TECHNICAL DATASHEET

PMC Panel Mount Power Supply

24 V 150 W 1 Phase / PMC-24V150W1B☐



PMC

Highlights & Features

- Universal AC input voltage range
- Power will not de-rate for the entire input voltage range
- Full corrosion resistant aluminium casing
- High MTBF > 700,000 hrs. as per Telcordia SR-332
- Safety approval according to IEC/UL 60950-1, IEC/EN/UL 62368-1 and EMI to EN/BS EN 55032, Class B
- Also available: IP20 and Front Face connectors

Safety Standards

CB Certified for worldwide use

Model Number: PMC-24V150W1B☐
Unit Weight: 0.54 kg (1.19 lb)
Dimensions (L x W x H): 178 x 97 x 38 mm (7.01 x 3.82 x 1.50 inch)

General Description

Delta's PMC series of panel mount power supply offers a nominal output voltage of 24 V, a wide temperature range from -10°C to 70°C, and a highly dependable minimum hold-up time. The state-of-the-art design is made to withstand harsh industrial environments. What makes the product stand out from the crowd is its lightweight full aluminium body design, which can withstand shock and vibration requirements (in accordance to IEC 60068-2-27 and IEC60068-2-6 respectively). The PMC series also offers overvoltage and overload protections. Using a wide input range design, it is compatible worldwide. 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	Rated Output Voltage	Rated Output Current
PMC-24V150W1B☐	85-264 Vac (125-375 Vdc)	24 Vdc	6.25 A

Model Numbering

PM	C –	24V	150W	1	B	☐
Panel Mount	Product Type C – Enclosed	Output Voltage	Output Power	Single Phase	With PFC	Connector Type A – Terminal Block J – IP20 Connector* L – Front Face*

*Options



A J L

All parameters are specified at 25°C ambient and AC input unless otherwise indicated.
www.DeltaPSU.com (January 2022, Rev. 07)

PMC Panel Mount Power Supply
24 V 150 W 1 Phase / PMC-24V150W1B☐

Specifications

Input Ratings / Characteristics

Nominal Input Voltage		100-240 Vac
Input Voltage Range		85-264 Vac
Nominal Input Frequency		50-60 Hz
Input Frequency Range		47-63 Hz
DC Input Voltage Range*		125-375 Vdc
Input Current		< 1.70 A @ 115 Vac, < 1.00 A @ 230 Vac
Efficiency at 100% Load		> 89% @ 115 Vac, > 91% @ 230 Vac
Max Power Dissipation	0% load	< 0.85 W @ 115 Vac, < 0.75 W @ 230 Vac
	100% load	< 18.5 W @ 115 Vac, < 14.8 W @ 230 Vac
Max Inrush Current (Cold Start)		< 60 A @ 115 Vac, < 120 A @ 230 Vac
Power Factor		> 0.99 @ 115 Vac, > 0.90 @ 230 Vac
Leakage Current		< 1 mA @ 240 Vac

*Fulfills test conditions for DC input. Safety approval for DC input can be obtained upon request.

Output Ratings / Characteristics**

Nominal Output Voltage	24 Vdc
Factory Set Point Tolerance	24 Vdc ± 2%
Output Voltage Adjustment Range	22-28 Vdc
Output Current	6.25 A (150W max.)
Output Power	150 W
Line Regulation	< 0.5% (@ 85-264 Vac input, 100% load)
Load Regulation	< 1.0% (@ 85-264 Vac input, 0-100% load)
PARD*** (20MHz)	< 100 mVpp
Rise Time	< 30 ms @ nominal input (100% load)
Start-up Time	< 3000 ms @ nominal input (100% load)
Hold-up Time	> 30 ms @ 115 Vac & 230 Vac (100% load)
Dynamic Response (Overshoot & Undershoot O/P Voltage)	± 5% @ 85-264 Vac input, 0-100% load (Slew Rate: 0.1 A/μs, 50% duty cycle @ 5 Hz)
Start-up with Capacitive Loads	8,000 μF Max

**For power de-rating from 50°C to 70°C, see power de-rating on page 3.
***PARD is measured with an AC coupling mode, 5cm wires, and in parallel with 0.1 μF ceramic capacitor & 47 μF electrolytic capacitor.

PMC Panel Mount Power Supply

24 V 150 W 1 Phase / PMC-24V150W1B☐

Mechanical

Case Chassis / Cover		Aluminium
Dimensions (L x W x H)		178 x 97 x 38 mm (7.01 x 3.82 x 1.50 inch)
Unit Weight		0.54 kg (1.19 lb)
Indicator	Green LED	DC OK
Cooling System		Convection
Terminal	PMC-24V150W1BA	M3.5 x 7 Pins (Rated 300V/15A)
	PMC-24V150W1BJ	M3.5 x 7 Pins (Rated 300V/20A)
	PMC-24V150W1BL	M3.5 x 7 Pins (Rated 300V/20A)
Wire		Refer to page 7
Noise (1 Meter from power supply)		Sound Pressure Level (SPL) < 40dBA

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		5 to 95% RH (Non-Condensing)
Operating Altitude		5,000 Meters (16,400 ft.)
Shock Test	Non-Operating	IEC 60068-2-27, 30 G (300 m/S²) for a duration of 18 ms, 3 times per direction, 18 times in total
Vibration	Non-Operating	IEC 60068-2-6, 10 Hz to 150 Hz @ 50m/S² (5 G peak); 90 min per axis for all X, Y, Z direction
Bump Test	Operating	IEC 60068-2-29, 10 G (100 m/S²) for a duration of 11 ms, 1000 times per direction, 6000 times in total direction
Over Voltage Category		II
Pollution Degree		2

