

PMT Panel Mount Power Supply

PMT2 350W series / PMT-□V350W2B□□

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PMT2

Highlights & Features

- AC input voltage range selectable by switch (90-132Vac, 180-264Vac)
- No load power consumption < 0.75W
- Low profile design: 30mm height
- High MTBF > 700,000 hrs per Telcordia SR-332
- 150% Peak power supported as option
- Wide operating temp -30°C ~70°C (Support -40°C cold start)

Safety Standards



CB Certified for worldwide use

Model Number: PMT-□V350W2B□□
Unit Weight: 0.833 kg (1.84 lb)
Dimensions (L x W x H): 215 x 115 x 30 mm
 (8.46 x 4.53 x 1.18 inch)

General Description

PMT 2nd generation (PMT2) 350W power supplies is designed in a low 30mm profile. It uses a selectable AC switch input. With the built-in fan, it can operate from -30°C to 70°C.

Model Information

PMT Panel Mount Power Supply

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
PMT-12V350W2B□□	90-132Vac, 180-264Vac (Selectable by Switch)	12Vdc	29.0A
PMT-24V350W2B□□		24Vdc	14.6A
PMT-36V350W2B□□		36Vdc	9.7A
PMT-48V350W2B□□		48Vdc	7.3A

Model Numbering

							CC code
PM	T –	□V	350W	2	B	□	□
Panel Mount	Product Type T – Enclosed	Output Voltage 12 – 12V 24 – 24V 36 – 36V 48 – 48V	Output Power	Single Phase with Low Profile	Family Code: B With No PFC	Connector Type <u>With UL, TUV, CE, EAC</u> R*1 – Terminal Block <u>With UL, EAC</u> M – Terminal Block	Blank – Without connector cover & coating B – Single side coating *2 C – With connector cover + single side coating *2

*1 Support 150% peak power & with EMI Class B

*2 Only 12V/24V model

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Specifications

Model Number	PMT-12V350W2B□□	PMT-24V350W2B□□	PMT-36V350W2B□□	PMT-48V350W2B□□
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Input Ratings / Characteristics

Nominal Input Voltage	100-120Vac, 200-240Vac (Selectable by Switch)			
Input Voltage Range	90-132Vac, 180-264Vac (Selectable by Switch)			
Nominal Input Frequency	50-60Hz			
Input Frequency Range	47-63Hz			
Input Current	6A typ. @ 115Vac, 3.4A typ. @ 230Vac			
Efficiency at 100% Load @ 230Vac	84.5% typ.	87% typ.	88% typ.	88% typ.
No Load Power Consumption	0.75W typ. @ 230Vac			
Max Inrush Current (Cold Start)	60A typ. @ 230Vac			
Leakage Current	< 0.75mA @ 240Vac			

Output Ratings / Characteristics*3

Nominal Output Voltage	12Vdc	24Vdc	36Vdc	48Vdc
Factory Set Point Tolerance	12Vdc $\pm$ 1.5%	24Vdc $\pm$ 1%	36Vdc $\pm$ 1%	48Vdc $\pm$ 1%
Output Voltage Adjustment Range	10.8-13.2Vdc	21.6-26.4Vdc	32.4-39.6Vdc	43.2-52.8Vdc
Output Current	29.0A 43.5A/1S*5	14.6A 21.9A/1S*5	9.7A 14.55A/1S*5	7.3A 10.95A/1S*5
Output Power	348W Max. 522W Max./1S*5	350.4W Max. 525.6W Max./1S*5	349.2W Max. 523.8W Max./1S*5	350.4W Max. 525.6W Max./1S*5
Line Regulation	$\pm$ 0.5% typ. @ 100-132Vac, 180-264Vac (Selectable by Switch)			
Load Regulation	$\pm$ 1% @ 100-132Vac, 180-264Vac (Selectable by Switch) $\pm$ 0.5% typ. @ 100-132Vac, 180-264Vac (Selectable by Switch)			
PARD*4 (20MHz)	< 150mVpp @ 0°C to 70°C 450mVpp typ. @ -30°C to 0°C < 200mVpp @ 0°C to 70°C 600mVpp typ. @ -30°C to 0°C			
Rise Time	30ms typ. @ 115Vac & 230Vac			
Start-up Time	1500ms typ. @ 115Vac & 230Vac			
Hold-up Time	20ms typ. @ 115Vac & 230Vac			
Dynamic Response (Overshoot & Undershoot O/P Voltage)	$\pm$ 10% @ 115 & 230Vac input, 10-100% load (Slew Rate: 2.5A/ μ S, 50% duty cycle @ 5Hz & 10KHz)			
Start-up with Capacitive Loads	8,000 μ F Max	8,000 μ F Max	3,000 μ F Max	2,000 μ F Max

*3 For power de-rating from > 50°C to 70°C, see power de-rating on page 3.

