CliQ DIN Rail Power Supply 12V 30W 1Phase

Features

- 3 Years warranty
- RoHS Compliant
- Over load protection
- Over voltage protection
- Over temperature protection
- Expected life time : 10 Years
- Power boost 150% for 3 seconds
- Compact design for easy handling
- Output terminals for fast wiring and easy installation
- With Conformal Coating (Class 1 Div 2 Hazard Loc Ready)
- Redundancy :External ORing Diode

Model No. DRP 012V 030W 1AZ
Weight: 0.20 KG
Size: 100 mm X 32 mm X 100.6mm (H x W x D)

Description

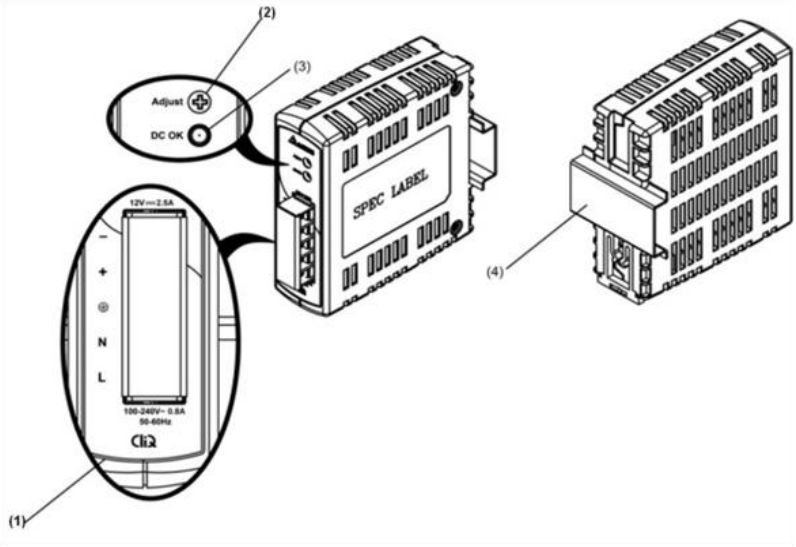
The new CliQ DRP012V030W1AZ is the latest offering from one of the World's No.1 Power Supply Company. The product offers a nominal output voltage of 12V, a wide temperature range from -20°C to 70°C and a minimum holdup time of >22ms@115Vac.The state-of-the-art design is made to withstand harsh industrial environments. The rugged, compact design plastic case is shock and vibration resistant according to IEC60068-2-6. The 30 watts CliQ DIN Rail power supply provides over voltage, overload and thermal protection. Due to the wide input voltage range from 85 to 264Vac, the Delta's CliQ power supply is worldwide 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	< 0.7A @ 115Vac, < 0.42A @ 230Vac
Efficiency	> 84.5% @ 115Vac & 230Vac
Inrush current (Cold Start)	< 40A @ 115Vac, < 80A @ 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
Ripple & Noise (PARD), 20MHz BW	< 100mVpp (25°C)
Output Current (Nominal)	2.5 A
Power Derating above 50°C	Derated Linearly 2.5% / °C
Rise Time	< 20 ms @ nominal input, 100% load (25°C)
Start-Up Time	< 2500ms @ nominal input, 100% load (25°C)
Hold-Up Time	> 22ms @ 115Vac, > 110ms @ 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)

CliQ DIN Rail Power Supply 12V 30W 1Phase

Device Description:



