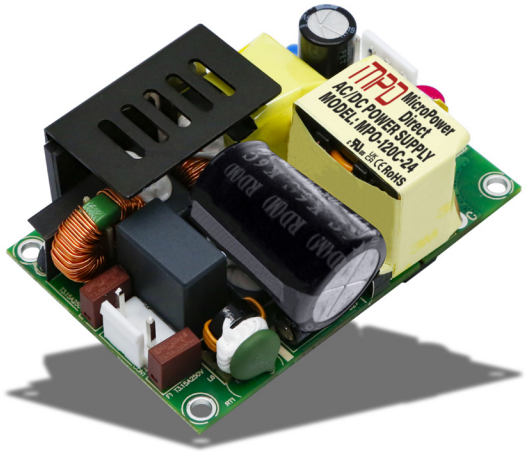
MPO-120C

Compact, Open Frame 120W, Industrial/Medical AC/DC Power Supplies



Key Features:

- 120W Output Power
- Miniature 3" x 2" Size
- 4 kV I/O Isolation
- UL 60601 Approval
- UL 62368 Approval
- Insulation 2 x MOPP
- Suitable For BF Apps
- Meets EN 55032 B
- Meets EN 60335
- Meets EN 61558
- <0.1mA Leakage Current
- -40° to +85°C Operation
- Active PFC

Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

Parameter	Conditions		Min.	Typ.	Max.	Units
Input Voltage Range			85		264	VAC
			120		370	VDC
Input Frequency			47		60	Hz
Input Current	See Model Selection Guide					
Leakage Current		240 VAC	<0.1 mA; Single Fault<0.5 mA			
Inrush Current, Cold Start		115 VAC		40		A Pk
		230 VAC		75		
Power Factor	Full Load	115 VAC	0.98			
		230 VAC	0.94			

Output

Parameter	Conditions		Min.	Typ.	Max.	Units
Output Voltage Accuracy		12V, 15V Output		±2.0		%
		All Other Outputs		±1.0		
Line Regulation		At Rated Load		±0.5		%
Load Regulation		0 - 100% Load		±1.0		%
Ripple & Noise (20 MHz), See Note 1		12V, 15V Output			120	mV
		19V, 24V, 27V Outputs			150	
		36V, 48V, 54V Outputs			200	
Hold-Up Time		230 VAC, 25°C	15			mSec
Temperature Coefficient				±0.03		%/°C
Temperature Derating	Air Cooling	+50°C to +85°C	2.0			%/°C
	10CFM	+55 to +85°C	2.0			
		40°C to -30°C	2.0			
Input Voltage Derating	Air Cooling	85 - 115 VAC	1.0			%/VAC
	10CFM	85 - 100 VAC	2.0			
Standby Power Consumption				0.50		W
Over Temperature Protection	See Note 2					
Over Current Protection		Self Recovery	130			%IOUT
Short Circuit Protection, See Note 3	Continuous (Autorecovery)					

General

Parameter	Conditions		Min.	Typ.	Max.	Units
Isolation Voltage, See Note 4		Input to Output	4,000			VAC
		Input to Ground	1,500			
		Output to Ground	1,500			
Insulation Resistance, See Note 5			100			MΩ
Isolation Level		Input to Output	2 x MOPP			
		Input to Ground	1 x MOPP			
		Output to Ground	1 x MOPP			

EMI See Page 2

Environmental

Parameter	Conditions		Min.	Typ.	Max.	Units
Operating Temperature Range		Ambient	-40		+85	°C
Storage Temperature Range			-40		+85	°C
Cooling	Free Air Convection (See Derating Curves)					
Humidity, RH, Non-condensing		Storage	10		95	%
		Operating	20		90	

Physical

Size	3.00 x 2.00 x 1.22 in. (See Mechanical Drawing on Page 4)	
Weight	Open Frame	4.41 oz (125g) (See Mechanical Drawing on Page 4)
	Case	6.34 oz (180g) (See Mechanical Drawing on Page 5)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	300			kHours
Safety Standards, See Note 6	UL/cUL 60601-1 recognition (UL certificate)				
	UL/cUL 62368-1 recognition (UL certificate)				
	EN60335				
Safety Class	Class I (with PE connected), Class II (without PE)				