*4 PARD is measured with an AC coupling mode, and in parallel to end terminal with 0.1 μ F ceramic capacitor & 47 μ F electrolytic capacitor. PSU need to burn in > 5 minutes when AMB $\leq$ 0°C

*5 PMT-□V350W2BR□ models only

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Mechanical

Case Chassis	SGCC
Case Cover	SGCC
Dimensions (L x W x H)	215 x 115 x 30 mm (8.46 x 4.53 x 1.18 inch)
Unit Weight	0.833 kg (1.84 lb)
Indicator	Green LED (DC OK)
Cooling System	Force Cooling
Terminal	M3.5 x 9 Pins (Rated 300V/20A)
Wire	AWG 18-12 Current rating can refer to page 6 "Wire AWG Table"

Environment

Surrounding Air Temperature	Operating	-30°C to +70°C (-40°C Cold Start)
	Storage	-40°C to +85°C
Power De-rating	> 50°C de-rate power by 2% / °C < 100Vac de-rate power by 2% / V (80% load @ 90Vac)	
Operating Humidity	20 to 90% (Non-Condensing)	
Operating Altitude	0 to 5,000 Meters (0 to 16,400 ft)	
Shock Test	Non-Operating	IEC 60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions
	Operating	IEC 60068-2-27, Half Sine Wave: 10G for a duration of 11ms, 3 shock for each 3 directions.
Vibration	Non-Operating	IEC 60068-2-6, Random: 5Hz to 500Hz (2.09G); 20 min per axis for all X, Y, Z direction
	Operating	IEC 60068-2-6, Sine Wave: 20Hz to 500Hz (5G); 10min per cycle, 60min for each axis (X, Y,Z)
Over Voltage Category	II	
Pollution Degree	2	

Protections

Overvoltage	13.2V-17.4V SELV Output, Latch Mode	26.4-33.6V SELV Output, Latch Mode	39.6V-48.6V SELV Output, Latch Mode	52.8V-64.8V SELV Output, Latch Mode
Overload / Overcurrent	110-175% of rated load current, Hiccup Mode, Non-Latching (Auto-Recovery)			
Over Temperature	Latch Mode			
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)			
Protection Against Shock	Class I with PE*6 connection			

*6 PE: Protection Earth

Reliability Data

MTBF	> 700,000 hrs as per Telcordia SR-332 I/P: 230Vac, O/P: 100% Load, Ta: 25°C)
Expected Cap Life Time	10 years (230Vac, 50% load @ 40°C)

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Safety Standards / Directives

Safety Entry Low		SELV
Electrical Safety	TUV Bauart	PMT-□V350W2BR□: EN 62368-1
	UL/cUL	UL 62368-1, and CAN/CSA C22.2 No. 62368-1
CB scheme	KC	IEC 62368-1, IEC 60950-1
	EAC	K 60950-1 (Except 36V model)
UL/cUL	TP TC 004/2011	PMT-□V350W2BM□: UL 62368-1, and CAN/CSA C22.2 No. 62368-1
	EAC	IEC 62368-1, IEC 60950-1
CE		PMT-□V350W2BR□: In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU
Galvanic Isolation	Input to Output	3.0KVac
	Input to Ground	2.0KVac
	Output to Ground	0.5KVac

EMC

Emissions (CE & RE)		PMT-□V350W2BR□: CISPR 32, EN 55032, EN 61000-6-4, KN32, AS/NZS CISPR32 Compliance to FCC Title 47, EN 61000-6-3 : Class B PMT-□V350W2BM□: CISPR 32, EN 55032, FCC Title 47: Class B (With Delta EMI filter P/N: 12DCCG5B)
Immunity		PMT-□V350W2BR□: EN 55035, KN35, EN 61000-6-2 & Compliance to EN 61000-6-1
Electrostatic Discharge	IEC 61000-4-2	Level 4 Criteria A ¹⁾ Air Discharge: 15kV Contact Discharge: 8kV
Radiated Field	IEC 61000-4-3	Level 3 Criteria A ¹⁾ 80MHz-1GHz, 10V/M with 1kHz tone / 80% modulation
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 3 Criteria A ¹⁾ 2kV
Surge	IEC 61000-4-5	Level 4 Criteria A ¹⁾ Common Mode ⁴⁾ : 4kV Differential Mode ⁵⁾ : 2kV
Conducted	IEC 61000-4-6	Level 3 Criteria A ¹⁾ 150kHz-80MHz, 10Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Level 4 Criteria A ¹⁾ 30A/Meter
Voltage Dips and Interruptions	IEC 61000-4-11	0% residual; 1 cycle, Criteria B ²⁾ 40% residual; 10 cycle, Criteria C ³⁾ 70% residual; 25 cycle, Criteria C ³⁾

1) Criteria A: Normal performance within the specification limits

2) Criteria B: Output out of regulation, or shuts down during test. Automatically restored to normal operation after test.

3) Criteria C: Output out of regulation, shuts down during test (Need to recycle AC power cord to normal operation after test)

4) Asymmetrical: Common mode (Line to earth)

