PMC Panel Mount Power Supply

12 V 60 W 1 Phase, NEC Class 2 / PMC-12V060W1N☐

PMC

Highlights & Features

- Universal AC input voltage without power de-rating
- Full corrosion resistant Aluminium chassis
- NEC Class 2 power supply and Limited Power Source (LPS) approvals
- High MTBF > 700,000 hrs. as per Telcordia SR-332
- Wide operating temperature range from -20°C to 70°C
- Conformal Coating (Class I, Div 2 Hazardous Locations Ready)
- Certified according to IEC/EN/UL 62368-1

Safety Standards

CB Certified for worldwide use

Model Number: PMC-12V060W1N☐
Unit Weight: 0.28 kg (0.62 lb)
Dimensions (L x W x H): 128 x 97 x 38 mm (5.04 x 3.82 x 1.50 inch)

General Description

Delta's PMC series of panel mount power supply offers a nominal output voltage of 12 V, 60 W output power ranging with NEC Class 2 power supply and Limited Power Source (LPS) approvals. The PMC-12V060W1NA comes with a wide temperature range from -20°C to +70°C and conformal coating on PCBA (Class I, Div 2 Hazardous Locations Ready) to protect against chemical and dust pollutants. The PMC series also offers overvoltage and overload protection. Using a wide input voltage range design, it is compatible worldwide. The input also includes DC operating voltage from 125-375 Vdc. Best of all, this excellent design and quality does not come with a big price tag.

Model Information

PMC Panel Mount Power Supply

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
PMC-12V060W1NA	85-264 Vac (125-375 Vdc)	12 Vdc	5.00 A

Model Numbering

PMC	12 V	060 W	1	N	☐
PMC Series	Output Voltage	Output Power	Single Phase	NEC Class 2	Connector Type A – Terminal Block J – IP20 Connector* L – Front Face*

*Options

A J L

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Specifications

Input Ratings / Characteristics

Nominal Input Voltage		100-240 Vac
Input Voltage Range		85-264 Vac
Nominal Input Frequency		50-60 Hz
Input Frequency Range		47-63 Hz
Nominal DC Input Voltage		125-250 Vdc
DC Input Voltage Range*		125-375 Vdc
Input Current		< 1.35 A @ 115 Vac, < 0.90 A @ 230 Vac
Efficiency at 100% Load		> 86.0% @ 115 Vac, > 87.0% @ 230 Vac
Max Power Dissipation	0% load	< 1.00W @ 115Vac, < 1.50W @ 230Vac
	100% load	< 9.80W @ 115Vac, < 8.95W @ 230Vac
Max Inrush Current		< 50 A @ 115 Vac, < 100 A @ 230 Vac
Leakage Current		< 1 mA @ 240 Vac

*Safety approval according to IEC/EN/UL 60950-1 and IEC/EN/UL 62368-1.

Output Ratings / Characteristics**

Nominal Output Voltage	12 Vdc
Factory Set Point Tolerance	12 Vdc ± 2%
Output Voltage Adjustment Range	12-14 Vdc
Output Current	5.00 A (60 W max.)
Output Power	60 W
Line Regulation	< 0.5% (@ 85-264 Vac input, 100% load)
Load Regulation	< 1.0% (@ 85-264 Vac input, 0-100% load)
PARD*** (20MHz)	< 100 mVpp @ 25°C & 50°C < 150 mVpp @ -10°C & -20°C
Rise Time	< 60 ms @ nominal input (100% load)
Start-up Time	< 2500 ms @ nominal input (100% load)
Hold-up Time	> 15 ms @ 115 Vac, > 80 ms @ 230 Vac (100% load)
Dynamic Response (Overshoot & Undershoot O/P Voltage)	± 5% @ 85-264Vac input, 0-100% load (Slew Rate: 0.1A/μs, 50% duty cycle @ 5Hz to 1KHz)
Start-up with Capacitive Loads	5,000 μF Max

**For power de-rating from 50°C to 70°C, see power de-rating on page 3.
***PARD is measured with an AC coupling mode, 5cm wires, and in parallel with 0.1μF ceramic capacitor.