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MICROPOWER DIRECT

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Model Selection Guide

Model Number	Input		Output						Over Voltage Protection (VDC) See Note 7	Max Output Capacitance (µF)	Efficiency (%, Typ)
	Current (A)		Voltage (VDC)	Adjust Range (VDC)	Current (A)		Power (W)	Transient Power (W) See Note 7			
	115 VAC	230 VAC			Rated	% Min.					
MPO-120C-12	2.0	1.0	12.0	11.4 - 12.6	9.50	0.00	114.0	141.6	16.0	6,000	94
MPO-120C-15	2.0	1.0	15.0	14.3 - 15.8	7.60	0.00	114.0	142.5	25.0	5,000	94
MPO-120C-19	2.0	1.0	19.0	17.3 - 19.8	6.30	0.00	119.7	149.0	25.0	4,500	93
MPO-120C-24	2.0	1.0	24.0	22.8 - 25.2	5.00	0.00	120.0	150.0	32.0	3,200	95
MPO-120C-27	2.0	1.0	27.0	25.6 - 28.4	4.44	0.00	119.9	149.8	35.0	2,400	95
MPO-120C-36	2.0	1.0	36.0	35.3 - 37.8	3.33	0.00	120.0	149.7	50.0	2,000	94
MPO-120C-48	2.0	1.0	48.0	45.6 - 50.4	2.50	0.00	120.0	150.0	60.0	1,600	94
MPO-120C-54	2.0	1.0	54.0	51.3 - 55.5	2.22	0.00	120.0	149.6	60.0	1,300	94

Notes:

1. Output ripple is measured at 20 MHz bandwidth using 0.1 µF and 10 µF capacitors connected in parallel as close to the power supply terminals as possible.
2. After an overtemperature fault, the output voltage is turned off. When the temperature returns to normal, re-power the unit to return to normal operation.
3. Output short circuit protection is provided by a "hiccup mode" circuit. The unit recovers <3 seconds after the fault condition is removed.
4. Input-output, input-ground and output-ground isolation are tested for 60 seconds with a leakage current of <10 mA.
5. Insulation resistance is for input-output, input-ground, and output-ground. It is tested at an ambient temperature of 25ºC ± 5ºC, at a relative humidity of <70%RH (no condensation) with a test voltage of 500 VDC.
6. Transient power is specified for a period of 10S. The unit cannot exceed the transient power limit.
7. After an overvoltage fault, the unit power must be recycled for the unit to recover.
8. All units include an on-board slow blow fuse.

The **MPO-120C** is also available with a compact metal case. Contact the factory for more information (not available for the MPO-120C-19). (Example **MPO-120C-12-C**)

