PMC

Panel Mount Power Supply 24V 150W 1AA

Model No. PMC 24V 150W 1AA
Weight: 0.48kg
Size: 178mm x 97mm x 38mm (H x W x D)

Features

- RoHS compliant
- 2 years warranty
- Universal AC inpu
- Overload protection
- Efficiency> 86% 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 PMC24V150W1AA is the latest offering from one of the World's No.1 Power Supply Company. The product offers a nominal output voltage of 24V, a wide temperature range from -10°C to 75°C and a minimum holdup time of >20ms.The state-of-the-art design is made to withstand harsh industrial environments. The rugged, compact design aluminum case is shock and vibration resistant according to IEC60068-2-6. The 150 watts PMC panel mount power supply provides over voltage, overload and thermal protection. Due to the wide input voltage range from 85 to 264 Vac, the Delta's PMC panel mount power supply is high line input voltage usable, multiple output terminals for fast wiring and easy installation.

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	< 3.1A @ 115Vac, < 2.0A @ 230Vac
Efficiency	> 86% @ 115Vac & 230Vac
Inrush current (Cold Start)	< 60A @ 115Vac, < 120A @ 230Vac
Leakage Current	< 1mA @ 240Vac

OUTPUT SPECIFICATION	
Output Voltage (Nominal)	24 Vdc
Output Voltage Tolerance	+/- 2% (Initial set point tolerance)
Output Voltage Adjust Range	22 - 28 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)	6.25 A
Power Derating above 50°C	Derated Linearly 2.5% / °C
Rise Time	< 30 ms @ nominal input, 100% load (25°C)
Start-Up Time	< 1000 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	8,000µF @ nominal input & nominal O/P voltage 24V (25°C)

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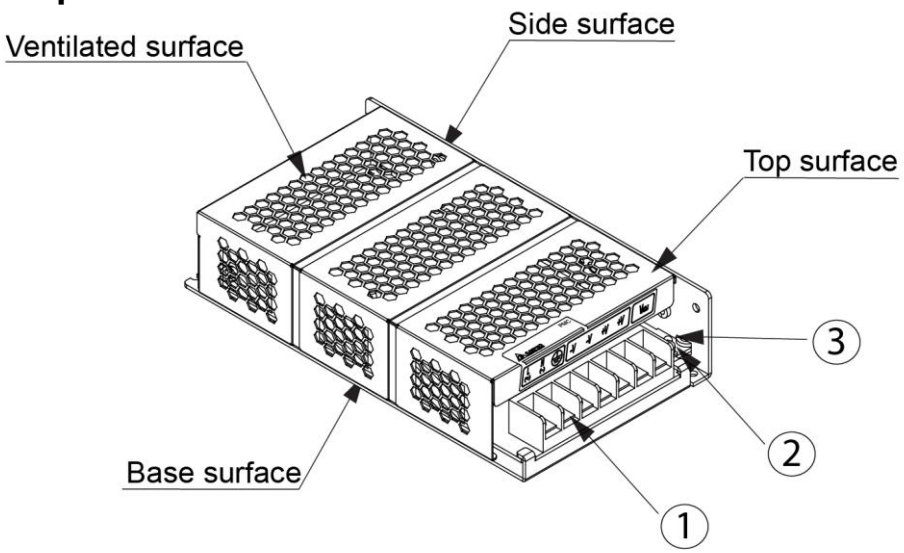
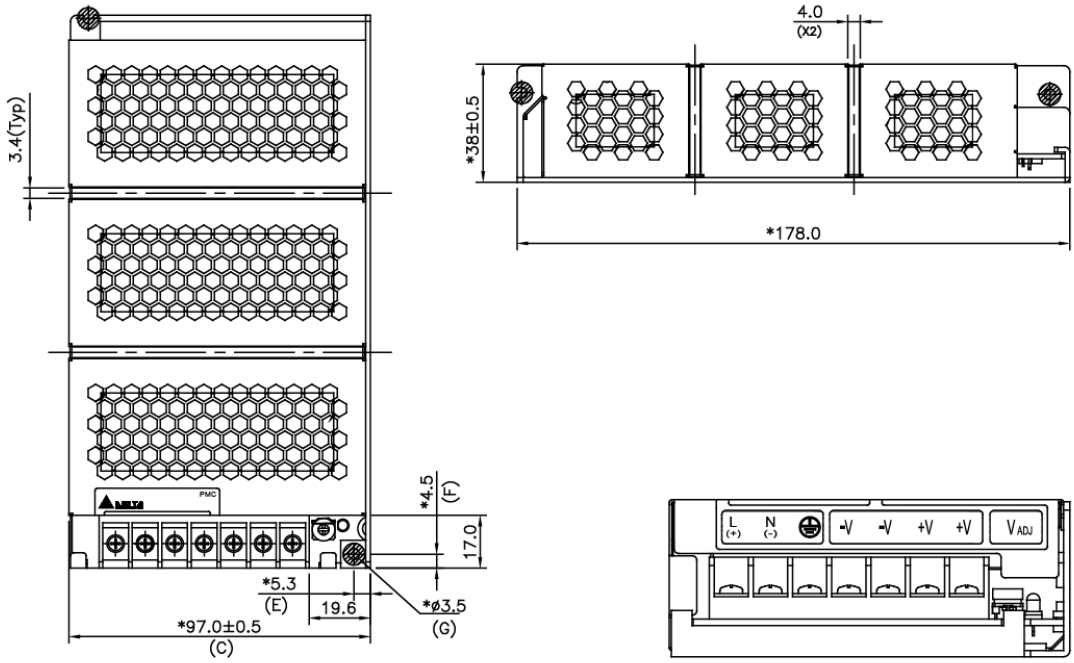
Device Description:



