DC/DC 504W DIN-Rail Power Supply

PVI500-2YBxx Series

MORNSUN®



RoHS

FEATURES

- Ultra-wide input voltage range: 250 - 850VDC (Transient 900VDC last for 3s)
- Meet transient 1.5 times overload power (duration 3s)
- Industrial grade operating temperature -40℃ to +85℃
- High I/O isolation voltage up to 4000VAC
- High efficiency, low ripple & noise, high reliability
- DC OK function
- Meets the 1.2/50us 8KV impulse voltage requirement
- Power-on LED indicator
- Input under-voltage protection, reverse polarity protection, output short circuit, over-current, over-voltage, over-temperature protection
- Overvoltage category III, altitude 2000m (Design refer to IEC/EN62477)
- Design refer to UL61010, UL1741, EN/IEC62109, EN62477

The PVI500-2YBxx series is a high cost-performance, standard DIN-rail mounting, high-efficiency and energy-saving green power supply provided by MORNSUN for customers. It provides high-stability and high anti-interference power for energy storage, industrial control equipment, machines and other industrial equipment in various harsh environments. The power supply is small in size, light in weight and compact in structure, and standard DIN-rail mounting saves customers a lot of space. The product is safe and reliable, with good EMC performance; EMC and safety specifications are designed with reference to UL61010, UL1741, EN62477 and EN/IEC62109 standards.

Selection Guide

Cert.	Part No.	Output Power (W)	Nominal Output Voltage (Vo/Io)	Output Voltage Adj. Range ADJ (V)*	Efficiency (400VDC, %/Typ.)	Max. Capacitive Load (μF)**
/	PVI500-2YB24	504	24V/21.0A	24-26	95	20000
	PVI500-2YB48		48V/10.5A	48-50	96	10000

Note: *The actual adjustment range may exceed the stated values; ensure that the output voltage and power levels remain within the published maximum values;
**The maximum capacitive load derates with the voltage derating ratio.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	Transient (3s)		--	--	900	VDC
			250	--	850	
Input Current	400VDC		--	--	2.5	A
	800VDC		--	--	1.3	
Inrush Current	550VDC	Cold start	--	110	140	
Input Under-voltage Protection	Lockout activation range		190	--	220	VDC
	Lockout deactivation range		220	--	250	
Required External Input Fuse			1000VDC/4A, required (Brand: adler Part No.: A831400710 Holder Part No.: BH100-01)			
Input Reverse Polarity Protection			Available			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range		--	±0.5	±1.5	%
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	400VDC		--	±1.0	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak) 20%-100% load	24V	--	50	100	mV
		48V	--	70	150	

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Stand-by Power Consumption	400VDC			--	7	10	W
	550VDC/800VDC			--	3	5	
Temperature Coefficient				--	±0.03	--	%/℃
Short Circuit Protection				Hiccup, continuous, self-recovery			
Over-current Protection				≥150% Io, self-recovery after the over-current fault is removed			
Over-voltage Protection	24V			⩽35V	Output voltage hiccup		
	48V			⩽60V			
Over-temperature Protection	400VDC input, Rated load	Over-temperature protection start		70	--	85	℃
		Over-temperature protection release		55	--	70	
Minimum Load				0	--	--	%
Start-up Time				--	0.5	--	s
DC OK Signal**	Resistive load			30VDC/1A Max.			
Hold-up Time	550VDC input			--	20	--	ms
	800VDC input			--	50	--	

Note: *1. The ripple and noise test method uses the twisted-pair measurement method, using a 12" twisted pair, with 0.1uF and 47uF capacitors connected in parallel at the terminal, measured under 20MHz bandwidth. For the specific operation method, please refer to "Ultra-wide Ultra-high Voltage PV Module Power Supply Application Guide"; *2. At 0%-10% load, 3 times the rated load specification; at 10%-20% load, 2 times the rated load specification; **DC OK Signal: When the output voltage is normal, the relay dry contact is closed; when the output voltage is abnormal (<90%Vo), the relay dry contact is open.