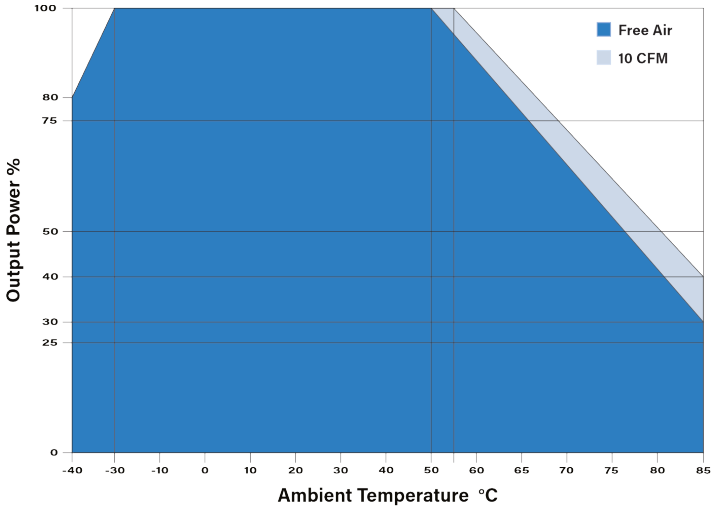
EMC Characteristics

Parameter	Conditions	Criteria	Level
Conducted Emissions	EN 55032		Class B
Radiated Emissions	EN 55032		Class B (Category I)
			Class A (Category II)
Harmonic Current	EN 61000-3-2		Class A & Class D
Voltage Flicker	EN 61000-3-3		
ESD	EN 61000-4-2	A	±15 kV Air
			±8 kV Contact
RS	EN 61000-4-3	A	10V/m
EFT	EN 61000-4-4	A	±2 kV
Surge	EN 61000-4-5	A	±2 kV Line to Line
			±4 kV Line to Gnd
CS	EN 61000-4-6	A	10V rms
Dips	EN 61000-4-11	B	0%, 70%

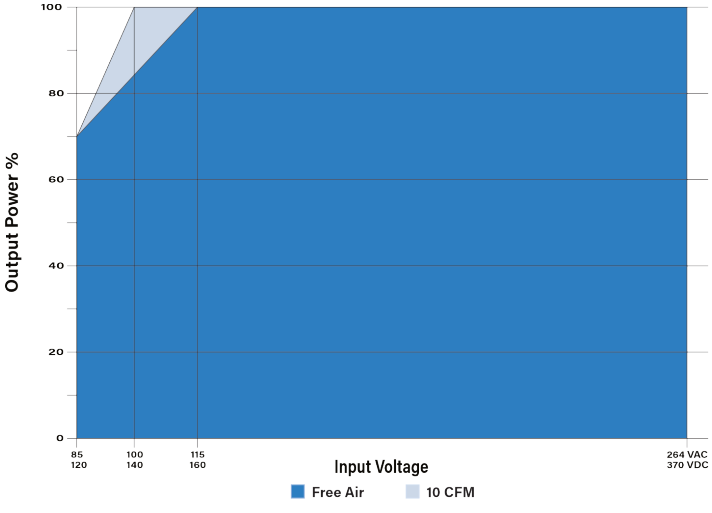
Notes:

1. All EMC tests are conducted on a metal plate measuring 360 x 360 mm with a thickness of 1mm. Contact the factory for more information.