1. Input & Output terminal block connector
2. DC Voltage adjustment potentiometer
3. DC OK Control LED (green)

Mechanical Drawing:



MECHANICAL SPECIFICATION	
Dimension	178 mm X 97 mm X 38 mm (H x W x D)
Weight	0.48kg
Cooling System	Convection
Input and Output Terminal	Terminal Block with screw M3.5 x7 pins (rated 300VAC, 15A)
Output Indicator	Green LED (DC OK)
Casing	Aluminium

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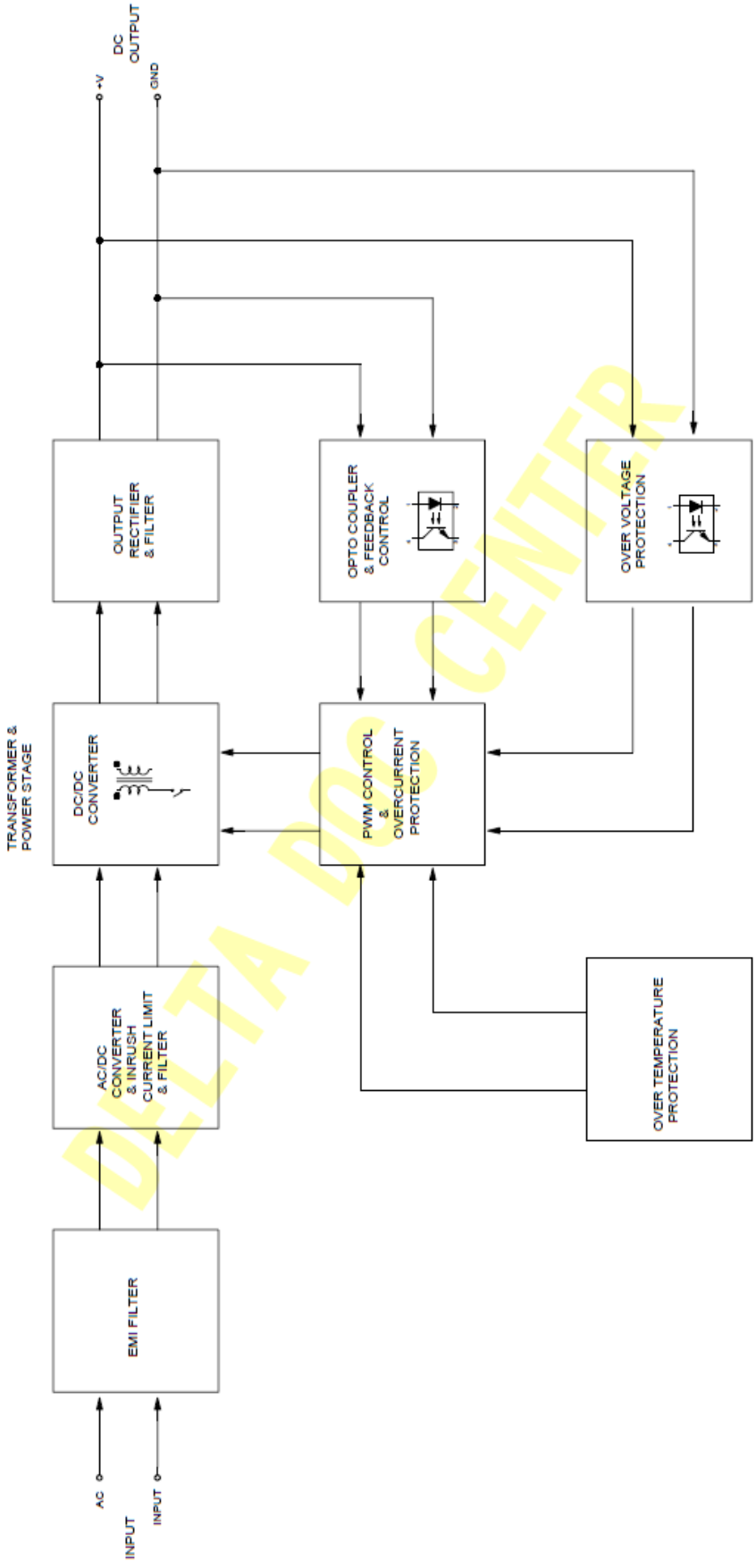
Block Diagram:



PROTECTION	
Over Voltage Protection	32V +10%/-10%, 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

Additionally power supply also has over temperature protection (OTP) as mentioned above this OTP comes into picture when the over load condition persists for a longer duration and the output current level is below the overload trigger point but > 100% load.

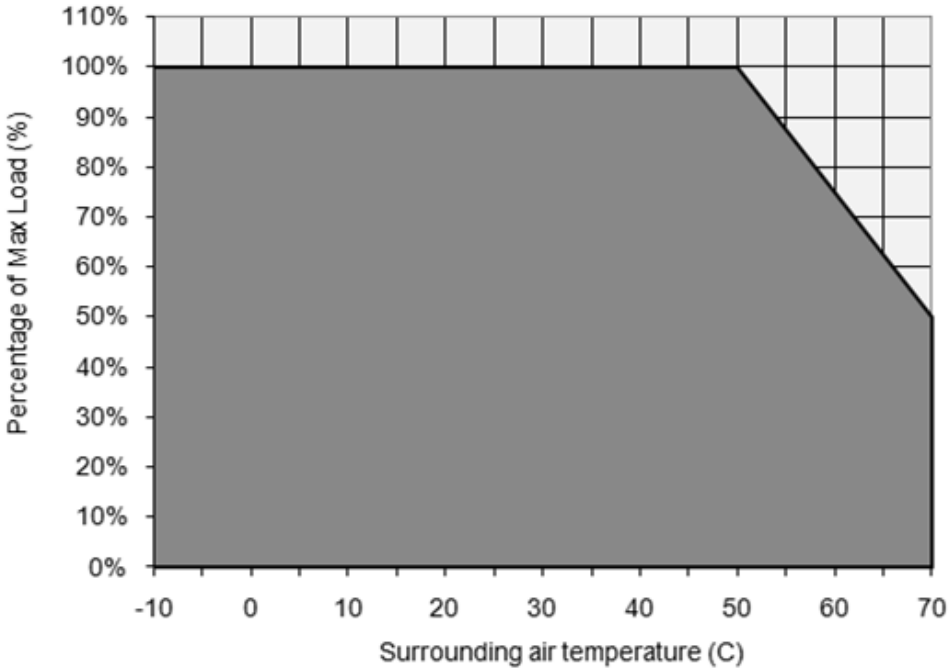
Over Voltage Protection

The Power Supply is protected by Over voltage in the event that power supply feedback circuit fails the output voltage will not be > 32V, +10% under any Line/Load and operating ambient conditions. The unique feature about this over voltage protection (OVP) is that power supply doesn't shut down but goes Hicc-up mode (Auto recovery) which is 32V, +/-10%. The power supply output voltage will recover back to 24Vdc once the fault condition 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.

