DESCRIPTIONS

DC-DC 250W DIN-Rail Power Supply



RoHS

FEATURES

- 250-1500VDC input voltage
  (Transient 1700VDC last for 30s)
- Operating ambient temperature range: -40℃ to +85℃
- High I/O isolation voltage up to 4000VAC
- Support 3+1 parallel redundanc y, current sharing
- Low ripple & noise, high efficiency, high reliability
- DC OK function
- Impulse withstand voltage 1.2/50us 8KV
- LED indicator for power on
- Input under-voltage protection, input reverse polarity protection, output short circuit, over-current, over-voltage, over-temperature protection
- Design refer to UL1741, EN/IEC62109, IEC62477

APPLICATIONS

- Energy storage
- Industrial control equipment
- Machineryn

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (vo/Io)	Output Voltage Adjustable Range ADJ (V)*	Efficiency at 800VDC (%) Typ.	Capacitive Load (μF) Max. **
/	DPVI250-15B-12	200	12V/16.70A	12-15	90	10000
	DPVI250-15B-24	250	24V/10.42A	24-29	92	5000

Note:1.*The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values;
2.**The maximum capacitive load is derated with the proportion of voltage derating.
3.The product picture is for reference only. For details, please refer to the actual product.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range	Transient (30s)		--	--	1700	VDC
				250	--	1500	
	Input Current	250VDC		--	--	1.0	A
		1500VDC		--	--	0.4	
	Inrush Current	800VDC	Cold start	--	200	--	
		1500VDC		--	300	--	
	Input Under-voltage Protection	Under-voltage protection start		200	210	220	VDC
		Under-voltage protection release		220	230	240	
	External Input Fuse			1500VDC/3A, required (brand: adler models: A831400710 base models: BH100-01)			
	Input Reverse Polarity Protection			Available			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy	All load range	12V	--	±1.5	--	%
			24V	--	±1	--	
	Line Regulation	Rated load		--	±0.5	--	
	Load Regulation	800VDC		--	±1.0	--	
	Minimum Load			0	--	--	
	Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	12V	--	--	120	mV
			24V	--	--	240	
	Stand-by Power Consumption	1500VDC		--	2	3	W
	Temperature Coefficient			--	±0.02	--	%/℃
	Short Circuit Protection			Hiccup, continuous, self-recovery			
	Over-current Protection			Hiccup, 110% - 330% Io, automatic recover after fault condition is removed, self-recovery			
	Over-voltage Protection	12V		≤25V	Output voltage hiccup or clamp,self-recovery		
		24V		≤35V			
	Over-temperature Protection**			Output voltage turn off, self-recovery			
	Start-up Delay Time***			--	1	3	s
	DC OK Signal****	Resistive load		30VDC/1A Max.			
	Hold-up Time	1200VDC input		--	10	--	ms

General Specifications	Isolation	Input - output	Electric Strength Test for 1min., leakage current < 10mA	4000	--	--	VAC
		Input - PE		4000	--	--	
		Output - PE		2000	--	--	
		Output - DC OK		500	--	--	
	Insulation Resistance	Input - output	Test voltage: 500VDC	100	--	--	MΩ
		Input - PE					
		Output - PE					
		Output - DC OK					
	Insulation Type			Primary and secondary meet reinforced insulation			
	Impulse Withstand Voltage	Input - output	8KV, 1.2/50us Impulse voltage				
		Input - PE	6KV, 1.2/50us Impulse voltage				
	Operating Temperature			-40	--	+85	℃
	Storage Temperature			-40	--	+85	
	Storage Humidity		Non-condensing	--	--	95	%RH
	Output Power Derating	Operating temperature derating	-40℃ to -25℃	2.66	--	--	%/℃
			+50℃ to +65℃	3.1	--	--	
			+65℃ to +85℃	2.175	--	--	
		Input voltage derating	250VDC - 300VDC	0.8	--	--	%/VDC
			300VDC - 320VDC (12V)	1.0	--	--	
			300VDC - 320VDC (24V)	0.8	--	--	
			320VDC - 400VDC (24V)	0.05	--	--	
			1400VDC - 1500VDC	0.2	--	--	
		Altitude derating	2000m - 5000m	10	--	--	%/Km
	Safety Class			CLASS I			
	MTBF		MIL-HDBK-217F@25℃	≥300,000 h			
Mechanical Specifications	Case Material		Metal (AL5052, SPCC)				
	Package Dimensions		125.00 x 48.00 x 137.00mm				
	Weight		860g (Typ.)				
	Cooling Method		Free air convection				

