

PMT Panel Mount Power Supply

12V 150W 1 Phase / PMT-12V150W1A□□

PMT



Highlights & Features

- Conforms to harmonic current IEC/EN 61000-3-2, Class A
- Selectable AC Switch (90-132Vac, 180-264Vac)
- High MTBF > 700,000 hrs. as per Telcordia SR-332
- Versatile configuration options (Enclosed, L Frame)
- Versatile connector options (Terminal Block, Front Face, Harness)

Safety Standards



CB Certified for worldwide use

Model Number: PMT-12V150W1A□□

Unit Weight: 0.48 kg

Dimensions (L x W x D): 178 x 97 x 38 mm

General Description

The new PMT series of panel mount power supplies is the latest offering from one of the world's largest power supply manufacturers and solution providers - Delta. The product offers a wide operating temperature range from -10°C to +70°C and can withstand shock and vibration requirements (in accordance to IEC 60068-2-27 and IEC 60068-2-6 respectively). In addition to features like overvoltage and overload protections, Delta's PMT series of panel mount power supplies is unlike many other brands in the same price level. The PMT series is designed for cost competitive markets without compromising the quality of the components and product specifications. The series of products has an expected life time of 10 years. This versatile series has three different connector options (Terminal Block, Front Face and Harness) and can also be converted into L Frame (PML) type of power supplies to satisfy different application needs.

Model Information

PMT Panel Mount Power Supply

| Model Number | Input Voltage Range | Output Voltage | Output Current |
|-----------------|---|----------------|----------------|
| PMT-12V150W1A□□ | 90-132Vac, 180-264Vac (Selectable by Switch) | 12Vdc | 12.5A |

Model Numbering

| | | | | | | | CC Code |
|-------------|--|----------------|--------------|--------------|----------|---|---|
| PM | □ - | 12V | 150W | 1 | A | □ | □ |
| Panel Mount | Product Type T – Enclosed L – L Frame* | Output Voltage | Output Power | Single Phase | No PFC | Connector Type A – Terminal Block G – Front Face* H – Harness* | Blank – Without connector cover A – With connector cover |

*Options

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Specifications

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 | < 3.00A @ 115Vac, < 2.00A @ 230Vac |
| Efficiency at 100% Load | > 86.0% @ 230Vac |
| Max Inrush Current | < 45A @ 230Vac |
| Leakage Current | < 1mA @ 240Vac |

Output Ratings / Characteristics

| | |
|---|---|
| Nominal Output Voltage | 12Vdc |
| Output Voltage Tolerance | ± 1% (initial set point tolerance from factory) |
| Output Voltage Adjustment Range | 11.4-13.5Vdc |
| Output Current | 12.5A |
| Output Power | 150W |
| Line Regulation | ± 0.5% typ. (@ 100-132Vac & 200-264Vac) |
| Load Regulation | ± 0.5% typ. (@ 100-132Vac & 200-264Vac) |
| PARD (20MHz) | < 120mVpp |
| Rise Time | < 30ms @ 115Vac, < 20ms @ 230Vac (100% load) |
| Start-up Time | < 1200ms @ 115Vac, < 800ms @ 230Vac (100% load) |
| Hold-up Time | > 20ms @ 115Vac, > 24ms @ 230Vac |
| Dynamic Response (Overshoot & Undershoot O/P Voltage) | ± 5% @ 0-100% load |
| Start-up with Capacitive Loads | 8,000µF Max |

Mechanical

| | |
|------------------------|--|
| Case Chassis | Aluminium |
| Case Cover | SGCC |
| Dimensions (L x W x D) | 178 x 97 x 38 mm |
| Unit Weight | 0.48 kg |
| Indicator | Green LED (DC OK) |
| Cooling System | Convection |
| Terminal | PM□-12V150W1A□□ PM□-12V150W1AG□□ PM□-12V150W1AH□□ |
| Wire | PM□-12V150W1A□□ / PM□-12V150W1AG□□ PM□-12V150W1AH□□ |
| | M3.5 x 7 Pins (Rated 300V/15A) M3.5 x 7 Pins (Rated 300V/20A) I/P (JWT): A3963WV2-5P-A O/P (JWT): A3963WV2-7P-U |
| | AWG 18-12 AWG 18 (For the recommended Housing and Terminal, please refer to the Table on Page 7) |

