PMC

Panel Mount Power Supply 12V 35W 1Phase

Model No. PMC 12V 35W 1AA
Weight: 0.21kg
Size: 98 mm X 97 mm X 38 mm (H x W x D)

Features

- RoHS compliant
- 2 years warranty
- Universal AC input
- Overload protection
- Efficiency> 84% Typ.
- Over voltage protection
- Expected life time: 10 years
- Over temperature protection
- Ease of wire connection to Terminals
- Full aluminum casing for lightweight and corrosion resistant handling

Description

The new Panel Mount Power Supply 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 12V, 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 IEC60068-2. 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 120-375Vdc. Best of all, this excellent design and quality does not come with a big price tag.

INPUT SPECIFICATION	
Input Voltage (Nominal)	100 - 240Vac
Input Voltage range	85 - 264Vac
Input Frequency (Nominal)	50 - 60Hz
Input Frequency range	47 - 63Hz
DC Input Voltage (Nominal)	125 - 250Vdc
DC Input Voltage Range	120 - 375Vdc
Input Current	< 0.75A @ 115Vac, < 0.5A @ 230Vac
Efficiency	> 83% @ 115Vac & > 84% @ 230Vac
Inrush current (Cold Start)	< 30A @ 115Vac, < 60A @ 230Vac
Leakage Current	< 1mA @ 240Vac

OUTPUT SPECIFICATION	
Output Voltage (Nominal)	12 Vdc
Output Voltage Tolerance	+/- 2% (Initial set point tolerance)
Output Voltage Adjust Range	11 - 14 Vdc
Line Regulation	< 0.5% Typical @ 85 to 264Vac input, 100% load
Load Regulation	< 1% Typical @ 85 to 264Vac input, 0 to 100% load
Residual Ripple (PARD), 20MHz BW	< 100mVpp (25°C)
Output Current (Nominal)	3.00 A
Power Derating above 50°C	Derated Linearly 2.5% / °C
Rise Time	< 30 ms @ nominal input, 100% load (25°C)
Start-Up Time	< 2500 ms @ nominal input, 100% load (25°C)
Hold-Up Time	> 15ms @ 115Vac, > 80ms @ 230Vac (100% load, 25°C)
Dynamic Response (Overshoot & Undershoot O/P Voltage)	+/-5% @ 0% - 100% load
Startup with capacitive loads	6,600µF @ nominal input & nominal O/P voltage 12V (25°C)