Note:1.*The "parallel cable" method is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 1uF ceramic capacitor;

2.**Output voltage turn off, self-recovery after fault conditions is removed;

3.***Full input voltage / output load range (The cooling-time between input power-off and power-on again is greater than 15s);

4.****DC OK Signal: When the output voltage is (constant current mode) normal, the relay is connected. When the output voltage is abnormal, the relay is disconnected.

Electromagnetic Compatibility (EMC)

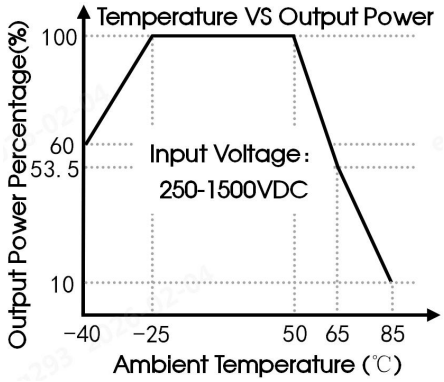
Electromagnetic	Emissions (EMI)	CE	CISPR32 EN55032	CLASS A
		RE	CISPR32 EN55032	CLASS A
		EN61000-6-4		

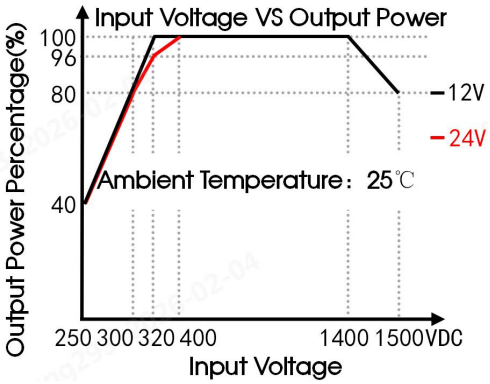
Compatibility (EMC)	Immunity (EMS)	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria A
		RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
		EFT	IEC/EN61000-4-4	±4KV	Perf. Criteria A
		Surge	IEC/EN61000-4-5	Line to line ±2KV/line to PE ±4KV	Perf. Criteria A
		CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
		PFMF	IEC/EN61000-4-8	30A/m	Perf. Criteria A
		EN61000-6-2			

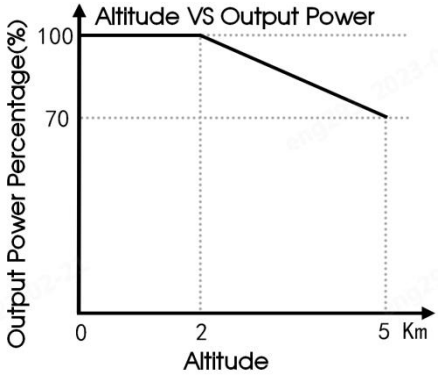
Functional Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Current Sharing Accuracy	When units in parallel, each power supply needs to carry a rated load of more than 50%		--	±5	--	%
LED Signal	Output status indication	Normal output	Green on			/
		Output protection	Flicker/light off			
		Power off	Light off			