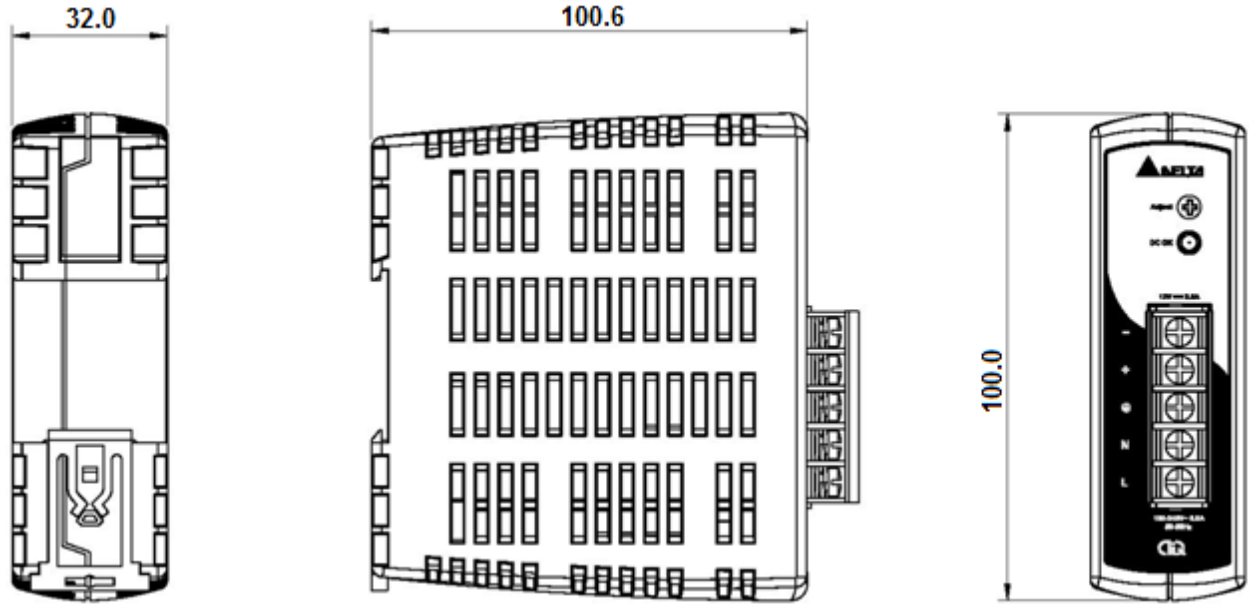
(1) Input & Output terminal block connector

(2) DC voltage adjustment potentiometer

(3) DC OK control LED (green)

(4) Universal mounting rail system

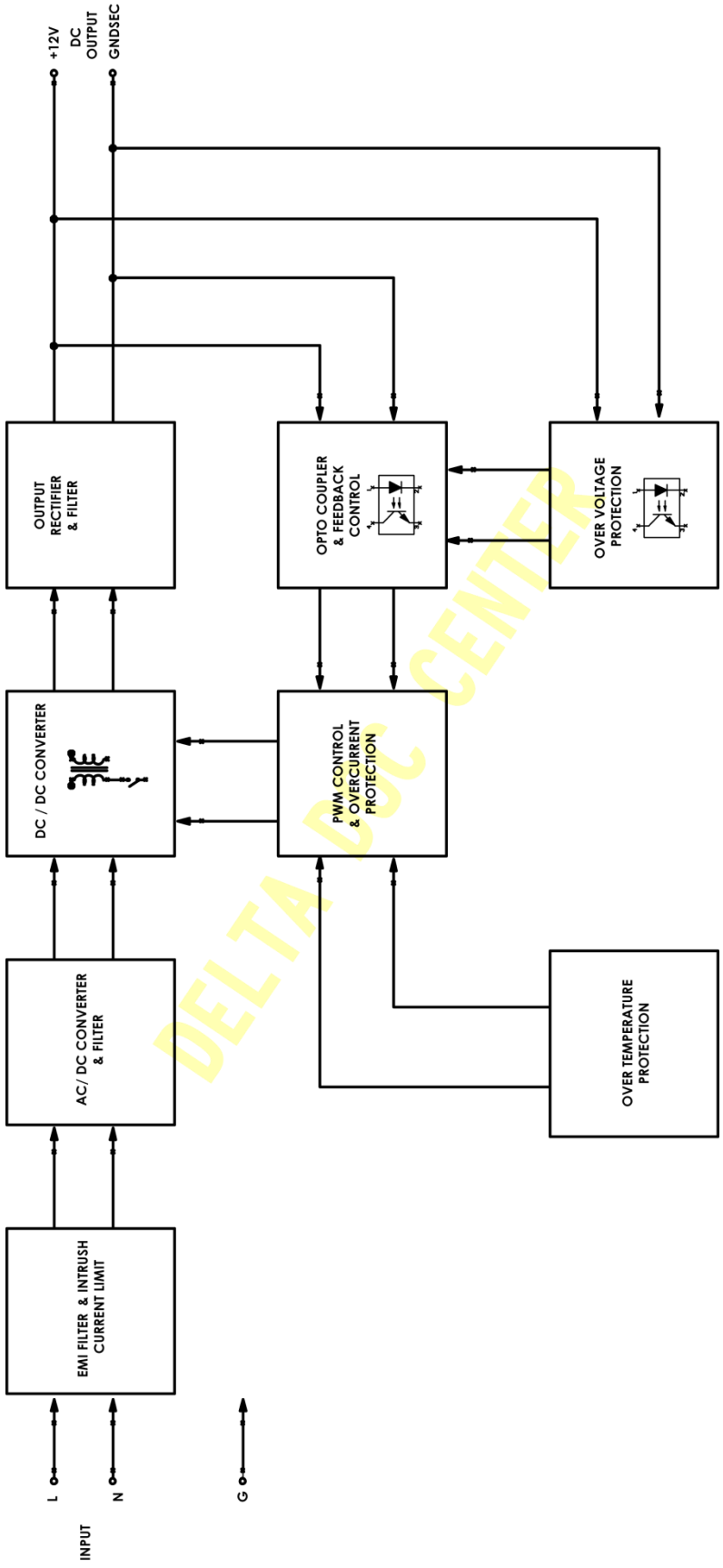
Mechanical Drawing:



