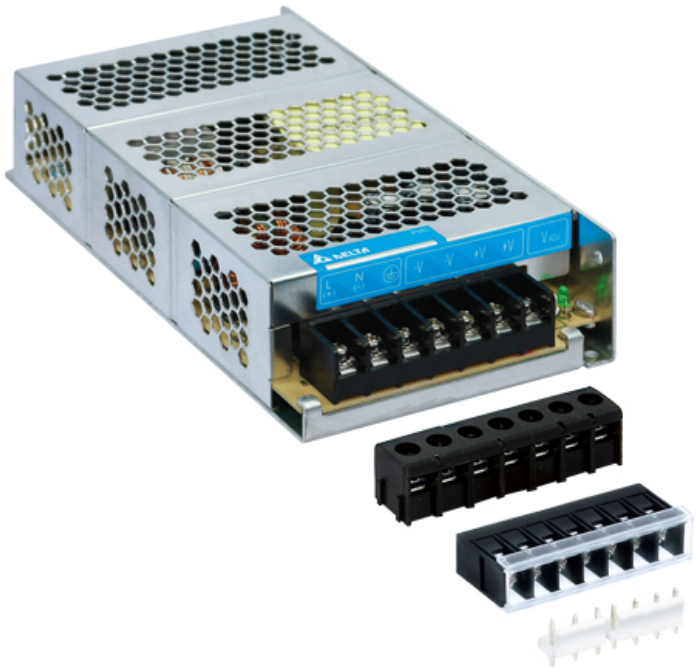
TECHNICAL DATASHEET

PMC Panel Mount Power Supply

48V 150W 1 Phase / PMC-48V150W1B☐



PMC

Highlights & Features

- Universal AC input voltage range
- Full Aluminium casing for lightweight and corrosion resistant handling
- High PF > 0.99 @ 115Vac
- Conform to harmonic current IEC/EN 61000-3-2, Class A
- High MTBF > 700,000 hrs. as per Telcordia SR-332
- Overvoltage / Overcurrent / Over Temperature / Short Circuit Protections
- Versatile connector options:
  - Terminal Block Connector
  - IP20 Terminal Block Connector
  - Front Face Connector
  - Harness Connector

Safety Standards

CB Certified for worldwide use

Model Number: PMC-48V150W1B☐
Unit Weight: 0.53 kg
Dimensions (L x W x D): 178 x 97 x 38 mm

General Description

The new PMC-48V150W1B☐ is the latest offering from one of the world's largest power supply manufacturers and solution providers - Delta. The product range offers a nominal output voltage of 48V, a wide temperature range from -10°C to +70°C and a highly dependable minimum holdup time. The state-of-the-art design is made to withstand harsh industrial environments. What makes the product stands out from the crowd is its lightweight full aluminum body design which can withstand shock and vibration according to IEC 60068-2. Delta's Panel Mount Power Supply 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 125-375Vdc. 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	Output Voltage	Output Current
PMC-48V150W1B☐	85-264Vac (125-375Vdc)	48Vdc	3.125A

Model Numbering

PM	C –	48V	150W	1	B	☐
Panel Mount	Product Type C – Enclosed	Output Voltage	Output Power	Single Phase	With PFC	Connector Type A – Terminal Block J – IP20 Terminal Block* L – Front Face* H – Harness*

*Options

PMC Panel Mount Power Supply

48V 150W 1 Phase / PMC-48V150W1B□

Specifications

Input Ratings / Characteristics

Nominal Input Voltage	100-240Vac
Input Voltage Range	85-264Vac
Nominal Input Frequency	50-60Hz
Input Frequency Range	47-63Hz
Nominal DC Input Voltage	125-250Vdc
DC Input Voltage Range*	125-375Vdc
Input Current	< 1.70A @ 115Vac, < 1.00A @ 230Vac
Efficiency at 100% Load	> 89.0% @ 115Vac, > 91.0% @ 230Vac
Max Inrush Current	< 20A @ 115Vac, < 40A @ 230Vac
Power Factor	> 0.99 @ 115Vac, > 0.92 @ 230Vac
Leakage Current	< 1.5mA @ 240Vac