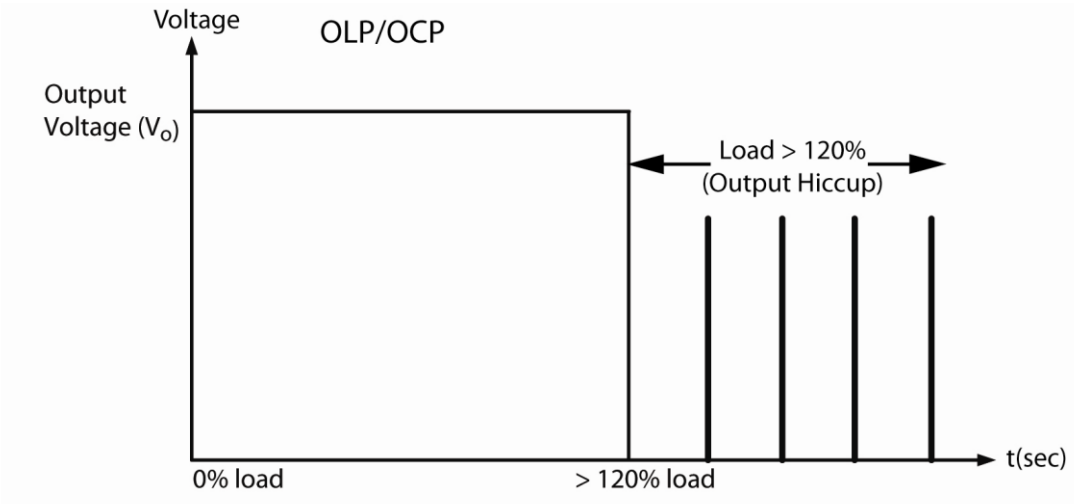
Derating Curve



Note

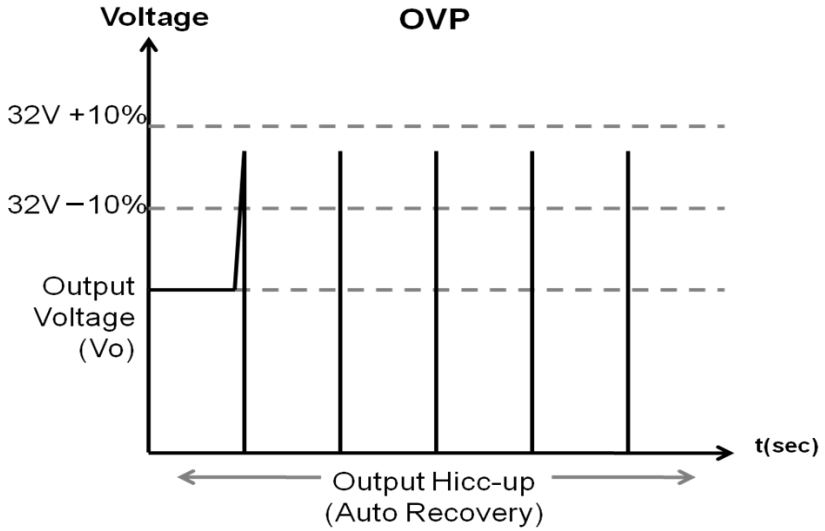
1. Do not use the power supply in areas outside the shaded portion as shown in the above graph, internal parts may occasionally deteriorate or be damaged.
2. For the power derating refer above graph ambient temperature > 50°C, the output capacity has to be reduced by 2.5% per Kelvin increase in temperature. 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 20 mm. 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



** 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 Voltage Protection



**The unique feature about this over voltage protection (OVP) is that power supply doesn't shut down but goes Hicc-up mode (Auto recovery) which is 32V, +/-10%. The power supply output voltage will recover back to 24Vdc once the fault condition 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 time when the AC input collapses and output voltage retains regulation for a certain period of time is called as hold up time. See in the picture a typical hold up time characteristic of a power supply. The hold time is measured until the output voltage remains in regulation hence it measured until the output voltage reaches 95% of its set value.