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Mechanical

Case Chassis / Cover		Aluminium
Dimensions (L x W x H)		128 x 97 x 38 mm (5.04 x 3.82 x 1.50 inch)
Unit Weight		0.28 kg (0.62 lb)
Indicator	Green LED	DC OK
Cooling System		Convection
Terminal	Input and Output	5 Pins (Rated 300 V/15 A)
Wire	PMC-12V060W1NA	AWG 20-14
	PMC-12V060W1NJ	AWG 20-12
	PMC-12V060W1NL	AWG 20-12
Noise (1 Meter from power supply)		Sound Pressure Level (SPL) < 40 dBA

Environment

Surrounding Air Temperature	Operating	-20°C to +70°C
	Storage	-25°C to +85°C
Power De-rating		< -10°C de-rate power by 2.0% / °C, > 50°C de-rate power by 2.5% / °C
Operating Humidity		5 to 95% RH (Non-Condensing)
Operating Altitude		0 to 3,000 Meters (9,840 ft)
Shock Test	Non-Operating	IEC 60068-2-27, 30 G (300 m/S²) for a duration of 18 ms, 1 times per direction, 2 times in total
Vibration	Non-Operating	IEC 60068-2-6, 10 Hz to 150 Hz @ 50 m/S² (5G peak); 20 min per axis for all X, Y, Z direction
Over Voltage Category		II
Pollution Degree		2

Protections

Overvoltage	< 17.6 V, SELV Output, Non-Latching (Auto-Recovery)
Overload / Overcurrent	> 110-160% of rated load, Hiccup Mode, Non-Latching (Auto-Recovery)
Over Temperature	< 75°C Surrounding Air Temperature @ 100% load, Non-Latching (Auto-Recovery)
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)
Internal Fuse at L pin	T3.15AH
Protection Against Shock	Class I with PE* connection

*PE: Primary Earth

Reliability Data

MTBF	> 700,000 hrs. as per Telcordia SR-332 I/P: 115Vac, O/P: 100% load, Ta: 25°C
Expected Cap Life Time	10 years (115 Vac & 230 Vac, 50% load @ 40°C)

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Safety Standards / Directives

Safety Entry Low Voltage		SELV (IEC 60950-1)
Electrical Safety	TUV Bauart	EN 62368-1, LPS, NEC Class 2
	UL/cUL recognized to	UL 60950-1 and CSA C22.2 No. 60950-1 (File No. E191395), UL 62368-1 and CSA C22.2 No. 62368-1 (File No. E191395)
	CB scheme	IEC 60950-1, IEC 62368-1, LPS
	KC	K 60950-1
	BIS	IS 13252-1
	UKCA	BS EN 62368-1
CE		In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU
UKCA		In conformance with Electrical Equipment (Safety) Regulations 2016 No. 1011 and The Electromagnetic Compatibility Regulations 2016 No. 1091
Galvanic Isolation	Input to Output	3.0 KVac
	Input to Ground	1.5 KVac
	Output to Ground	0.5 KVac

EMC

Emissions (CE & RE)		Generic Standards: CISPR 32, EN/BS EN 55032, FCC Title 47: Class B, (Class A for DC input)
Immunity		Generic Standards: EN/BS EN 55024
Electrostatic Discharge	IEC 61000-4-2	Level 4 Criteria A[1)] Air Discharge: 15 kV Contact Discharge: 8 kV
Radiated Field	IEC 61000-4-3	Level 3 Criteria A[1)] 80 MHz-1 GHz, 10 V/M, 80% modulation (1 KHz)
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 3 Criteria A[1)] 2 kV
Surge	IEC 61000-4-5	Level 3 Criteria A[1)] Common Mode[2)]: 2 kV Differential Mode[3)]: 2 kV
Conducted	IEC 61000-4-6	Level 3 Criteria A[1)] 150 kHz-80 MHz, 10 Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Criteria A[1)] 10 A/Meter (1 A/Meter for DC input)
Voltage Dips and Interruptions	IEC 61000-4-11	100% dip; 1 cycle (20 ms); Self Recoverable
Low Energy Pulse Test (Ring Wave)	IEC 61000-4-12	Level 3 Criteria A[1)] Common Mode[2)]: 2 kV Differential Mode[3)]: 1 kV
Voltage Fluctuation and Flicker		IEC/EN/BS EN 61000-3-3