*Fulfills tested conditions

Output Ratings / Characteristics

Nominal Output Voltage	48Vdc
Output Voltage Tolerance	± 2% (initial set point tolerance from factory)
Output Voltage Adjustment Range	44-53Vdc
Output Current	3.125A
Output Power	150W
Line Regulation	< 0.5% typ. (@ 85-264Vac, 100% load)
Load Regulation	< 1% typ. (@ 85-264Vac, 0-100% load)
PARD (20MHz)	< 200mVpp
Rise Time	< 30ms @ nominal input (100% load)
Start-up Time	< 3,000ms @ nominal input (100% load)
Hold-up Time	> 30ms @ 115Vac & 230Vac (100% load)
Dynamic Response (Overshoot & Undershoot O/P Voltage)	± 5% @ 0-100% load
Start-up with Capacitive Loads	2,000μF Max @ 25°C (CC and CR mode) 1,000μF Max @ -10°C and 50°C (CC mode) 2,000μF Max @ -10°C and 50°C (CR mode)

Mechanical

Case Chassis / Cover	Aluminium
Dimensions (L x W x D)	178 x 97 x 38 mm
Unit Weight	0.53 kg
Indicator	Green LED (DC OK)
Cooling System	Convection
Terminal	M3.5 x 7 Pins (Rated 300V/15A)
Wire **PMC-48V150W1BA / PMC-48V150W1BL**	AWG 20-14
PMC-48V150W1BJ	AWG 20-12
Noise (1 Meter from power supply)	Sound Pressure Level (SPL) < 40dBA

All parameters are specified at 25°C ambient unless otherwise noted.

PMC Panel Mount Power Supply

48V 150W 1 Phase / PMC-48V150W1B□

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
Operating Humidity		< 95% RH (Non-Condensing)
Operating Altitude		5,000 Meters
Shock Test (Non-Operating)		IEC 60068-2-27, 30G (300m/S²) for a duration of 18ms, 1 time per direction, 2 times in total
Vibration (Non-Operating)		IEC 60068-2-6, 10Hz to 150Hz @ 50m/S² (5G peak); 20 min per axis for all X, Y, Z direction
Pollution Degree		2

Protections

Overvoltage	< 63V, SELV Output, Hicc-up Mode, Non-Latching (Auto-Recovery)
Overload / Overcurrent	> 120% of rated load current, Hicc-up Mode, Non-Latching (Auto-Recovery)
Over Temperature	< 75°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		SIQ to EN 60950-1, UL/cUL recognized to UL 60950-1 and CSA C22.2 No. 60950-1, CB scheme to IEC 60950-1, CCC to GB4943
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