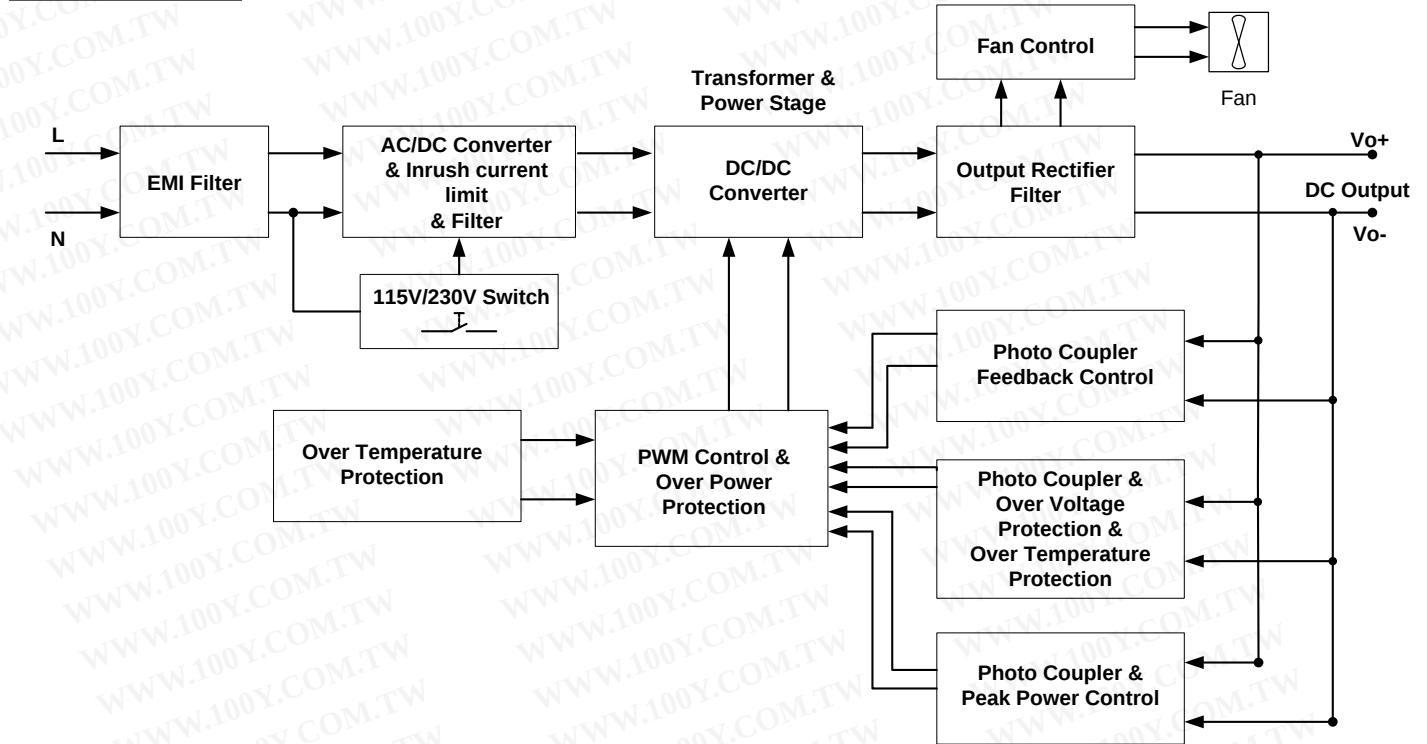
5) Symmetrical: Differential mode (Line to line)

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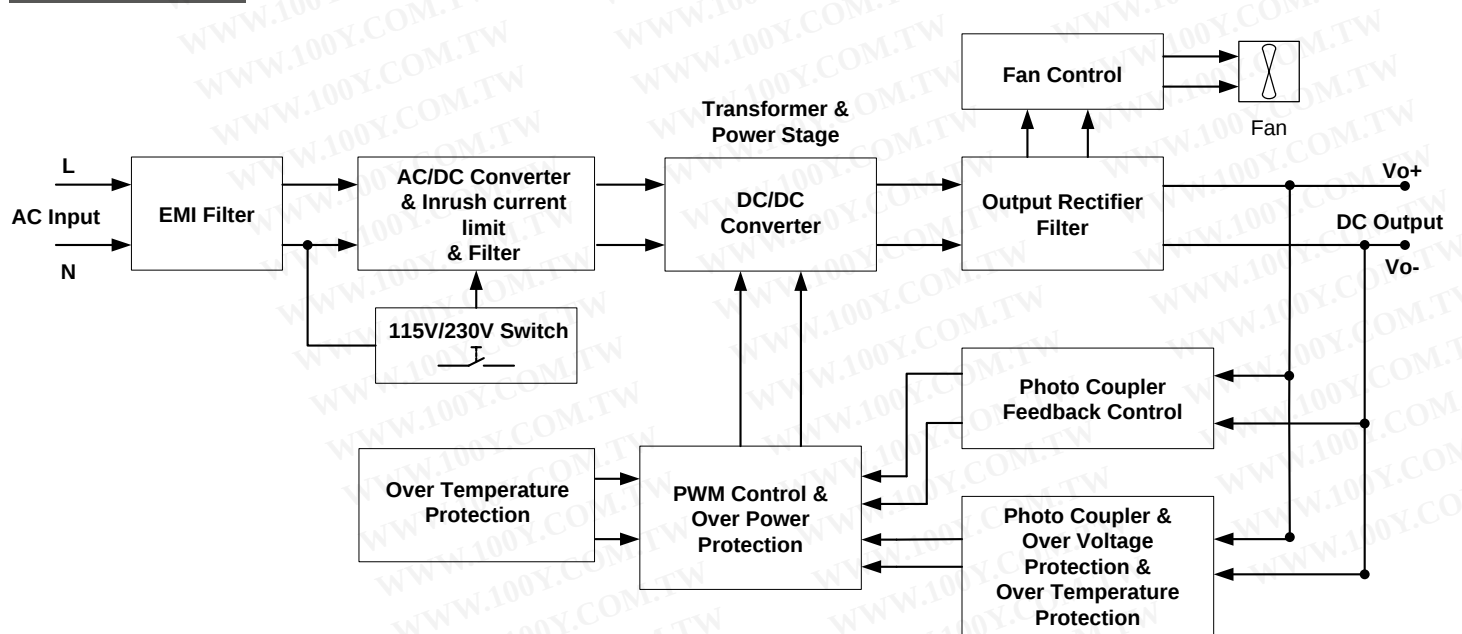
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Block Diagram

