

# MPU-500AS

## Very Compact, U-Channel, High Efficiency 500W, AC/DC Power Supplies



### Key Features:

- 500W Output Power
- Universal 90-264 AC Input
- Only 5.1 x 3.25 x 1.59 In
- Active PFC
- EN 62368 Approved
- Efficiency to 92%
- Meets EN 55032 B
- Model With Top Fan Available
- 4 kVAC Isolation



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### 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	Universal	90		264	VAC	
		127		370	VDC	
Input Frequency		47		63	Hz	
Inrush Current	Cold Start, 115 VAC			40.0	A Pk	
		Cold Start, 230 VAC			80.0	
Power Factor Correction, See Note 1	115 VAC		0.98			W/VA
	230 VAC	0.94				
Safety Ground Leakage Current	264 VAC			0.10	mA	
Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Output Minimum Load			±1.0			
Output Voltage Accuracy			±2.0		%	
Output Voltage Adjust			±5.0		%V <sub>OUT</sub>	
Line Regulation	V <sub>IN</sub> = 100 to 264 VAC		±1.0		%	
Load Regulation	I <sub>OUT</sub> = 10 to 100%		±1.0		%	
		12 V <sub>OUT</sub>		160		
Ripple & Noise, See Note 2			240		mV	
		24 V <sub>OUT</sub>		480		
		48 V <sub>OUT</sub>				
Hold-Up Time	See Note 3	8			mSec	
Temperature Coefficient	See Note 4		±0.03		%/°C	
Overload Protection	See Note 5	130		160	%I <sub>OUT</sub>	
Over Voltage Protection, See Note 6		12 V <sub>OUT</sub>		15	VDC	
		24 V <sub>OUT</sub>		30		
		48 V <sub>OUT</sub>		56		
Over Temperature Protection	See Note 7		125		°C	
Short Circuit Protection, See Note 8	Level 1 (Nominal): Continuous, Auto Recovery					
	Level 2 (Instantaneous High Current): Latch Off					
General						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage	Input to Output	4,000			VAC	
		5,656			VDC	
	Input to Field Grnd	2,000			VAC	
		2,828			VDC	
	Output to Field Grnd	1,500			VAC	
		2,121			VDC	
Switching Frequency			65		kHz	
EMI Characteristics						
Parameter	Standard	Criteria	Level			
Radiated Emissions	EN 55032		A			
Conducted Emissions	EN 55032		B			
Noise Immunity (EMS)	EN 55035					
Environmental						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Operating Temperature Range	Ambient	-30	+25	+80	°C	
Storage Temperature Range		-30		+85	°C	
Cooling	Free Air Convection (See Derating Curves)					
Humidity	RH, Non-condensing			95	%	
Physical						
Size and Weight	See Mechanical Drawings (Page 5)					
Reliability Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	160			kHours	
Safety Standards	UL/cUL 62368 recognition (UL certificate)					
Vibration	10~500 Hz, 2G 10 min/1 Cycle. Period of 60 min each along X, Y & Z Axis					

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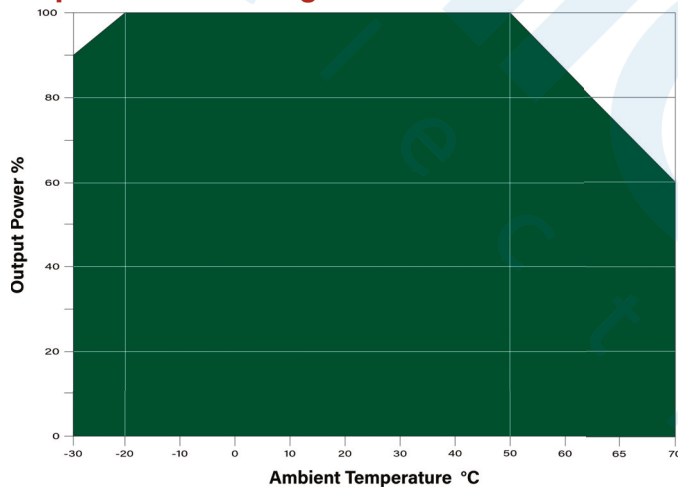
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Model Number	Input		Voltage (VDC)	Output						Max Output Power (W)			Efficiency (See Note 12)
	Current (A)			With 30 CFM	Current (A)				With 30 CFM	Conduction Cooling See Note 11	Natural Convection		
	115 VAC	230 VAC			Conduction Cooling		Convection Cooling						
					100 VAC Input	230 VAC Input	100 VAC Input	230 VAC Input					
MPU-500AS-12	6.3	3.15	12.0	41.50	33.30	37.50	20.83	27.50	500	400W	250W	90.5	
MPU-500AS-24	6.3	3.15	24.0	20.80	16.60	18.75	10.42	13.75	500	(100 VAC) 450W	(100 VAC) 330W	91.0	
MPU-500AS-48	6.3	3.15	48.0	10.41	8.33	9.375	5.21	6.87	500	(230VAC)	(230VAC)	92.0	