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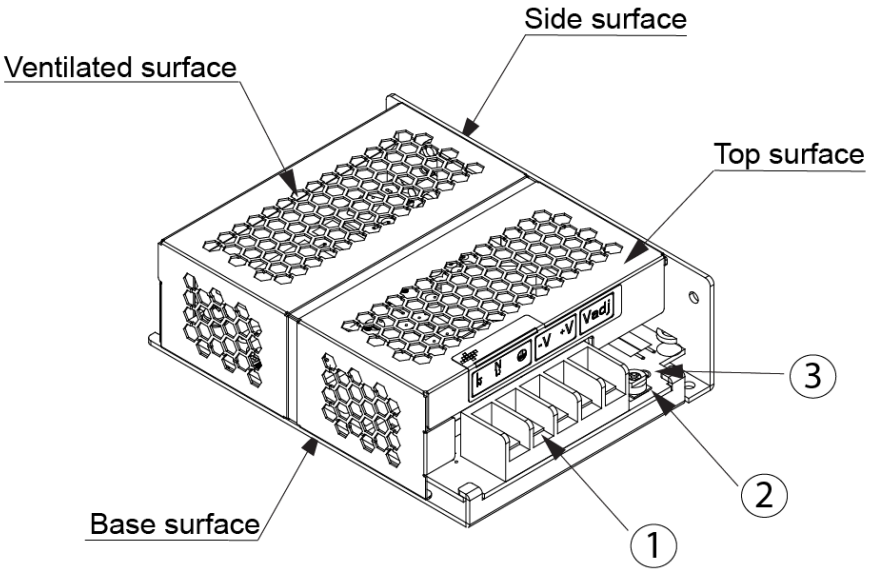
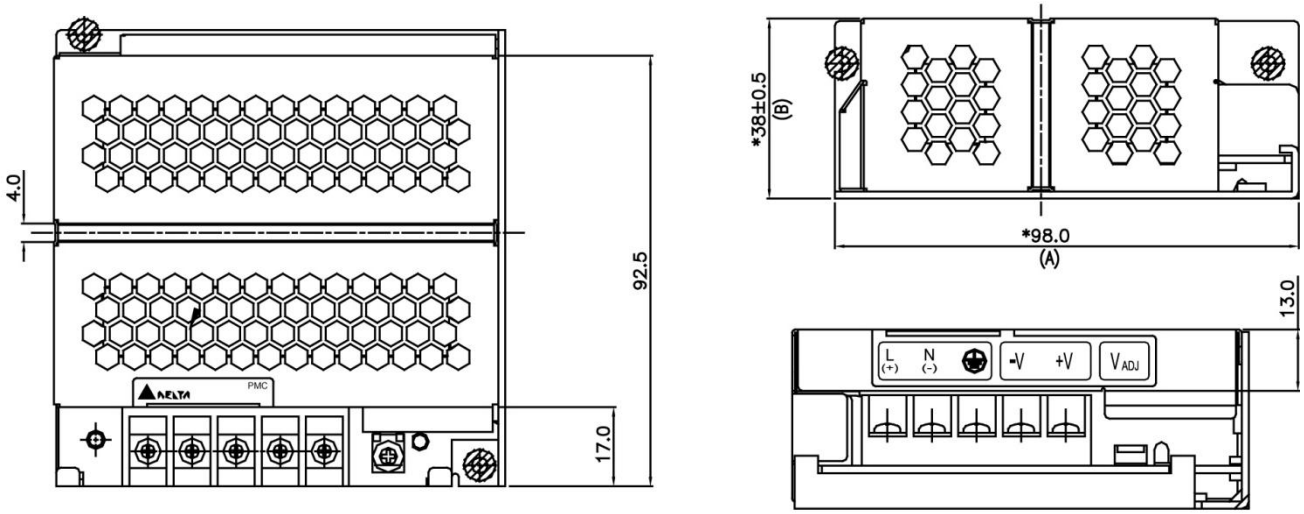
Device Description



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

Mechanical Drawing



MECHANICAL SPECIFICATION	
Dimension	98 mm X 97 mm X 38 mm (H x W x D)