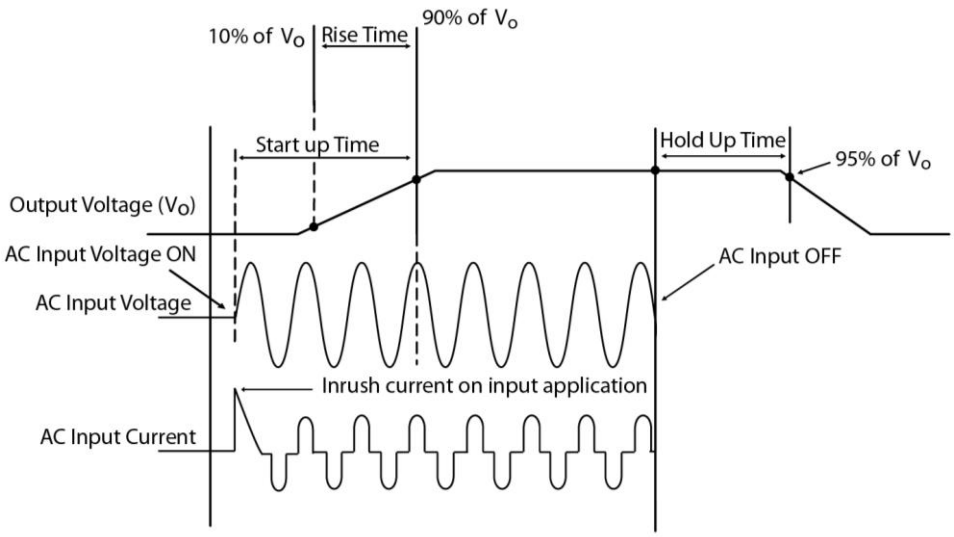
Output Voltage Adjust

The 24 VDC connection is made using the "+" and "–" screw connections. At the time of delivery, the output voltage is 24 V DC. The output voltage can be set from 22 to 28 VDC on the potentiometer seen as Adjust on the front panel of each power supply.

Dynamic Load

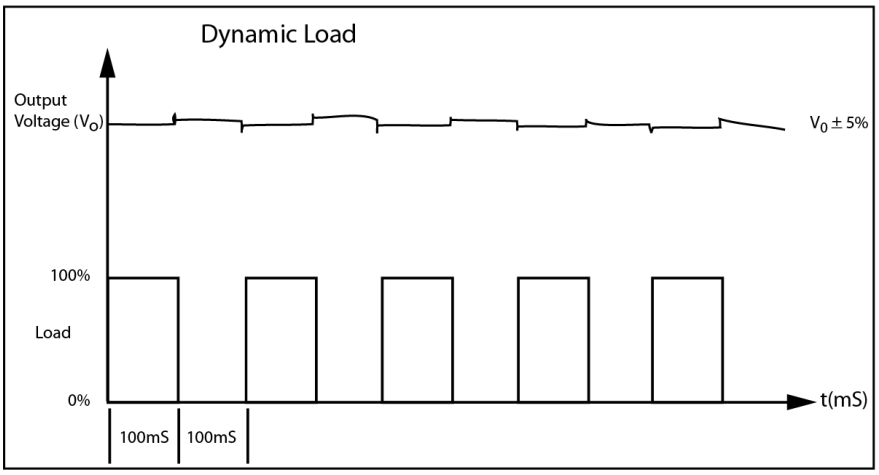
Additionally power supply is capable of dynamic change of load from 0% to 100% with output voltage within ±5% of regulation limits. See below the dynamic behavior of the PSU.