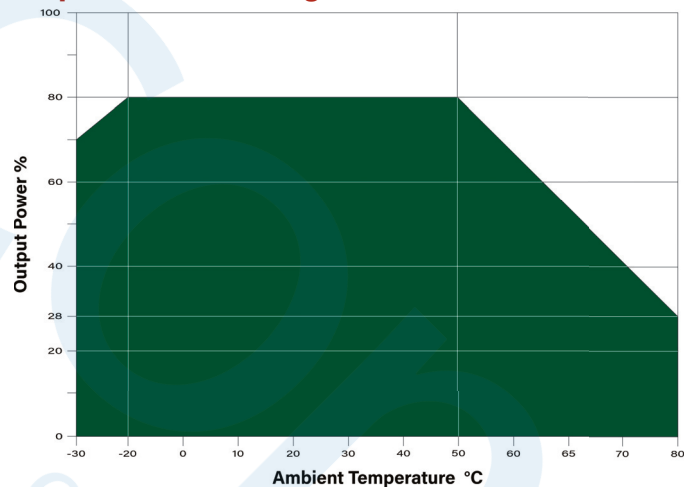
Notes:

- PFC meets EN61000-3-2.
- Ripple and noise is measured at 20 MHz bandwidth using a 0.1 μF and a 47 μF capacitor connected in parallel. The capacitors should be connected to the power supply terminals using a 30 cm, 18 AWG twisted pair copper wire. The oscilloscope probe ground lead should be as short as possible and connect directly to the ground ring of the probe.
- Hold up time is measured with the input voltage set to 115 VAC and the output voltage set at 90%.
- The temperature coefficient is given for the temperature range 0°C to +50°C. For the -30°C to 0°C temperature range it is ±0.06%/°C.
- Overload protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed.
- The overvoltage limit is ±5%. The unit recovers automatically when the output returns to within normal limits.
- The overtemperature limit is 125 °C, measured at the power transformer. The unit recovers automatically when the temperature drops below this limit.
- Under normal operation, short circuit protection is provided by a "hiccup mode" circuit. The unit recovers automatically when the fault condition is removed. If a high instantaneous current is sensed, the unit will latch off. In this case, the cause of the fault will need to be removed and the unit restarted.
- Each unit includes fusing on each input line. Since these are not field replaceable, it is recommended that an external fuse be used on the input of the power supply for protection. For these units, a 10A/250V slow blow fuse is recommended.
- The maximum capacitive load is 5,000 μF for the 12 VOUT model, 2,500 μF for the 24 VOUT model, and 1,250 μF for the 48 VOUT model.
- To operate the unit using only "conduction cooling", the unit must be mounted on an aluminum plate. The suggested size of the plate (W x L x H) is 17.72 (450) x 17.72 (450) x 3.0 (0.118). The plate should have an even, smooth surface. If possible, it should be coated with thermal grease. The power supply should be mounted firmly in place.
- Efficiency is specified as typical, with the input at 230 VAC.