Weight	0.21kg
Cooling System	Convection
Input Terminal & Output Terminal	Terminal Block with screw M3.5 x5 pins (rated 300VAC, 15A)
Output Indicator	Green LED (DC OK)
Casing	Aluminium

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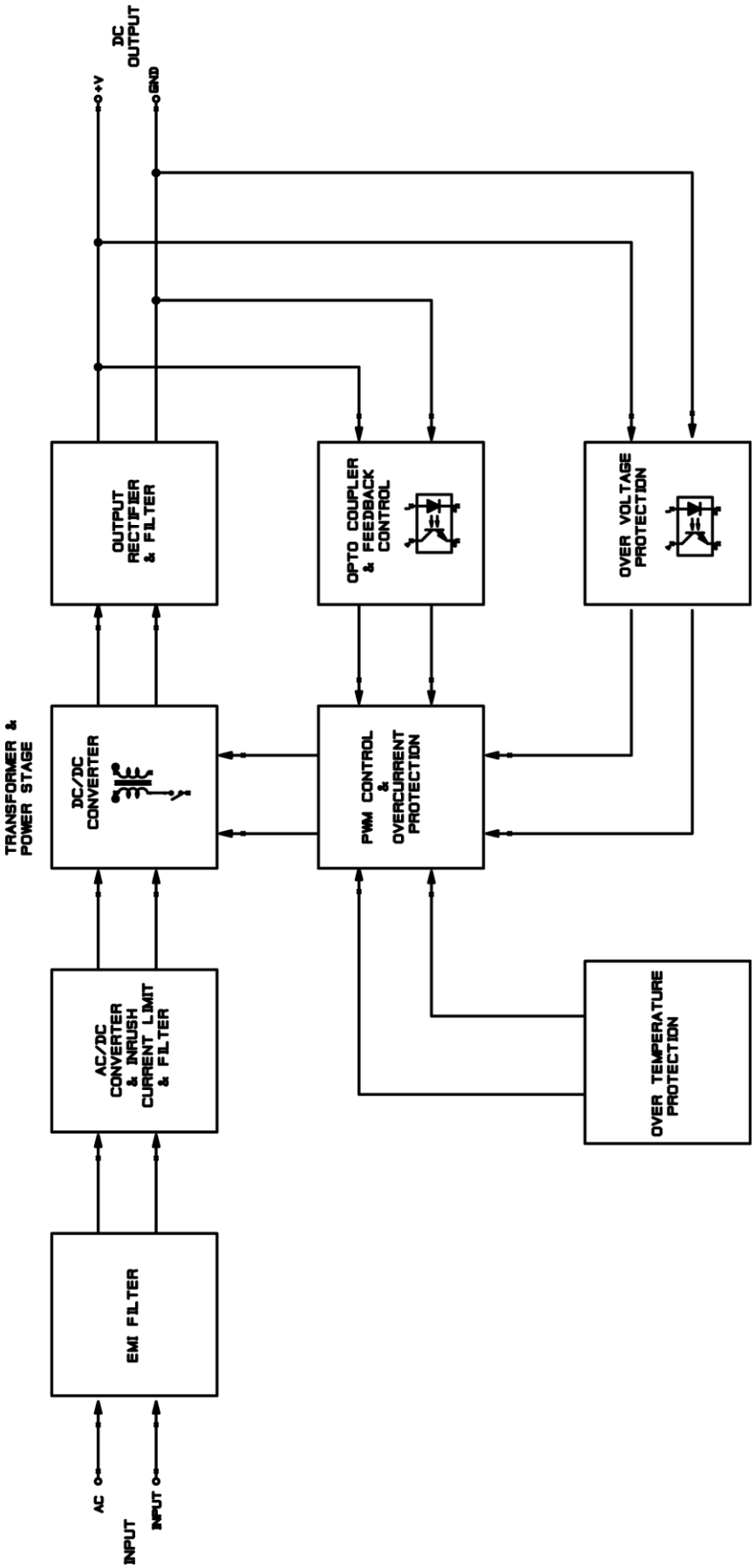