Protections

Overvoltage	< 32V ±10%, SELV Output, Hiccup Mode, Non-Latching (Auto-Recovery)
Overload / Overcurrent	> 120% of rated load current, Hiccup Mode, Non-Latching (Auto-Recovery)
Over Temperature	< 75°C Surrounding Air Temperature @ 100% load, Non-Latching (Auto-Recovery)
Short Circuit	Hiccup Mode, Non-Latching (Auto-Recovery when the fault is removed)
Internal Fuse at L pin	T4AH
Degree of Protection	IP20 (PMC-24V150W1BJ)
Protection Against Shock	Class I with PE* connection

*PE: Primary Earth

PMC Panel Mount Power Supply
24 V 150 W 1 Phase / PMC-24V150W1B☐

Reliability Data

MTBF	> 700,000 hrs. as per Telcordia SR-332 I/P: 115 Vac, O/P: 100% load, Ta: 25°C
Expected Cap Life Time	10 years (115 Vac & 230 Vac, 50% load @ 40°C)

Safety Standards / Directives

Safety Entry Low Voltage		SELV (IEC 60950-1)
Electrical Safety	SIQ Bauart	EN 62368-1
	UL/cUL recognized	UL 60950-1 and CSA C22.2 No. 60950-1 (File No. E191395) UL 62368-1 and CSA C22.2 No. 62368-1 (File No. E191395)
	CB Scheme	IEC 60950-1, IEC 62368-1
	UKCA	BS EN 62368-1
CCC		GB9254, GB17625.1 and GB4943.1
KC		K60950-1
CE		In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU
UKCA		In conformance with Electrical Equipment (Safety) Regulations 2016 No. 1011 and The Electromagnetic Compatibility Regulations 2016 No. 1091
Galvanic Isolation	Input to Output	3.0 KVac
	Input to Ground	1.5 KVac
	Output to Ground	0.5 KVac

PMC Panel Mount Power Supply

24 V 150 W 1 Phase / PMC-24V150W1B☐

EMC

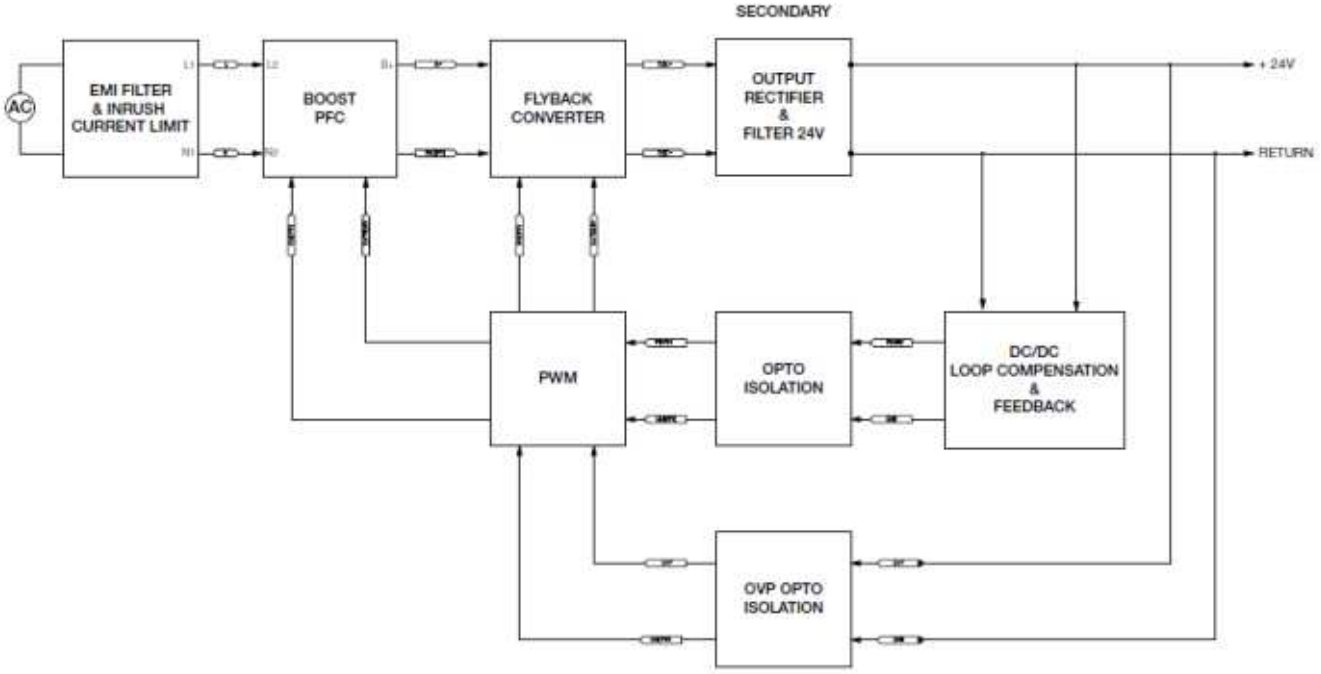
Emissions (CE & RE)		Generic Standards: CISPR 32, EN/BS EN 55032, KN 32 FCC Title 47: Class B, GB9254		
Immunity		Generic Standard: EN/BS EN 55024, KN 35		
Electrostatic Discharge	IEC 61000-4-2	Level 4 Criteria A[1)] Air Discharge: 15 kV Contact Discharge: 8 kV		
Radiated Field	IEC 61000-4-3	Level 3 Criteria A[1)] 80 MHz-1 GHz, 10 V/M with 1 kHz tone / 80% modulation		
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 3 Criteria A[1)] 2 kV		
Surge	IEC 61000-4-5	Level 3 Criteria A[1)] Common Mode[2)]: 2 kV Differential Mode[3)]: 1 kV		
Conducted	IEC 61000-4-6	Level 3 Criteria A[1)] 150 kHz-80 MHz, 10 Vrms		
Power Frequency Magnetic Fields	IEC 61000-4-8	Criteria A[1)] 10 A/Meter		
Voltage Dips and Interruptions	IEC 61000-4-11	100% dip; 1 cycle (20 ms); Self Recoverable		
Low Energy Pulse Test (Ring Wave)	IEC 61000-4-12	Level 3 Criteria A[1)] Common Mode[2)]: 2 kV Differential Mode[3)]: 1 kV		
Harmonic Current Emission		IEC/EN/BS EN 61000-3-2, Class A; GB17625.1		
Voltage Fluctuation and Flicker		IEC/EN/BS EN 61000-3-3		
Voltage Sag Immunity SEMI F47 – 0706		80% of 200 Vac 70% of 200 Vac 50% of 200 Vac	160 Vac, 1000 ms 140 Vac, 500 ms 100 Vac, 200 ms	Criteria A[1)] Criteria A[1)] Criteria A[1)]