Characteristic Curve

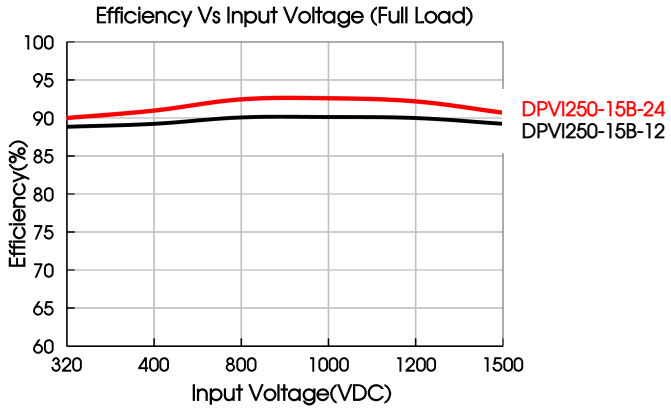


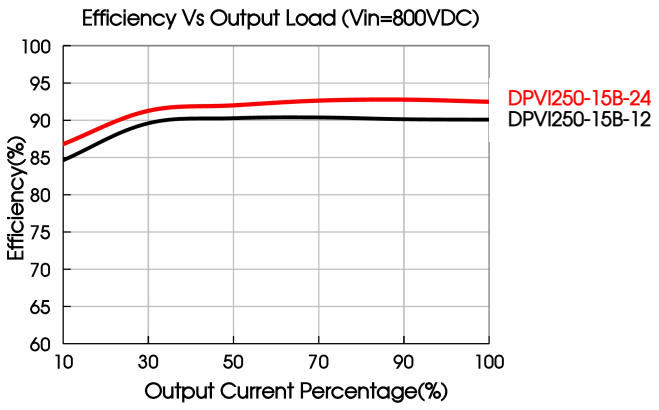




Note: 1. With an DC input between 250-320VDC(12V)/250-400VDC(24V)/1400-1500VDC, the output power must be derated as per temperature derating curves;

2. This product is suitable for applications using natural free air cooling; for applications in closed environment please consult our FAE.





Design Reference

1. Typical application

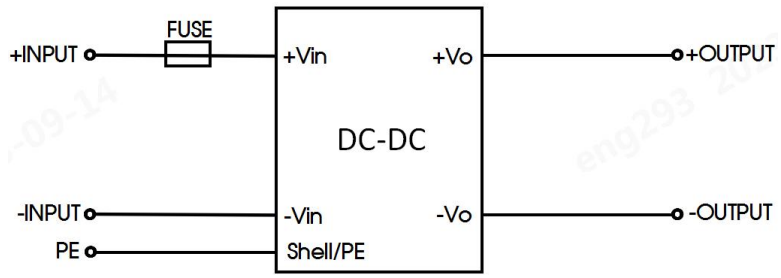
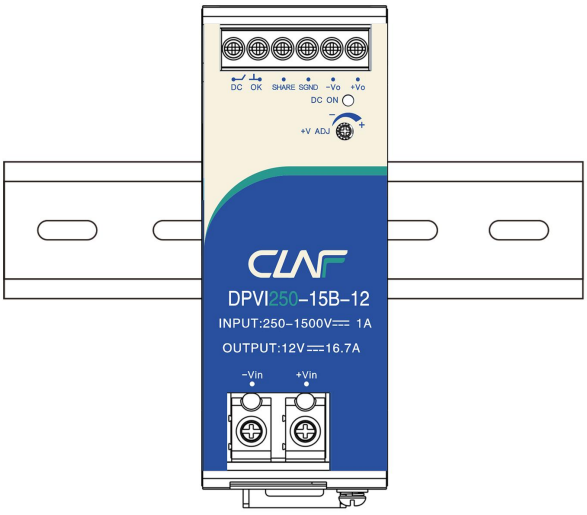
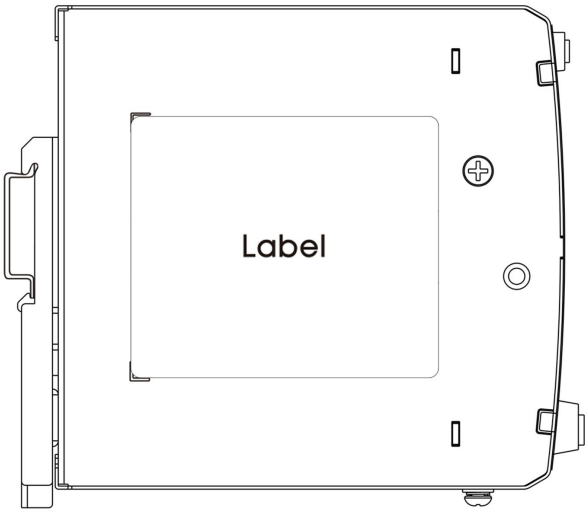


Fig. 1

Part No.	FUSE
DPVI250-15B-xx	1500VDC/3A, required (brand: adler models: A831400710 base models: BH100-01)

Installation Diagram

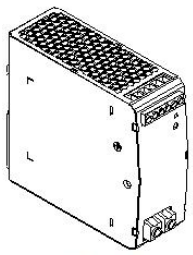




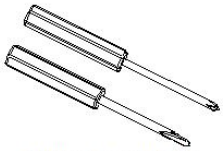
File name	DPVI250–15B–xx Installation Instruction	Version number	V0	Page 1 of 1