PMT-□V350W2BR□



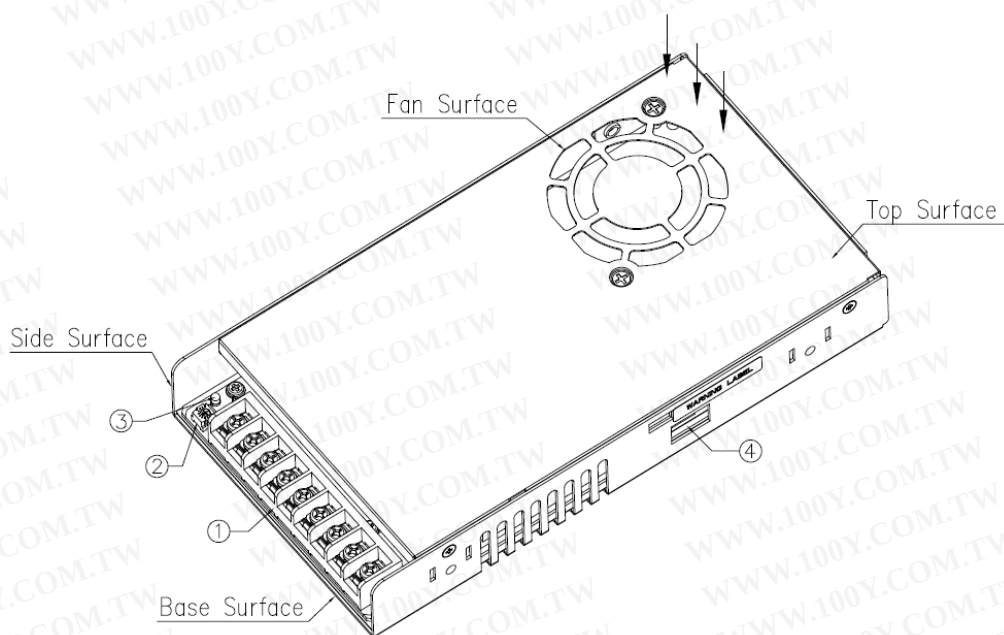
PMT-□V350W2BM□



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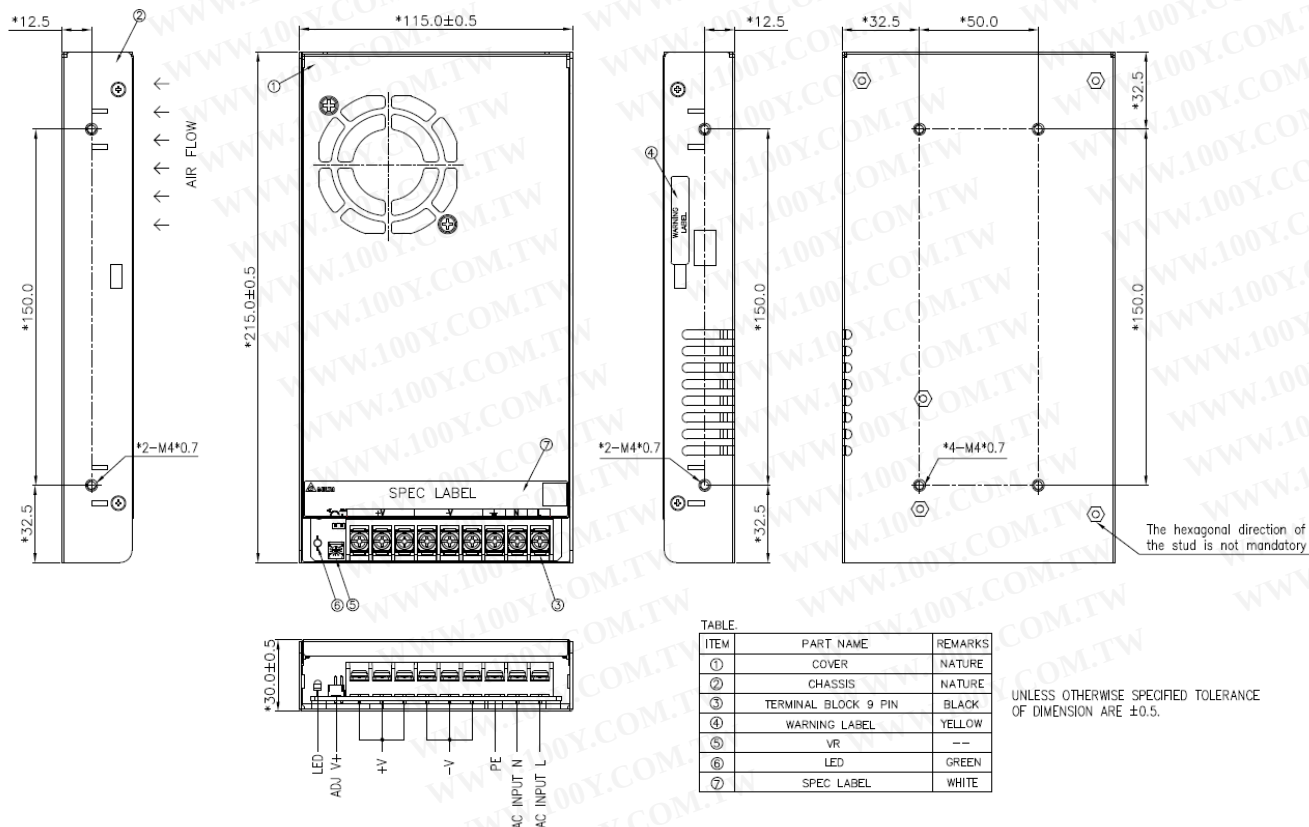
Device Descriptions