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Environment

| | | |
|-----------------------------|-----------|--|
| Surrounding Air Temperature | Operating | -10°C to +70°C |
| | Storage | -25°C to +85°C |
| Power De-rating | | > 50°C de-rate power by 2.5% / °C < 100Vac de-rate power by 3% / 1V |
| Operating Humidity | | 10-95% RH (Non-Condensing) |
| Operating Altitude | | 5,000 Meters |
| Shock Test (Non-Operating) | | IEC60068-2-27, Half Sine: 50G for a duration of 11ms, 3 times per direction, 18 times in total |
| Vibration (Non-Operating) | | IEC60068-2-6, Random: 5Hz to 500Hz @ 2.09Grms, 20 min per axis for all X, Y, Z direction |
| Pollution Degree | | 2 |

Protections

| | | |
|--------------------------|--|--|
| Overvoltage | | 115-135%, Hicc-up Mode, Non-Latching (Auto-Recovery) |
| Overload / Overcurrent | | 110-150%, Hicc-up Mode, Non-Latching (Auto-Recovery) |
| Over Temperature | | < 70°C Surrounding Air Temperature @ 100% load, Non-Latching (Auto-Recovery) |
| Short Circuit | | Hicc-up Mode, Non-Latching (Auto-Recovery when the fault is removed) |
| Protection Against Shock | | Class I with PE* connection |

*PE: Primary Earth

Reliability Data

| | | |
|------------------------|--|---|
| MTBF | | > 700,000 hrs. as per Telcordia SR-332 |
| Expected Cap Life Time | | 10 years (115Vac & 230Vac, 50% load @ 40°C) |

Safety Standards / Directives

| | | |
|--------------------|------------------|---|
| Electrical Safety | | TUV Bauart to EN60950-1, UL/cUL recognized to UL60950-1 and CSA C22.2 No. 60950-1, CB scheme to IEC60950-1, CCC to GB4943 |
| ITE | | IEC/EN/UL 60950-1 |
| CE | | In conformance with EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC |
| Material and Parts | | RoHS Directive 2011/65/EU Compliant |
| Galvanic Isolation | Input to Output | 3.0KVac |
| | Input to Ground | 1.5KVac |
| | Output to Ground | 0.5KVac |

PMT Panel Mount Power Supply

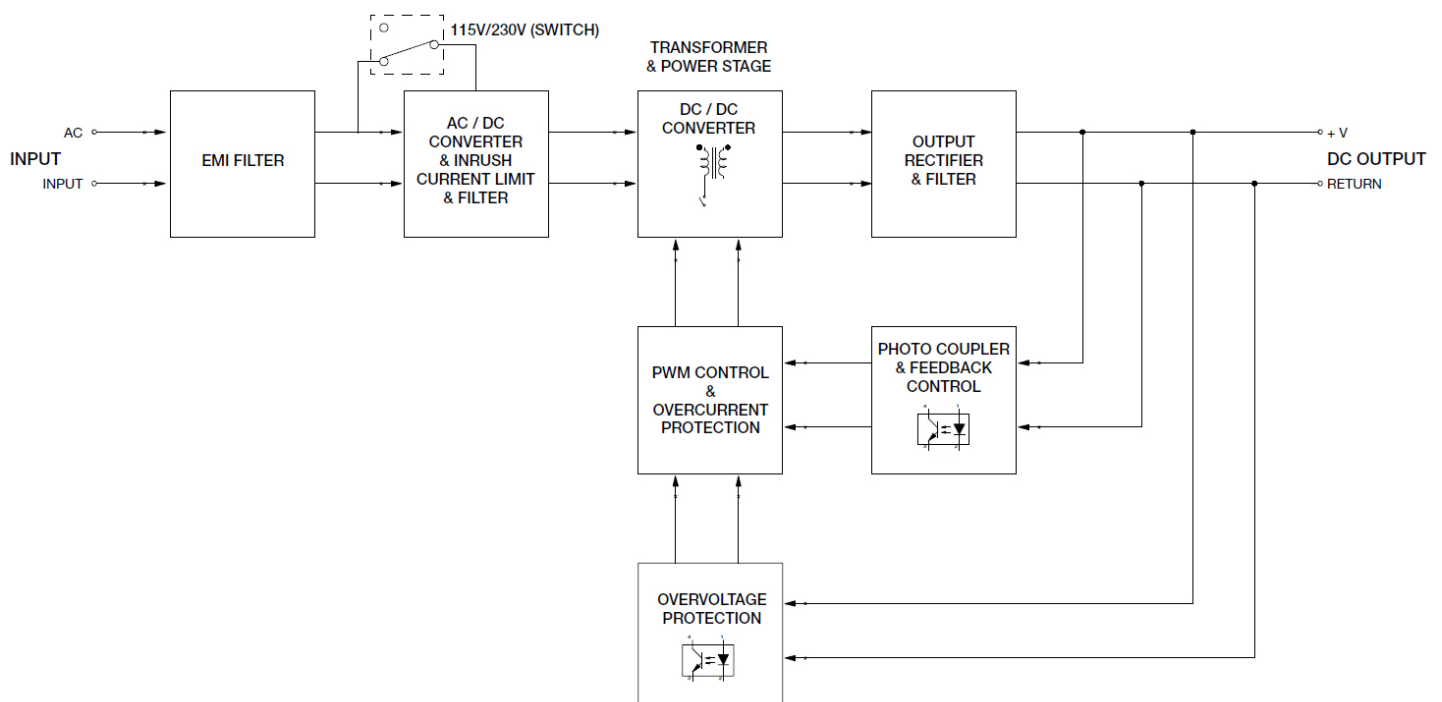
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EMC