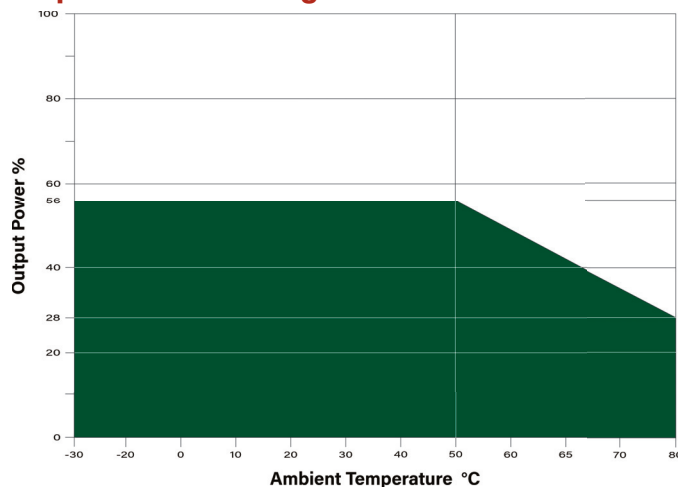
Temperature Derating, VIN = 100-197 VAC, 30 CFM



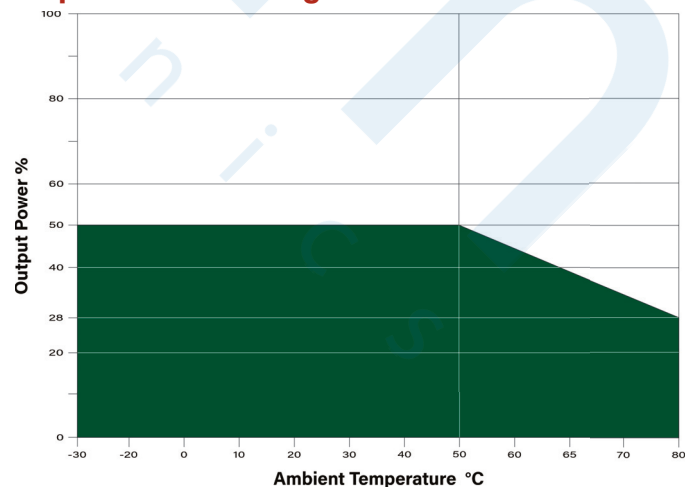
Temperature Derating, VIN = 100-197 VAC, Conduction



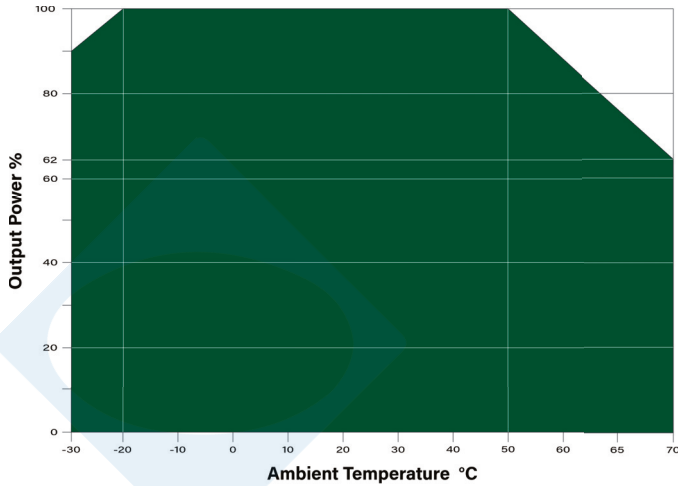
Temperature Derating, VIN = 115 VAC Natural Convection



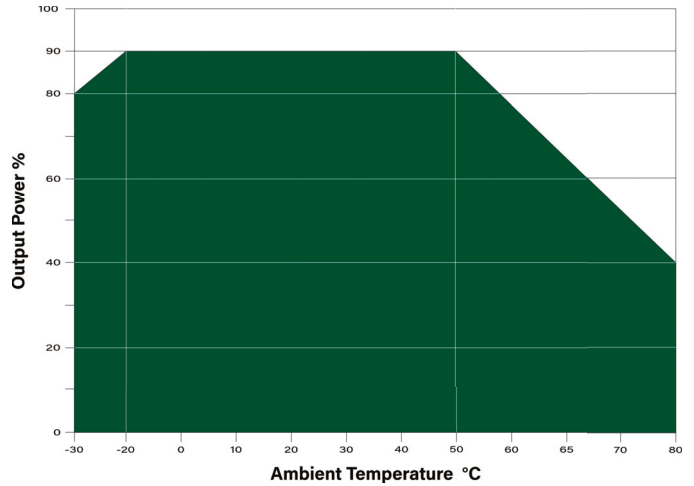
Temperature Derating, VIN = 115 VAC, Natural Convection