Materials required in the installation

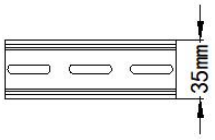
1	Product	1 PCS
2	Phillips screwdriver Slotted screwdriver	1 PCS
3	TS35/7.5 or TS35/15	1 PCS
4	14–6AWG wire	/ PCS
	The content is for reference only. Regarding the actual wire diameter and tightening torque, refer to the dimensional drawing.	



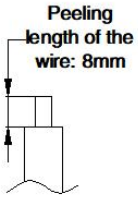
Product



Phillips screwdriver
Slotted screwdriver
Diameter of the cutting
Diameter: 3mm



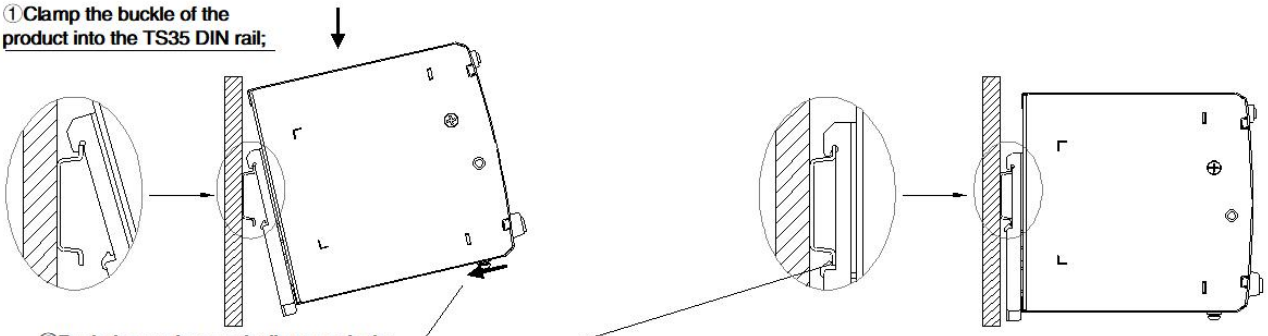
TS35/7.5 or TS35/15



14–6AWG wires

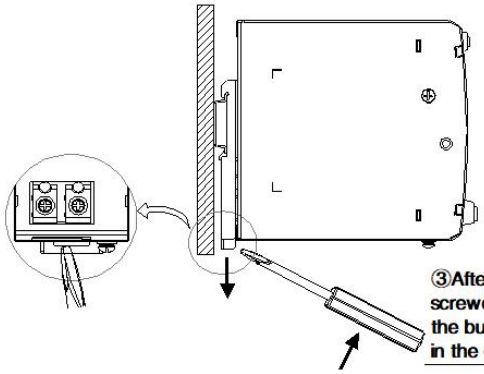
Installation Steps ①–②

①Clamp the buckle of the product into the TS35 DIN rail;

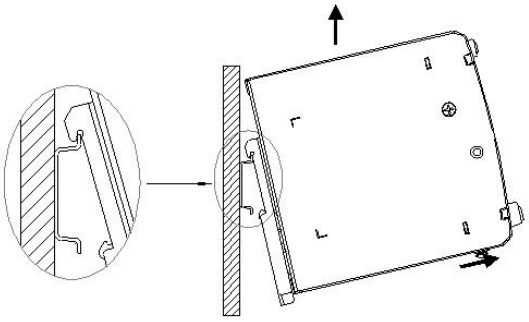


②Push the product vertically towards the TS35 DIN rail until hearing the sound of the buckle snapping into it.

Disassembly steps ③–④

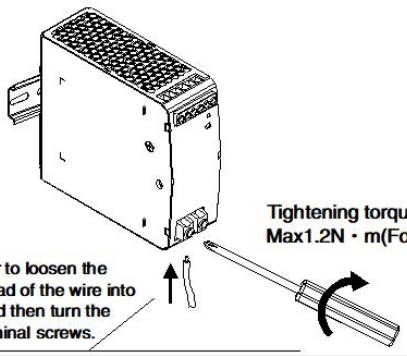


③After inserting the Slotted screwdriver into the square groove at the bottom of the buckle, push the slider of the buckle downward in the direction shown in the figure.