| | | |
|-----------------------------------|---|--|
| EMC / Emissions | CISPR22, EN55022, FCC Title 47: Class B | |
| Immunity to | | |
| 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 3 Criteria A ¹⁾ Common Mode ²⁾ : 2kV Differential Mode ³⁾ : 1kV |
| Conducted | IEC 61000-4-6 | Level 3 Criteria A ¹⁾ 150kHz-80MHz, 10Vrms |
| Power Frequency Magnetic Fields | IEC 61000-4-8 | Criteria A ¹⁾ 10A/Meter |
| Voltage Dips | IEC 61000-4-11 | 100% dip; 1 cycle (20ms); Self Recoverable |
| Low Energy Pulse Test (Ring Wave) | IEC61000-4-12 | Level 3 Criteria A ¹⁾ Common Mode ²⁾ : 2kV Differential Mode ³⁾ : 1kV |
| Harmonic Current Emission | IEC/EN 61000-3-2, Class A | |
| Voltage Fluctuation and Flicker | IEC/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)

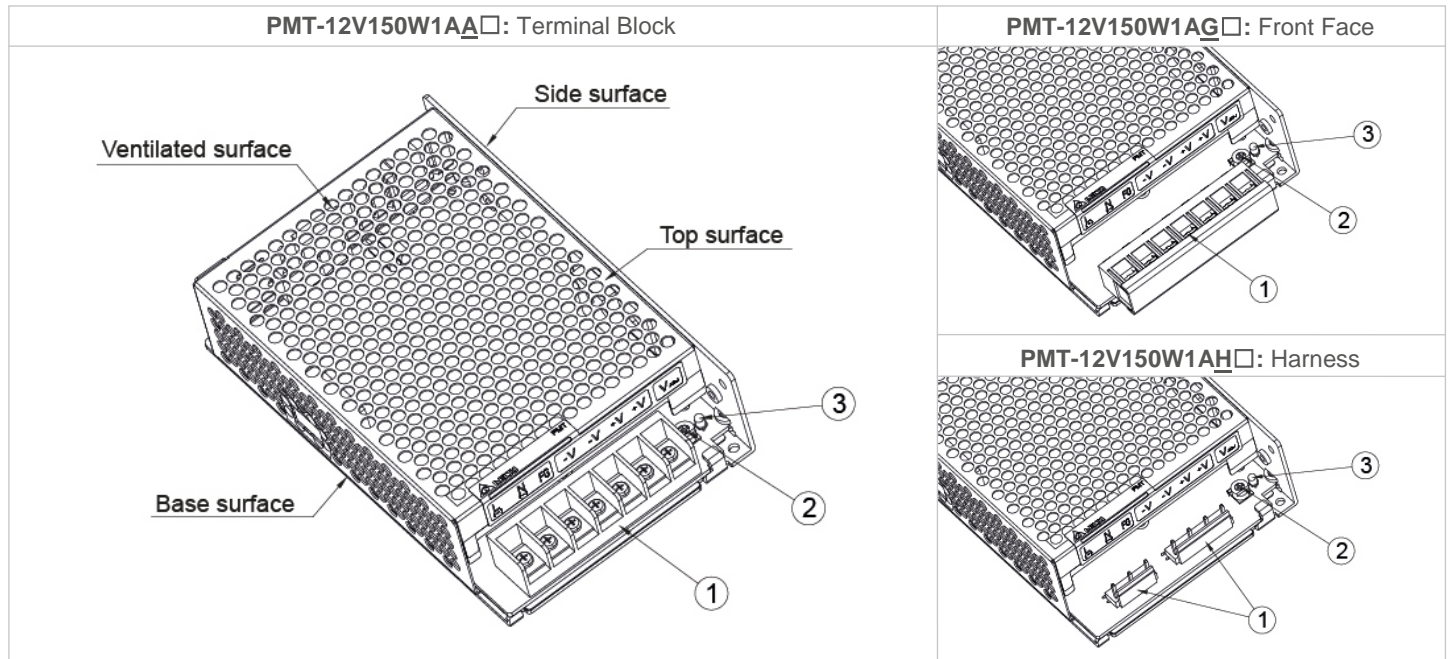
Block Diagram



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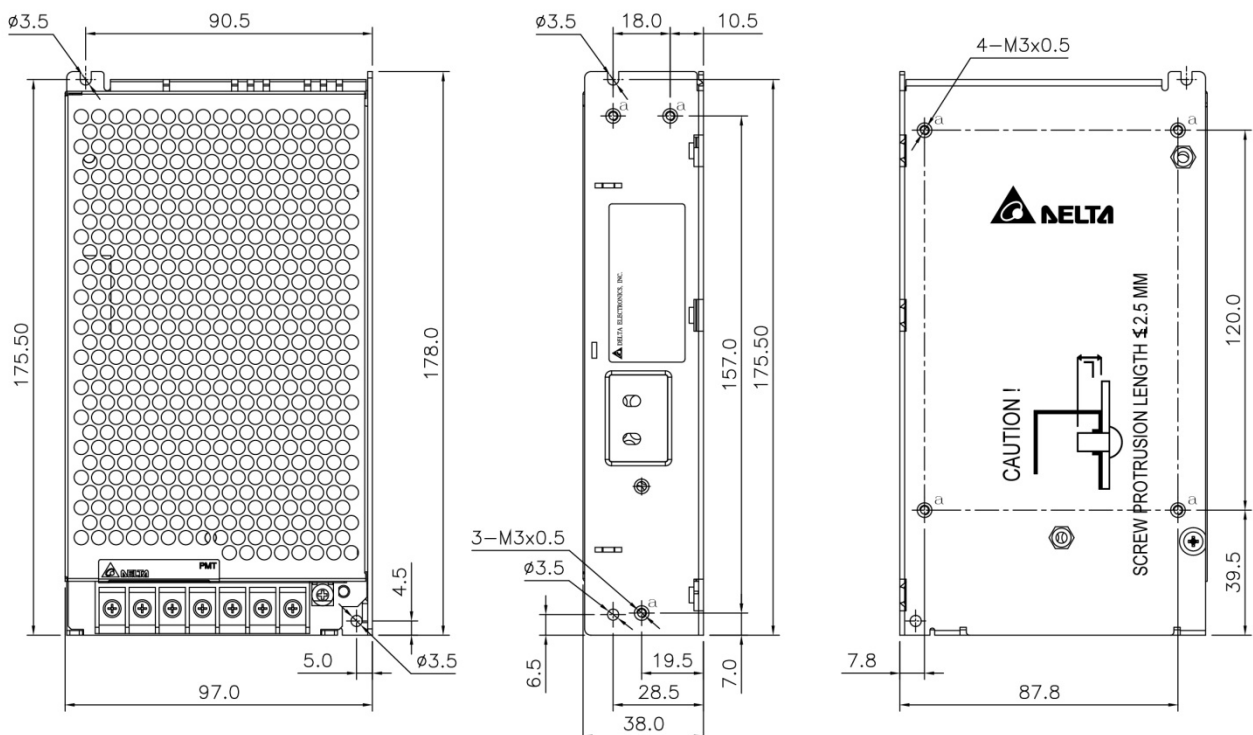
Device Description