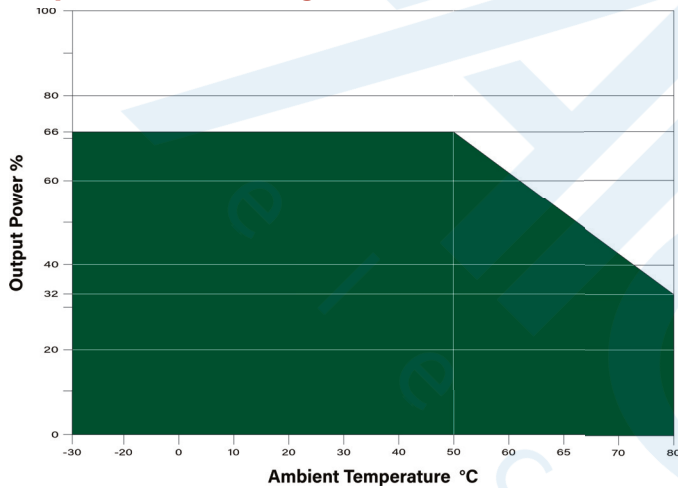
Temperature Derating,  $V_{IN} = 198-264$  VAC, 30 CFM



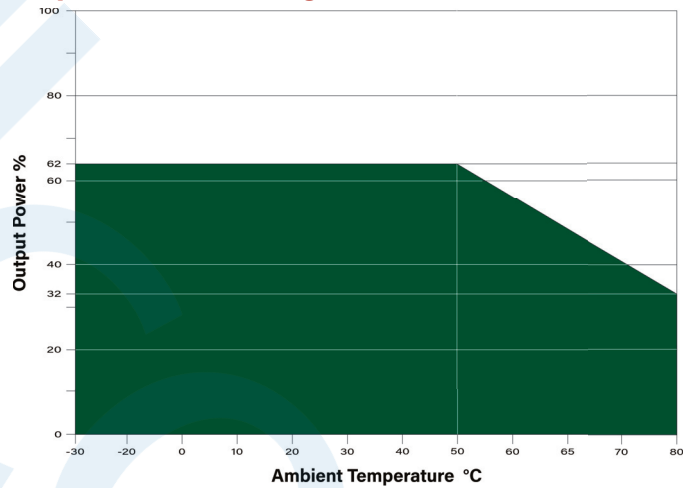
Temperature Derating,  $V_{IN} = 198-264$  VAC, Conduction



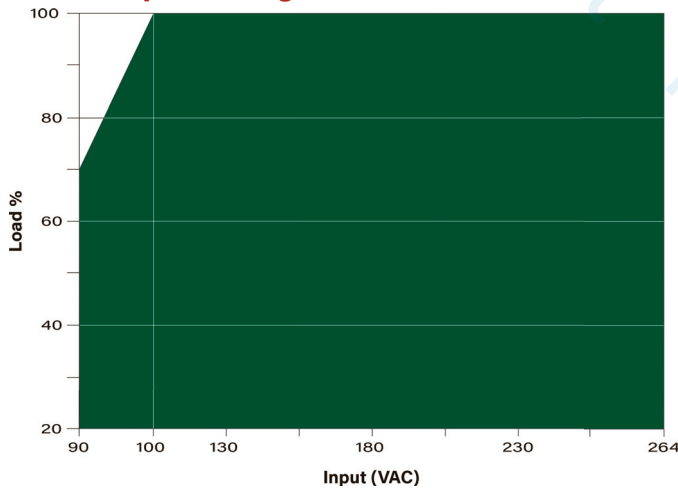
Temperature Derating,  $V_{IN} = 230$  VAC Natural Convection