MECHANICAL SPECIFICATION	
Dimension	100 mm X 32 mm X 100.6 mm (H x W x D)
Weight	0.20kg
Cooling System	Convection
Input & Output Terminal	Terminal Block with screw M3.5x5 pins (rated 300V/15A)
Output Indicator	Green LED (DC OK)
Casing	Plastics

CliQ DIN Rail Power Supply 12V 30W 1Phase

Block Diagram:



CliQ DIN Rail Power Supply 12V 30W 1Phase

PROTECTION	
Over Voltage Protection	16V +10%/-5%, SELV output, Hicc-up Mode, Non-Latching (Auto recovery).
Over Load, Over Current Protection	> 150% of rated load current, Hicc-up Mode, Non-Latching (Auto recovery).
Over Temperature Protection	< 80°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} (150%) 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. Also in the event of a higher ambient operating condition with 100% load the power supply will run into OTP when the ambient temperature is > 80°C. The protection is self recoverable when activated output voltage bounces until the operating ambient temperature of the power supply is reduced or the power supply is used within its power derating curve.

Over Voltage Protection

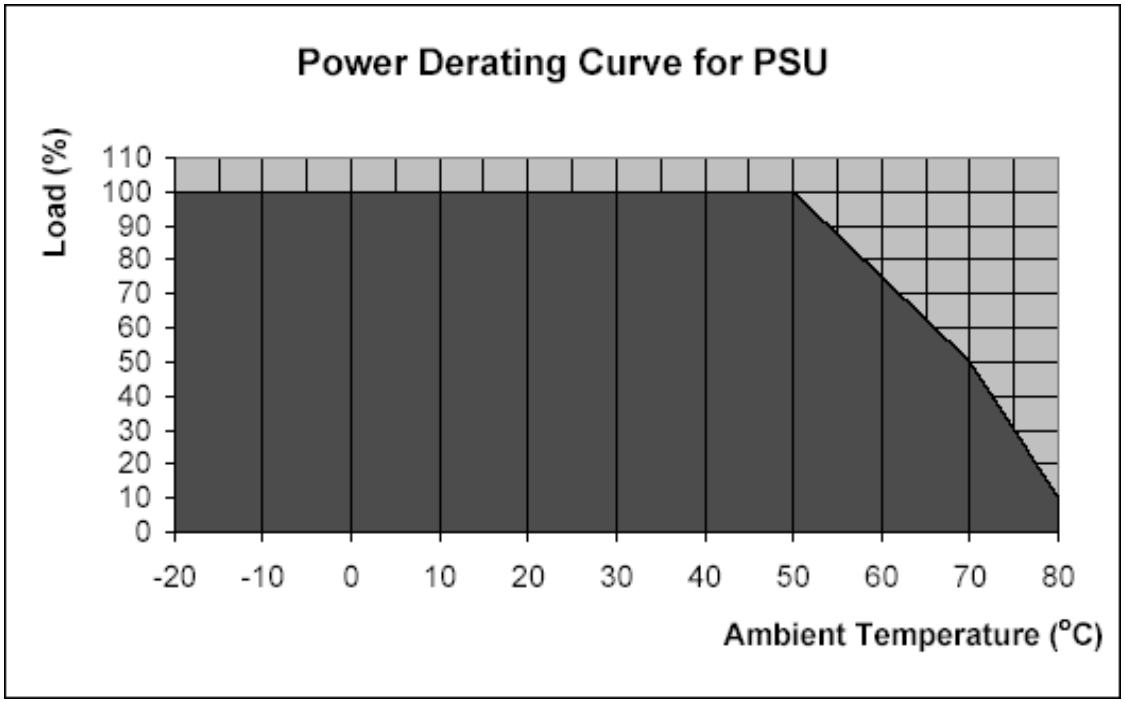
The Power Supply is protected by Over voltage in the event that power supply feedback circuit fails the output voltage will not be >16V +10%/-5%,under any Line/Load and operating ambient conditions. The unique feature about this over voltage protection (OVP) is that power supply doesn't shut down but goes in 2nd level regulation which is 15-16Vdc. The Power supply will continue to deliver the power but due to high output voltage it will be operating > 100% load (16V x 2.5A = 40 Watts) if this condition persists the power supply will sense OTP (Over Temperature Protection) and will go under bouncing mode. The power supply output voltage will recover back to 12Vdc 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