PMC Panel Mount Power Supply

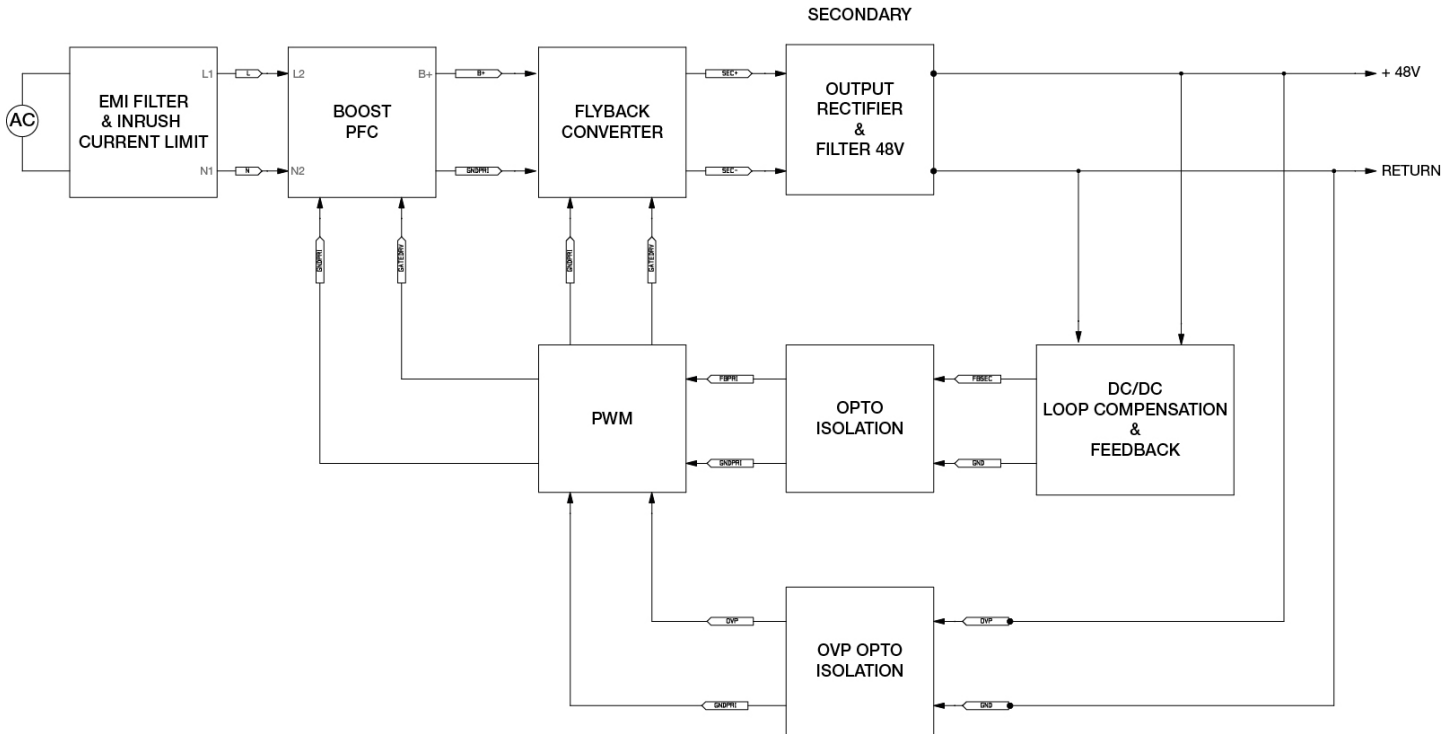
48V 150W 1 Phase / PMC-48V150W1B□

EMC

EMC / Emissions		CISPR 22, EN 55022, FCC Title 47: Class B, GB9254
Immunity to		EN 55024
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, 80% modulation (1kHz)
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



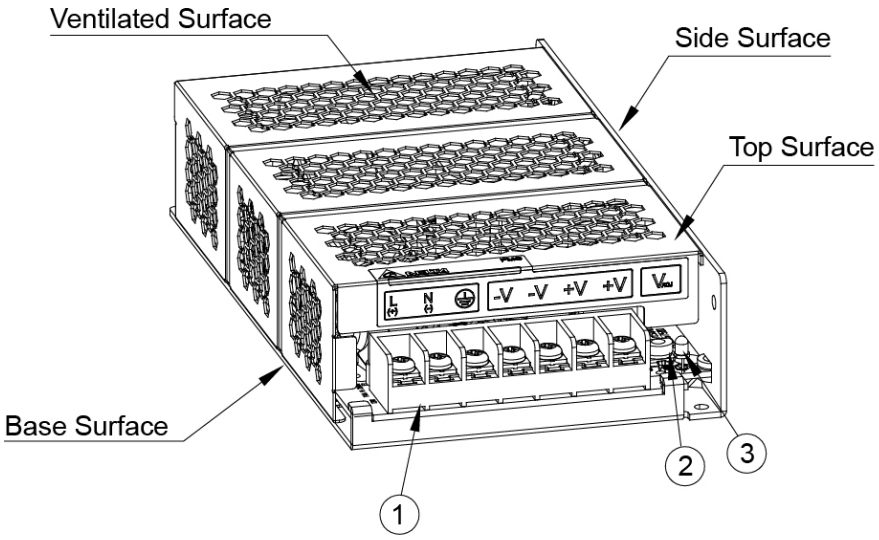
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PMC Panel Mount Power Supply