Temperature Derating,  $V_{IN} = 198$  VAC, Natural Convection

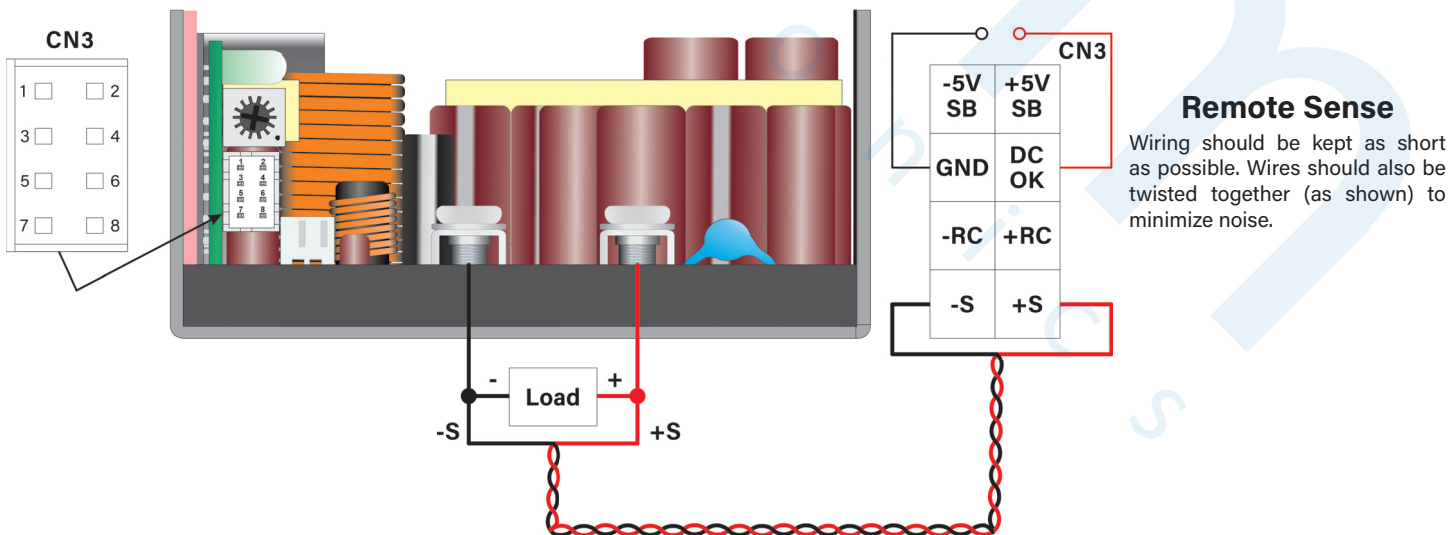
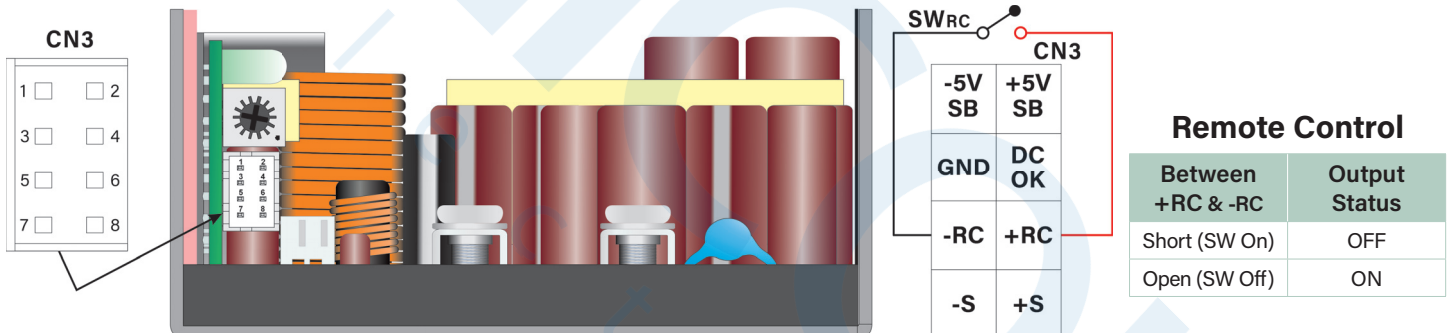
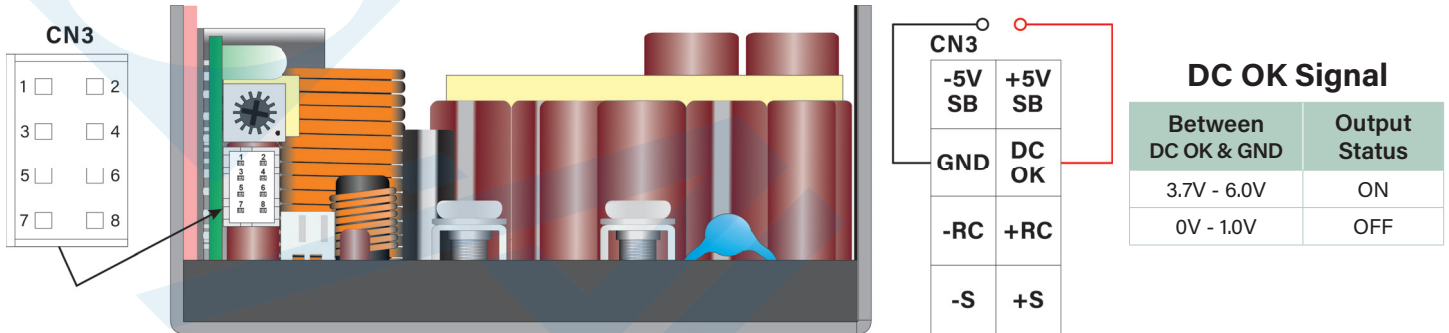