General Specifications

Item		Operating Conditions			Min.	Typ.	Max.	Unit
Isolation Voltage	Input - Output	Test time 1 min., leakage current <3mA			4000	--	--	VAC
	Input - PE	Test time 1 min., leakage current <5mA			4000	--	--	
	Output - PE	Test time 1 min., leakage current <2mA			500	--	--	
	Output - DC OK	Test time 1 min., leakage current <1mA			500	--	--	
Insulation Resistance	Input - Output	Test voltage: 500VDC			100	--	--	MΩ
	Input - PE							
	Output - PE							
	Output - DC OK							
Insulation Type					Primary and secondary sides meet the reinforced insulation class			
Impulse Withstand Voltage	Input - Output	Withstand 8KV, 1.2/50us impulse voltage						
	Input - PE	Withstand 6KV, 1.2/50us impulse voltage						
Operating Temperature					-40	--	+85	℃
Storage Temperature					-40	--	+85	
Storage Humidity		Non-condensing			--	--	90	%RH
Output Power Derating		Operating Temperature Derating	-30℃ to -10℃	250-499VDC	1.5	--	--	%/℃
			+50℃ to +70℃	High-temp. short 4H, 8H interval	1.5	--	--	
			+70℃ to +85℃		4	--	--	
			+50℃ to +70℃	Long-term operation	2	--	--	
			+70℃ to +85℃		3.33	--	--	
		Input Voltage Derating	250VDC - 400VDC		0.33	--	--	%/VDC
			800VDC - 850VDC		0.4	--	--	
		Altitude Derating	2000m - 5000m		3.33	--	--	%/Km
Safety Standard					Design refer to UL61010-1, UL61010-2-201, UL1741, EN62477, EN/IEC62109-1			
Safety Class					CLASS I			
MTBF		MIL-HDBK-217F@25℃			⩾300,000 h			

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Mechanical Specifications

Case Material	Metal (AL5052, SPCC)
Dimensions	80.00 x 124.00 x 127.00mm
Weight	890g (Typ.)
Cooling Method	Free air convection

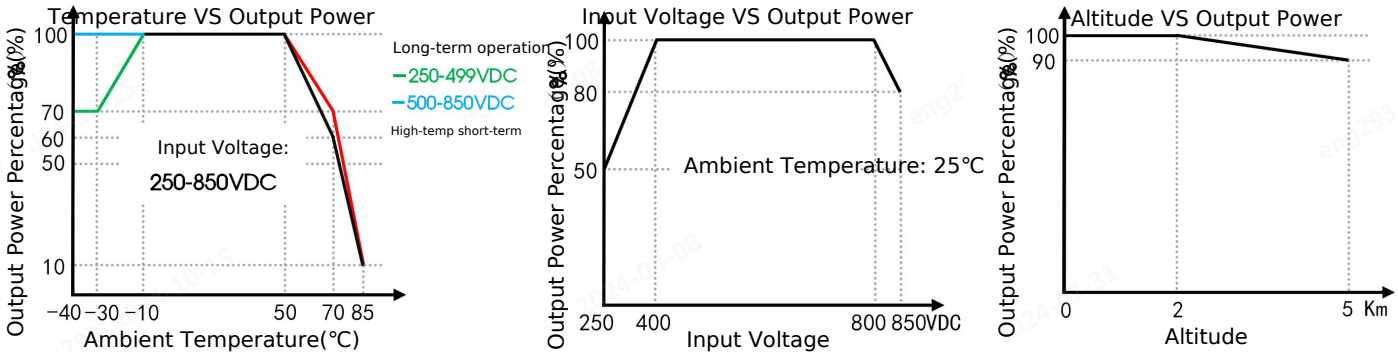
Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32 EN55032 CLASS A	
	RE	CISPR32 EN55032 CLASS A	
	EN61000-6-4		
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV/Air ±15KV	Perf. Criteria A
	RS	IEC/EN61000-4-3 10V/m	Perf. Criteria A
	EFT (Input)	IEC/EN61000-4-4 ±4KV	Perf. Criteria A
	EFT (Output)	IEC/EN61000-4-4 ±2KV	Perf. Criteria A
	EFT (DC OK)	IEC/EN61000-4-4 ±1KV	Perf. Criteria A
	Surge (Input)	IEC/EN61000-4-5 Line to line ±2KV/line to PE ±4KV	Perf. Criteria A
	Surge (Output)	IEC/EN61000-4-5 Vo+ to Vo- ±500V/Vo+/Vo- to PE ±1KV	Perf. Criteria A
	Surge (DC OK)	IEC/EN61000-4-5 DC OK to PE, ±1KV	Perf. Criteria A
	CS	IEC/EN61000-4-6 10Vr.m.s	Perf. Criteria A
	PFMF	IEC/EN61000-4-8 30A/m	Perf. Criteria A
	EN61000-6-2		