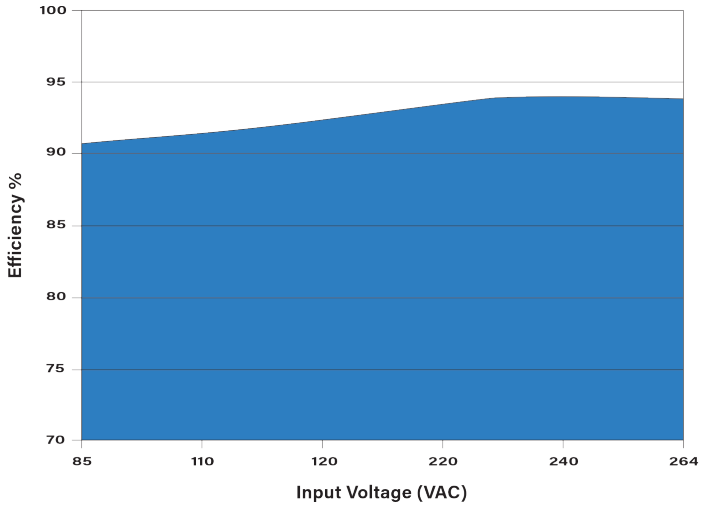
Temperature Derating



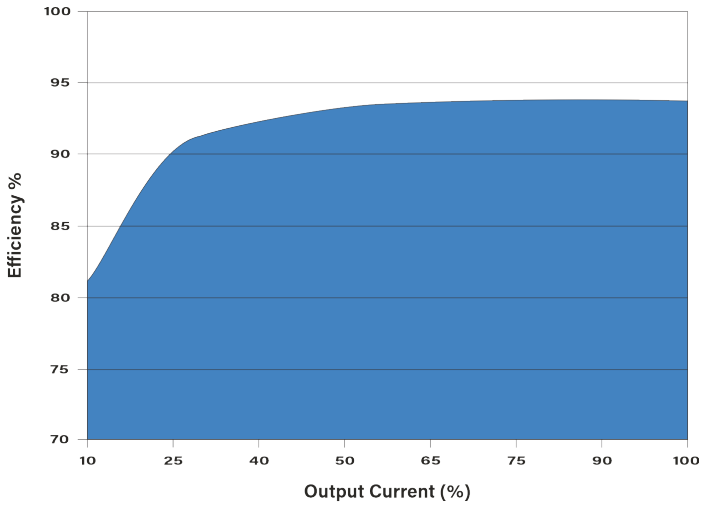
Input Voltage Derating



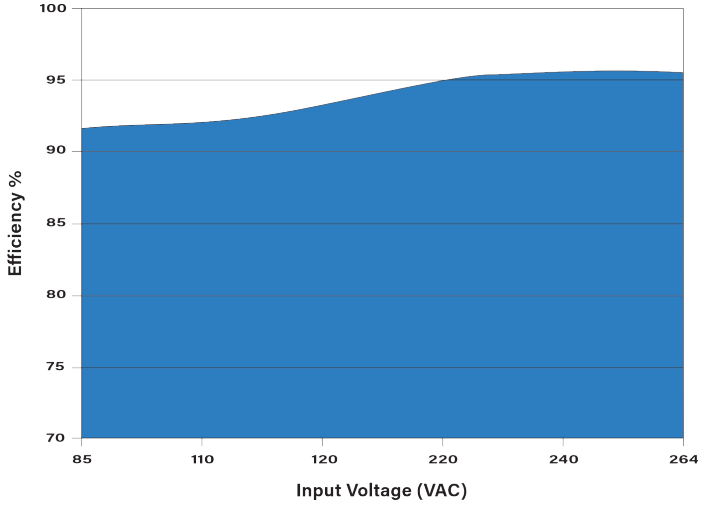
Efficiency vs Input Voltage: 12 VOUT



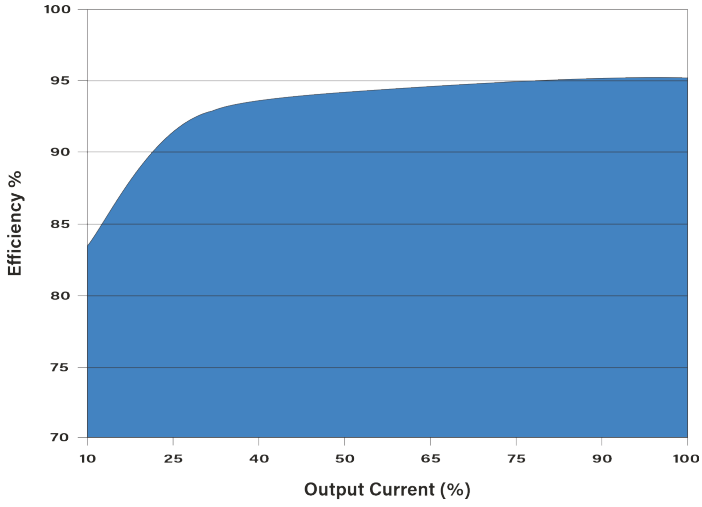
Efficiency vs Output Load: 12 VOUT



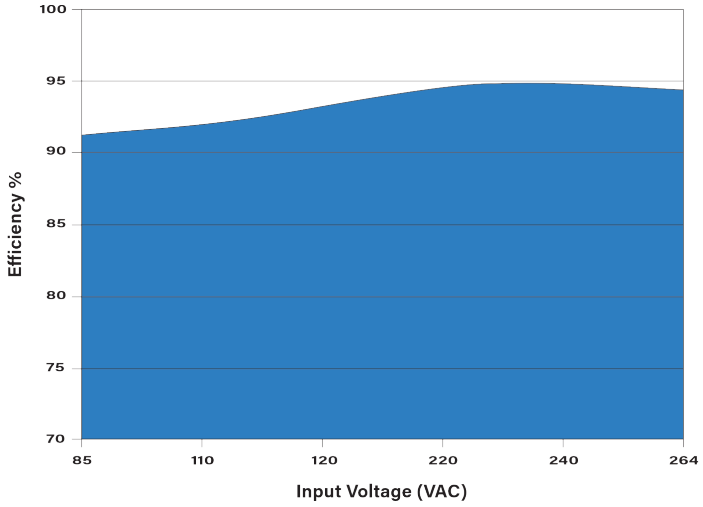
Efficiency vs Input Voltage: 24 VOUT



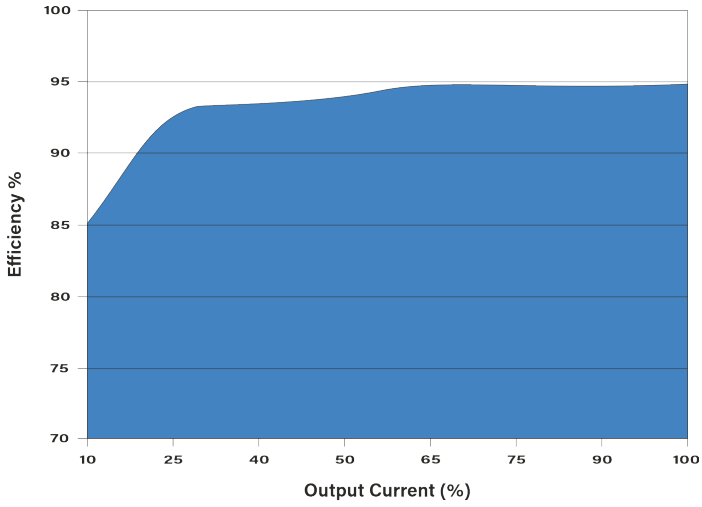
Efficiency vs Output Load: 24 VOUT