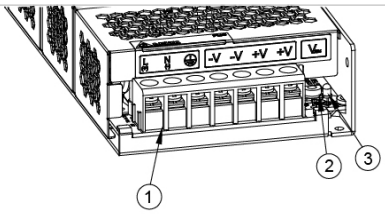
48V 150W 1 Phase / PMC-48V150W1B□

Device Description

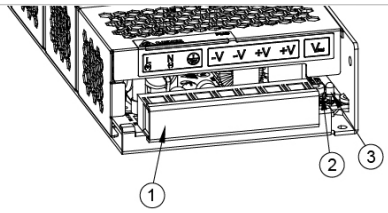
PMC-48V150W1BA: Terminal Block



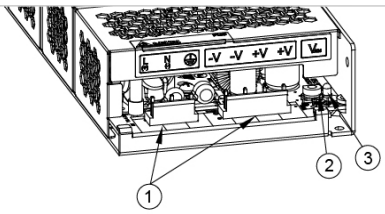
PMC-48V150W1BJ: IP20 Terminal Block



PMC-48V150W1BL: Front Face



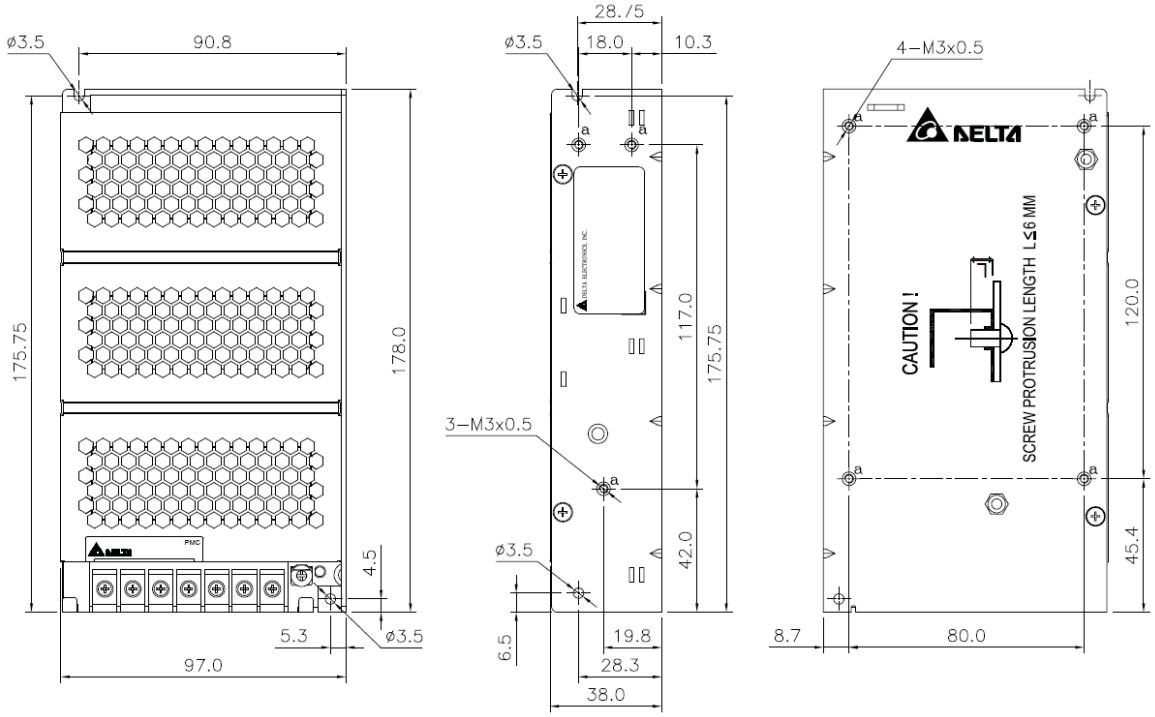
PMC-48V150W1BH: Harness



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 (PMC-48V150W1BA: Terminal Block)



All parameters are specified at 25°C ambient unless otherwise noted.
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Engineering Data