1) Criteria A: Normal performance within the specification limits
2) Asymmetrical: Common mode (Line to earth)
3) Symmetrical: Differential mode (Line to line)

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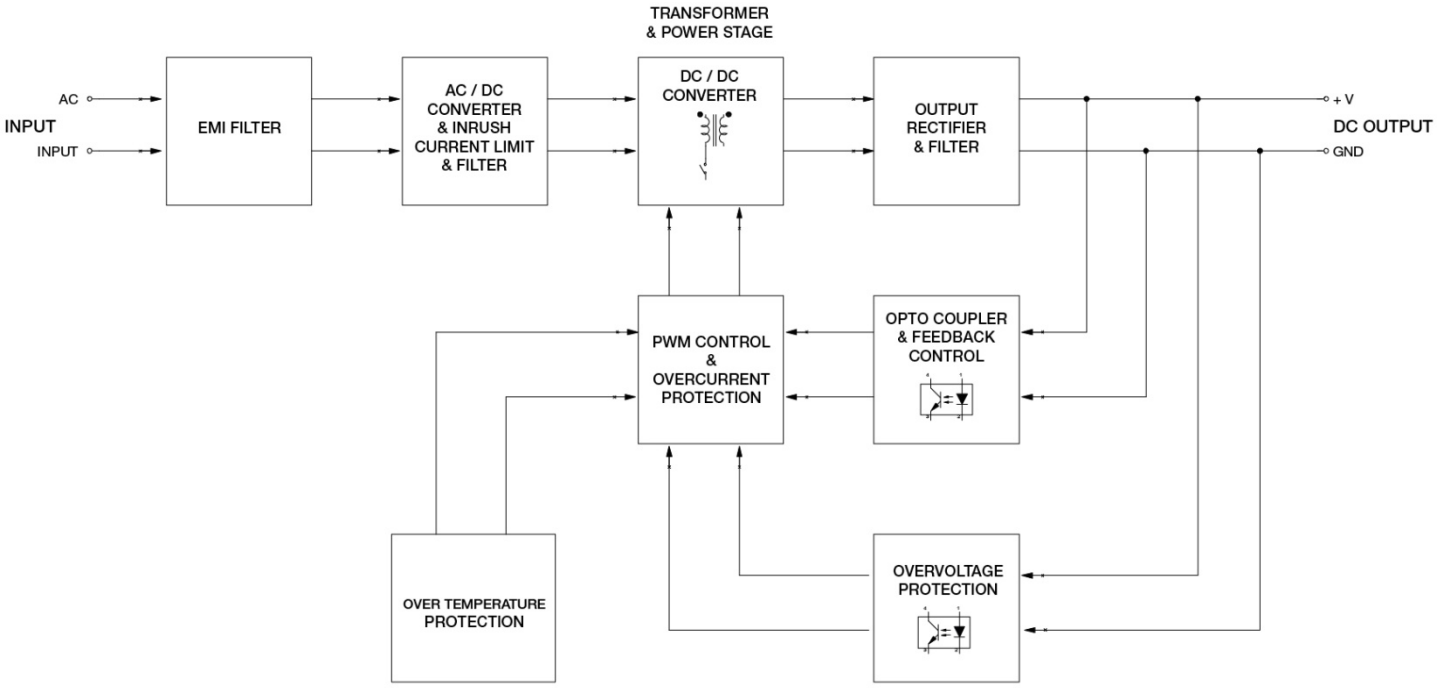
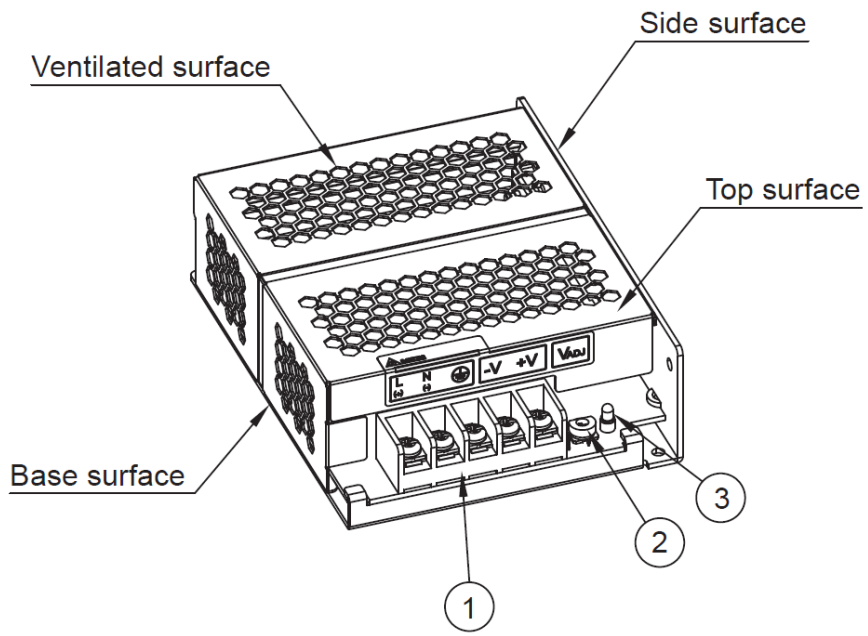
Block Diagram