1) Criteria A: Normal performance within the specification limits
2) Asymmetrical: Common mode (Line to earth)
3) Symmetrical: Differential mode (Line to line)

PMC Panel Mount Power Supply

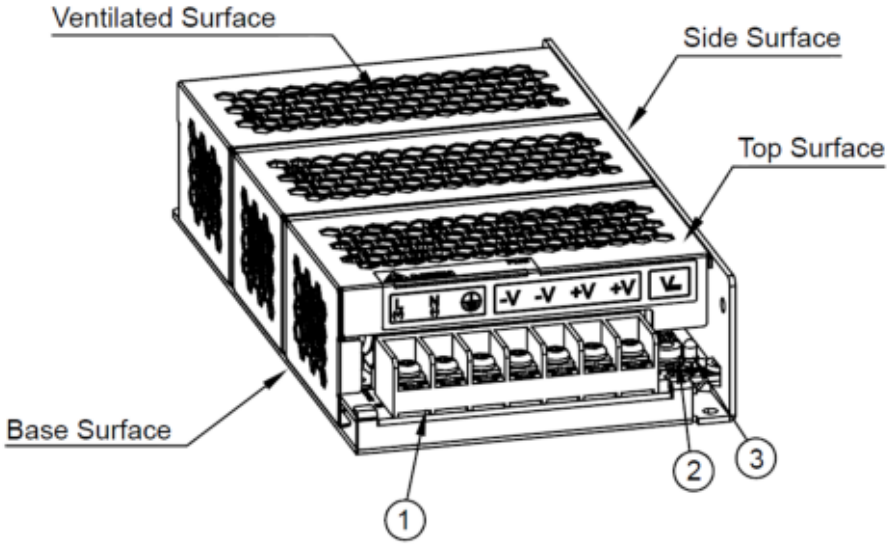
24 V 150 W 1 Phase / PMC-24V150W1B☐

Block Diagram

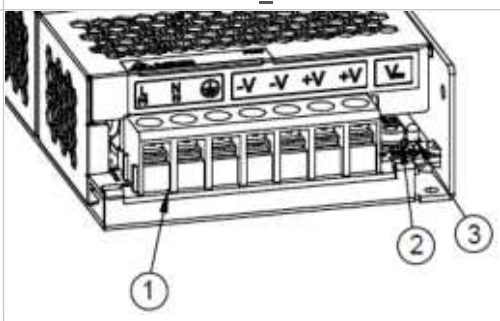


Device Description

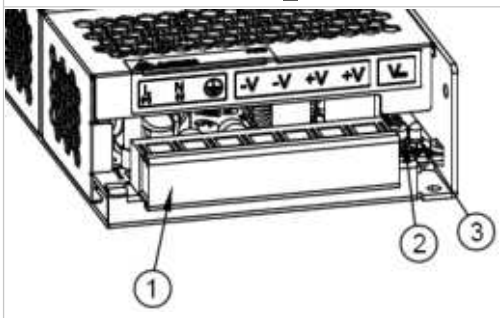
PMC-24V150W1BA: Terminal Block



PMC-24V150W1BJ: IP20 Connector