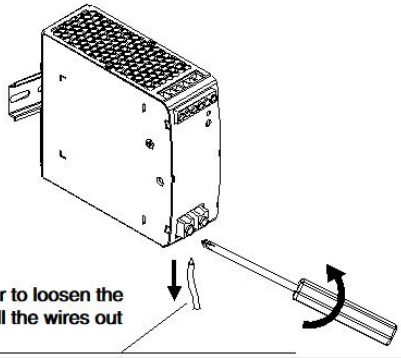
④Hold the bottom of the product and push it outwards, then lift the product up to take the product out of the DIN rail.

Wiring / Unwiring Steps ⑤–⑥



Tightening torque:
Max1.2N・m(For reference);

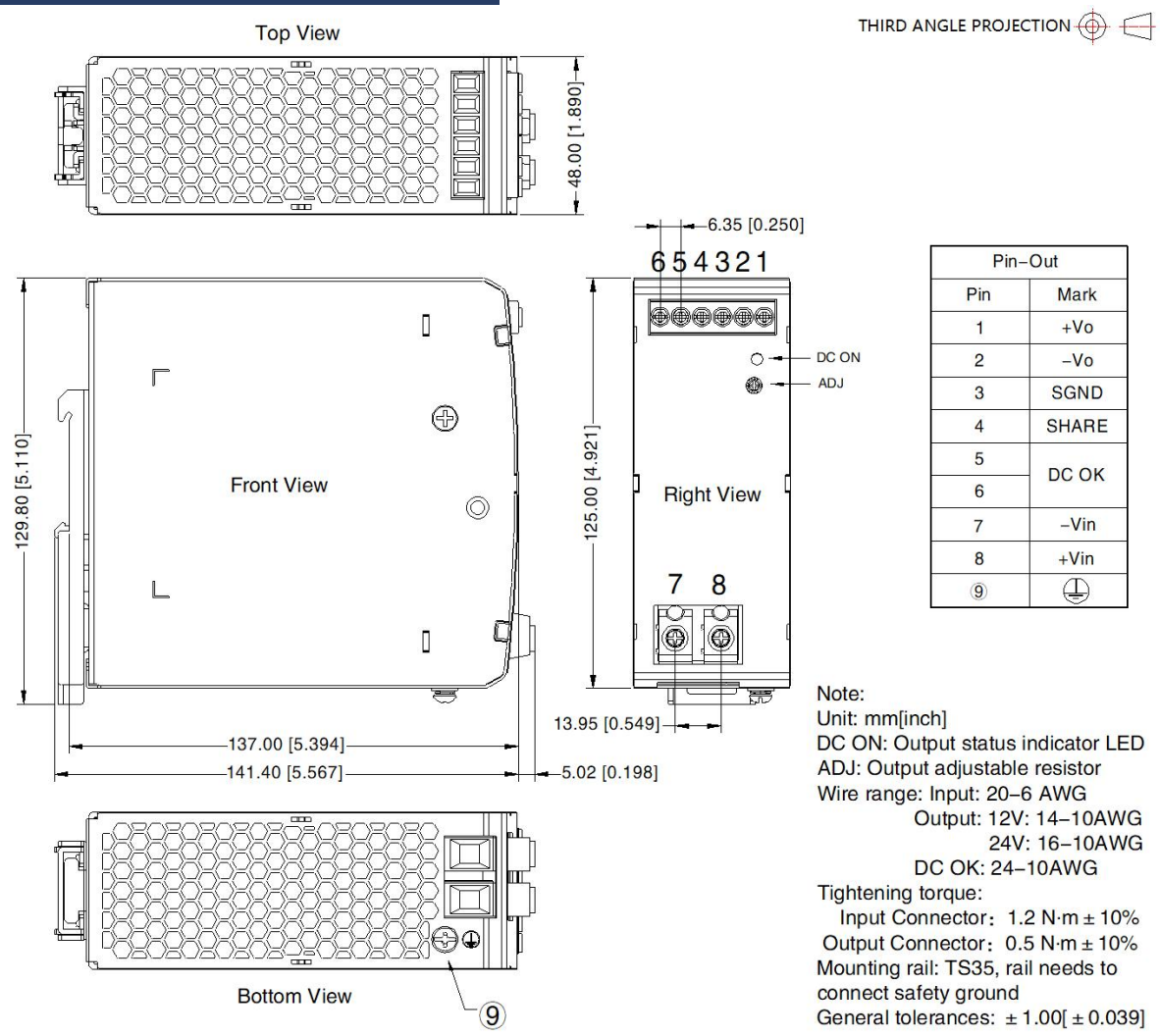
⑤Use the Phillips screwdriver to loosen the terminal screws, insert the head of the wire into the bottom of the terminal, and then turn the screwdriver to tighten the terminal screws.



