500W 5"×3" Reliable Green Medical Power Supply RPS-500 series

User's Manual

ANSI/AAMI ES60601-1 BS EN/EN60601-1 IEC60601-1

ECO Medical 2xMOPP BF rated

Features

- 5"×3" compact size
- 320W convection,500W force air
- 550W peak power (3sec.)
- Medical safety approved (2 x MOPP) accroding to ANSI/AAMI ES60601-1 and IEC/BS EN/EN60601-1
- EMI for both Class Ⅰ & Class Ⅱ configuration
- -30~+70℃ wide range operating temperature
- No load power consumption<0.5W by PS_ON control
- High efficiency up to 94%
- Protections: Short circuit / Overload / Over voltage / Over temperature
- 5Vdc standby output, 12Vdc fan supply, Power Good, Power Fail and remote sense
- Operating altitude up to 4000 meters (Note.5)
- LED indicator for power on
- 3 years warranty

Applications

- Oral irrigator
- Hemodialysis machine
- Medical computer monitors
- Sleep apnea devices
- Pump machine
- Electric bed

GTIN CODE

MW Search: https://www.meanwell.com/serviceGTIN.aspx

Description

RPS-500 is a 500W highly reliable green PCB type medical power supply with a high power density on the 5" by 3" footprint. It accepts 80~264VAC input and offers various output voltages between 12V and 48V.The working efficiency is up to 94% and the extremely low no load power consumption is down below 0.5W.RPS-500 (blank type only) is able to be used for both Class Ⅰ (with FG) and Class Ⅱ (no FG) system design. The extremely low leakage current is less than 220μA. In addition, it conforms to international medical regulations (2*MOPP) and EMC BS EN/EN55011, perfectlyfitting all kinds of BF rated "patient contact" medical system equipment. RPS-500 series also offers the enclosed style models(-C / TF /SF)

Model Encoding

RPS - 500 - 12 -C

- -C: Type
- 12: Output voltage
- 500: Rated wattage
- RPS: Series name

Type	Description	Note
Blank	PCB Type	In stock
-C	Enclosed casing Type	In stock
-TF	Enclosed Type with fan on the top	In stock
-SF	Enclosed Type with fan on the side	In stock