- 1) Input & Output terminal block connector
- 2) DC voltage adjustment potentiometer
- 3) DC OK control LED (Green)
- 4) AC selectable switch

Dimensions

L x W x H: 215 x 115 x 30 mm (8.46 x 4.53 x 1.18 inch)



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Wire AWG Table

Current rating for PVC Wire AWG			
6AWG	52.5A	20AWG	6.5A
8AWG	37.5A	22AWG	5.0A
10AWG	29.0A	24AWG	3.5A
12AWG	22.5A	26AWG	2.5A
14AWG	16.5A	28AWG	2.0A
16AWG	12.0A	30AWG	1.5A
18AWG	9.0A		

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Engineering Data

Output Load De-rating VS Surrounding Air Temperature

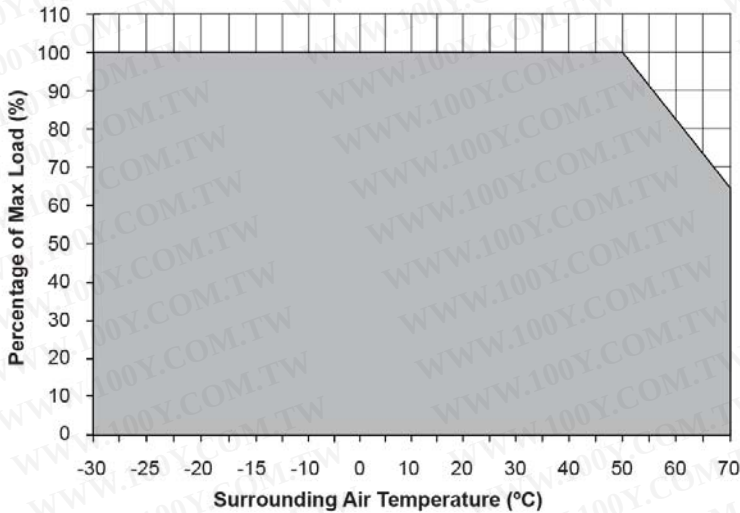
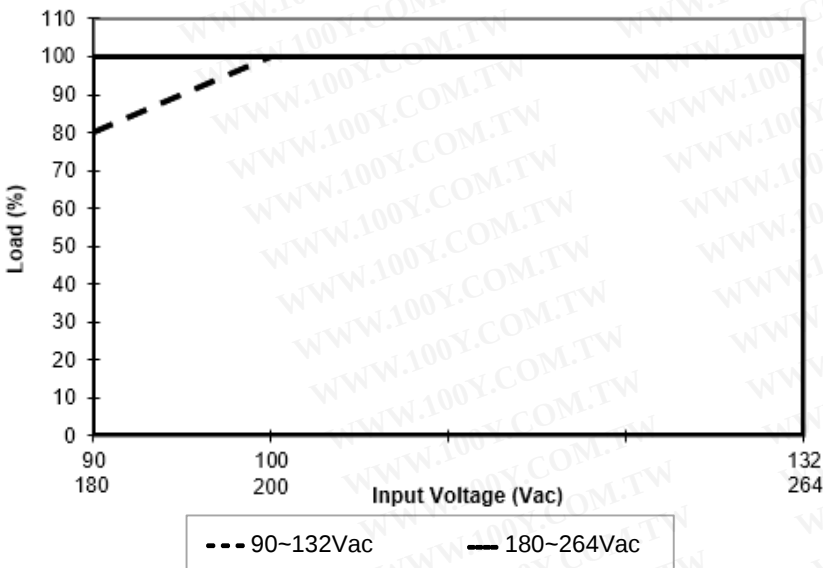


Fig. 1 De-rating for Horizontal Mounting Orientation
> 50°C de-rate power by 2.0% / °C

Note

1. Power supply components may degrade, or be damaged, when the power supply is continuously used outside the shaded region, refer to the graph shown in Fig. 1 & Fig.2.
2. The PSU will be bouncing and start up time will not exceed 5s when ambient temperature at -30 °C
3. If the output capacity is not reduced when the surrounding air temperature >50°C, the device will run into Over Temperature Protection. When activated, power supply will latch off, until the surrounding air temperature is lowered or the load is reduced as far as necessary to keep the device in working condition, and require removal/re-application of input AC voltage in order to restart.
4. In order for the device to function in the manner intended, it is also necessary to keep a safety distance as recommended in the safety instructions while the device is in operation.
5. Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!