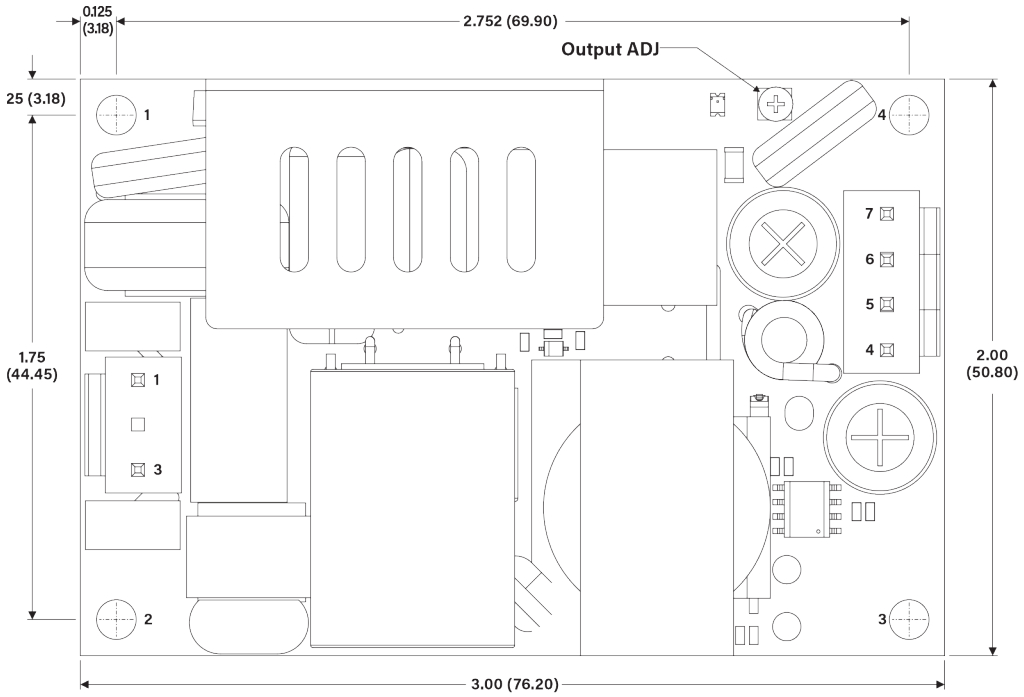
Efficiency vs Input Voltage: 48 VOUT

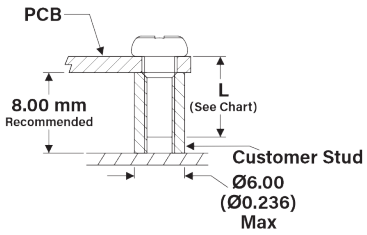


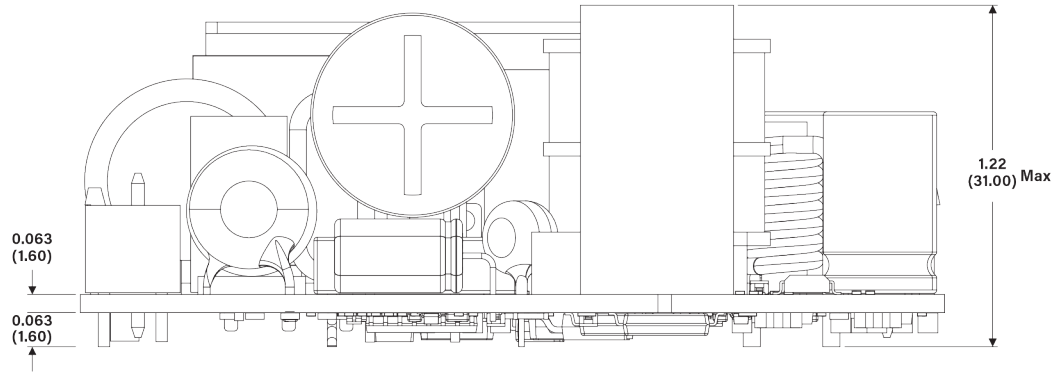
Efficiency vs Output Load: 48 VOUT



Mechanical Dimensions







Unit Mounting Screws:

Position	Screw	Max L	Max Torque
1, 2, 3, 4	M3	6 mm	0.4N•m

1. For class I systems, points 1 & 4 must be connected to earth grnd.
2. For class II systems, points 1 & 4 must be connected together