500W 5"×3" Reliable Green Medical Power Supply RPS-500 series

SPECIFICATION

MODEL				RPS-500-12□	RPS-500-15□	RPS-500-18□	RPS-500-24□	RPS-500-27□	RPS-500-36□	RPS-500-48□
OUTPUT	DC VOLTAGE			12V	15V	18V	24V	27V	36V	48V
	RATED CURRENT Note.7	Blank	25CFM	41.6A	33.3A	27.8A	20.8A	18.5A	13.9A	10.4A
			Convection	26.7A	21.3A	17.8A	13.4A	11.9A	8.9A	6.7A
		-C	25CFM	41.6A	33.3A	27.8A	20.8A	18.5A	13.9A	10.4A
			Convection	25.8A	20.7A	17.2A	12.9A	11.5A	8.6A	6.5A
		-TF/SF	Built-in fan	41.6A	33.3A	27.8A	20.8A	18.5A	13.9A	10.4A
	RATED POWER Note.7	Blank	25CFM	499.2W	499.5W	500.4W	499.2W	499.5W	500.4W	499.2W
			Convection	320.4W	319.5W	320.4W	321.6W	321.3W	320.4W	321.6W
		-C	25CFM	499.2W	499.5W	500.4W	499.2W	499.5W	500.4W	499.2W
			Convection	309.6W	310.5W	309.6W	309.6W	310.5W	309.6W	312W
		-TF/SF	Built-in fan	499.2W	499.5W	500.4W	499.2W	499.5W	500.4W	499.2W
	PEAK POWER(3sec.)			550W						
	RIPPLE & NOISE (max.) Note.2			200mVp-p	200mVp-p	200mVp-p	200mVp-p	200mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE(main output)			11.4~12.6V	14.3~15.8V	17.1~18.9V	22.8~25.2V	25.6 ~ 28.4V	34.2 ~37.8V	45.6 ~50.4V
	VOLTAGE TOLERANCE Note.3			±3.0%	±3.0%	±3.0%	±2.0%	±2.0%	±1.0%	±1.0%
	LINE REGULATION			±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION			±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME			1000ms, 30ms/230VAC 1500ms, 30ms/115VAC at full load						
	HOLD UP TIME (Typ.)			10ms/230VAC 10ms/115VAC at full load						
INPUT	VOLTAGE RANGE Note.4			80 ~ 264VAC 113 ~ 370VDC						
	FREQUENCY RANGE			47 ~ 63Hz						
	POWER FACTOR			PF>0.94/230VAC PF>0.98/115VAC at full load						
	EFFICIENCY (Typ.)			91%	92%	92.5%	93%	93.5%	94%	94%
	AC CURRENT (Typ.)			5.8A/115VAC 2.9A/230VAC						
	INRUSH CURRENT (Typ.)			COLD START 40A/115VAC 80A/230VAC						
	LEAKAGE CURRENT (max.) Note.5			Earth leakage current <220μA/264VAC 50Hz , Touch current < 100μA/264VAC						
PROTECTION	OVERLOAD			105 ~ 135% rated output power						
				Protection type : Hiccup mode, recovers automatically after fault condition is removed						
	OVER VOLTAGE			13.2 ~ 15.6V	16.5 ~ 19.5V	19.8 ~23.4V	26.4 ~ 31.2V	29.7 ~ 35.1V	39.6 ~ 46.8V	52.8 ~ 62.4V
				Protection type : Hiccup mode, recovers automatically after fault condition is removed						
	OVER TEMPERATURE			Protection type : Shut down o/p voltage, recovers automatically after temperature goes down						
FUNCTION	5V STANDBY			5Vsb : 5V@0.6A without fan, 1A with fan 25CFM ; Tolerance ±2%, ripple : 120mVp-p(max.)						
	12V FAN SUPPLY			12V@0.5A for driving fan ; Tolerance -15% ~+10% at main output 20% rated current (25CFM)						
	FAN CONTROL			Fan on by 20% load min. (For RPS-500-xxTF/SF)						
	PS-ON INPUT SIGNAL			Power ON: PS-ON = "Hi" or " > 2 ~ 5V" ; Power OFF: PS-ON = "Low" or " < 0 ~ 0.5V"						
	POWER GOOD / POWER FAIL			500ms>PG>10ms ; The TTL signal goes high with 10ms to 500ms delay after power set up ; The TTL signal goes low at least 1ms before Vo below 90% of rated value						
ENVIRONMENT	WORKING TEMP.			-30 ~ +70℃ (Refer to "Derating Curve")						
	WORKING HUMIDITY			20 ~ 90% RH non-condensing						
	STORAGE TEMP.			-40 ~ +85℃						
	TEMP. COEFFICIENT			±0.03%/℃ (0 ~ 50℃)						
	VIBRATION			10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes						
	OPERATING ALTITUDE Note.6			4000 meters						