PROTECTION	
Over Voltage Protection	16V +10%/-5%, SELV output, Hicc-up Mode, Non-Latching (Auto recovery).
Over Load, Over Current Protection	> 120% of rated load current, Hicc-up Mode, Non-Latching (Auto recovery).
Over Temperature Protection	< 75°C Ambient Temp@ 100% load. Non-Latching (Auto-recovery).
Short Circuit Protection	Hicc-up Mode, Non-Latching, (Auto-recovery when the fault is removed).

Over Load Protection

The Power Supply is provided with an overload protection (OLP/OCP) function which protects the power supply from possible damage by over current. Additionally power supply also has over temperature protection (OTP) in case the over load condition persists for a longer duration and is below the overload trigger point but > 100% load. Typically the over load current (I_{OL}) is > I_{SURGE} (120%) output voltage will start drooping down when the power supply reaches max power limit and will run into bouncing mode when the output reaches UVLO (under voltage point). The output voltage will recover automatically when the overload condition is removed.

Over Temperature Protection

The Power Supply has an 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 ambient operating condition at 100% load, the Power Supply will run into OTP when the ambient temperature is > 55°C. When activated, the output voltage will go into bouncing mode until the operating ambient temperature drops to 50°C or output capacity is reduced as recommended in the graph.

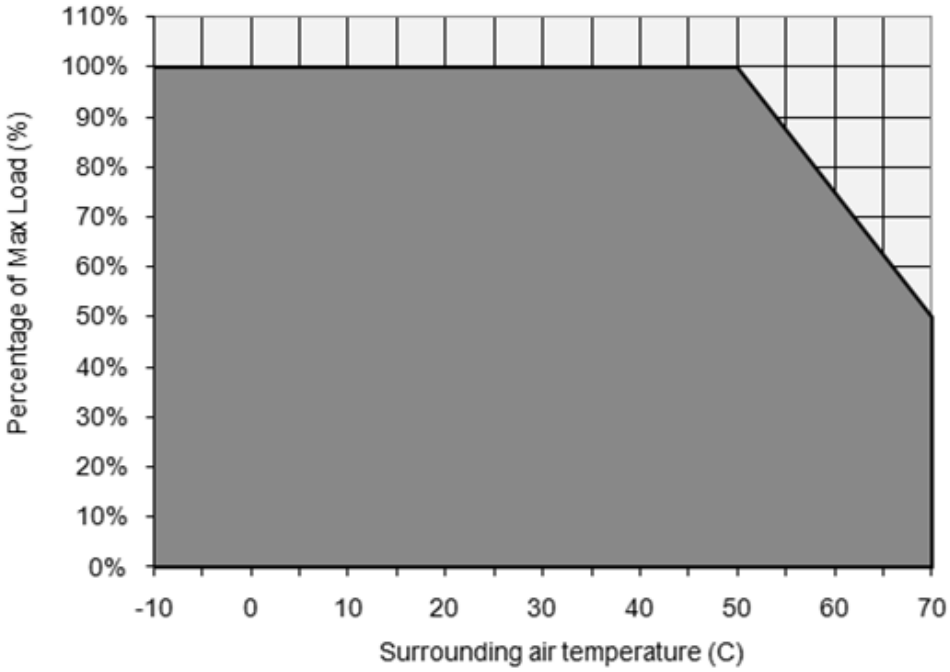
Over Voltage Protection

The Power Supply has an overvoltage protection (OVP) and is activated when the power supply feedback circuit fails. The output voltage will not be > 16 +10%/-5% under any Line/Load and operating ambient temperature. The Power Supply does not shut down but goes into Hiccup mode (Auto-Recovery) which is 16 +10%/-5%. The output voltage will recover back to 12Vdc once the fault is removed

Short Circuit Protection

The Power Supply also has a short circuit protection which is in line with the overload protection and activates whenever there is a short across the output voltage, output goes in bouncing mode and remains until the fault is removed.

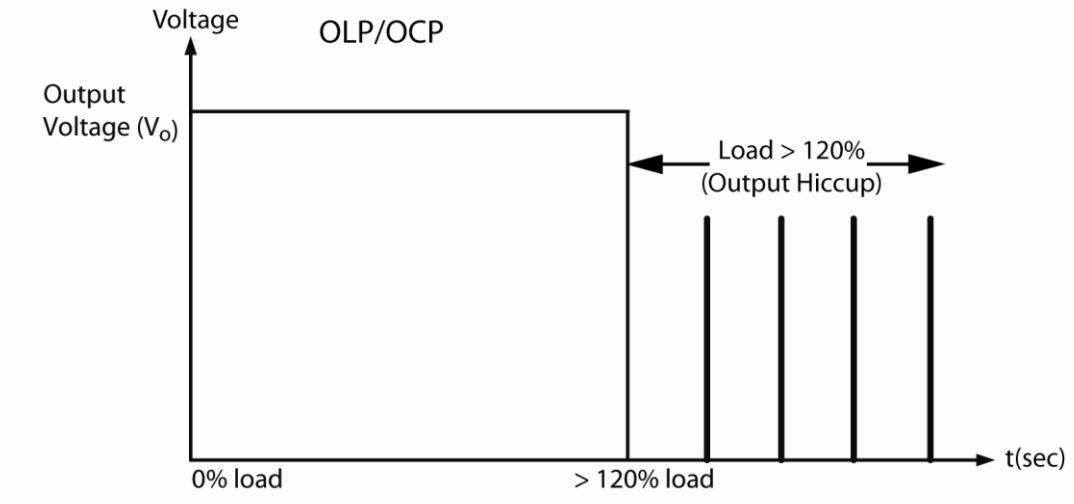
Derating Curve



Note

1. Do not use the power supply in areas outside the shaded portion as shown in the above graph, internal parts may occasionally deteriorate or be damaged.
2. For the power derating refer above graph ambient temperature > 50°C, the output capacity has to be reduced by 2.5% per Kelvin increase in temperature. If the output capacity is not reduced when Amb > 50°C device will run into thermal protection by switching off i.e. device will go in bouncing mode and will recover when Amb is lowered or load is reduced as far as necessary to keep device in working condition.
3. If the power supply has to be mounted in any other direction please contact your service provider.
4. In order for the device to function in the manner intended, it is also necessary to observe lateral spacing of 20mm to other modules.
5. Depending on the ambient temperature and load of the device, the temperature of the housing can become very high!