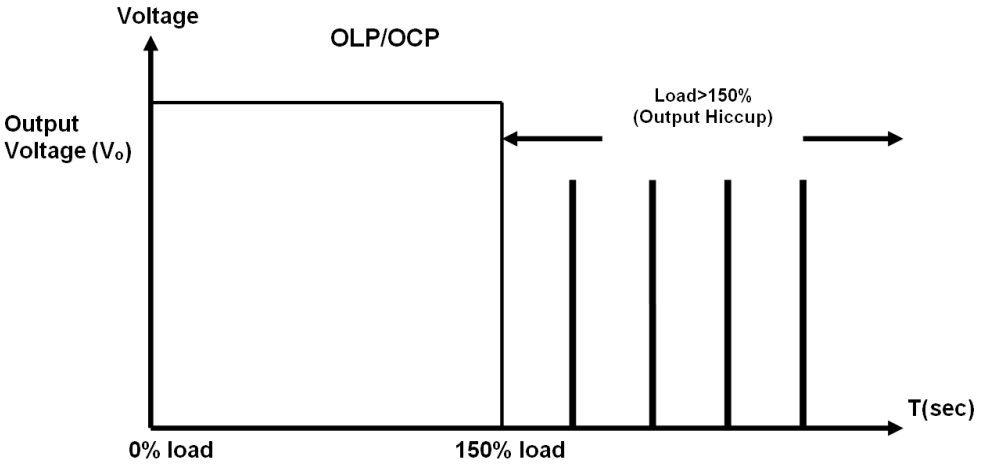
(For both Horizontal and Vertical)



Note

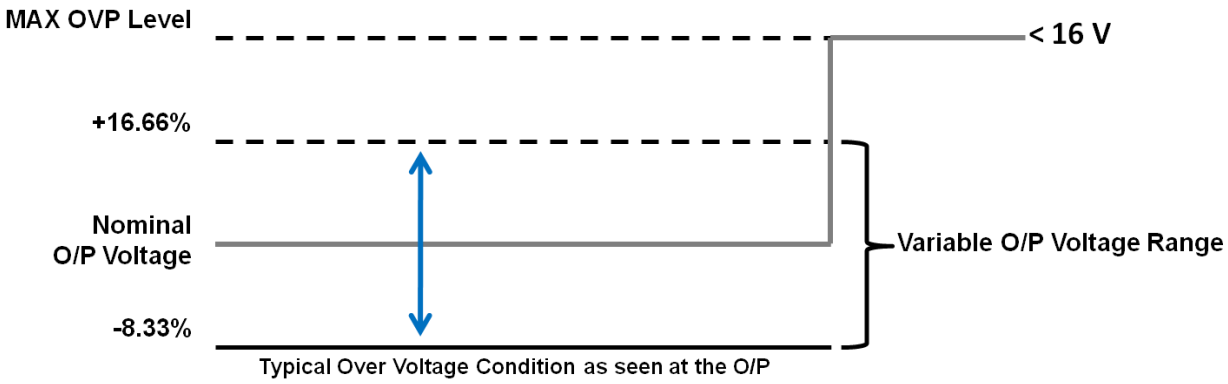
1. Do not use the device in areas outside of the shaded portion shown in the above graph. Internal parts may gradually deteriorate and become damaged.
2. For the power derating refer above graph ambient temperature > 50°C, the output capacity has to be reduced by 2.5% per Kelvin increase in temperature. 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 device has to be mounted in any other direction, please contact your service provider for more details.
4. In order for the device to function in the manner intended, it is also necessary to observe a lateral spacing of 20mm. from other equipments.
5. Depending on the ambient temperature and output capacity of the device, the device housing can be very hot!