De-rating

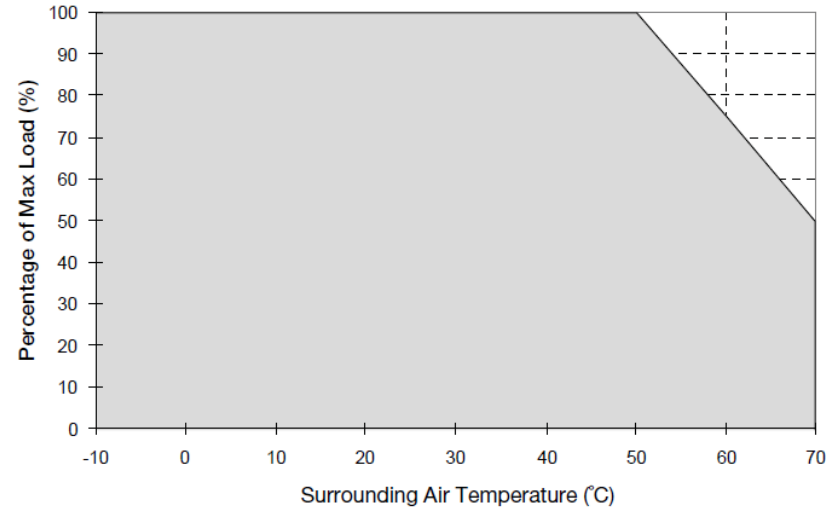
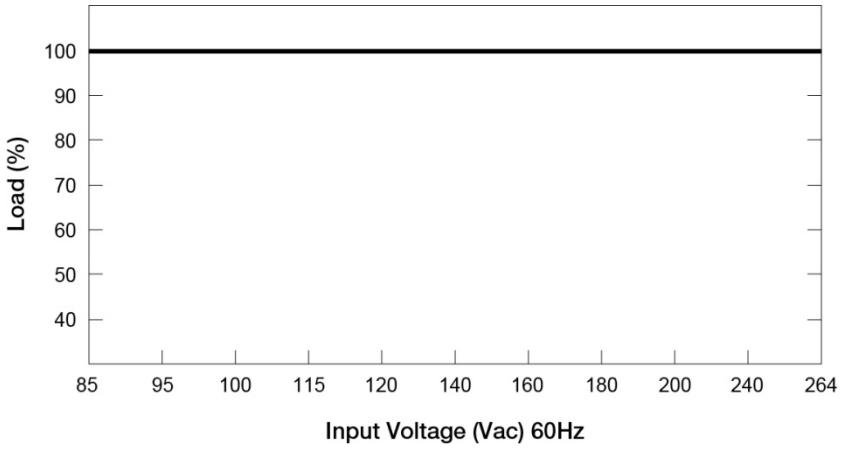


Fig. 1 De-rating for Vertical and Horizontal Mounting Orientation
> 50°C de-rate power by 2.5% / °C

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 surrounding air temperature >50C, 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 across the entire input voltage range

All parameters are specified at 25°C ambient unless otherwise noted.

PMC Panel Mount Power Supply
48V 150W 1 Phase / PMC-48V150W1B□

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.
Ⓒ Input / Output Connector