500W 5"×3" Reliable Green Medical Power Supply RPS-500 series

SPECIFICATION

SAFETY & EMC (Note 8)	SAFETY STANDARDS	IEC 60601-1:2005+A1+A2, TUV BS EN/ EN 60601-1:2006+A1+A12+A2, ANSI/AAMI ES60601-1:2005+A2 CAN/CSA C22.2 No. 60601-1:2014+A2, EAC TP TC 004 approved; Design refer to BS EN/EN60335-1(by request)				
	ISOLATION LEVEL	Primary-Secondary: 2xMOPP, Primary-Earth:1xMOPP, Secondary-Earth:1xMOPP				
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC I/P-FG:2KVAC O/P-FG:1.5KVAC				
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH				
	EMC EMISSION	**Parameter**	**Standard**	**Test Level / Note**		
		Conducted emission	BS EN/EN55011 (CISPR11)	Class Ⅰ: Class B , Class Ⅱ: Class A		
		Radiated emission	BS EN/EN55011 (CISPR11)	Class A		
		Harmonic current	BS EN/EN61000-3-2	Class A		
		Voltage flicker	BS EN/EN61000-3-3	-----		
	EMC IMMUNITY	BS EN/EN55035 , BS EN/EN60601-1-2, BS EN/EN61204-3				
		Parameter	**Standard**	**Test Level / Note**		
		ESD	BS EN/EN61000-4-2	Level 4, 15KV air ; Level 4, 8KV contact		
		RF field susceptibility	BS EN/EN61000-4-3	Level 3, 10V/m(80MHz~2.7GHz) Table 9, 9~28V/m(385MHz~5.78GHz)		
		EFT bursts	BS EN/EN61000-4-4	Level 3, 2KV		
		Surge susceptibility	BS EN/EN61000-4-5	Level 4, 4KV/Line-FG ; 2KV/Line-Line		
		Conducted susceptibility	BS EN/EN61000-4-6	Level 3, 10V		
		Magnetic field immunity	BS EN/EN61000-4-8	Level 4, 30A/m		
		Voltage dip, interruption	BS EN/EN61000-4-11	100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods		
OTHERS	MTBF	1132.3K hrs min. Telcordia SR-332 (Bellcore) ; 144.2K hrs min. MIL-HDBK-217F (25℃)				
	DIMENSION	Type	RPS-500	RPS-500-C	RPS-500-TF	RPS-500-SF
		L*W*H	127x76.2x41mm	130x86x43mm	130x86x58.5mm	160x86x43mm
			5″x3″x1.61″inch	5.11″x3.39″x1.69″inch	5.11″x3.39″x2.30″inch	6.3″x3.39″x1.69″inch
	PACKING	P.W.	0.46Kg	0.54Kg	0.58Kg	0.64Kg
		Q'TY	30pcs	24pcs	24pcs	24pcs
		G.W.	14.8Kg	14Kg	14.9Kg	16.4Kg
		M'MENT	0.96CUFT	0.77CUFT	0.86CUFT	0.91CUFT

NOTE

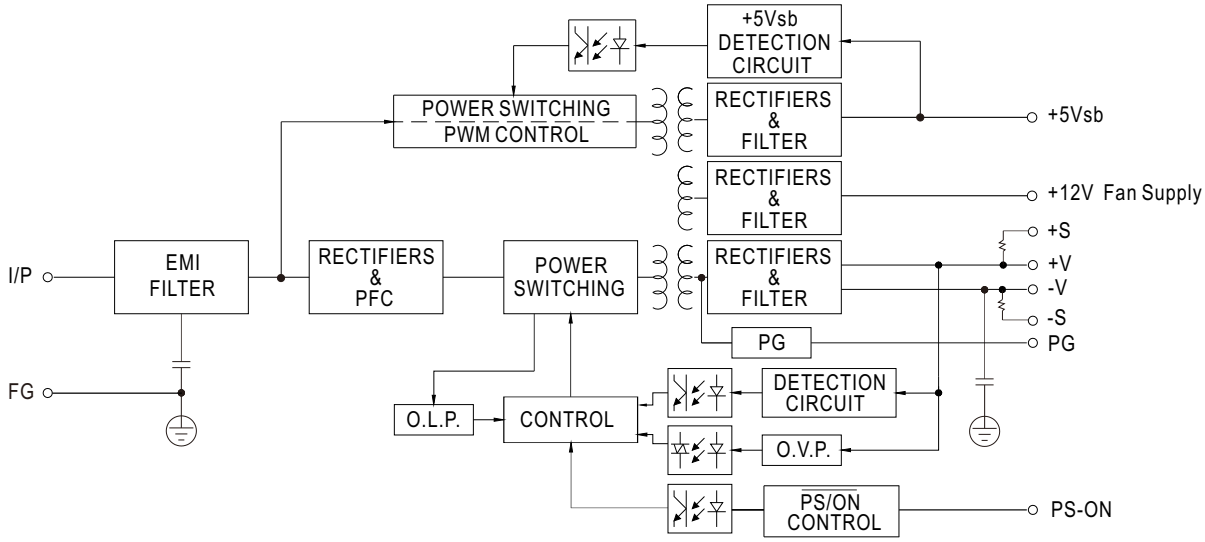
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μF & 47 μF parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Derating may be needed under low input voltages. Please check the derating curve for more details.
5. Touch current was measured from primary input to DC output.
6. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).
7. Please refer to "Derating curve".
8. The power supply is considered a component which will be installed into a final equipment. All EMC tests are executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)