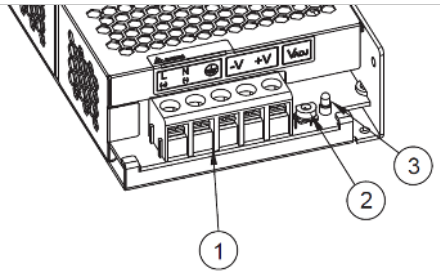


Device Description

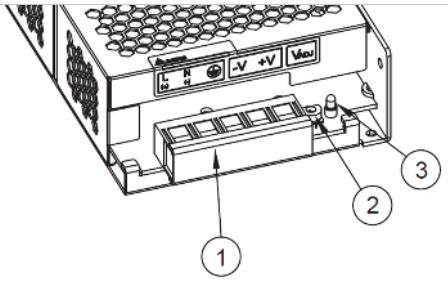
PMC-12V060W1NA: Terminal Block



PMC-12V060W1NJ: IP20 Connector



PMC-12V060W1NL: Front Face



1) Input & Output terminal block connector
2) DC voltage adjustment potentiometer
3) DC OK control LED (Green)

All parameters are specified at 25°C ambient and AC input unless otherwise indicated.
www.DeltaPSU.com (August 2021, Rev. 04)

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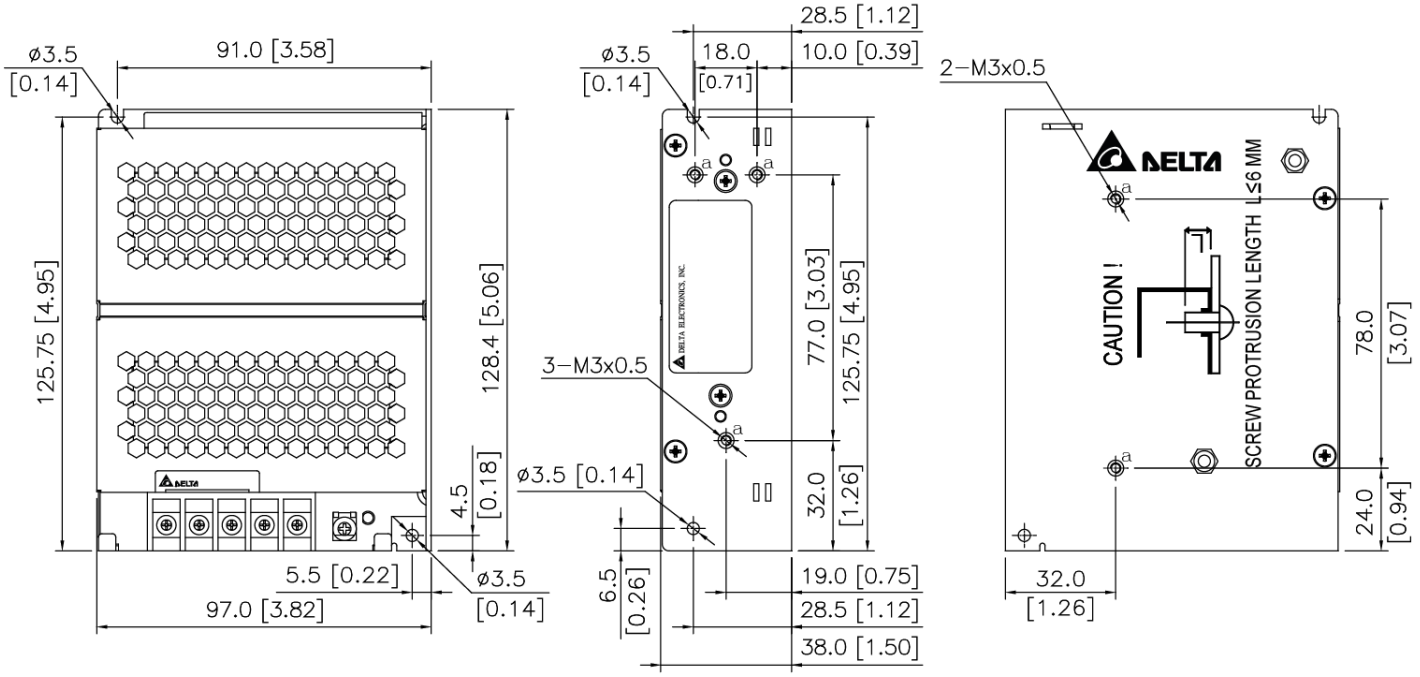
Dimensions

L x W x H: 128 x 97 x 38 mm (5.04 x 3.82 x 1.50 inch) (PMC-12V060W1NA and PMC-12V060W1NJ)



