlled by TTL level. And there are protection switch to test the external water, ventilation, etc.
- 5) **Easy control of laser power:** Both 0-5V analog signal and PWM signal can control the laser power.
- 6) The power supply has **open circuit protection:** Under the condition of good protective earthing, the power supply can work in open-circuit for a short time, which could avoid the damage of laser power supply because of the bursting of laser tube, thereby enhancing the life of power supply.
- 7) The power supply can take feedback interface which can be used in closed-loop control and testing the working current of laser.
- 8) The power supply adds a new function, that is timely scene judging which part is damaged, (laser tube or laser power)
- 9) Application: acrylic sculpture, cut; fabric sculpture, cut; rubber sheet sculpture, cut, etc.



## II. Specification

Input	Input Voltage	AC220V or AC110V (to be specified when placing order)
	AC frequency	47—440HZ
	Max Input Power	350W
	Max Input Current	3A
Output	Max Input Voltage	DC 25KV
	Max Output Current	DC 20MA
Efficiency	≥90 % (full load)	
Mean Time Between Failure (MTBF)	≥10000H	
Response Speed	≤1ms (from the switch Signal is given to the output current up to 90% of the setting current)	
Control Interface	TTL level switch control; high or low effective level can be chosen (details refer to the control terminal specification)	
Withstand Voltage	Input-Output, Input-Shell: AC1500V 10MA 60S; Output negative is connected with machine shell.	
Protection	can work in open-circuit condition for a short time (Require a good protective earthing and avoid arc between the positive and the machine shell)	
Environment	Operating Temperature : -10~40°C), Relative Humidity (RH)≤90 %	
Cooling Way	Force-Air Cooling (FAC)	
Dimension	L×W×H=167*144*97(mm)	
Color	Golden Yellow , Black	
Weight	1.65KG	

## III. Operation Instruction:

1)**Laser Tube connection:** (Referring to Power supply and laser device's connection diagram

High voltage terminal (HV+) of HY-T50 power supply should be connected to the positive pole of CO2 laser device. Current circuit of the power supply shall be connected to negative pole (laser output terminal) of laser device, through an ampere meter or directly.

2)**Connection of control signal**(Referring to Power supply and control board's connection diagram)

The control signal shall be reliably connected to control terminal of the power supply HY-T50, and make sure the DAC output signal, the enclosure of laser device and the external computer with the power supply all connected together. the laser device shall work as expected. If no laser emission after on the laser device, should check the control signal is correct or not (include check the voltage specification and logic), if use PWM control as power control, should make sure  $f \geq 20\text{KHz}$ , Amplitude (peak value)  $\leq 5\text{V}$ , Check and make sure protection switch WP's connection is correct at the same time.

3)**Voltage of power input:**

HY-T50's power input of the power supply shall be 220VAC/50Hz. If 110VAC required ,please

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specify when placing order.

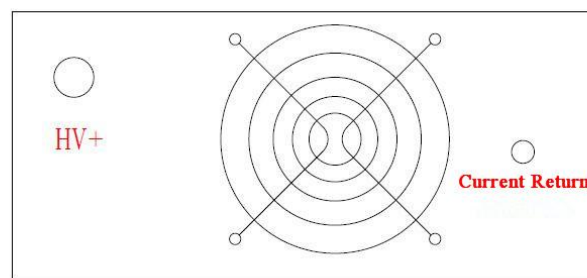
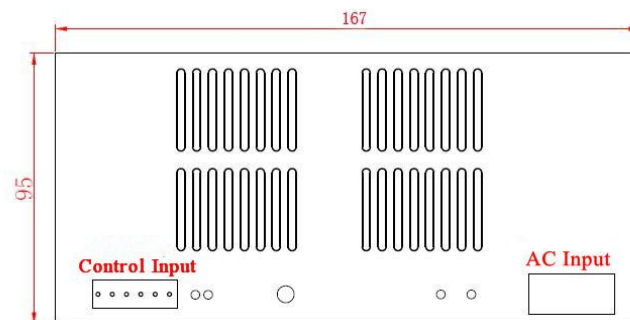
#### 4)Others:

A group of protection switches are also reserved for detection of water switch, fan switch, open-enclosure protection and so on.