PMC-24V150W1BL: Front Face



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

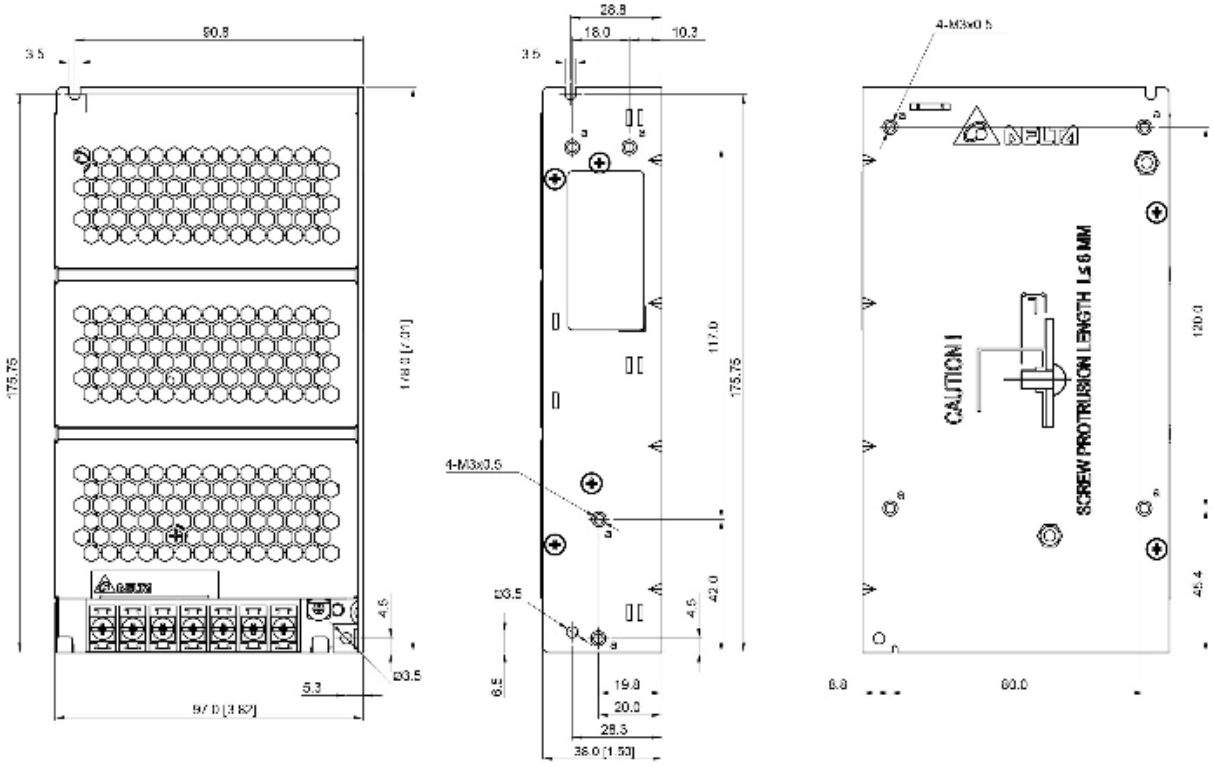
PMC Panel Mount Power Supply

24 V 150 W 1 Phase / PMC-24V150W1B☐

Dimensions

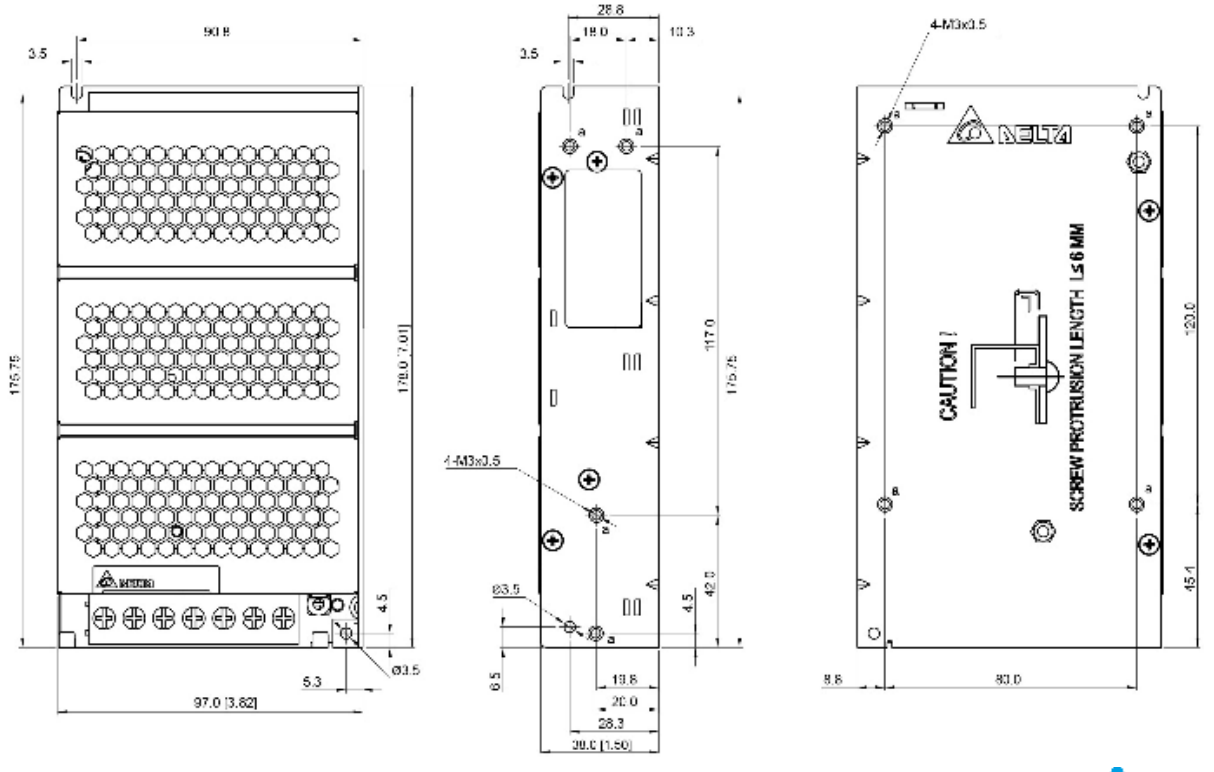
- **PMC-24V150W1BA:** Terminal Block

  L x W x H: 178 x 97 x 38 mm (7.01 x 3.82 x 1.50 inch)



- **PMC-24V150W1BJ:** IP20 Connector

  L x W x H: 178 x 97 x 38 mm (7.01 x 3.82 x 1.50 inch)