Over Load Protection



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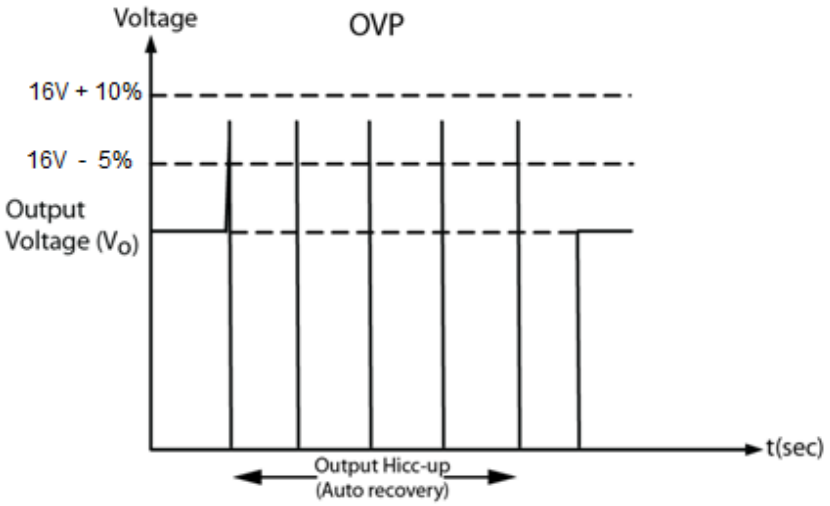
Over Voltage Protection



**The Power Supply does not shut down but goes into Hiccup mode (Auto-Recovery) which is 16 +10%/-5%. The output voltage will recover back to 12Vdc once the fault is removed*

ENVIRONMENT	
Ambient temperature (Operating)	-10°C to +50°C, with operation to 70°C possible with a linear derating to half power from 50°C to 70°C.
Operating Humidity	< 95%RH
Ambient temperature (Storage)	-25°C to 85°C
Altitude (Operating)	3,000 Meters
Shock Test	IEC60068-2-27, 30G (300m/s2)
Vibration (Non-Operating)	IEC60068-2-6, 10Hz to 150Hz @ 50m/s2 (5G peak) for all X, Y, Z direction
Bump	IEC60068-2-29, 11ms/ 10gn
MTBF	> 700,000 hrs, as per BELL CORE STD or IEC61709 Tested at 115Vac & 230Vac input, 100% load, 25°C ambient
Expected Cap Life Time	10 years (115Vac & 230Vac, 50% load and 40°C ambient).
Material and Parts	RoHS directive, WEEE directive
Degree of protection	IPX0
Class of protection	Class I with PE connection
Pollution degree	2

Inrush Current

Inrush Current is the first surge current seen on the input side when AC input is applied to the power supply. It is the first pulse captured; see a typical picture for the inrush current as seen in the power supply.

Start Up Time

Start up time is measured from the point AC input is applied and the o/p voltage reaches within 90% of its set value. See picture below for a typical start up time characteristic of a power supply.

Rise Time

Rise time is the time needed for o/p voltage to rise from 10% of its set value to 90% of its set value. See the picture below for a typical rise time measurement in a power supply.

Hold Up Time

Hold-up time is the duration which output voltage retains regulation while AC input collapses. Picture below is a typical hold-up time characteristic.

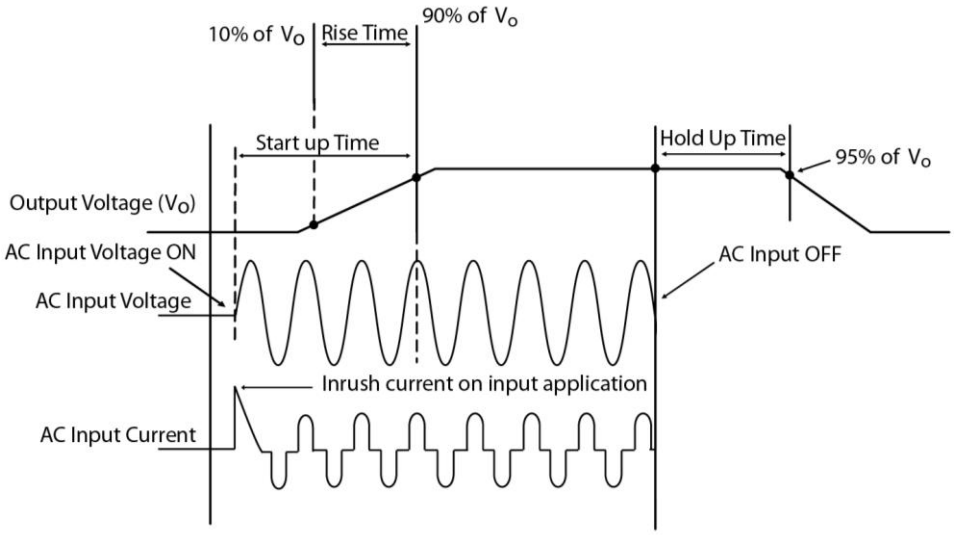
Output Voltage Adjust

The 12VDC connection is made using the "+" and "–" screw connections. At the time of delivery, the output voltage is 12V DC. The output voltage can be set from 11 to 14 VDC on the potentiometer seen as Adjust on the front panel of each power supply.