※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

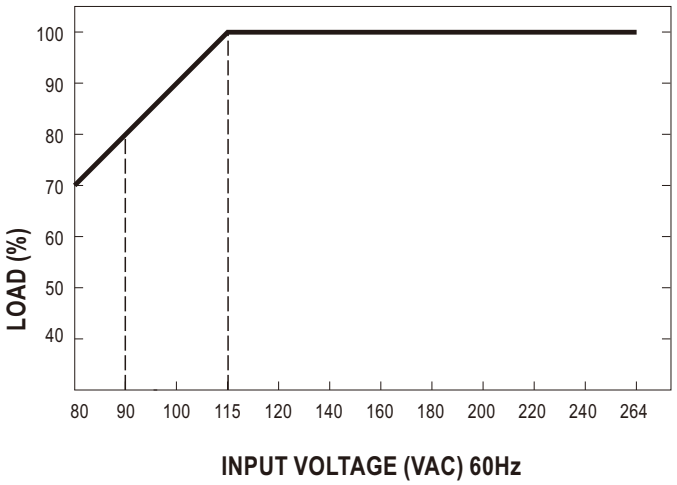
EMI Performance	Conducted	Radiated
Class Ⅰ (with FG)	Class B	Class A
Class Ⅱ (no FG)	Class A	Class A

■ Block Diagram

PFC fosc : 90KHz
PWM fosc : 100KHz

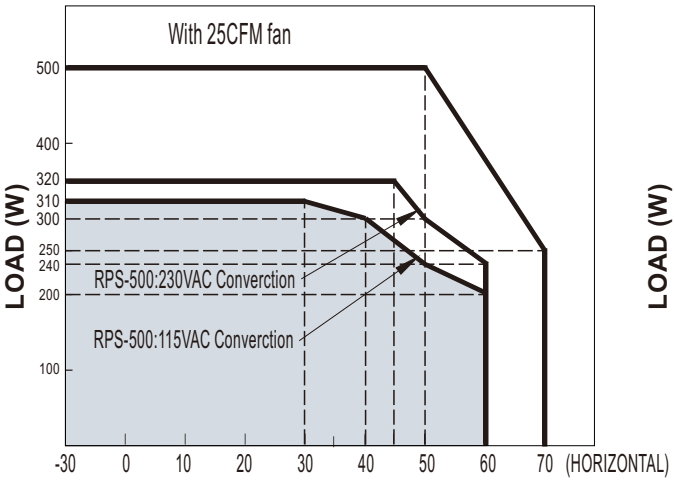


■ Output Derating vs Input Voltage



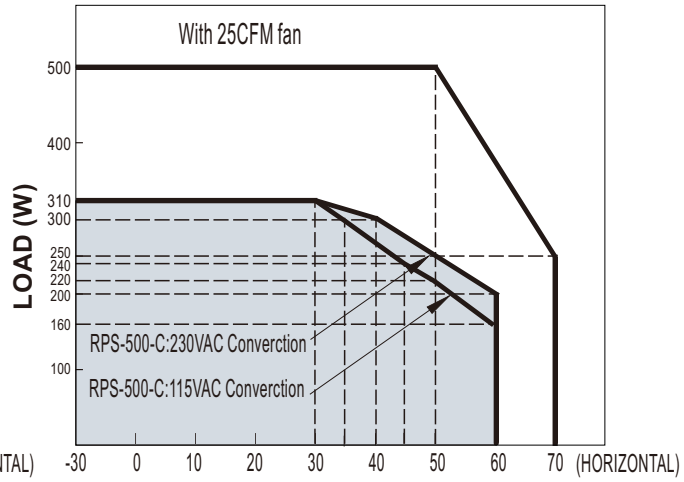
■ Derating Curve

◎ RPS-500



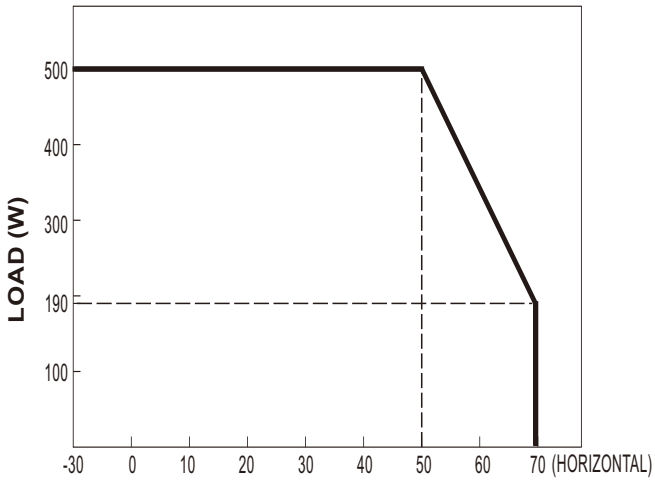
AMBIENT TEMPERATURE (℃)