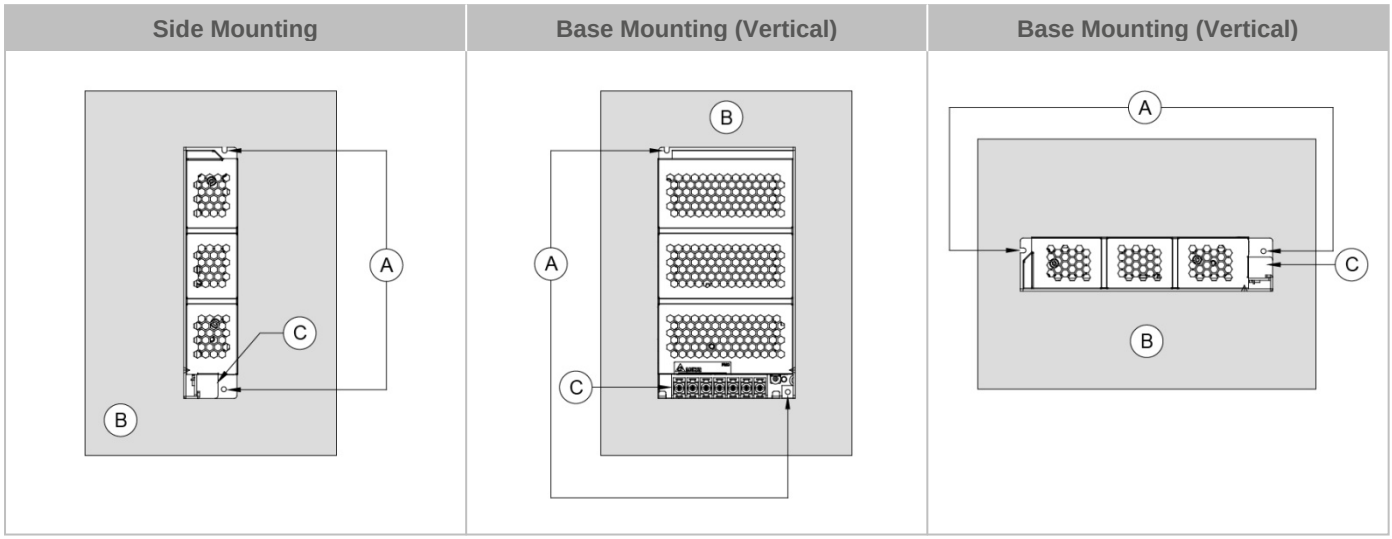
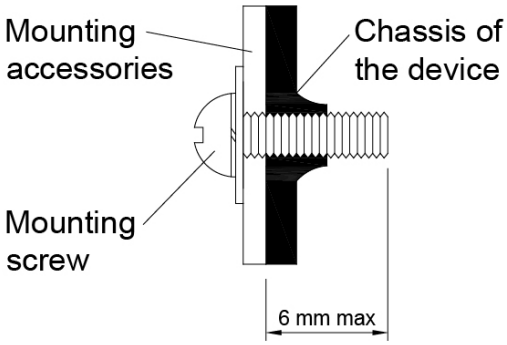


Fig. 2 Mounting Orientation

– **PMC-48V150W1BA / PMC-48V150W1BL:** Use flexible cable (stranded or solid) of AWG No. 20-14.
– **PMC-48V150W1BJ:** Use flexible cable (stranded or solid) of AWG No. 20-12.
– The torque at the Connector shall not exceed 13Kgf.cm. The insulation stripping length should not exceed 0.275" or 7mm.

Installation of Mounting Accessories



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

Safety Instructions

– To ensure sufficient convection cooling, always maintain a safety distance of ≥ 20mm 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.