Hold Up Time



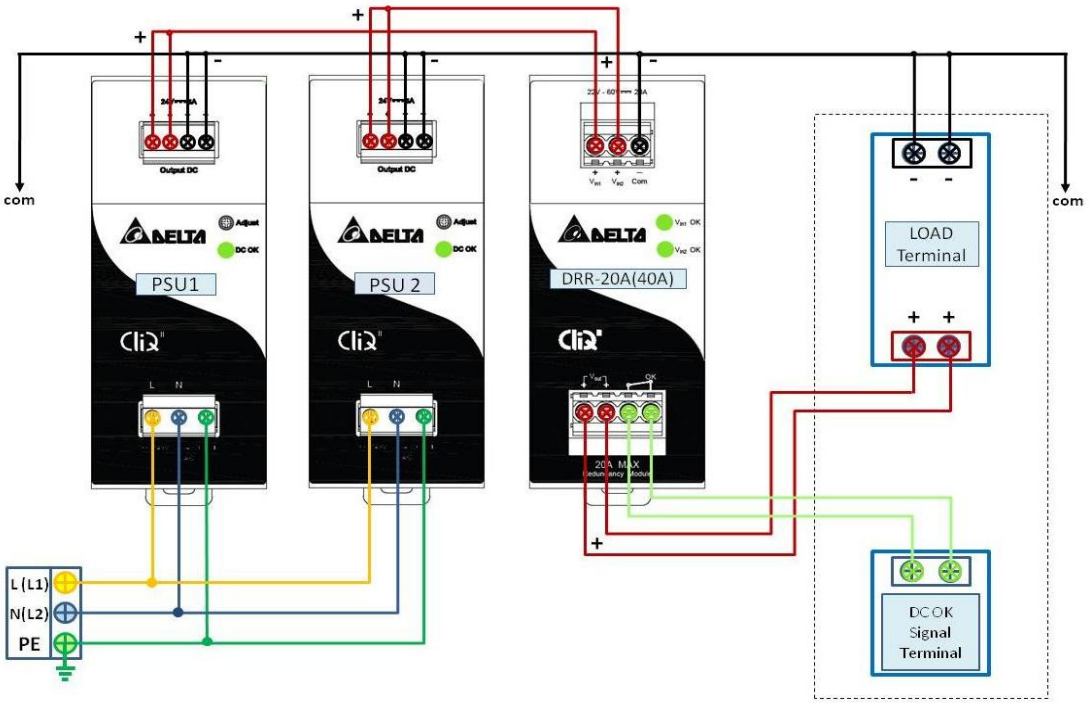
** The hold time is measured until the output voltage remains in regulation hence it measured until the output voltage reaches minimum regulation -2% of its set value.*

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 DRP 20A- (40A)



Parallel Operation

When 2 Power Supplies are connected in parallel, they can share the load if the following steps are taken.

Step1. Measure the output voltages at no load from Vin 1 to Com i.e. Voltage Vin 1 to Com and Voltage Vin 2 to Com of Redundancy module. If the voltages are not the same, follow Step 2. If same, skip to step 3.