◎ RPS-500-C



AMBIENT TEMPERATURE (℃)

◎ RPS-500-TF/SF



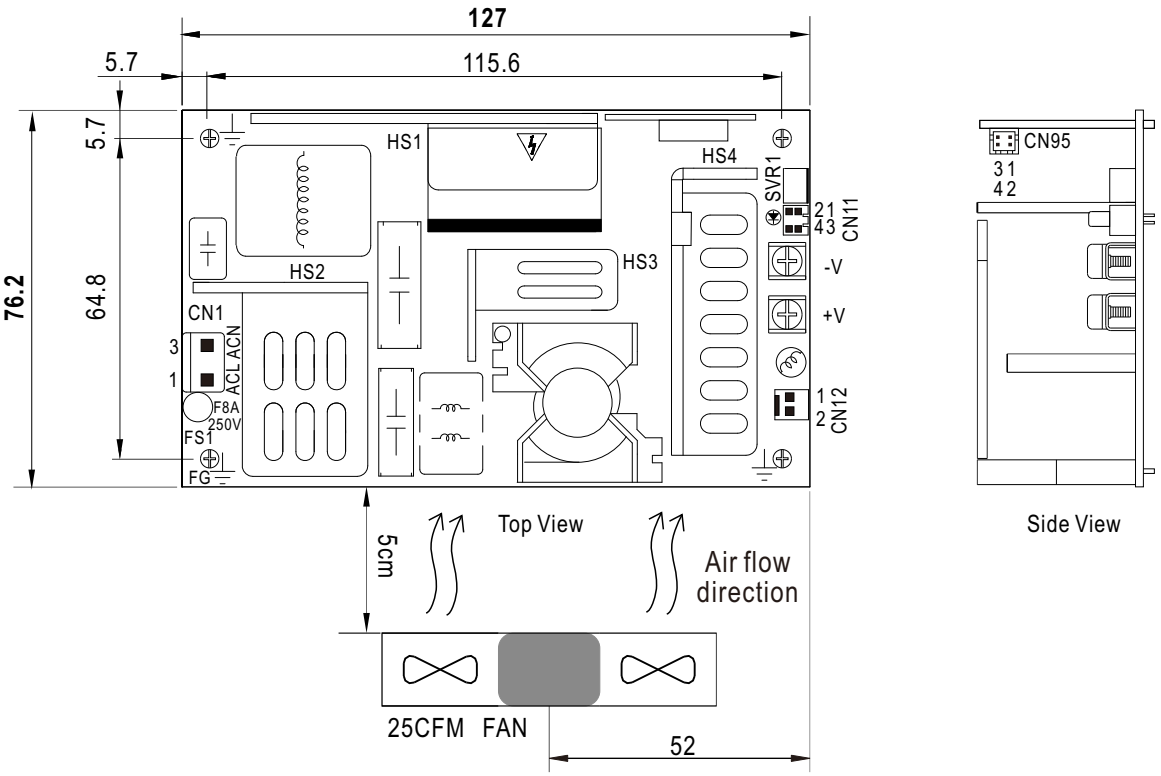
AMBIENT TEMPERATURE (℃)