Functional Specifications

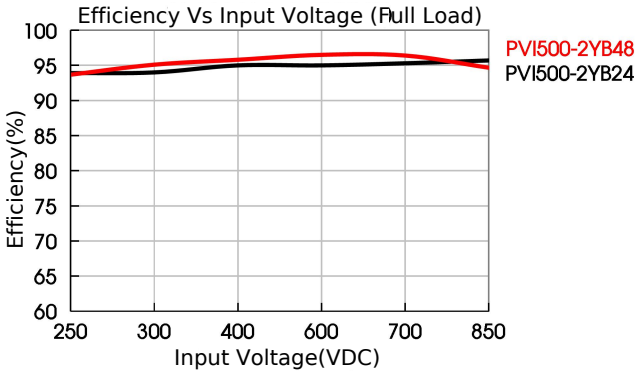
Item	Operating Conditions		Min.	Typ.	Max.	Unit
DC OK Signal	Full voltage and full load range	DC OK turn-on trigger		0.92Vo - 0.98Vo		
		DC OK turn-off trigger		**<0.90Vo**		

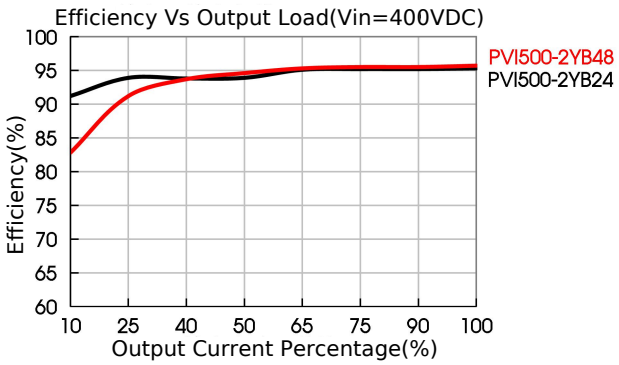
Product Characteristic Curve



Note: 1. For input voltage of 250-400VDC/800-850VDC, input voltage derating is required on the basis of temperature derating; 2. This product is suitable for applications using natural air cooling; for applications in a closed environment, please consult our FAE.

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Design Reference

1. Typical Application Circuit

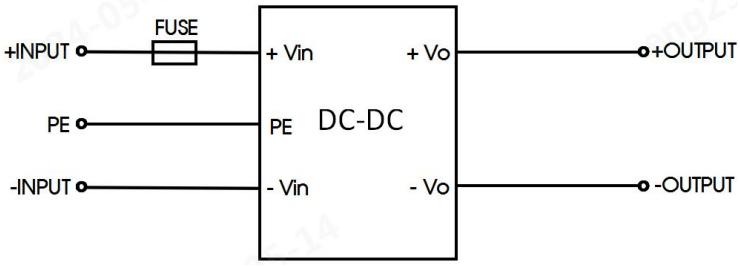
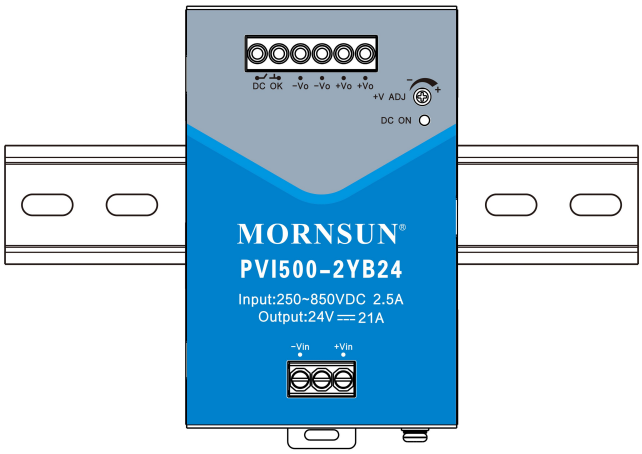
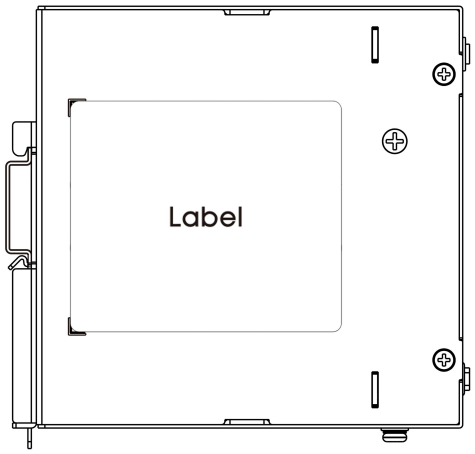