Load vs Input Voltage,  $T_A = 25^\circ\text{C}$

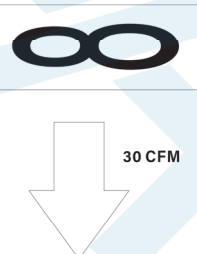
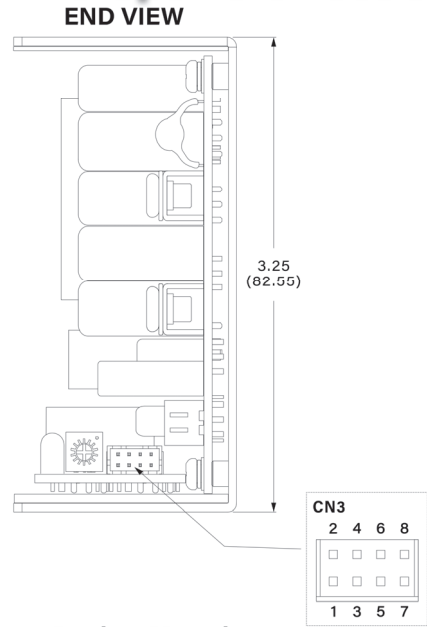
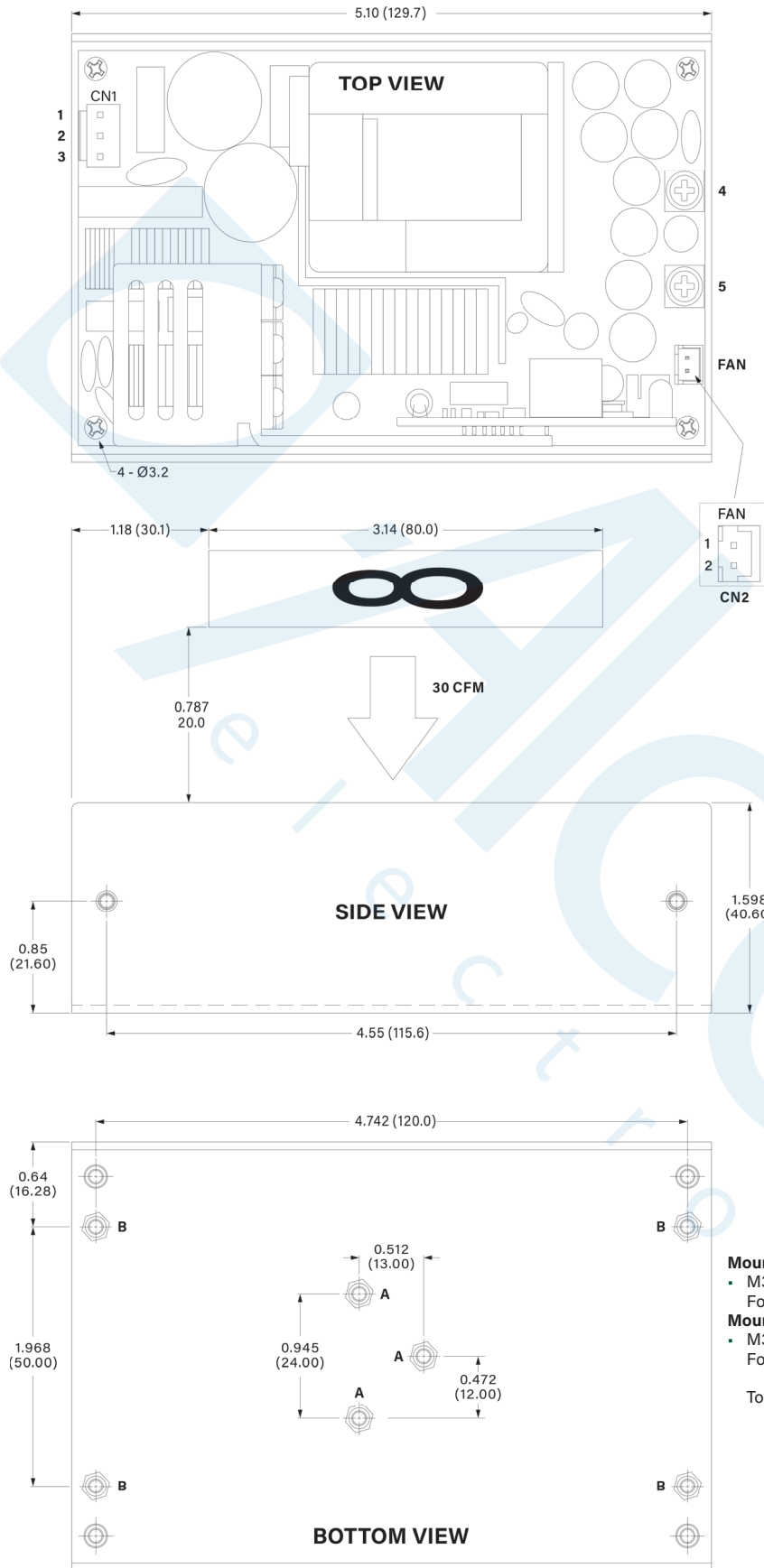