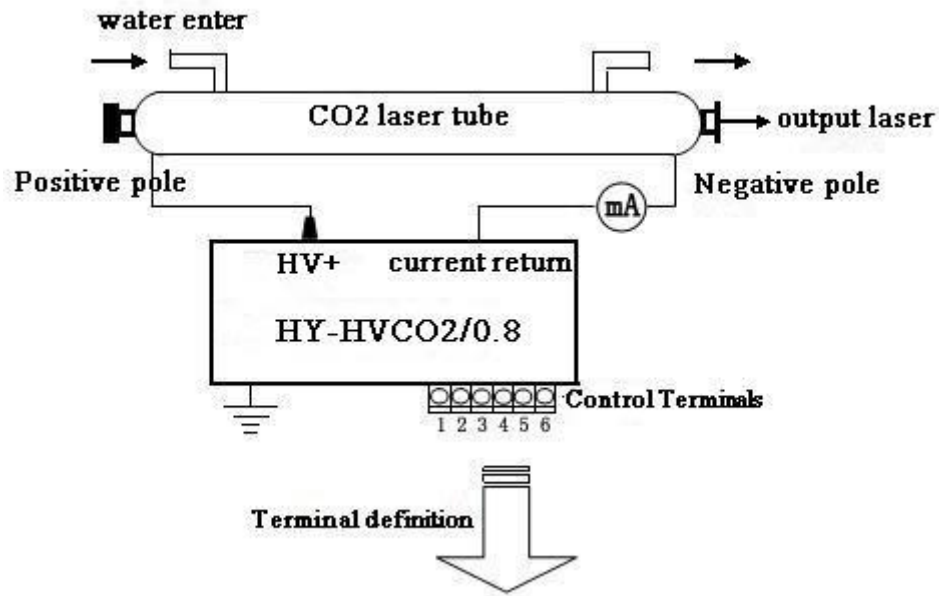
#### **Caution:**

1. Water cooling system should be working properly when switching on laser device.
2. Circuit of high voltage output should not be open! (High voltage output terminals (positive and negative poles) shall be connected properly to positive and negative poles of laser device respectively.)
3. Attentions should be given to avoid any electric shock after the power supply being switched off. (The **Insulation safety requirements** should be 40KV between the terminal of output and "G")
4. Well-grounded **three-pole receptacle** should be used. The enclosure should be well grounded to avoid electric shock.

### IV. The size of power supply and Terminals



### V. The instruction of Power supply and laser wiring diagram and Terminals



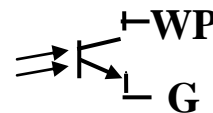
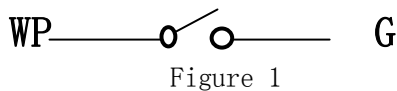
**Terminal definition:**

1	2	3	4	5	6
TH	TL	WP	G	IN	5V

**Terminal definition as follow:**

TH	Input Signal	The control of laser: $TH \geq 3V$ , emitting laser; $TL \leq 0.3V$ , no laser.
TL	Input Signal	The control of laser: $TH \geq 3V$ , emitting laser; $TL \leq 0.3V$ , no laser.
WP*1	Input Signal	The control of laser: $TH \geq 3V$ , emitting laser; $TL \leq 0.3V$ , no laser.
G	GND	This foot must be connected well with the shell of laser machine and the ground of control board.
IN*2	Input Signal	The control of laser power: Both 0-5V analog signal and PWM signal can control the laser power.
5V	Output Power	Output 5V, the maximum output current is 20mA.

**Caution :**



1. can be used as detecting end of blower switch or water detection switch. If WP and ground are not connected by empty node as Picture 1, but connected through optocoupler, the connection should be follow as picture 2.

2. When the laser power is controlled by PMW, the frequency of PWM must be equal or greater than 20 kHz and the amplitude (P-P)  $\leq 5V$ .