Fig. 1

Part No.	FUSE
PVI500-2YBxx	1000VDC/4A, required (Brand: adler Part No.: A831400710 Holder Part No.: BH100-01)

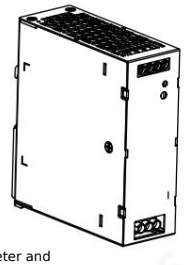
Installation Diagram



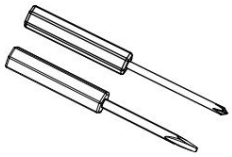


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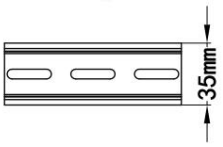
Installation Material List		
1	Product body	1 PCS
2	Phillips screwdriver Slotted screwdriver	1 PCS
3	TS35/7.5 or TS35/15	1 PCS
4	24–10AWG Wire specifications	/ PCS
	The above is for reference only. For actual wiring diameter and locking torque, refer to the dimension drawing.	



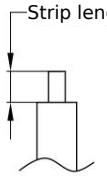
Product body



Phillips screwdriver
Slotted screwdriver
Tip diameter: 3mm

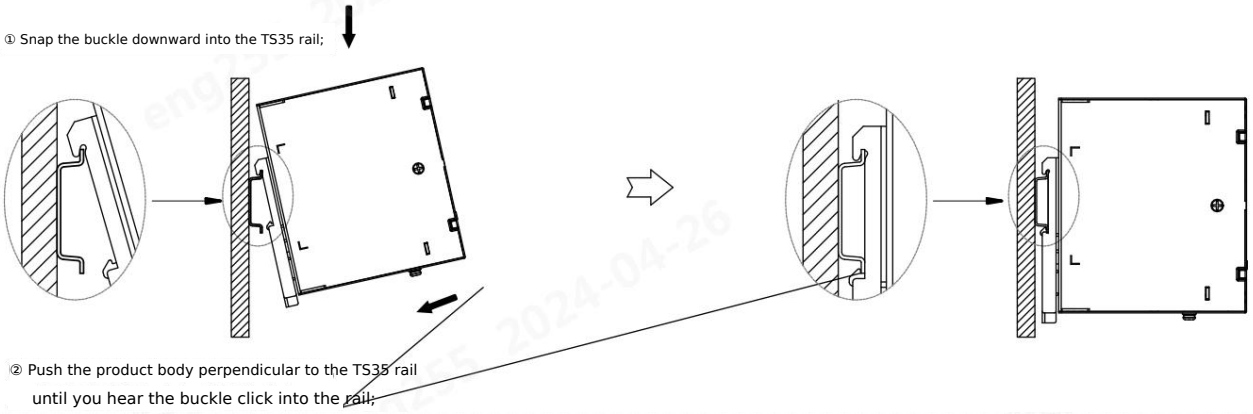


TS35/7.5 or TS35/15

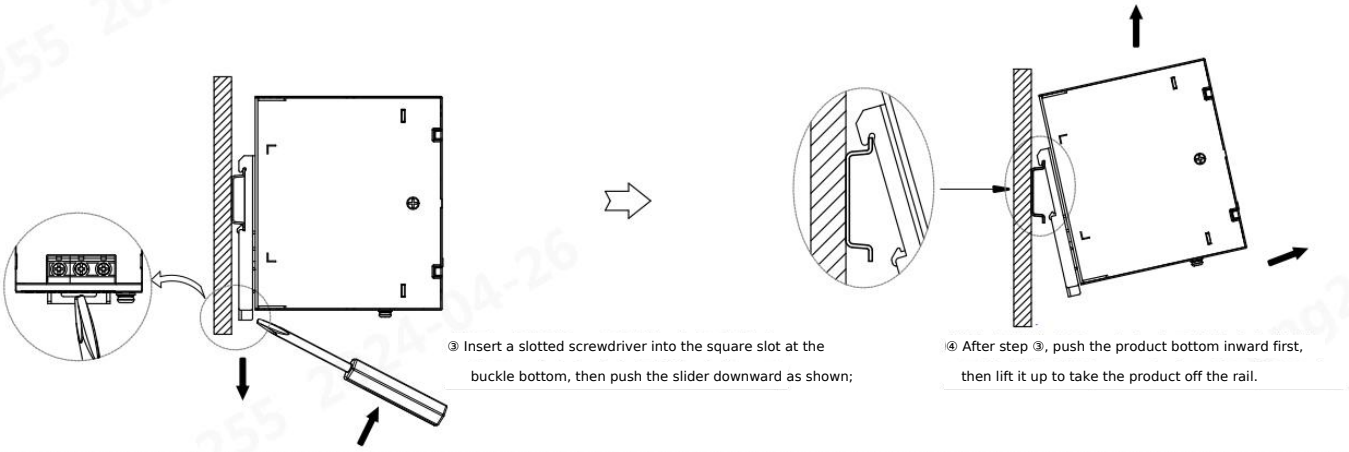


Wire specifications: 22-10AWG

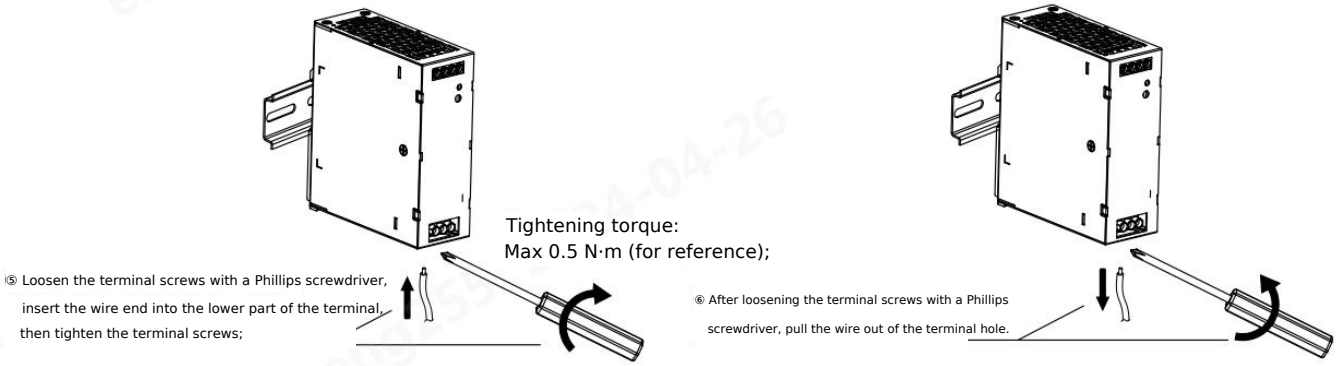
Installation Steps ①–②



Removal Steps ③–④