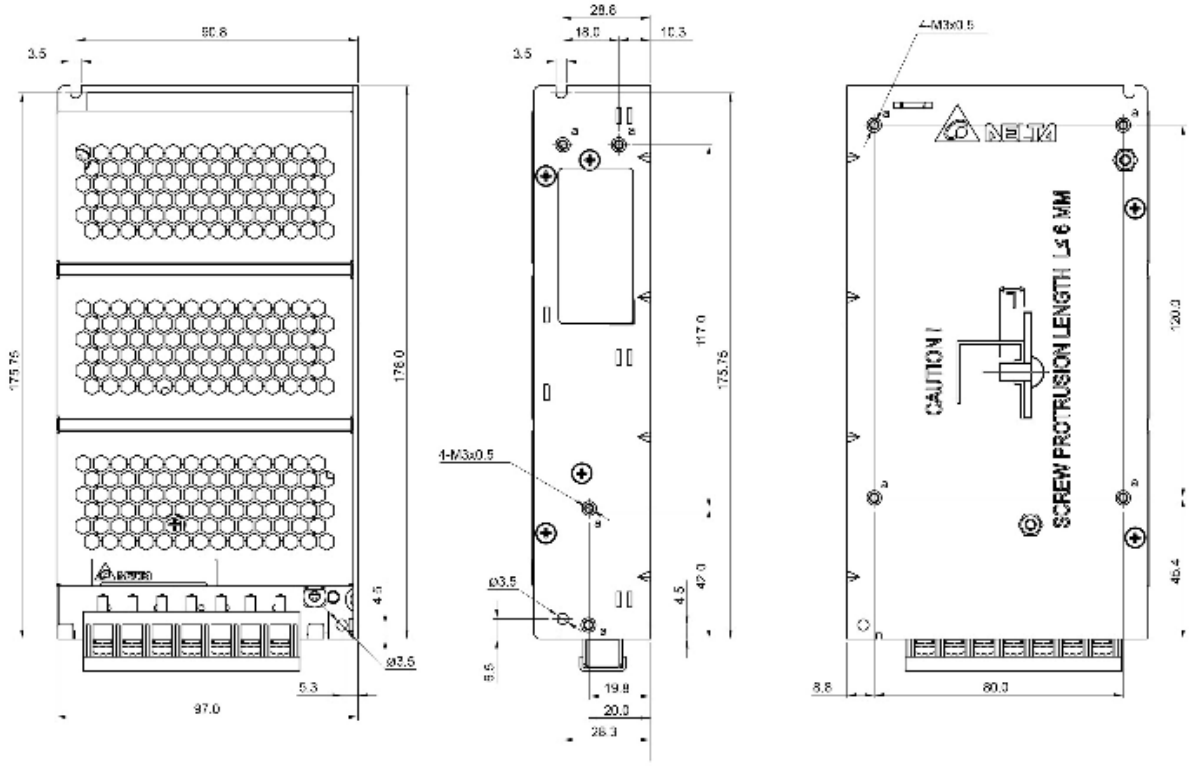
All parameters are specified at 25°C ambient and AC input unless otherwise indicated.
www.DeltaPSU.com (January 2022, Rev. 07)

PMC Panel Mount Power Supply

24 V 150 W 1 Phase / PMC-24V150W1B☐

■ **PMC-24V150W1BL:** Front Face

L x W x H: 178 x 97 x 38 mm (7.01 x 3.82 x 1.50 inch)



Engineering Data

Output Load De-rating VS Surrounding Air Temperature

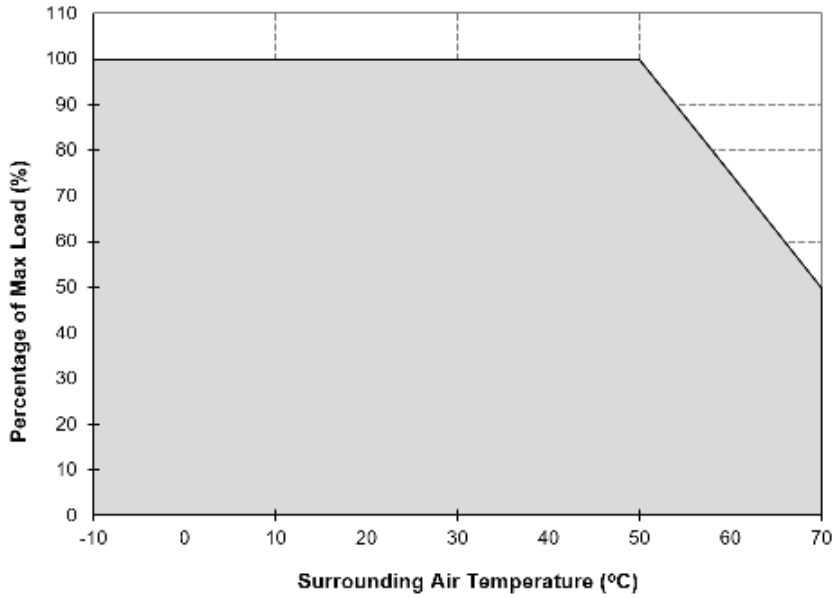


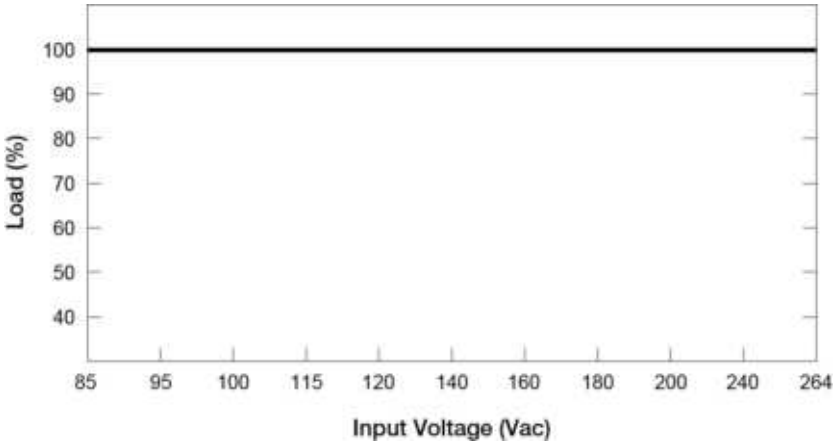
Fig. 1 De-rating for Vertical and Horizontal Mounting Orientation
> 50°C de-rate power by 2.5% / °C

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 exceeds its specification as defined on Page 3 under “Environment”, 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 as recommended in the safety instructions 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 contact **info@deltapsu.com** for more details.