⑥The Phillips screwdriver to loosen the terminal screws and pull the wires out of the terminal holes

Note: Keep the following installation clearances: 20mm on top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

Dimensions and Recommended



Pin-Out	
Pin	Mark
1	+Vo
2	-Vo
3	SGND
4	SHARE
5	DC OK
6	
7	-Vin
8	+Vin
⑨	⏚

Note:
Unit: mm[inch]
DC ON: Output status indicator LED
ADJ: Output adjustable resistor
Wire range: Input: 20–6 AWG
Output: 12V: 14–10AWG
24V: 16–10AWG
DC OK: 24–10AWG
Tightening torque:
Input Connector: 1.2 N·m ± 10%
Output Connector: 0.5 N·m ± 10%
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

1.CAUTION: RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE.

1.ATTENTION: RISQUES D'ÉLECTROCUTION. NE PAS RETIRER LE COUVERCLE. NE CONTIENT AUCUNE PIÈCE POUVANT ÊTRE RÉPARÉE PAR L' UTILISATEUR.

2.CAUTION: DISCONNECT ALL SOURCES OF SUPPLY BEFORE SERVICING.

2.ATTENTION: COUPER TOUTES LES SOURCES D'ALIMENTATION AVANT DE FAIRE L'ENTRETIEN ET LESL RÉPARATIONS.

3.CAUTION: RISK OF ELECTRIC SHOCK FROM STORED ENERGY. WAIT 5 MIN AFTER DISCONNECTING ALL SOURCES OF SUPPLY BEFORE ACCESSING.

3.ATTENTION:RISQUE D'ÉLECTROCUTION EN RAISON DE L'ÉLECTRICITÉ EMMAGASINÉE. ATTENDRE 5 MINUTES APRÈS AVOIR DÉBRANCHÉ TOUTES LES SOURCES D'ALIMENTATION AVANT D'Y ACCÉDER.

Note:

1. 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;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;
6. The output voltage can be adjusted by the ADJ, clockwise to increase;
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;