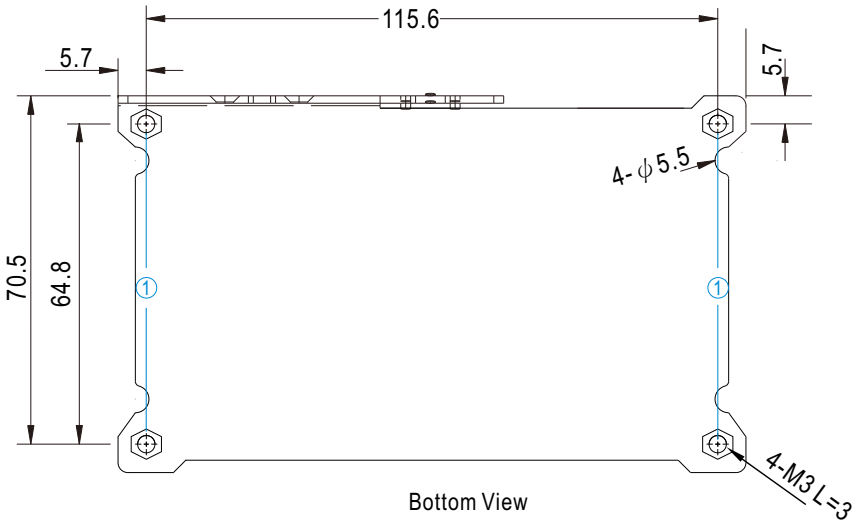
Order No.	RPS-500	RPS-500-C	RPS-500-TF	RPS-500-SF
Products				
Convection	320W	310W	---	---
Force Air	500W	500W	500W	500W

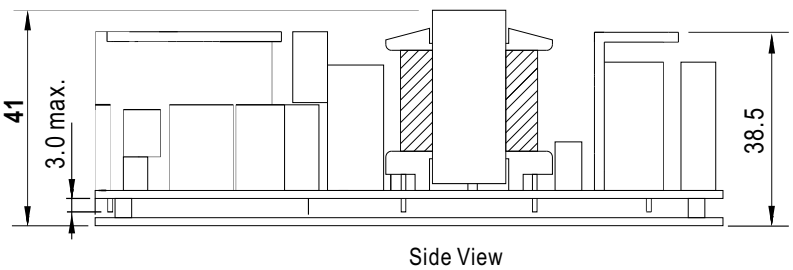
■ Mechanical Specification

(Unit: mm , tolerance ± 1mm)

● RPS-500 (PCB Type)

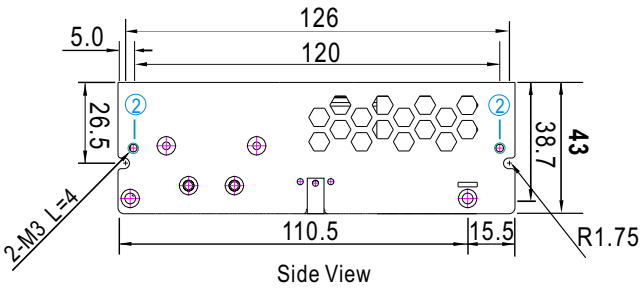


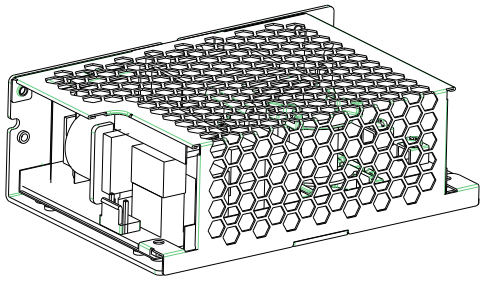


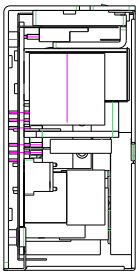


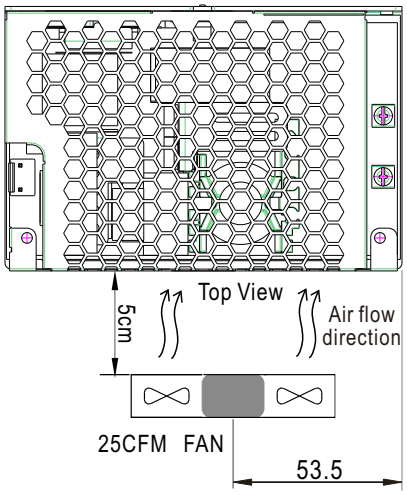
RPS-500-C (Enclosed type)