The MPU-500AS is available with a fan and cover included. See the datasheet for the MPU-500ASF.

Pin No	Function	Description
1	-5VSB	Connects to the unit -VOUT terminal
2	+5VSB	Standby VOUT equals 4.2V to 5.5V referenced to pin 1. The Max load current is 1A with a fan or 0.4A without a fan.
3	GND	Return for the DC OK signal output. Connects to the unit -VOUT terminal
4	DC OK	A DC output referenced to pin 3 (GND)
5	-RC	Return for the +RC signal output. Connects to -VOUT
6	+RC	Turns the unit output On/Off by electrical or dry contact between pins 5 (-RC) and 6 (+RC). To disable VOUT the voltage level between -RC and +RC must be less than 1V. To enable the output, the voltage level must be between 3.3V and 5V.
7	-Sense	The -S signal should be connected to the negative load terminal. The -S and +S leads should be twisted together to minimize noise pick up.
8	+Sense	The -S signal should be connected to the negative load terminal. The -S and +S leads should be twisted together to minimize noise pick up.



# Mechanical Dimensions



## Connections

**Input Connector (CN1):**  
 • JST VHR-3N or Equivalent  
 Mating Terminal SVH-41T-P1.1

Term.	Function
1	AC-Neutral
2	No Pin
3	AC-Line

**Fan Connector (CN2):**  
 • JXHP-2 or Equivalent  
 Mating Terminal SXH-002T-P0.6

Term.	Function
1	+12V
2	GND

**Function Connector (CN3):**  
 • JST PHDR-08VS or Equivalent  
 Mating Terminal SPHD-001T-P0.5

Term.	Function
1	-5V SB
2	+5V SB
3	GND
4	DC OK
5	-RC
6	+RC
7	-Sense
8	+Sense

**Mounting Screws (A):**  
 • M3 x 0.5P  
 For Fixture to Chassis Only

**Mounting Screws (B):**  
 • M3 x 0.5P  
 For Fixture to PCB/Chassis

Torque: 3 ± 0.5 kgf.cm

**Output Connections (4, 5):**  
 • 2 M3.5 Pan HD Screws  
 Torque to 8 lbs-in Max  
 Suitable Wire = 22 - 14 AWG

**Notes:**  
 • All dimensions are typical in inches (mm)  
 • Tolerance x.xx = ±0.02 (±0.50)  
 • Weight = 21.34 Oz (0.605 kg)