DPVI250-15B-xx Series Parallel Redundancy and Current Sharing Application Notes

Parallel Operating

1. Redundancy

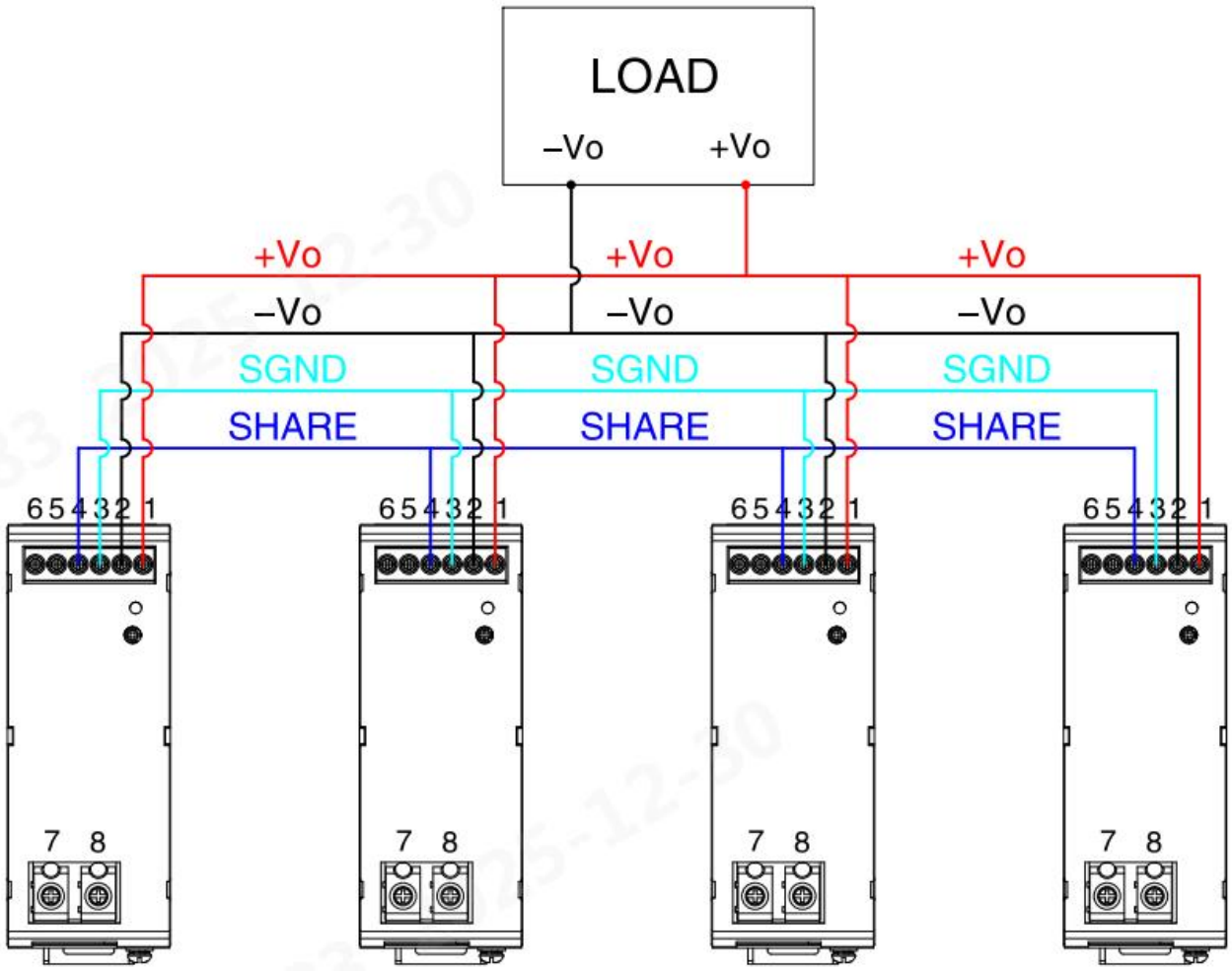
The output of the power module can be connected in parallel to achieve redundancy, thereby improving system reliability. The maximum power of the redundant system needs to be derated to ensure that the redundant system can still meet the rated load requirements when a power module fails. At present, the common practice is to build a redundant system using the N+1 method, that is, N+1 power supplies are connected in parallel. It supports the maximum load current N*Iomax, where Iomax is the rated output current of each power supply, for example, the rated output current of each power supply is 10A, and 3+1 are only connected in parallel to build a 3*10A=30A redundant system.

The power modules support 3+1 parallel redundant operation. When any power module in the parallel connection fails, other power modules can continue to work.

Note: When used in parallel, the maximum load current cannot exceed the maximum output current of a single power module at startup, otherwise the entire parallel power supply system will not be able to start and work normally. When any power supply in the parallel connection fails, its current-sharing connection terminal needs to be removed to prevent other power modules from being affected by it, resulting in a decrease in output voltage.

2. Current Sharing

The each power module has a current sharing connection terminal (SHARE and SGND of JP401). If the current sharing function is required, the current sharing terminals of all power modules must be connected together when working in parallel. The wiring method of the current sharing function is shown in the figure below:



Note: The JP401ports of each power module have the same function, and there is no sequence.

The output voltage of each power module will affect the accuracy of current sharing. It is recommended that the output voltage of the power module be the rated voltage ±50mV. In practical applications, if the output voltage value needs to be adjusted, the output voltages of all parallel-connected power modules need to be adjusted to the same voltage. The recommended voltage range is: target voltage value ±50mV.

After the output load of each power module is greater than 50% of the rated load, the current sharing accuracy is required to be ±5%. The formula for calculating the average current is:

$$\text{Current Sharing Accuracy}=\frac{Io\max - Io\min}{Io\max}*100\%$$

Iomax: The maximum output current value of the power modules connected in parallel

Iomin: The minimum output current value of the power modules connected in parallel