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

Dimensions

L x W x D: 178 x 97 x 38 mm



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Engineering Data

De-rating

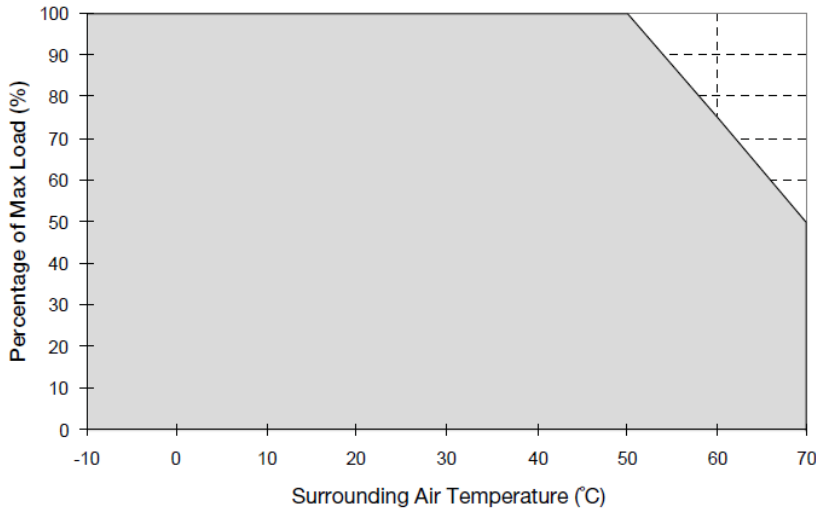
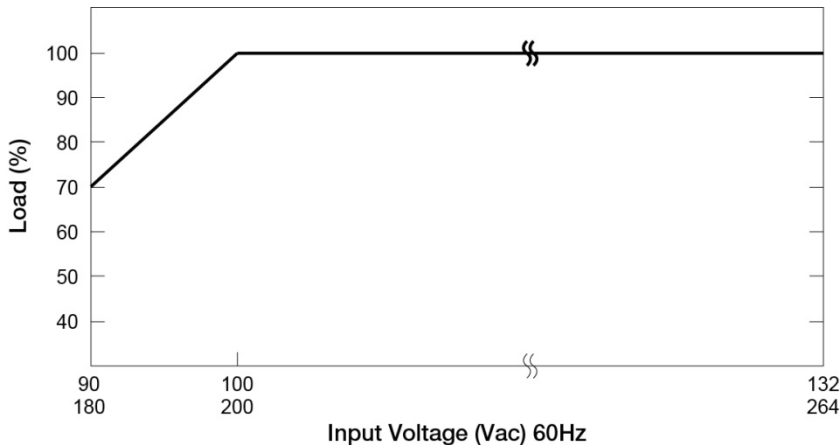


Fig. 1 De-rating for Vertical and Horizontal Mounting Orientation
 > 50°C de-rate power by 2.5% / °C

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 >70°C, the device will 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 of 20mm with adjacent units 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 do not hesitate to contact info@deltapsu.com for more details.

Output De-rating VS. Input Voltage



- No output power de-rating for the input voltage from 100Vac to 132Vac & 200Vac to 264Vac

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Assembly & Installation

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 5mm length.
- Ⓑ This surface belongs to customer's end system or panel where the power supply is mounted.
- Ⓒ Connector

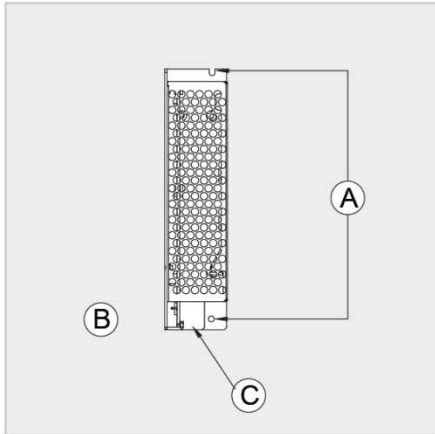


Fig. 2.1 Side Mounting (Vertical)

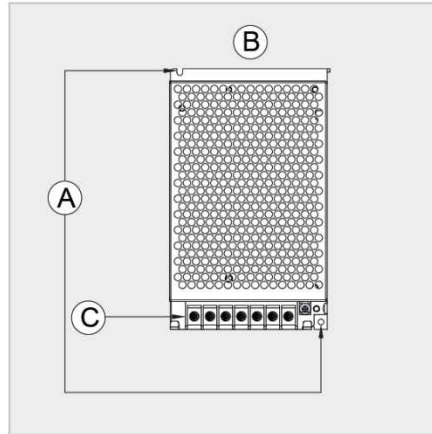


Fig. 2.2 Base Mounting (Vertical)