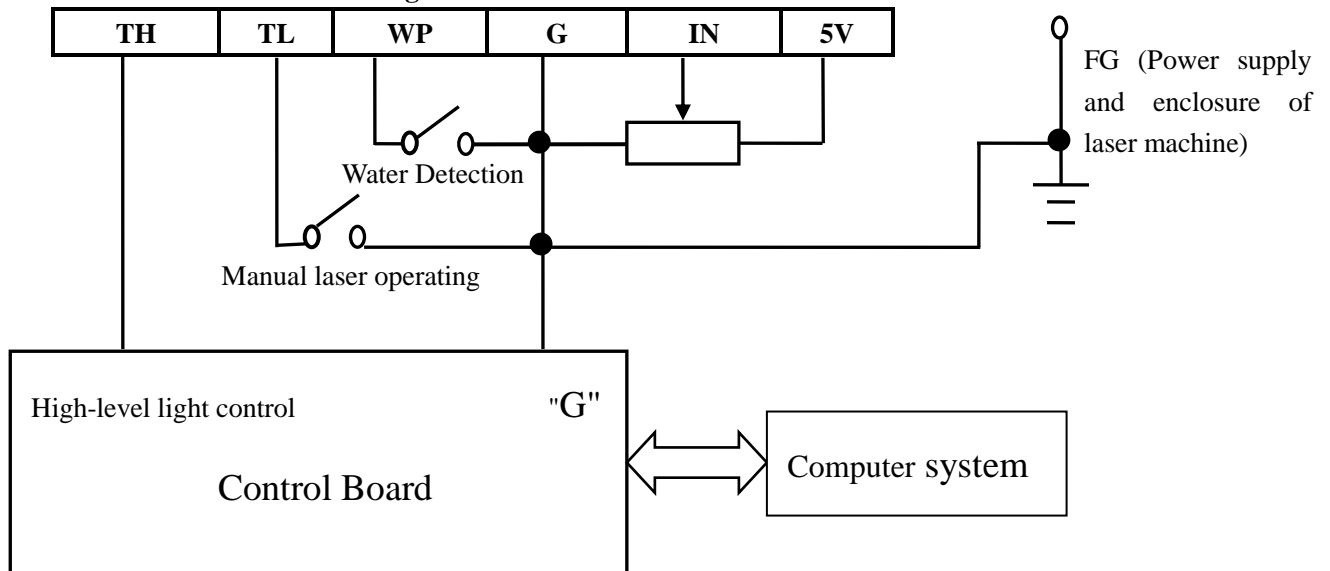


**Function of control interface:**

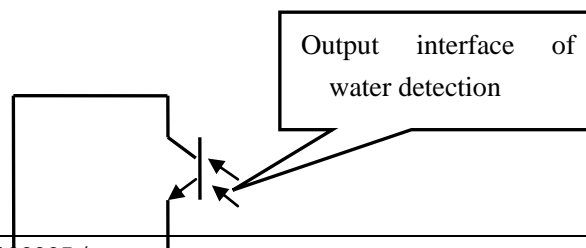
TH	TL	WP	IN	Laser Output
unconnected	Low( $\leq 0.3V$ )	Low( $\leq 0.3V$ )	0—5V or PWM	Output laser Power: Pmin~Pmax
	Low( $\leq 0.3V$ )		unconnected	Output about 40% laser
	High( $\geq 3V$ )		Any value (ok)	No laser
High( $\geq 3V$ )	Unconnected		0—5 or PWM	Output laser, Pmin~Pmax
Low( $\leq 0.3V$ )			Unconnected	Output about 40% laser
Low( $\leq 0.3V$ )			Any value (ok)	No laser
Any value (ok)	Any value (ok)	High( $\geq 3V$ )		No laser