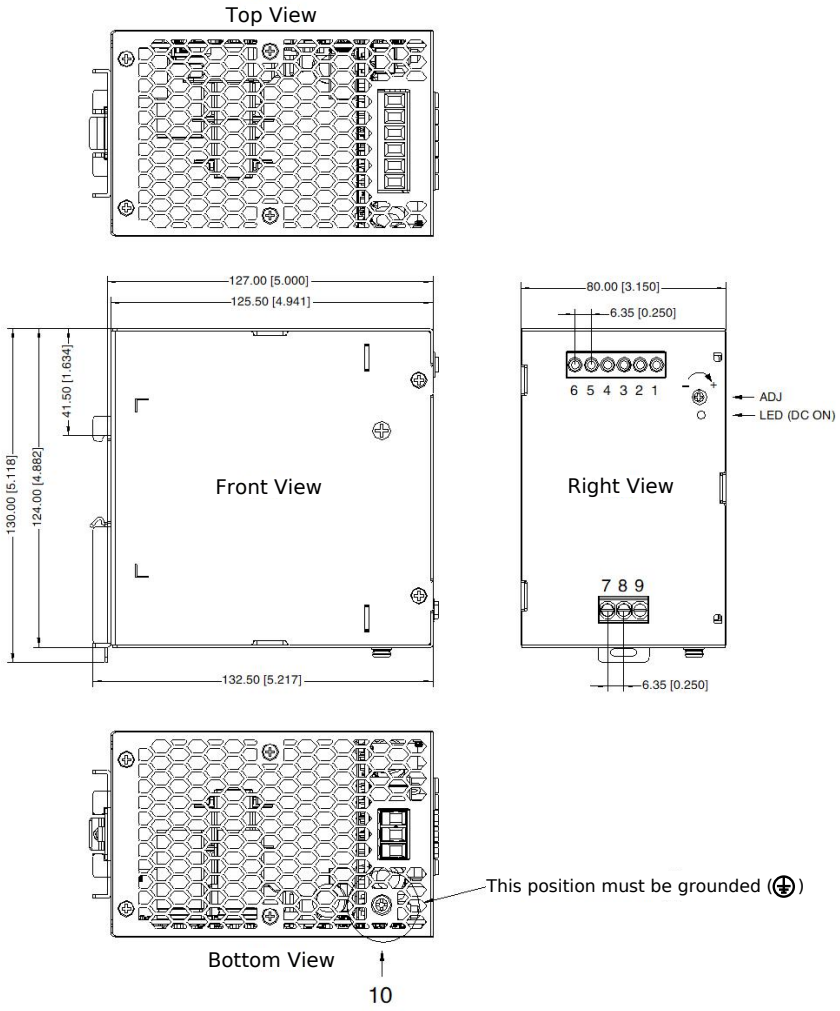
Wiring Steps ⑤–⑥



Note: When the equipment load exceeds 50% of the rated power for a long time, keep a clearance of 20mm at the top, 20mm at the bottom, and 5mm on each side. If adjacent equipment is a heat source (e.g. another power supply), increase this clearance to 15mm.

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Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	+Vo
2	+Vo
3	–Vo
4	–Vo
5	DC OK
6	
7	–Vin
8	NC
9	+Vin

Note:
Unit: mm[inch]
DC ON: Output status indicator
ADJ: Output adjustable resistor
Wiring range:
Input (Pin7, Pin9): 20-10AWG
Output (Pin1-4): 24V 14-10AWG
48V 18–10AWG
DC–OK(Pin5–6)：24–16AWG
Input terminal tightening torque: Max 0.5 N·m
Output terminal tightening torque: Max 0.5 N·m
Rail type: TS35, the rail must be grounded
Unmarked tolerance: ±1.00[±0.039]

Note: 1. For additional information on Product Packaging, please refer to "Product Packaging Information" at www.mornsun.cn. Packaging bag number: 58220791; 2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load; 3. All index testing methods in this datasheet are based on our company corporate standards; 4. To improve conversion efficiency, audible noise may occur when the module operates under high voltage, but it does not affect product performance and reliability; 5. We can provide product customization service. Please contact our technicians directly for specific information; 6. Products are related to laws and regulations: see "Features" and "EMC"; 7. The out case needs to be connected to the system earth (⏚) when the terminal equipment is in operation; 8. Output voltage can be adjusted via the output adjustable resistor ADJ, clockwise to increase; 9. Our products shall be classified and stored according to ISO14001 and related environmental laws and regulations after being scrapped, and shall be handled by qualified units.

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