Output Load De-rating VS Input Voltage



- No output power de-rating for the input voltage from 100Vac to 264Vac

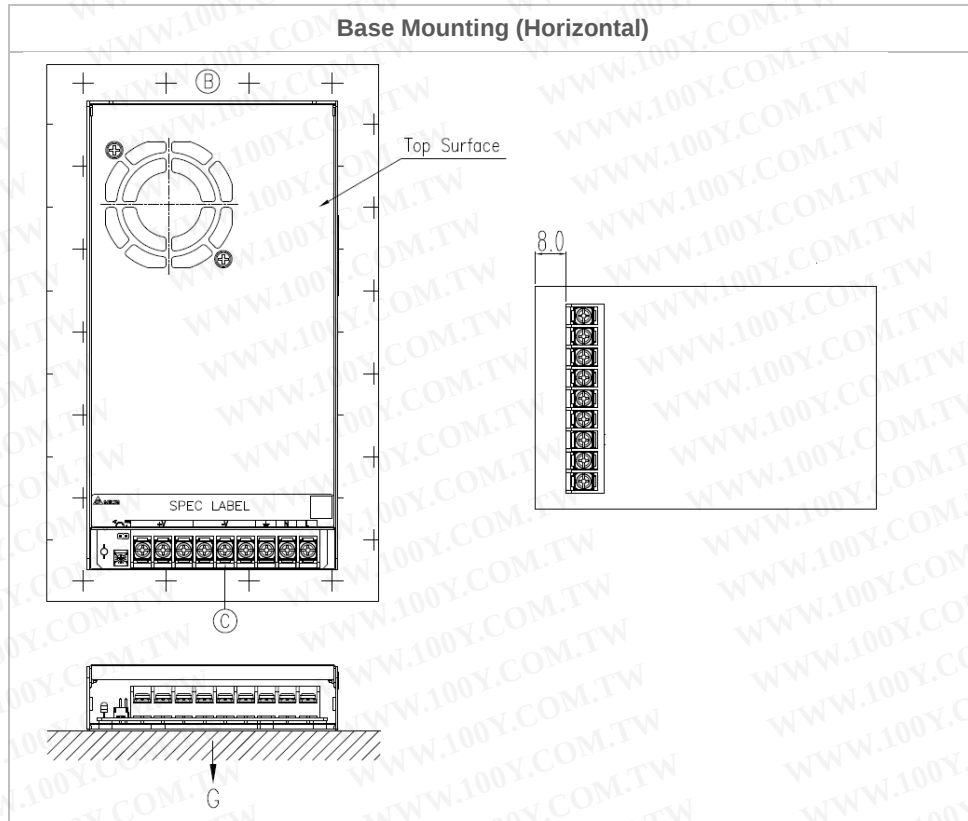
Fig. 2 De-rating for AC Input Voltage
< 100Vac de-rate power by 2% / V (80% load @ 90Vac)

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Assembly & Installation

- Ⓐ Base Mounting: Fig.3 shows the mounting hole locations for power supply assembly onto a metal mounting surface.
- Ⓑ This surface belongs to customer's end system or panel where the power supply is mounted.
- Ⓒ Connector



* If the device has to be mounted in any other orientation, please contact info@deltapsu.com for more details.

- Use flexible cable (stranded or solid) of AWG No.18-12. User should calculate and select the suitable wire specification (type/quantity/diameter) according to actual output current. The torque at the Connector shall not exceed 8Kgf.cm. (6.94 lbf.in). The insulation stripping length should not exceed 0.275" or 7mm. (Refer to Fig. 3).