Dynamic Load

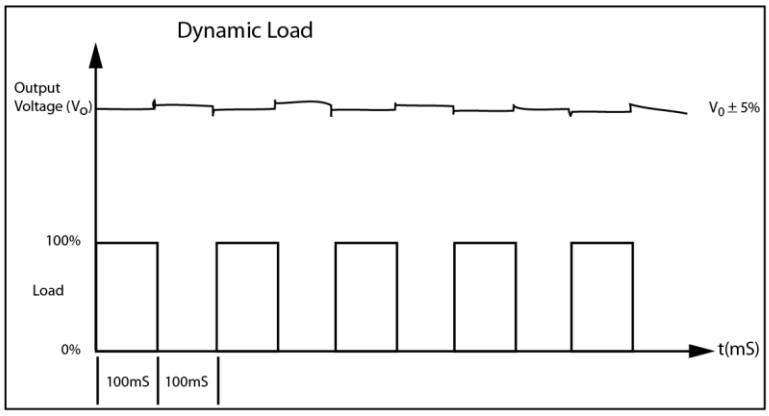
The Power Supply is capable of dynamic output voltage load change from 0% to 100% within +/-5% regulation limits. See picture below on the dynamic behavior the Power Supply.

Hold Up Time



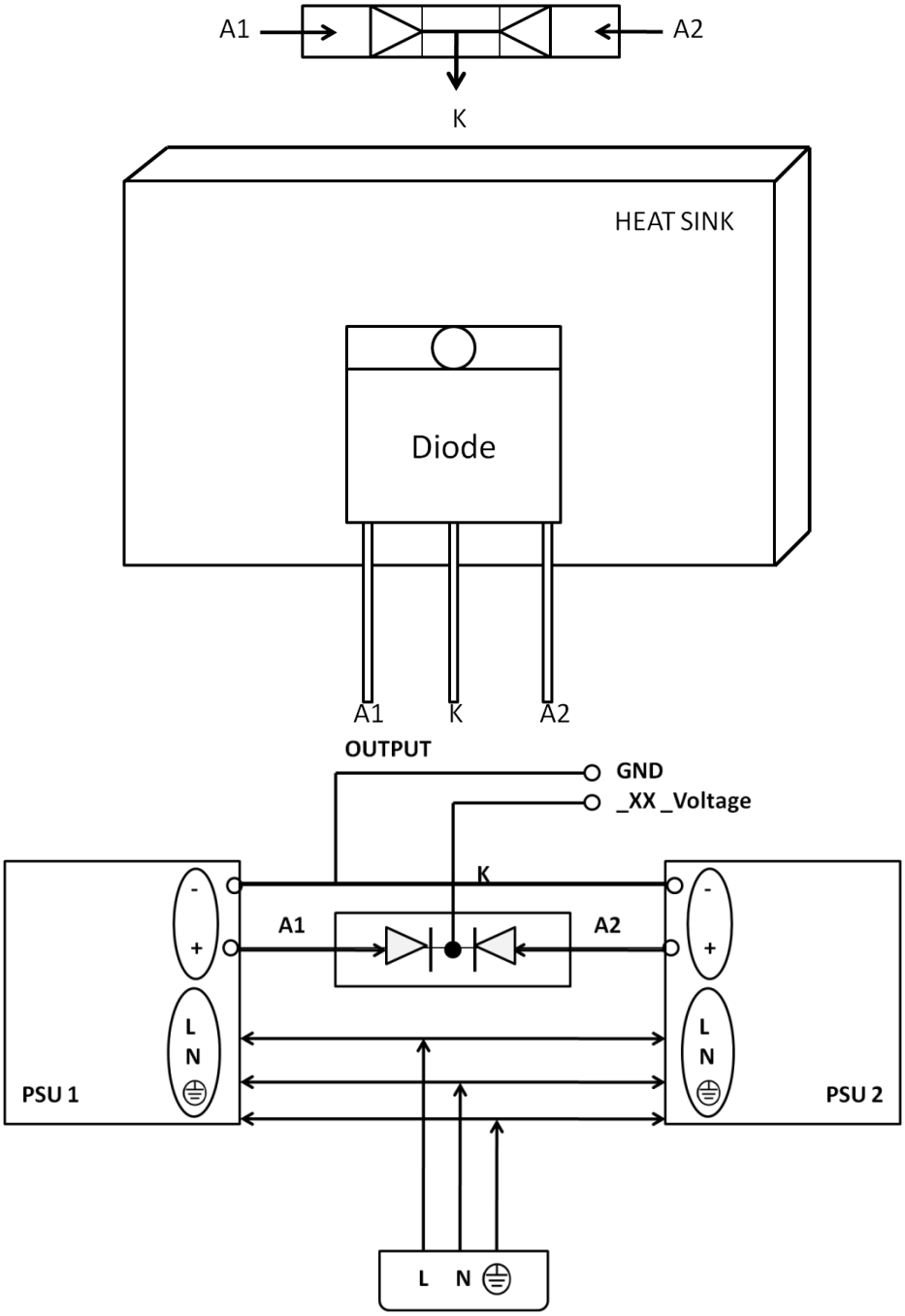
** Hold-up time is the duration which output voltage retains regulation while AC input collapses*