Over Load Protection



**Typically the over load current (I_{OL}) is > I_{SURGE} (150%) output voltage will start dropping when the power supply reaches max power limit.*

Over Voltage Protection



**The Power supply will continue to deliver the power but due to high output voltage it will be operating > 100% load (16V x 2.5A = 40 Watts) if this condition persists the power supply will sense OTP (Over Temperature Protection) and will go under bouncing mode. The power supply output voltage will recover back to 12Vdc once the fault condition is removed.*

CliQ DIN Rail Power Supply 12V 30W 1Phase

ENVIRONMENT	
Ambient temperature (Operating)	-20°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	> 300,000 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 below for the Inrush current in a typical Power Supply

Start Up Time

Start-up time is measured from the point AC input is applied to the point output voltage reaches within 90% of its set value. See below for a typical start-up time characteristic.

Rise Time

Rise time is measured from the point output voltage rises from 10% to 90% of its set value. See below for a typical rise time measurement.

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

The 12VDC connection is made using the "+" and "–screw connections. At the time of delivery, the output voltage is 12VDC. The output voltage can be set from 11To14VDC on the potentiometer seen as Adjust on the front panel of each power supply

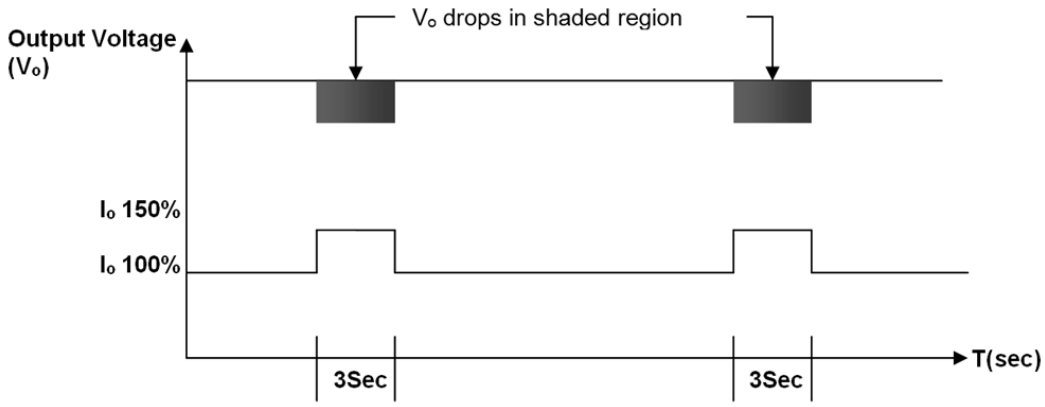
Surge Load

Typical surge load capability of the power supply, the PSU is capable of delivering 3 Sec. of Surge load about 150% of I_O max the output voltage can be out of regulation limits of $\pm$ 5%.