Installation of Mounting Accessories

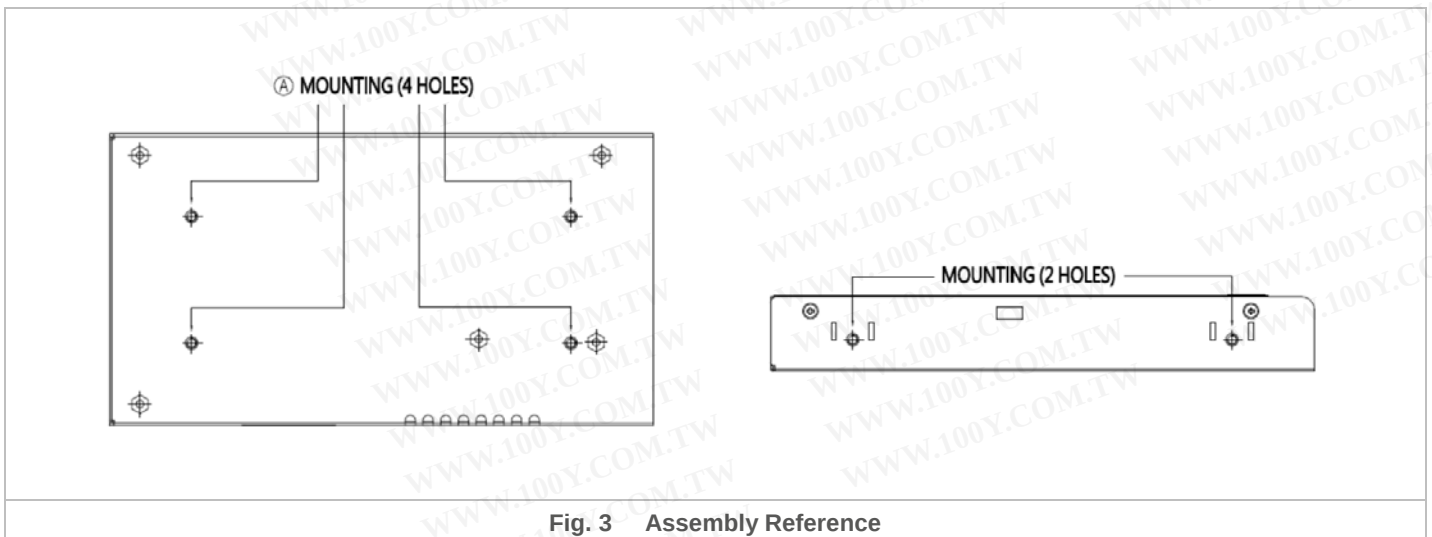


Fig. 3 Assembly Reference

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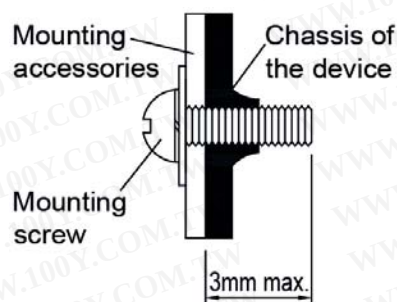


Fig. 4 Mounting Screw

- Only use M4 screw $\leq 3\text{mm}$ (0.20 inch) through the base mounting holes. This is to keep a safe distance between the screw and internal components.
- Recommended mounting tightening torque: 4~7Kgf.cm (3.47~6.08 lbf.in).

Safety Instructions

- If user's mounting orientation is not according to the recommended mounting orientations, please consult Delta for further information.
- To ensure sufficient convection cooling, always maintain a safety distance of $\geq 50\text{mm}$ (1.97 inch) from all ventilated surfaces while the device is in operation.
- The device is not recommended to be placed on low thermal conductive surface. For example, plastics.
- The enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Do not touch the device while it is in operation or immediately after power is turned OFF. Risk of burning!
- Do not touch the terminals while power is being supplied. Risk of electric shock.
- Prevent any foreign metal, particles or conductors from entering the device through the openings during installation. It may cause: Electric shock; Safety Hazard; Fire; Product failure
- The power supply must be mounted by metal screws onto a grounded metal surface. It is highly recommended that the Earth terminal on the connector be connected to the grounded surface.

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Functions

Start-up Time

The time required for the output voltage to reach 90% of its final steady state set value, after the input voltage is applied.

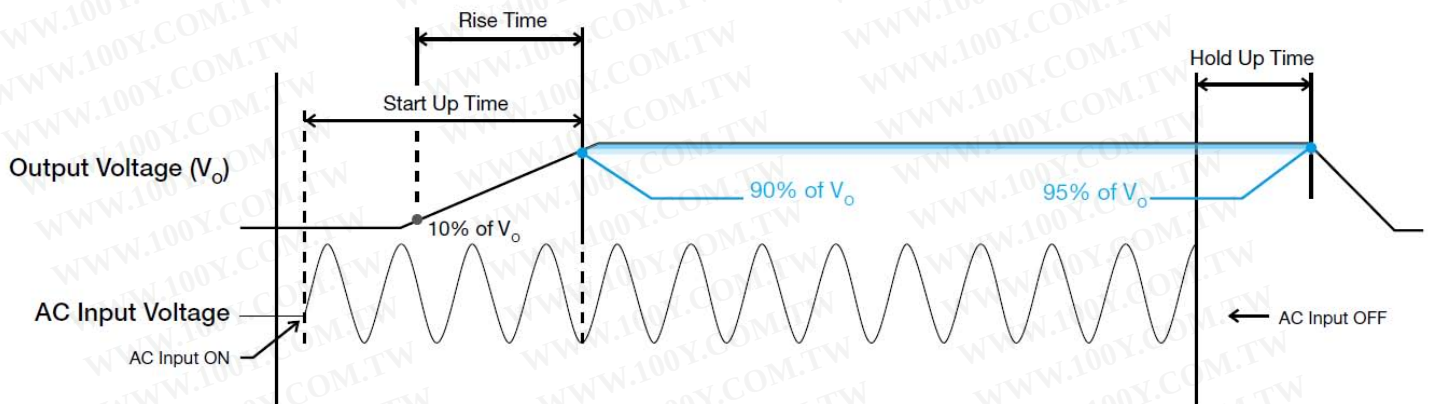
Rise Time

The time required for the output voltage to change from 10% to 90% of its final steady state set value.