Connections

Input Connector (CN1):

- JST-B3P-VH or equivalent (one pin removed)
- Mating Terminal: JST VHR or equivalent
- Contact: JST SVH-21T-P1.1

Pin	Function
1	AC-Neutral
2	Removed
3	AC-Line

Output Connector (CN2):

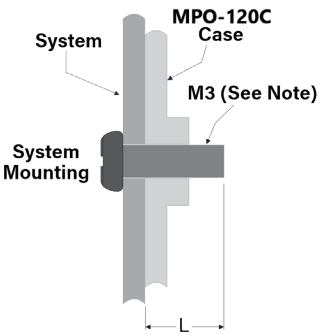
- JST-B4P-VH or equivalent
- Mating Terminal: JST VHR or equivalent
- Contact: JST SVH-21T-P1.1

Pin	Function
4	-Vout
5	-Vout
6	+Vout
7	+Vout

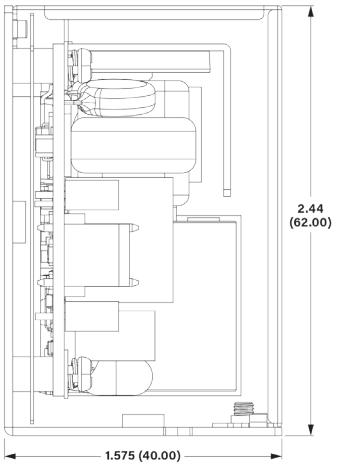
Notes:

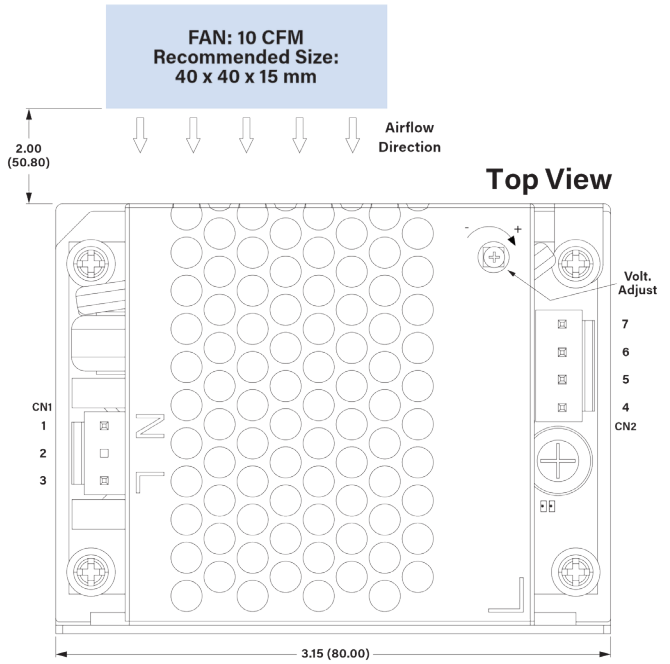
- All dimensions are typical in inches (mm)
- General Tolerance = ±0.039 (±1.0)
- Weight (Typ) = 4.41 Oz (125g)
- A minimum of 10 mm should be maintained between the power supply and any other components for safety .
- The unit uses double pole, neutral fusing. Disconnect the mains before servicing.

Case Option



End View





Connections

Input Connector (CN1):

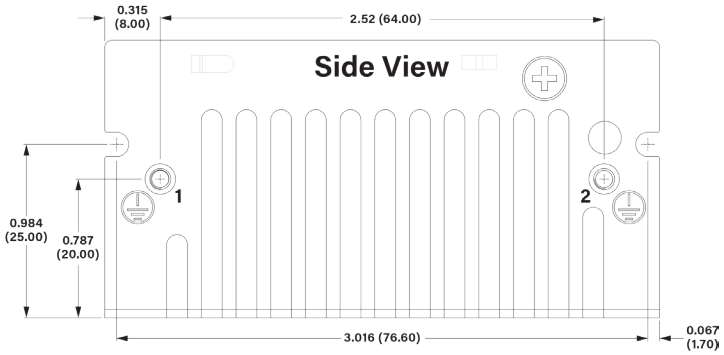
- JST-B3P-VH or equivalent (one pin removed)
- Mating Terminal: JST VHR or equivalent
- Contact: JST SVH-21T-P1.1

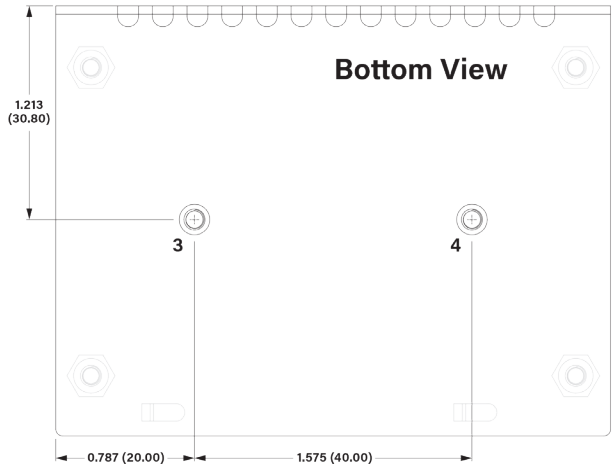
Pin	Function
1	AC-Neutral
2	Removed
3	AC-Line

Output Connector (CN2):

- JST-B4P-VH or equivalent
- Mating Terminal: JST VHR or equivalent
- Contact: JST SVH-21T-P1.1

Pin	Function
4	-VOUT
5	-VOUT
6	+VOUT
7	+VOUT





Unit Mounting Screws:

Position	Screw	Max L	Max Torque
1, 2	M3	4 mm	0.4N•m
3, 4	M3	3 mm	0.4N•m

The product case should be connected to earth grnd.
This is required for class I equipment.

Notes:

- All dimensions are typical in inches (mm)
- General Tolerance = ±0.039 (±1.0)
- Weight (Typ) = 6.34 Oz (180g)
- The unit uses double pole, neutral fusing. Disconnect the mains before servicing.