PMC Panel Mount Power Supply
24 V 150 W 1 Phase / PMC-24V150W1B☐

Output Load De-rating VS Input Voltage



- No output power de-rating across the entire input voltage range

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 5 mm (0.20 inch) length.
Ⓑ This surface belongs to customer's end system or panel where the power supply is mounted.
Ⓒ Connector

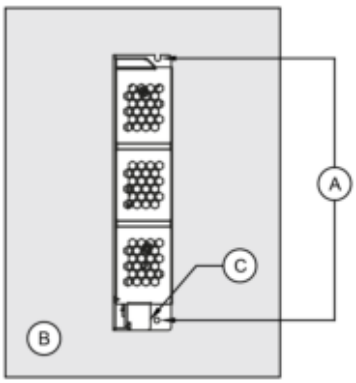
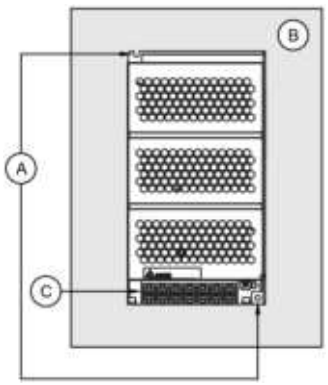
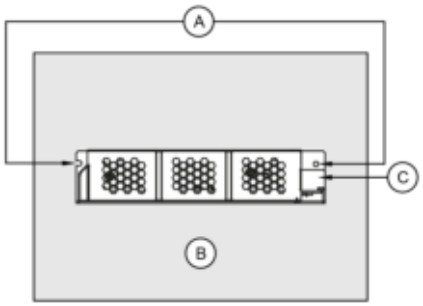
Side Mounting (Vertical)	Base Mounting (Vertical)	Side Mounting (Horizontal)
		

Fig. 2 Recommended Mounting Orientations

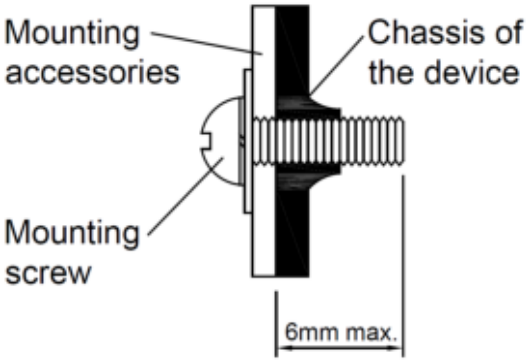
- Use flexible cable (stranded or solid) with the following sizes:

PMC-24V150W1BA	PMC-24V150W1BJ	PMC-24V150W1BL
AWG 20-14	AWG 20-12	AWG 20-12

- The torque at the Connector shall not exceed 13 Kgf.cm (11.23 lb.in). The insulation stripping length should not exceed 0.275" or 7 mm.

PMC Panel Mount Power Supply
24 V 150 W 1 Phase / PMC-24V150W1B☐

Installation of Mounting Accessories



- Only use M3 screw ≤ 6 mm (0.23 inch) through the base mounting holes. This is to keep a safety distance between the screw and internal components.
- Recommended mounting tightening torque: 4~8 Kgf.cm (3.47~6.94 lbf.in).

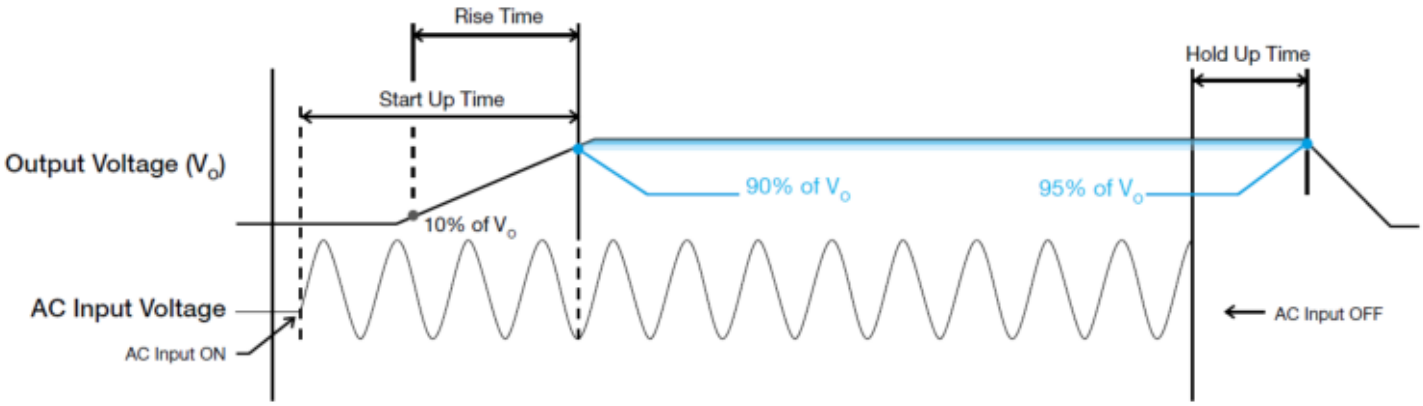
Safety Instructions

- To ensure sufficient convection cooling, always maintain a safety distance of ≥ 20 mm (0.78 inch) from all ventilated surfaces while the device is in operation.
- The device is not recommended to be placed on surface with low thermal conductivity, such as plastics, for example.
- 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
24 V 150 W 1 Phase / PMC-24V150W1B☐