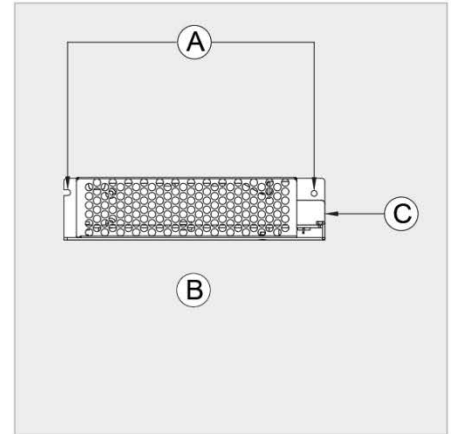
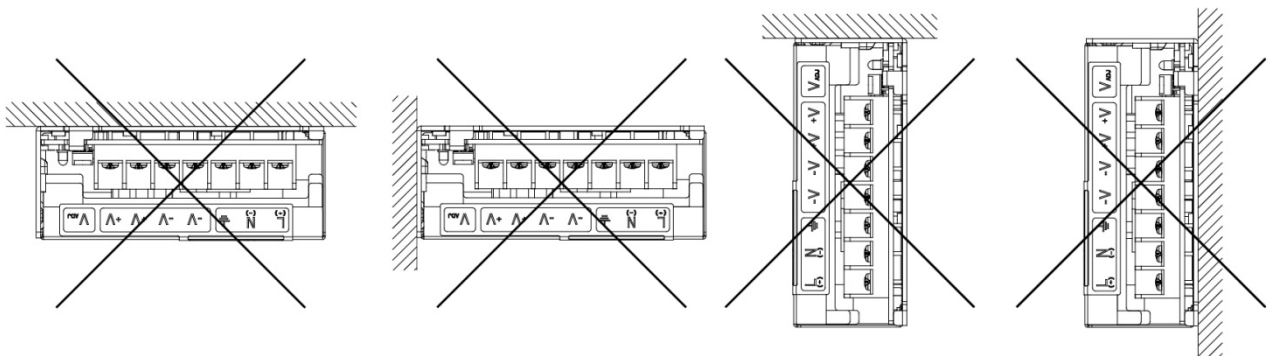


Fig. 2.3 Side Mounting (Horizontal)

- **PM□-12V150W1AA□ / PM□-12V150W1AG□**: Use flexible cable (stranded or solid) of AWG No. 18-12. The torque at the connector shall not exceed 13Kgf.cm. The insulation stripping length should not exceed 0.275" or 7mm.
- **PM□-12V150W1AH□**: Use flexible cable (stranded or solid) of AWG No. 18. Please refer to Table 1 for the recommended Housing and Terminal.

| Table 1 | Connector (Board Mounting) | Housing | Terminal |
|--------------|----------------------------|-------------|------------|
| Input (JWT) | A3963WV2-5P-A | A3963H02-5P | A3963T0P-2 |
| Output (JWT) | A3963WV2-7P-U | A3963H02-7P | |

Improper Installations



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Installation of Mounting Accessories