PMC Panel Mount Power Supply
48V 150W 1 Phase / PMC-48V150W1B□

Functions

Start-up Time

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

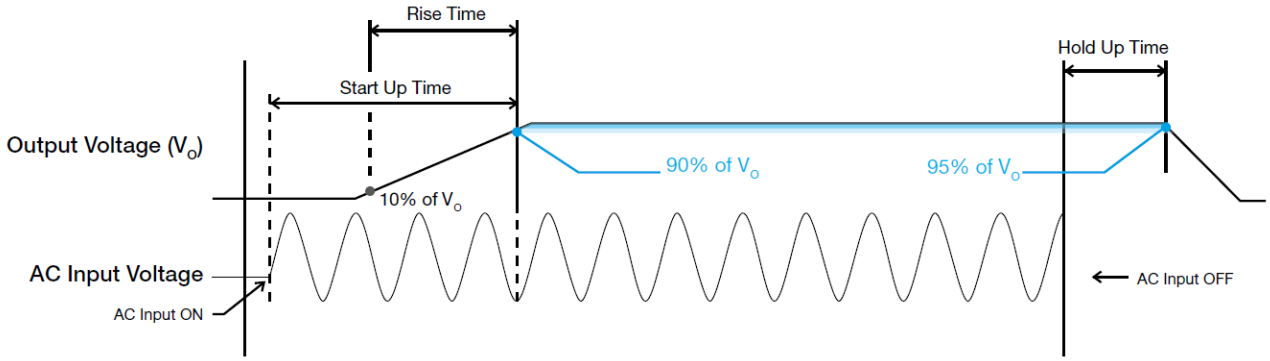
Rise Time

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

Hold-up Time

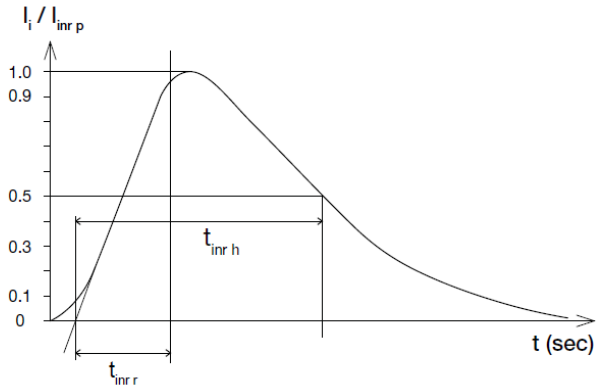
Hold up time is the time when the AC input collapses and output voltage retains regulation for a certain period of time. The time required for the output to reach 95% of its set value, after the input voltage is removed.

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



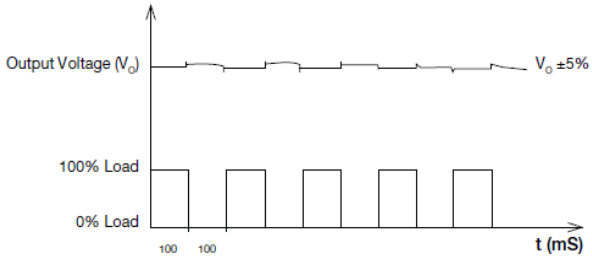
Inrush Current

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 remains within ±5% of its steady state value, when subjected to a dynamic load from 0 to 100% of its rated current.



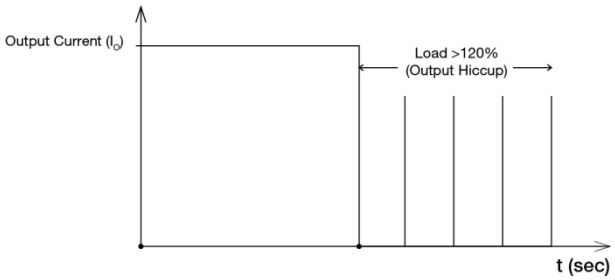
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48V 150W 1 Phase / PMC-48V150W1B□

Overload & Overcurrent Protections

The power supply's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output current exceeds 120% 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.



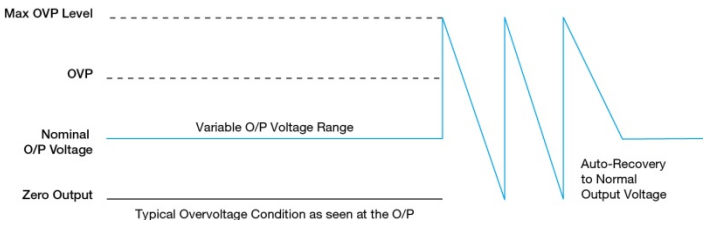
It is not recommended to prolong the duration of I_O when it is <120% but >100%, since it may cause damage to the PSU.

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.

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). 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.