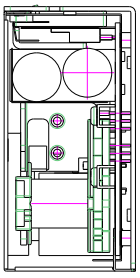
Case No. 247C-T 269A-D

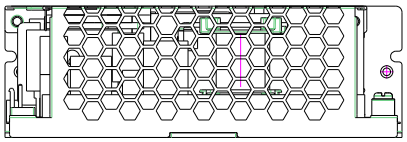


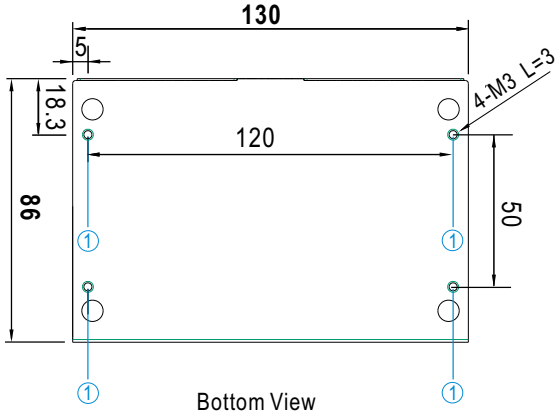






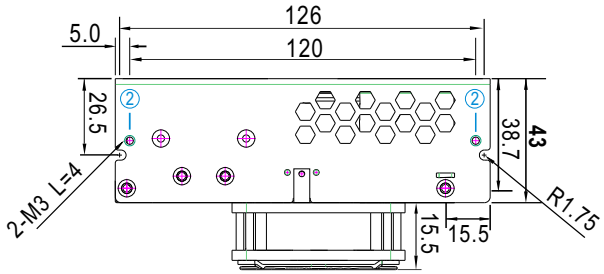




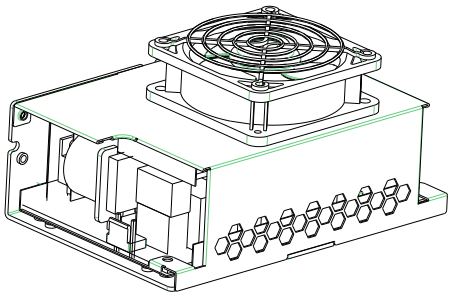


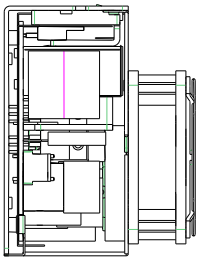
● RPS-500-TF (Enclosed type with fan on the top)