Engineering Data

Output Load De-rating VS Surrounding Air Temperature

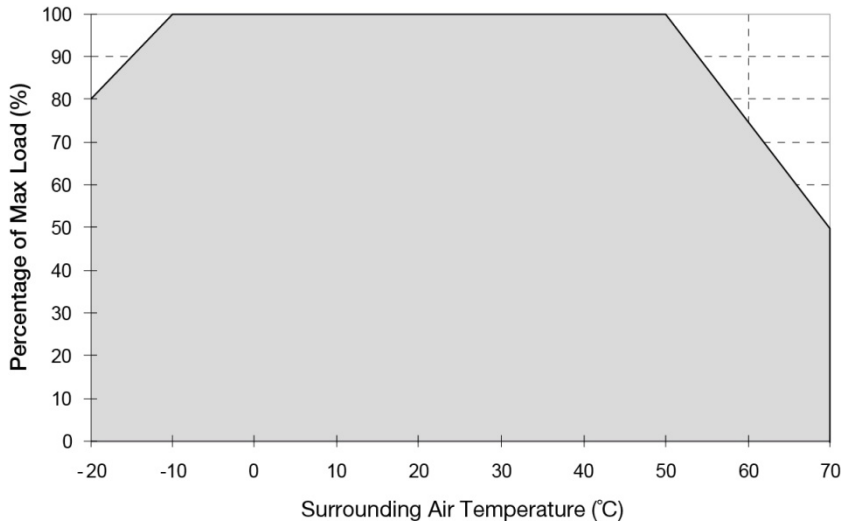


Fig. 1 De-rating for Vertical and Horizontal Mounting Orientation
< -10°C de-rate power by 2.0% / °C
> 50°C de-rate power by 2.5% / °C

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.
2. If the output capacity is not reduced when the surrounding air temperature exceeds its specification as defined on Page 3 under “Environment”, the device may run into Over Temperature Protection. When activated, the output voltage will go into bouncing mode and will recover when the surrounding air temperature is lowered or the load is reduced as far as necessary to keep the device in working condition.
3. 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.
4. Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!
5. If the device has to be mounted in any other orientation, please contact **info@deltapsu.com** for more details.

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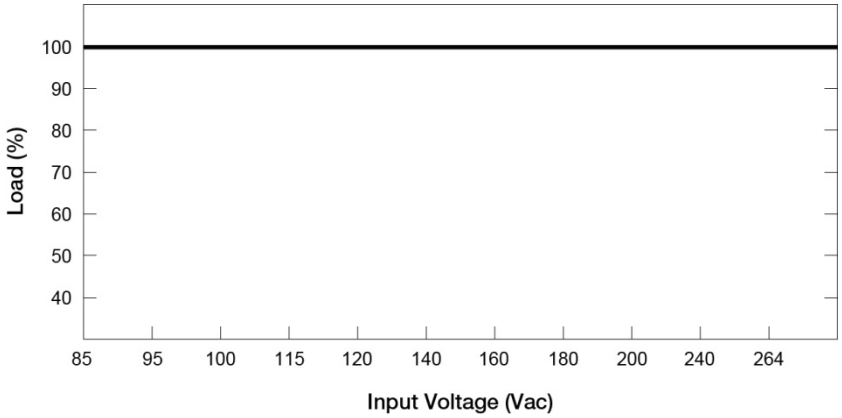
Output De-rating VS. Input Voltage



- No output power de-rating across the entire input voltage range

Assembly & Installation

Mounting

Ⓐ Mounting holes for power supply assembly onto the mounting surface.
The power supply shall be mounted on minimum 2 mounting holes using M3 screw minimum 5 mm (0.20 inch) length.
Ⓑ This surface belongs to customer's end system or panel where the power supply is mounted.
Ⓒ Connector

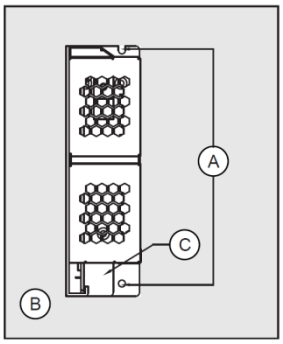
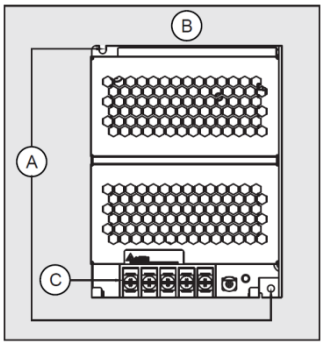
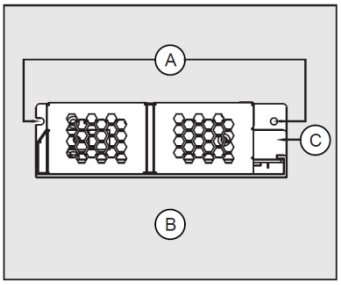
Side Mounting (Vertical)	Base Mounting (Vertical)	Side Mounting (Horizontal)
		