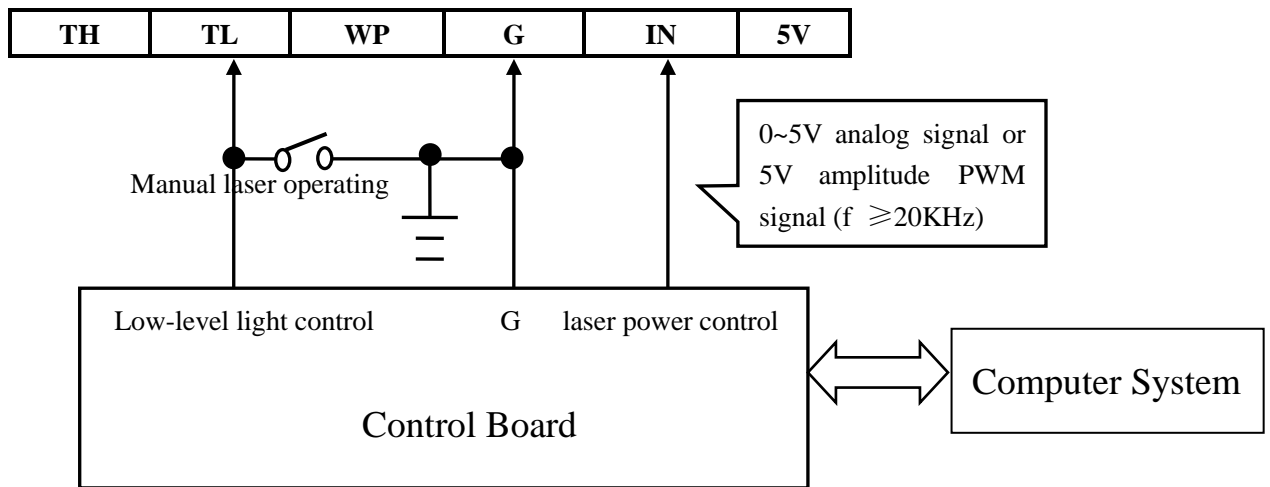
**VI. The connection of power supply and control board**

**1. Recommended connection: High-level laser emission control**



**2. Recommended connection: Low-level laser emission control**





## VII. The method of manually check the power supply worked whether properly or not

Make sure the power supply and laser tube wiring correct firstly, offline the control line and then press the red button "TEST" to test laser tube out light or not, this method can be simple judgment power supply is working correctly.

## VIII. Common Fault Detection and Ruled Out

Problem	Cause	Estimation	Solution
Trip after power on	1. External wiring: AC and FG reverse connection	Check if AC and FC misplaced	Connected correctly according to Instruction
	2. External wiring: short circuit between AC and AC	Use multimeter to check if short circuit between AC and AC.	Rewiring, and avoid short circuit
	3. Internal wiring: short circuit between AC and AC or AC and FG		Send back factory for maintenance
	4. Other causes		
AC power on but Fan of power supply does not work	1. Fan socket is loose.	Laser emission when manual test.	Open enclosure and tighten socket.
	2. Fan damaged	Laser emission when manual test.	Change fan or send back factory for maintenance
	3. Fuse is burned.	No laser emission when manual test.	Contact with us for repair.
	1. Control wire connected wrong	Check if wire is connected correctly according to <b>Operation Instruction</b>	Rewiring correctly
	2. Internal connector is loose.	Open outside case and check	Tighten connector.



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AC power on but no laser emission	3. Protection switch on but on water through or water through switch is broken.	Voltage > 0.5V between "WP" and "G"	Water through or change water through switch.
	4. Wrong output laser signal	Voltage between "TH" and "G" should < 3V when laser-open controlled by high level	Replace CNC card or change GND.
		Voltage between "TL" and "G" should > 3V when laser-open controlled by low level.	
	5. Power control signal is 0.	Voltage between "IN" and "G" is 0.	Increase voltage between "IN" and "G".
	6. Fuse is burned.	Fan does not work	Send back factory for maintenance
	7. Others		Send back factory for maintenance
Laser emission at all times	1. When "TL" control laser: short circuit between "TL" and "G".	Voltage between "TL" and "G" = 0	disconnected between "TL" and "G".
	2. Circuit is broken.		Send back factory for maintenance
	3. Switch of manual test laser emission is broken.		Change switch of manual test laser emission.
	4. Other causes.		Send back factory for maintenance
Current is not increased	1. AC voltage is too low	Output current is always at 5mA around.	Use AC voltage regulator.
	2. Power supply and laser Device is not connected very well		Send back factory for maintenance
	3. Power control signal from CNC card is not connected very well with "IN".	Output current is always at 10mA around.	Re-connected
	4. Potentiometer of power is broken.	Output current is not stable.	Change potentiometer.
	5. PWM frequency or amplitude is not suitable.		Change PWM frequency or amplitude.
	6. Internal Transformer is broken.	Output current is always at 5mA around	Contact with us for repair.
	6. One circuit does not work.		
7. Others			
Laser head is not stable during working.	GND is not connected well.		Connect earth wire of CNC card, enclosure of power supply, with enclosure of laser machine.
Laser emission is not stable			
When two laser head works, action abnormal.			

### IX. Site installation drawing size

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