Case No. 269A-D 247D-T

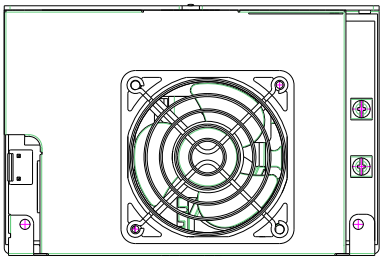


Side View

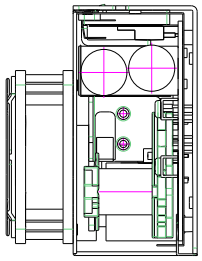




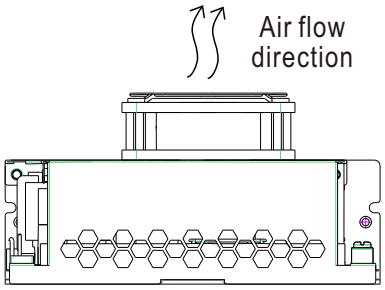
Side View



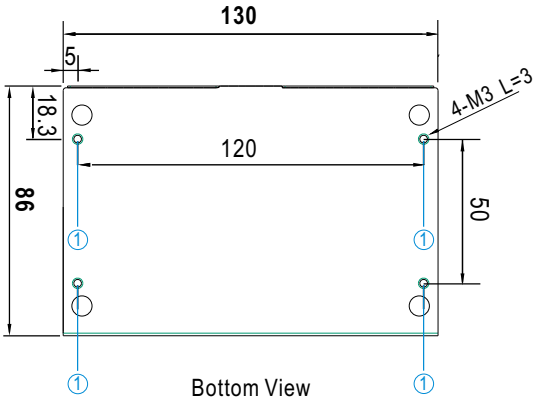
Top View



Side View



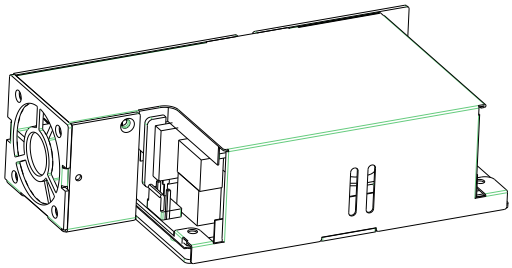
Side View

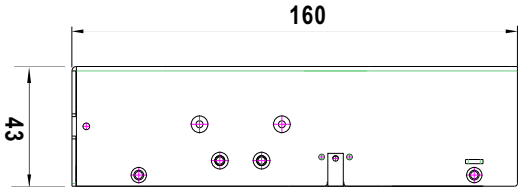


Bottom View

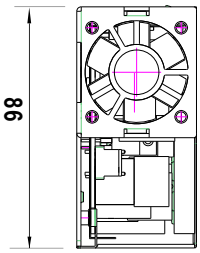
● RPS-500-SF (Enclosed type with fan on the side)

Case No. 248B

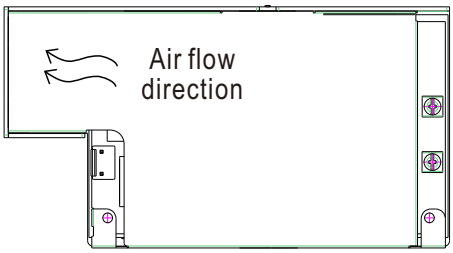




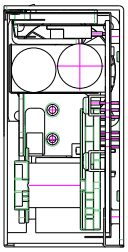
Side View



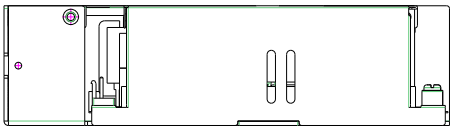
Side View



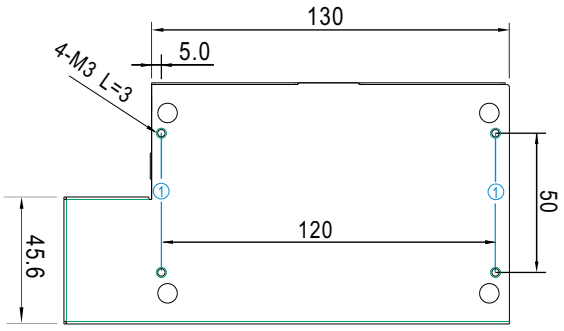
Top View



Side View



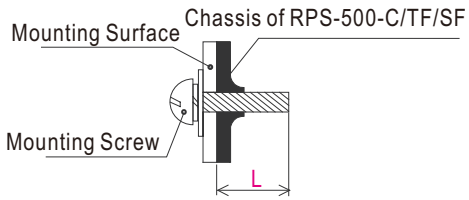
Side View



Bottom View

※ Mounting Instruction for -C/-TF/-SF Type

Hole No.	Recommended Screw Size	MAX. Penetration Depth L	Recommended mounting torque
①	M3	3mm	4~6Kgf-cm
②	M3	4mm	4~6Kgf-cm



※ CONNECTION

AC Input Connector (CN1) : JST B3P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	AC/L	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
2	No Pin		
3	AC/N		

DC Output Connector (CN2,CN3)

Pin No.	Assignment	Output Terminals
CN2	-V	M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90cNm)max.
CN3	+V	

⚠ HS1,HS2,HS3,HS4 can not be shorted

Function Connector(CN11): TKP DH2I-2X2 or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	-S	TKP DH2 or equivalent	TKP or equivalent
2	+S		
3	DC COM		
4	PG		

Function Connector(CN95): TKP DH2L-2X2 or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	5Vsb	TKP DH2 or equivalent	TKP or equivalent
2,4	DC COM		
3	PS-ON		

FAN Connector(CN12) : TKP 8812-2 or equivalent
(Except for RPS-500-TF/SF)

Pin No.	Assignment	Mating Housing	Terminal
1	DC COM	TKP 2502 or equivalent	TKP 8811 or equivalent
2	+12V		

※ Note: 1. The enclosed type (-C/TF/SF type) models are not suitable for configuration within a Class II (without FG) system, but suggested within a Class I (with FG) system.
2. Mounting Instruction for enclosed type.

■ Installation Manual

Please refer to : http://www.meanwell.com/manual.html