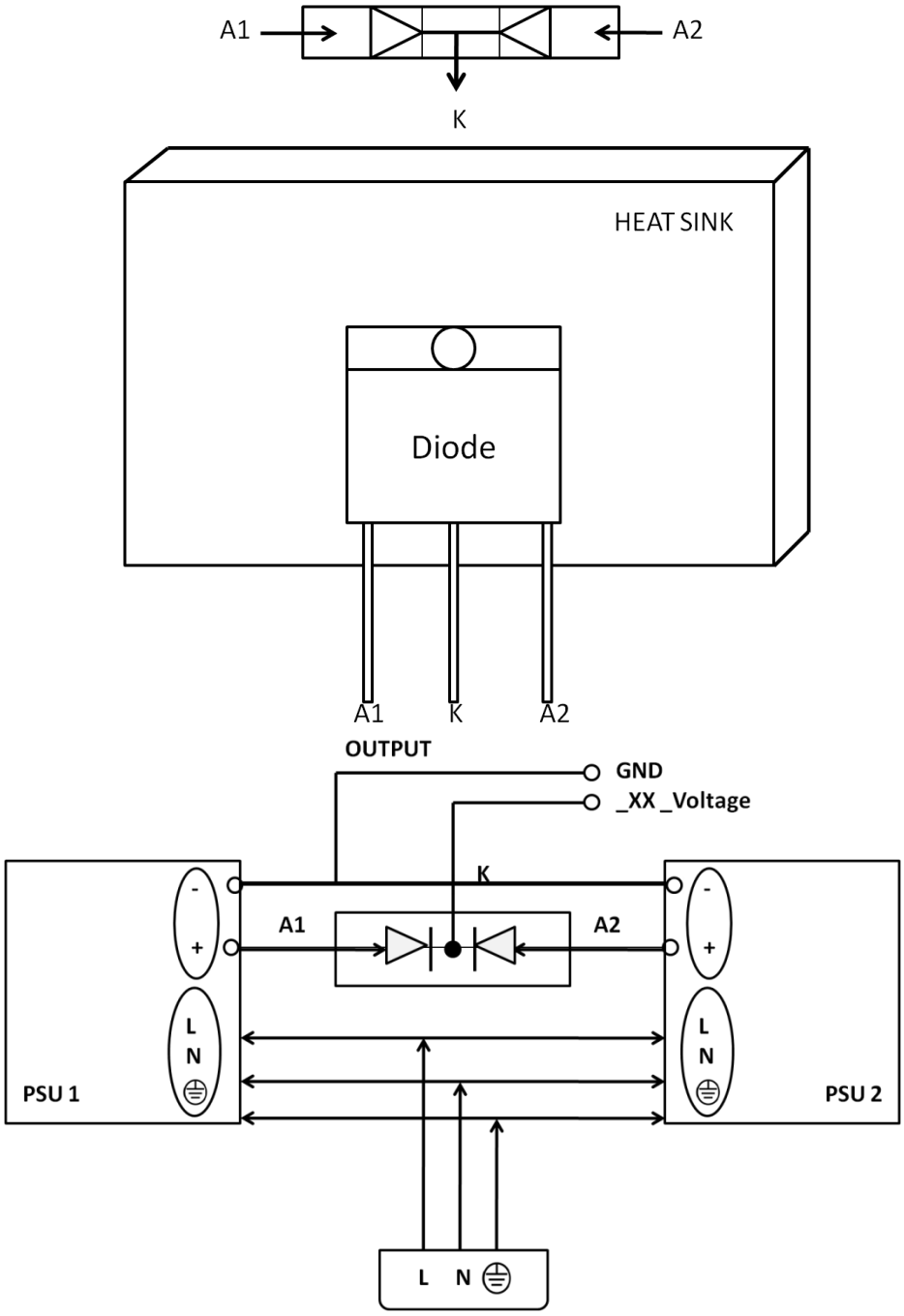
Step2. Adjust the output voltages, with the help of VR on the Power Supply front panel market as ADJUST, to the same level. For example, if PSU1 is measuring 24.15Vdc and PSU2 is measuring 24.25Vdc, adjust the output voltage of one to be the same as the other.

Step3. Connect the Power Supply to the end system load and measure the output voltages from Vin 1 to Com and voltage Vin 2 to Com of Redundancy module. Ensure that the output voltage is the same even after the 2 Power Supplies are connected to load. If not, adjust them as described in Step. 2 A difference of both PSU± 25mV is acceptable.

Note

1) If the output voltage of any Power Supply is higher, it will take the initial load and share the maximum load.
2) If the output voltages are the same, then an equal load current sharing between the 2 Power Supplies can be achieved.
3) The ORing diode must be of an appropriate rating. The rating must be at least 4 times of the output load current and at least reverse voltage rating of 20Vrr.
4) The use of a heat sink is advised to ensure the ORing Diode does not overheat.
5) Recommended Redundancy Module: DRR-20A

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. 24V of PSU1 and Anode2 A2 is connected to the +Ve i.e. 24V 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	Bauart via TUV IEC/EN/UL 60950-1 Safety of information technology equipment 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.