Hold-up Time

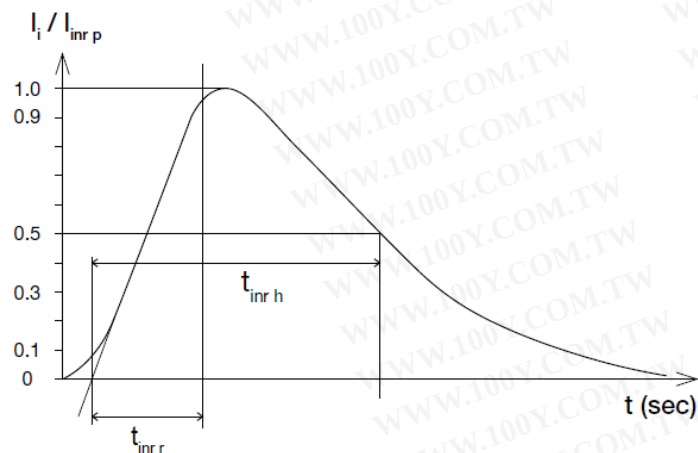
Time between the collapse of the AC input voltage, and the output falling to 95% of its steady state set value.

■ Graph illustrating the Start-up Time, Rise Time, and Hold-up Time



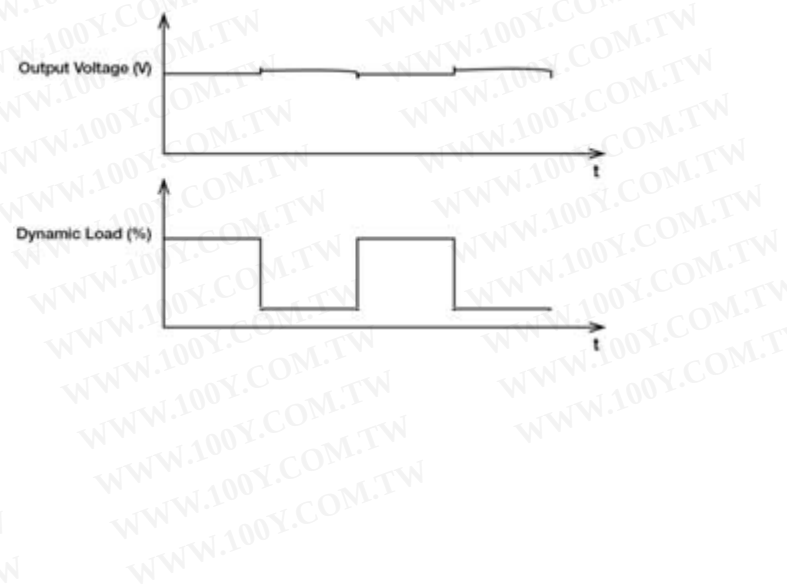
Inrush Current

Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent cycles of AC voltage.



Dynamic Response

The power supply output voltage will remain within $\pm 10\%$ of its steady state value, when subjected to a dynamic load from 10% to 100%.



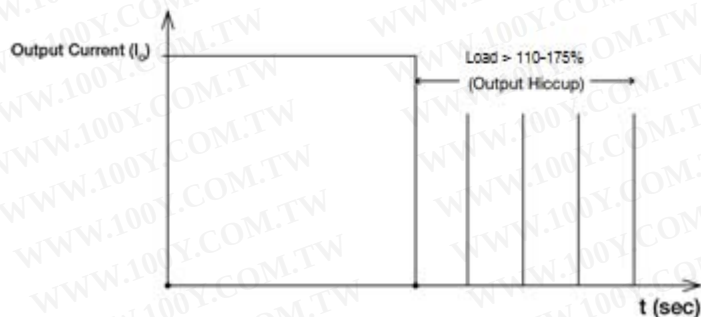
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Overload & Overcurrent Protections (Auto-Recovery)

The power supply's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output current exceeds 110% of I_o (Max load). In such occurrence, the V_o will start to droop and once the power supply has reached its maximum power limit, the protection is activated and the power supply will go into "Hiccup mode" (Auto-Recovery). The power supply will recover once the fault condition of the OLP and OCP is removed and I_o is back within the specifications.



It is not recommended to prolong the duration of I_o when it is $<110\%$ but $>100\%$, since it may cause damage to the PSU.

Short Circuit Protection (Auto-Recovery)

The power supply's output OLP/OCP function also provides protection against short circuits. When a short circuit is applied, the output current will operate in "Hiccup mode", as shown in the illustration in the OLP/OCP section on this page. The power supply will return to normal operation after the short circuit is removed.

Others

Attention

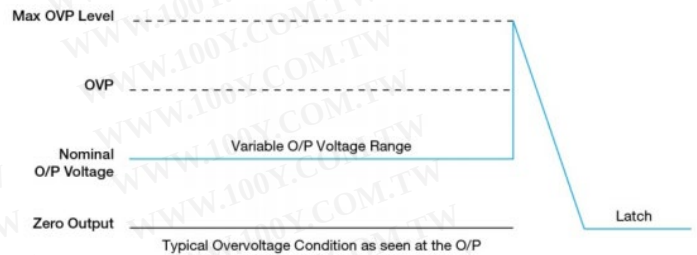
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Overvoltage Protection (Latch Mode)

The power supply's overvoltage circuit will be activated when its internal feedback circuit fails. The output voltage shall not exceed its specifications defined on under "Protections". Power supply will latch, and require removal/re-application of input AC voltage in order to restart.

The power supply should be latch, and require removal /re-apply of input AC voltage in order to restart.



Over Temperature Protection (Latch Mode)

As described in Engineering data section, the power supply also has Over Temperature Protection (OTP). In the event of a higher operating temperature at 100% load, the power supply will run into OTP when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will go into latch mode until the temperature drops to its normal operating temperature as recommended in the de-rating graph.