PMC Panel Mount Power Supply
48V 150W 1 Phase / PMC-48V150W1B□

Operating Mode

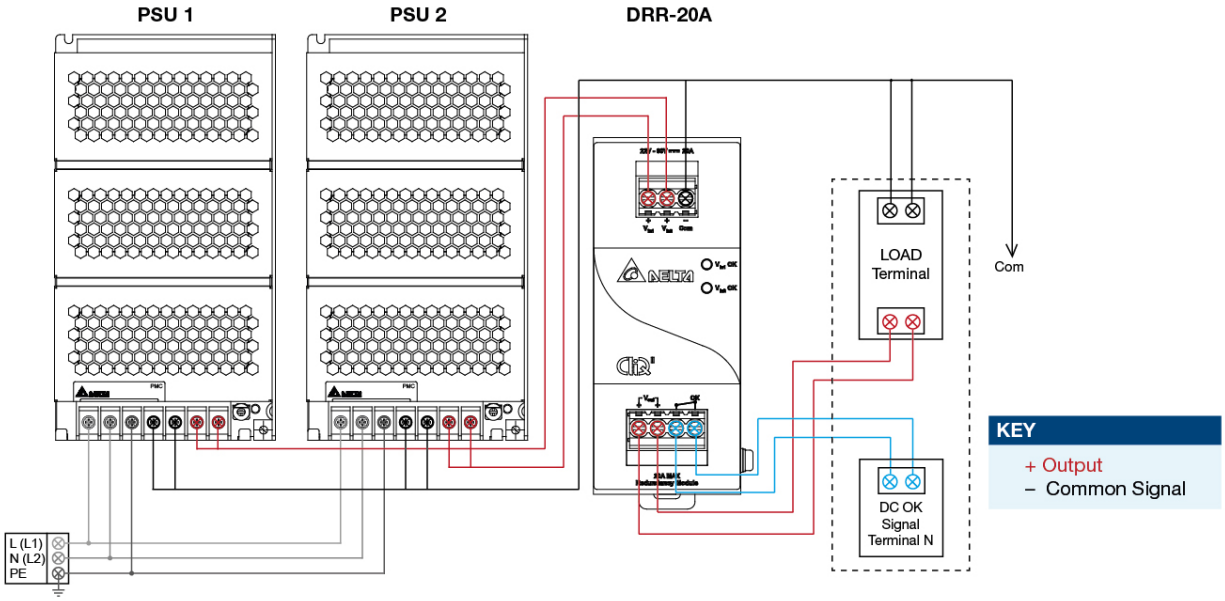


Fig. 3 Redundancy / Parallel Operation Connection Diagram

■ **Redundancy Operation**

In order to ensure proper redundancy operation for the power supply unit (PSU), ensure that the output voltage difference between the two units is kept at 0.90~1.00V for 48V supplies. Follow simple steps given below to verify:

Step 1.
Measure output voltage of PSU 1 and PSU 2. If PSU 1 is the master unit, then V_O of PSU 1 must be higher than PSU 2. In order to set the output voltage, connect the power supply to 50% load and set the PSU 1 and PSU 2 output voltage.

Step 2.
Connect the right DRR module, 20A as per the system requirement to the power supply units PSU 1 and PSU 2 at V_{in} 1 & V_{in} 2 respectively.

Step 3.
Connect the system load from V_{out}. Please note that output voltage V_{out} from DRR module will be = V_O (output voltage of power supply) – V_{drop}* (in DRR module).

■ **Parallel Operation**

These DRR modules can also be used for Parallel function in order to increase the output power by N+1 (e.g. 2.5A + 2.5A = 5A or 2.5A + 2.5A + 2.5A = 7.5A) or current sharing, and thus increasing the power supply and system reliability. Though the PMC-48V150W1B□ is not designed for current sharing, a good current sharing between two power supplies can be achieved by following simple steps as below (Refer to Fig. 3 for the Connection Diagram).

Step 1.
Set output load condition for both supplies at 50% and measure the output voltages.

Step 2.
Adjust output voltages to the same level or within ±25mV difference.

Step 3.
Connect PSU 1 and PSU 2 with the DRR-20A module and measure at V_{in} 1 & V_{in} 2 to verify the voltage difference. Ensure the voltages are within ±25mV.

Step 4.
Output voltage from DRR module V_{out} will be = V_O (output voltage of power supply) – V_{drop}* (in DRR module).

*V_{drop} will vary from 0.60V to 0.90V (Typical 0.65V) depending on the load current and surrounding air temperature.

PMC Panel Mount Power Supply
48V 150W 1 Phase / PMC-48V150W1B□

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 sinusodial 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.