Dynamic Load



** The power supply is capable of dynamic change of load from 0% to 100% with o/p voltage within ±5% of regulation limits.*

Redundancy Operation with ORing Diode



**See the figure for a typical Redundant/Parallel operation of PSU using PMC series power supplies. The 2 power supplies PSU1 & PSU 2 are connected thru a twin diode where Anode1 A1 is connected to the +Ve i.e. 12V of PSU1 and Anode2 A2 is connected to the +Ve i.e. 12V of PSU2 and the output ground GND are shorted together. The output of these 2 power supplies PSU1 & PSU2 is drawn from the Cathode K of the twin diode thus making the power supply work in Redundant/Parallel operation.*

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SAFETY STANDARDS /EMC

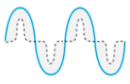
SAFETY STANDARD	CCC SIQ to EN60950-1, UL/cUL Recognize to UL 60950-1 asd CSA C22.2 no. 60950-1 CE EMC and Low Voltage directive CB test certificate and report to IEC60950-1
EMI	FCC Title 47, EN55022, CISPR22 : CLASS B
EMS	
• **EN 61000-4-2** [1] **Electrostatic Discharge Standard (ESD)**	LEVEL 4 Criteria A Air Discharge : 15 KV Contact discharge : 8 KV
• **EN 61000-4-3** [1] **Radiate Field Immunity**	LEVEL 3 Criteria A 80MHz - 1GHz / 10V/M with 1kHz tone / 80% modulation.
• **EN 61000-4-4** [1] **Fast transients (Burst Immunity)**	LEVEL 3 Criteria A 2 KV[4]
• **IEC 61000-4-5** [1] **Surge voltage Immunity**	LEVEL 3 Criteria A Common Mode : 2 KV[3] Differential Mode : 1 KV[4]
• **EN 61000-4-6** [1] **Conducted Immunity**	LEVEL 3 Criteria A 150KHz - 80MHz / 10Vrms.
• **EN 61000-4-8** [1] **Power frequency magnetic field**	LEVEL 3 Criteria A 10A/Meter
• **EN 61000-4-11** [2] **Voltage dips**	Input 100% dip 1 cycle, Main Buffering > 20ms, Self Recoverable
• **IEC 61000-4-12** [1] **Low Energy Pulse Test (Ring Wave)**	LEVEL 3 Criteria A Common Mode : 2 KV[3] Differential Mode : 1 KV[4]
Galvanic Isolation : **Input / output** **type test/routine test :** **Input / PE** **type test/routine test :** **output / PE** **type test/routine test :**	 3.0 KVac/ 1.5 KVac/ 500Vac/

1) Criterion A: Normal operating behavior within the defined limits.
2) Criterion B: Temporary impairment to operational behavior that is corrected by the device itself.
3) Symmetrical: Conductor to conductor.
4) Asymmetrical: Conductor to ground.

Delta RoHS Compliant

Restriction of the usage of hazardous substances

The European directive 2002/95/EC limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome6+, 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”. All items in the catalog conform 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 form fulfilling this standard, therefore, it is important to know whether it is mandatory to meet this standard for a specific application.