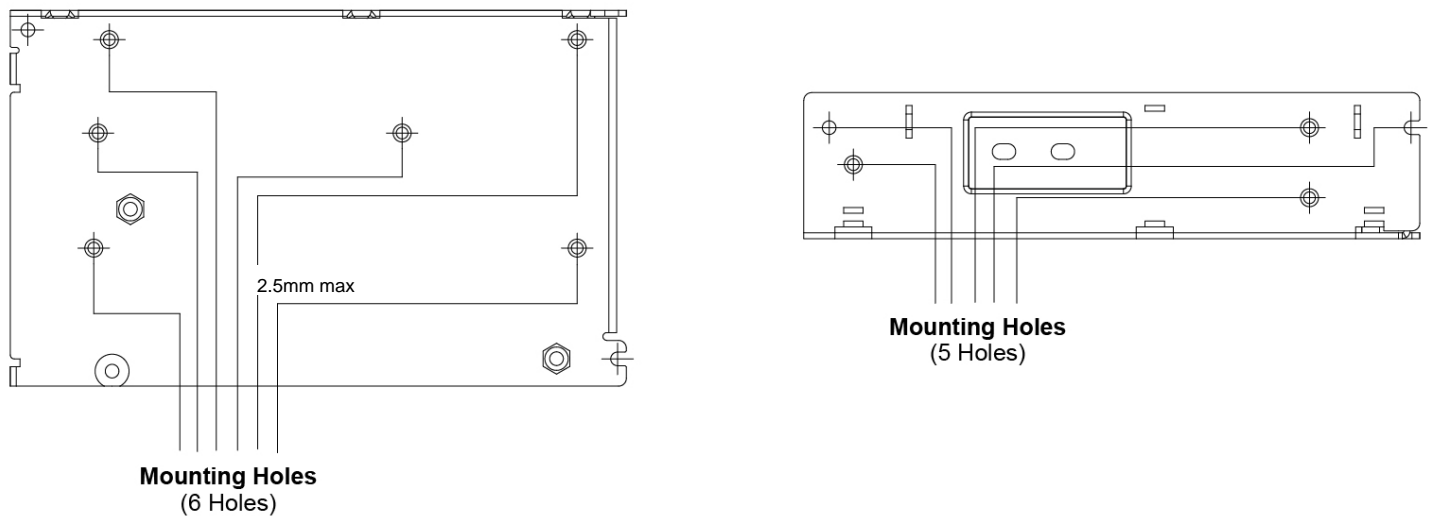
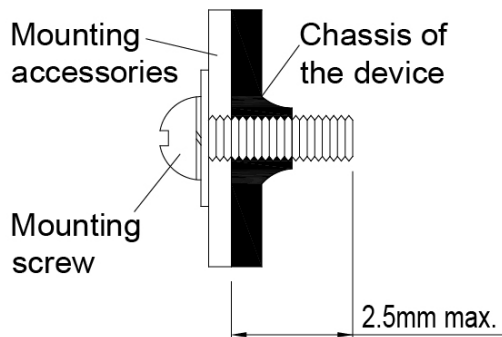


Fig. 3 Mounting Hole Locations

With reference to Fig. 3, the device should be mounted on a sturdy heat conducting surface with minimum of 4 mounting holes using M3 screw through the base or side mounting holes.



- Only use M3 screw $\leq 2.5\text{mm}$ through the base and side mounting holes. This is to keep a safe distance between the screw and internal components.
- Recommended mounting tightening torque: 4~7Kgf.cm.

Safety Instructions

- To ensure sufficient convection cooling, always maintain a safety distance of $\geq 20\text{mm}$ from all ventilated surfaces while the device is in operation.
- The device is not recommended to be placed on low thermal conductive surfaces, 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 to enter the device through the openings during installation. It can cause: - Electric shock; Safety Hazard; Fire; Product failure.
- The power supply must be mounted by metal screws onto a grounded metal surface. It is also highly recommended that the Earth terminal on the connector be connected to the grounded metal surface.
- Warning (For Standard Terminal Block and Front Face Terminal Block products): 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