Fig. 2 Recommended Mounting Orientations

- Use flexible cable (stranded or solid) with the following sizes:

PMC-12V060W1NA	PMC-12V060W1NJ	PMC-12V060W1NL
AWG 20-14	AWG 20-12	AWG 20-12

- PMC-12V060W1NA / PMC-12V060W1NJ / PMC-12V060W1NL: The torque at the Connector shall not exceed 13 Kgf.cm. The insulation stripping length should not exceed 0.275" or 7 mm

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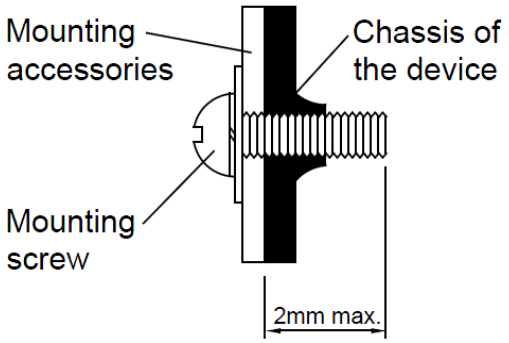
Installation of Mounting Accessories



- Only use M3 screw ≤ 6 mm through the base mounting holes. This is to keep a safety distance between the screw and internal components.
- Recommended mounting tightening torque: 4~8 Kgf.cm.

Safety Instructions

- To ensure sufficient convection cooling, always maintain a safety distance of ≥ 20 mm (0.79 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.
- Note that 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
- Warning: When connecting the device, secure Earth connection before connecting L and N. When disconnecting the device, remove L and N connections before removing the Earth connection.

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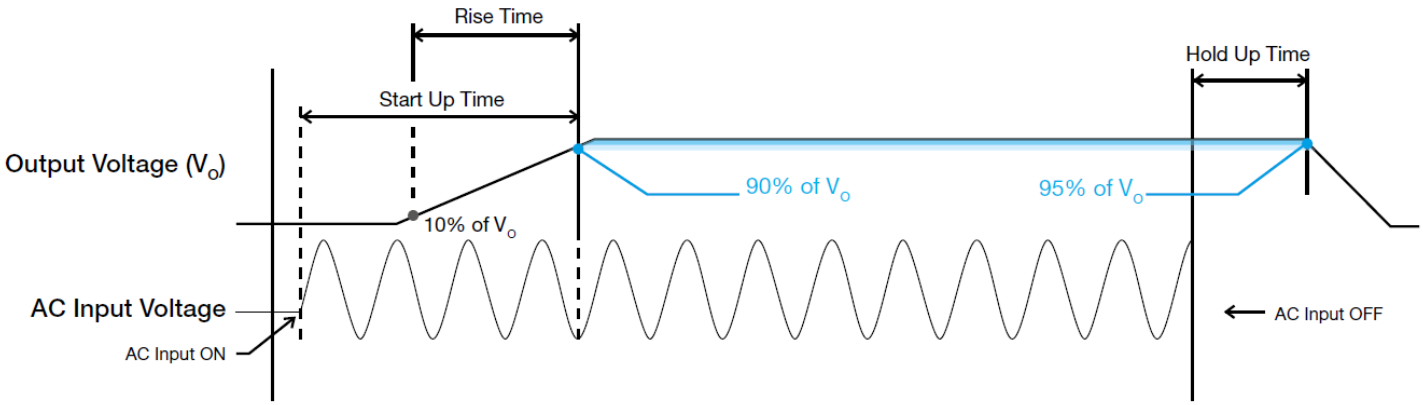
Functions

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



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

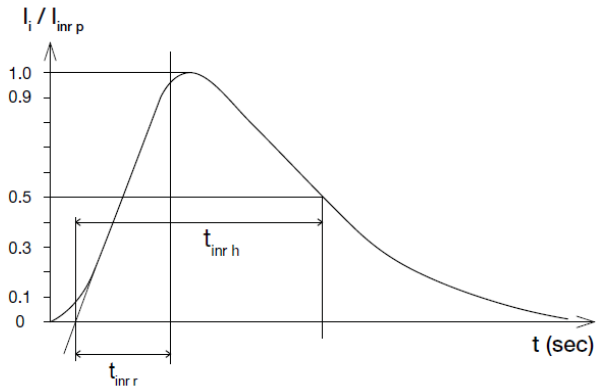
The time required for the output voltage to change from 10% to 90% of its final steady state set value.