Dynamic Load

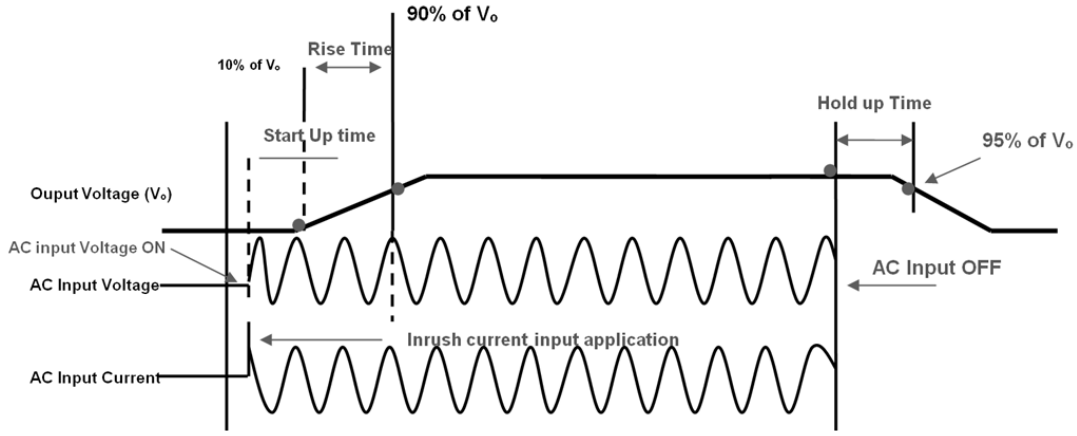
Additionally power supply is capable of dynamic change of load from 0% to 100% with output voltage within $\pm$5% of regulation limits. See below the dynamic behavior of the PSU.

Power Boost 150% for 3 Sec.



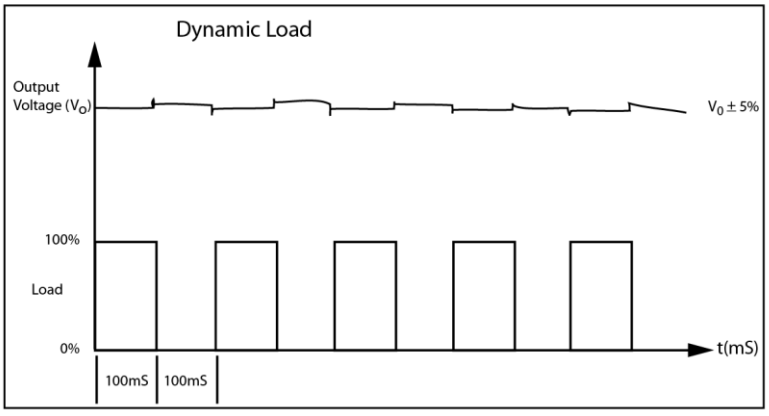
**Surge Load; typical surge load capability of the power supply, the PSU is capable of delivering 3 Sec*

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.*

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 Anode1 to Ground i.e. Voltage Anode1 to Ground of PSU1 and Voltage Anode2 to Ground of PSU2. If the voltages are not the same, follow Step 2. If they are the same, skip to Step 3.