Functions

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



Start-up Time

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

Rise Time

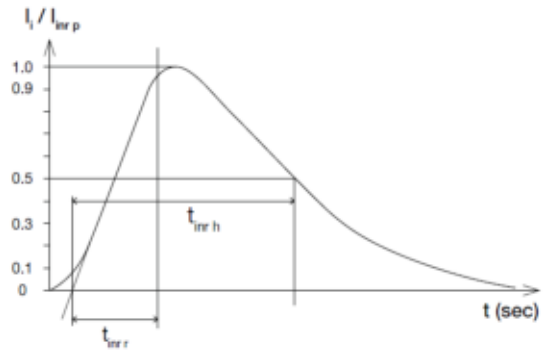
The time required for the output voltage to change from 10% to 90% of its final steady state set value.

Hold-up Time

Time between the collapse of the AC input voltage, and the output falling to 95% of its steady state set value.

Inrush Current

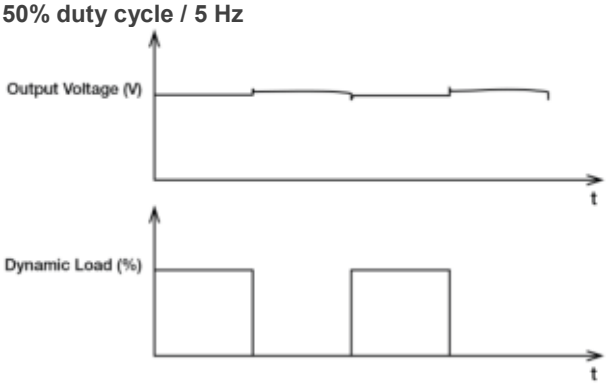
Inrush current is the peak, instantaneous, input current measured and, occurs when the input voltage is first applied. For AC input voltages, the maximum peak value of inrush current will occur during the first half cycle of the applied AC voltage. This peak value decreases exponentially during subsequent 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 5% to 100% of its rated current.

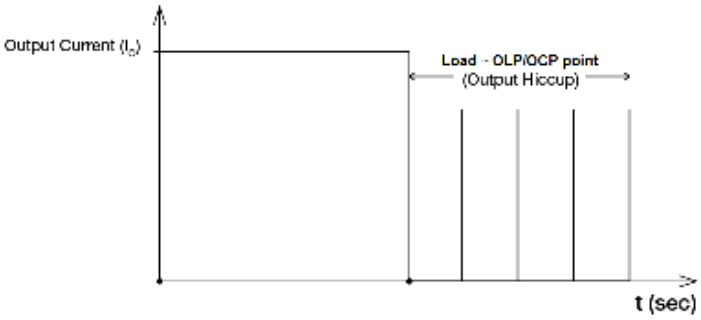
■ **50% duty cycle / 5 Hz**



PMC Panel Mount Power Supply
24 V 150 W 1 Phase / PMC-24V150W1B☐

Overload & Overcurrent Protections (Auto-Recovery)

The power supply's Overload (OLP) and Overcurrent (OCP) Protections will be activated when output current (I_O) exceeds its specification as defined on Page 3 under "Protections". In such occurrence, the output voltage (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.



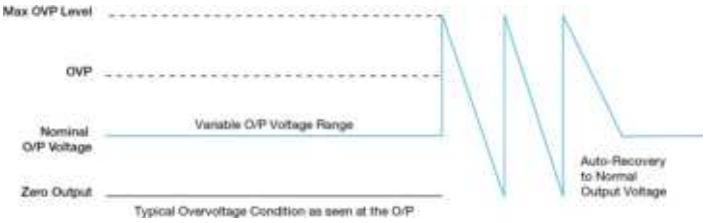
It is not recommended to prolong the duration of I_O when it is less than OLP/OCP point, but greater than 100%, since it may cause damage to the PSU.

Short Circuit Protection (Auto-Recovery)

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 (Auto-Recovery)

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 (Auto-Recovery)

As described in load de-rating section, 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
24 V 150 W 1 Phase / PMC-24V150W1B☐

Operating Mode

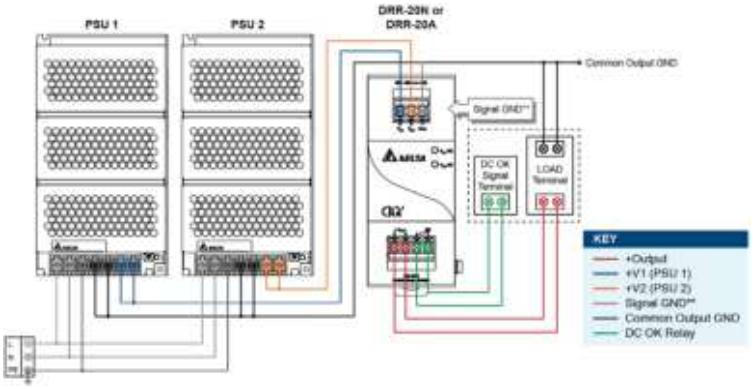
■ Redundant Operation

In order to ensure proper redundant operation for the power supply unit (PSU), the output voltage difference between the two units must be kept at 0.45~0.50 V for 24 V supplies. Follow simple steps given below to set them up for the redundant operation:

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, individually connect the power supply to 50% of rated load at any line voltage from 85-264 Vac, and set the PSU 1 and PSU 2 output voltage.