Hold-up Time

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

Inrush Current

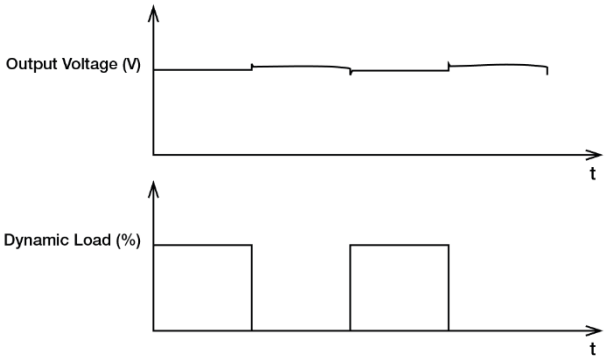
Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent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



Dynamic Response

The power supply output voltage will remains within ±5% of its steady state value, when subjected to a dynamic load from 0% to 100% of its rated current.

■ **50% duty cycle / 5Hz to 1KHz**



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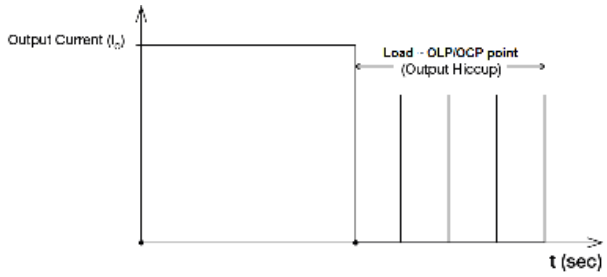
Overload & Overcurrent Protections (Auto-Recovery)

The power supply's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output current (I_O) exceeds its specification as defined on Page 3 under "Protections". In such occurrence, the output voltage (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.



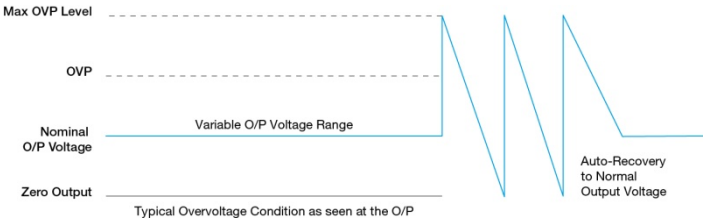
It is not recommended to prolong the duration of I_O when it is less than OLP/OCP point, but greater than 100%, since it may cause damage to the PSU.

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.

Overvoltage Protection (Auto-Recovery)

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 Page 3 under "Protections".



Over Temperature Protection (Auto-Recovery)

As mentioned above, 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 bouncing mode until the temperature drops to its normal operating temperature as recommended in the de-rating graph.

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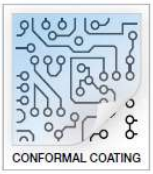
Others

Conformal Coating



The Protective Coating Technology

Delta Electronics Group has designed the perfect dipping technique which penetrates everywhere including under device, and prevents leakage. The conformal coating dipping can be applied to PCBs or circuit board. The coating preserves the performance of precision electronic primarily by preventing ionizable contaminants such as salt from reaching circuit nodes, where the material slumps around sharp edges. This can be a problem especially in highly conversing atmosphere.

Attention

Delta provides all information in the datasheets on an “AS IS” basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to www.DeltaPSU.com for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

Delta reserves the right to make changes to the information described in the datasheets without notice.

Manufacturer and Authorized Representatives Information

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