Start-up Time

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

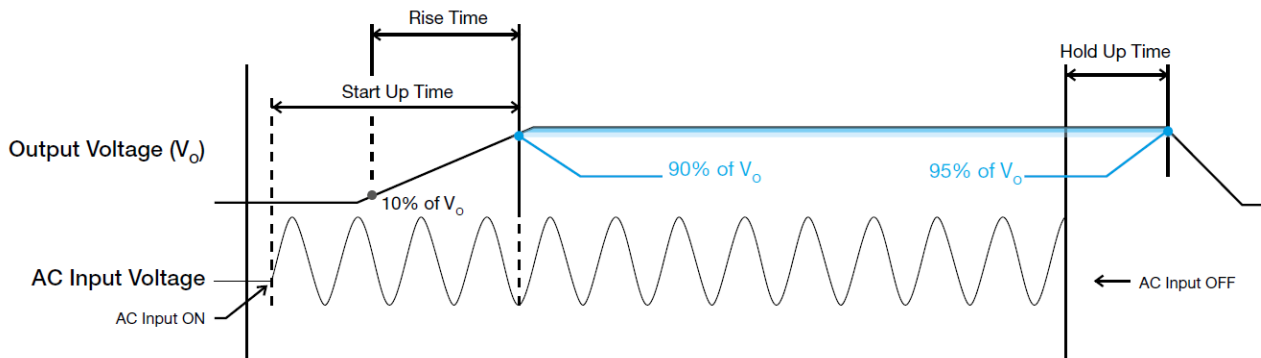
Rise Time

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

Hold-up Time

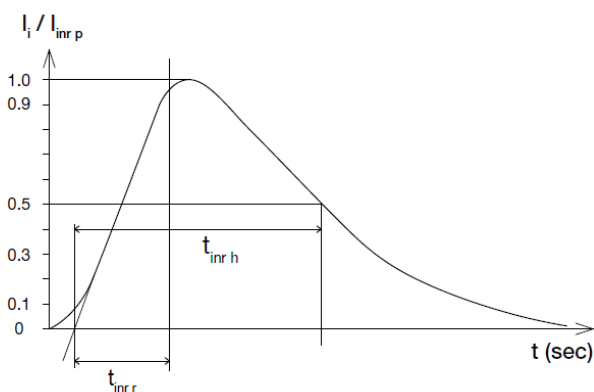
Hold up time is the time when the AC input collapses and output voltage retains regulation for a certain period of time. The time required for the output to reach 95% of its set value, after the input voltage is removed.

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



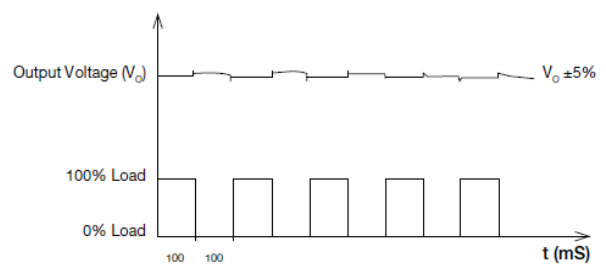
Inrush Current

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 $\pm 5\%$ of its steady state value, when subjected to a dynamic load from 0 to 100% of its rated current.

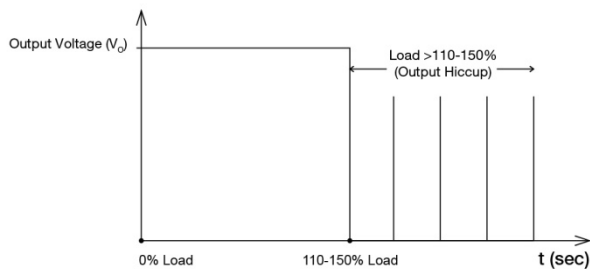


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Overload & Overcurrent Protections

The power supply's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output current exceeds 110-150% 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.



Additionally, if the I_O is <110-150% but >100% for a prolong period of time (depending on the load), the Over Temperature Protection (OTP) will be activated due to high temperature on critical components. The power supply will then go into "Hiccup mode" until the fault is removed.

Short Circuit Protection

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

Delta RoHS Compliant

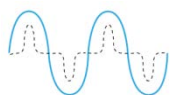


Restriction of the usage of hazardous substances

The European directive 2011/65/EU limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome, polybrominated flame retardants PBB and PBDE for the use in electrical and electronic equipment. RoHS is the abbreviation for "Restriction of the use of certain hazardous substances in electrical and electronic equipment".

This product conforms to this standard.

PFC – Norm EN 61000-3-2

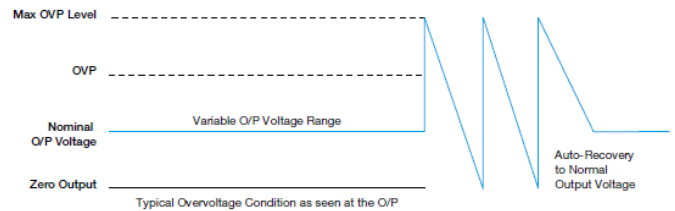


Line Current Harmonic content

Typically, the input current waveform is not sinusoidal due to the periodical peak charging of the input capacitor. In industrial environment, complying with EN 61000-3-2 is only necessary under special conditions. Complying to this standard can have some technical drawbacks, such as lower efficiency as well as some commercial aspects such as higher purchasing costs. Frequently, the user does not profit from fulfilling this standard, therefore, it is important to know whether it is mandatory to meet this standard for a specific application.

Overvoltage Protection

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

As mentioned above, the power supply also has Over Temperature Protection (OTP). This is activated when the overload condition persists for an extended duration and the output current is below the overload trigger point but >100% load. In the event of a higher operating condition at 100% load, the power supply will run into OTP when the surrounding air temperature is >70°C. When activated, the output voltage will go into bouncing mode until the operating surrounding air temperature drops to 50°C or output capacity is reduced as recommended in the de-rating graph.