Step 2.
Connect the power supply units PSU 1 and PSU 2 to Vin 1 & Vin 2, respectively, of the DRR-20N (or 20 A) module shown on the diagram on the right.

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).



**The Signal GND in the DRR module is for the built-in LED and DC OK signals. The Output GND terminals from the two PSU's do not need to be connected to the Signal GND terminal.

Fig. 3 Redundant Operation Connection Diagram

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

■ Parallel Operation

The power supply units (PSUs) can also be used for parallel operation in order to increase the output power. The difference in output voltage between the two units must be kept to within 25 mV of each other. This difference must be verified with the same output load connected independently to each unit.

Parameters such as EMI, inrush current, leakage current, PARD, start up time will be different from those on the datasheet, when two units are connected in parallel. The user will need to verify that any differences will still allow the two power supplies connected in parallel will work properly in their product/application.

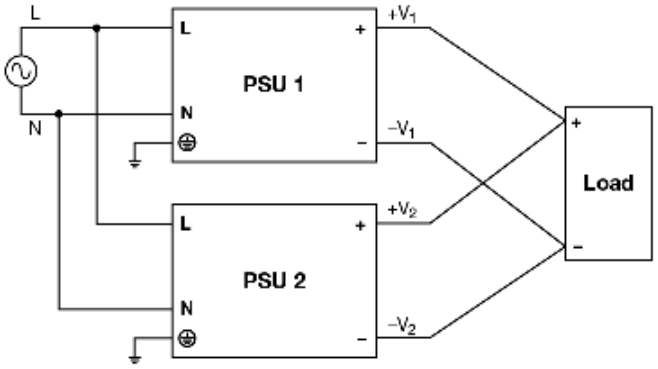


Fig. 4 Parallel Operation Connection Diagram

All parameters are specified at 25°C ambient and AC input unless otherwise indicated.

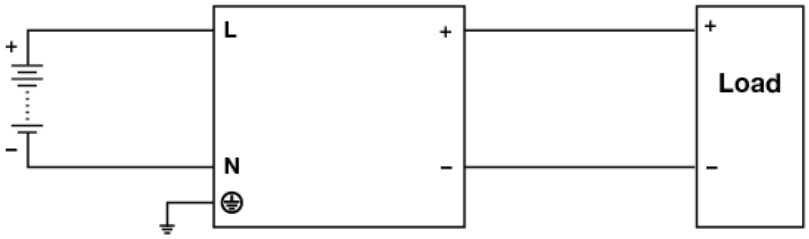


Fig. 5 DC Input Operation Connection Diagram

■ DC Input Operation

Step 1.
Use a battery or similar DC source.

Step 2.
Connect +pole to L and -pole to N.

Step 3.
Connect the PE terminal to an earth wire or to the machine ground.

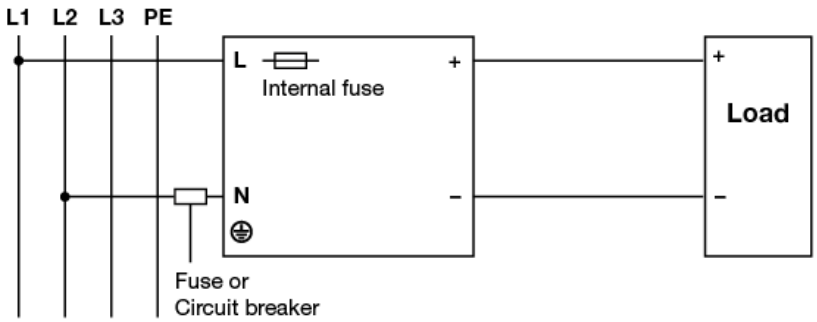


Fig. 6 2 of 3 Phase System Input Operation Connection Diagram

■ 2 of 3 Phase System Input Operation

Delta's PMC can use on 2 of 3 phase system. Please refer to the following step.

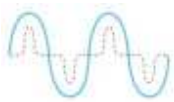
Step 1.
The input voltage applied from Line to Neutral is below the maximum rated input. The input voltage shall be below 240 Vac +10%.

Step 2.
The external protector is needed on N (Neutral) input line to secure a safety. N line does not have internal fuse protection. An appropriate fuse or circuit breaker should be connected in series with N input line connection like the following.

PMC Panel Mount Power Supply
24 V 150 W 1 Phase / PMC-24V150W1B☐

Others

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.

Attention

Delta provides all information in the datasheets on an “AS IS” basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to **www.DeltaPSU.com** for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

Delta reserves the right to make changes to the information described in the datasheets without notice.

Manufacturer and Authorized Representatives Information

Manufacturer

Thailand
Delta Electronics (Thailand) PCL.
909 Pattana 1 Rd., Muang, Samutprakarn, 10280 Thailand

Taiwan
Delta Electronics, Inc.
3 Tungyuan Road, Chungli Industrial Zone, Taoyuan County 32063, Taiwan

Authorized Representatives

The Netherlands
Delta Greentech (Netherlands) B.V.
Zandsteen 15, 2132 MZ Hoofddorp, The Netherlands

United Kingdom
Delta Electronics Europe Limited
1 Redwood Court, Peel Park Campus,
East Kilbride, Glasgow, G74 5PF, United Kingdom