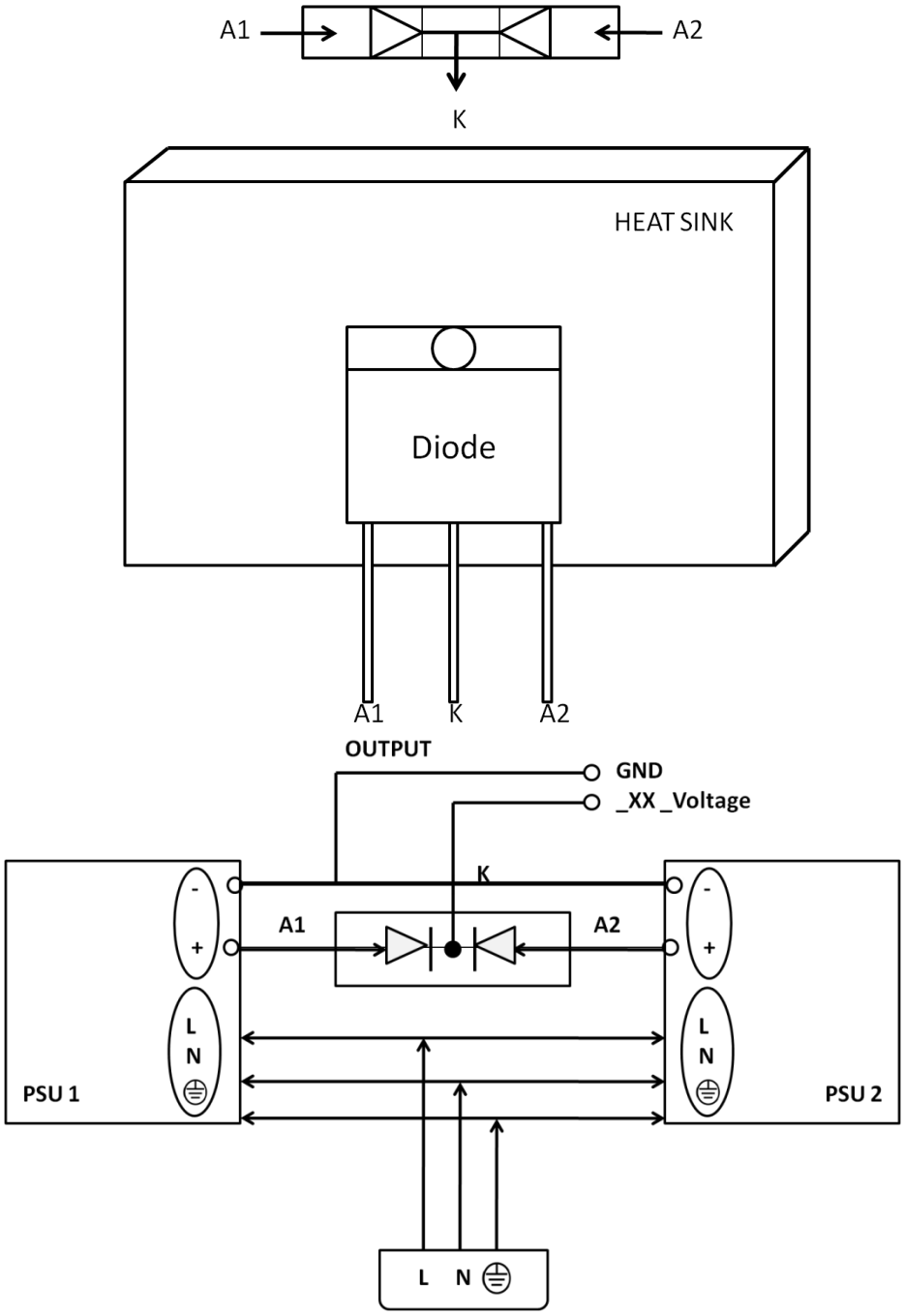
Step2. Adjust the o/p voltages with the help of VR available on the front panel of the PSU marked as ADJUST for both PSU1 and PSU2 at the same level for e.g. if PSU1 o/p is measuring 12.15Vdc and PSU2 is measuring 12.25Vdc adjust the o/p voltage of either PSU1 close to 12.25Vdc or adjust the o/p voltage of PSU2 close to 12.15Vdc

Step3. Connect the Power Supply to the end system load and measure the output voltages from A1 to Ground i.e. Voltage Anode 1 to Ground of PSU1 and Voltage Anode 2 to Ground of PSU2. Ensure that the output voltages are the same even after the 2 Power Supplies are connected to load. If not, adjust them with the VR available on the front panel. A tolerance of +/-25mV would be 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 CliQ 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.*

CliQ DIN Rail Power Supply 12V 30W 1Phase

SAFETY STANDARDS /EMC

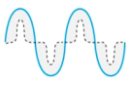
SAFETY STANDARD	IEC60204-1: 1998	
	UL 508	Industrial control equipment
	CE	EMC and Low Voltage directive
	CB	Test certificate and report to IEC60950-1
	IEC/EN/UL 60950-1	Safety of information technology equipment
	IEC 62103:2003/EN 50178	Electronic Equipment in power installations
	TUV Bauart EN60950-1	UL/C-UL recognized to UL60950-1, CSA C22.2 No. 60950-1
	ANS/ ISA	Class 1 Div 2 T4 Hazardous Location (Pending)
	CSA C22.2 No.107	Canadian Standard : CSA C22.2 No.107.1-01 Rectifying equipment, commercial & industrial Power supplies
EMI	CISPR22, EN55022, EN55011, FCC Title 47 : 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 :**	 4.0 KVac/ 1.5 KVac/ 1.5 KVac/	

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

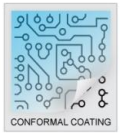
The European directive 2002/95/EC limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome6+, polybrominated flame retardants PBB and PBDE for the use in electrical and electronic equipment. RoHs is the abbreviation for “Restriction of the use of certain hazardous 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.



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 preserve the performance of precision electronic primarily by preventing ionizable contaminants such as salt from reaching circuit nodes where the material slumps around sharp edges can be a problem especially in the highly conversing atmosphere.