400W Single Output Green Medical Type

RPS-400 series

Features

- 5"×3" miniature size
- Universal AC input / Full range
- Built-in active PFC function
- Medical safety approved
  (2 x MOPP between primary to secondary)
- Suitable for BF application with appropriate system consideration
- EMI Class B for Class Ⅰ (with FG) and Class A for Class Ⅱ (without FG)
- Low leakage current <250μA
- No load power consumption<0.5W by PS-ON control
- High efficiency up to 94%
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection for 250W and 400W with 25CFM forced air
- Built-in 12V/0.5A Fan supply
- Standby 5V@1A with fan , 0.6A without fan
- Built-in remote sense function
- LED indicator for power on
- Output 18V available
- 3 years warranty

Applications

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

Description

RPS-400 is a 400W 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-400 is able to used for both Class Ⅰ (with FG) or Class Ⅱ (no FG) system design.
RPS-400 is able to be used for both Class Ⅰ (with FG) or Class Ⅱ (no FG) system design. The extremely low leakage current is less than 250μA. In addition, it conforms to international medical regulations (2*MOPP) and EMC EN55011, perfectly fitting all kinds of BF rated "patient contact" medical system equipment. RPS-400 series also offers the enclosed style models(-C / TF /SF)

Model Encoding

RPS - 400 - 12 -C

- Blank : PCB type
- -C : Enclosed type
- -TF: Enclosed type with top fan
- -SF: Enclosed type with side fan

Output voltage
Output wattage
Series name

MEAN WELL

400W Single Output Green Medical Type

RPS-400 series

SPECIFICATION

RPS-400-xx☐ ☐=Blank,-C ; Blank=PCB only, -C=Enclosed type

MODEL			RPS-400-12☐	RPS-400-15☐	RPS-400-24☐	RPS-400-27☐	RPS-400-36☐	RPS-400-48☐
OUTPUT	DC VOLTAGE		12V	15V	24V	27V	36V	48V
	CURRENT	25CFM	33.3A	26.7A	16.7A	14.9A	11.2A	8.4A
		Convection	20.8A	16.7A	10.5A	9.3A	7A	5.3A
	RATED POWER	25CFM	399.6W	400.5W	400.8W	402.3W	403.2W	403.2W
		Convection	249.6W	250.5W	252W	251.1W	252W	254.4W
	RIPPLE & NOISE (max.) Note.2		120mVp-p	150mVp-p	200mVp-p	200mVp-p	250mVp-p	250mVp-p
	VOLTAGE ADJ. RANGE(MAIN OUTPUT)		11.4~12.6V	14.3~15.8V	22.8~25.2V	25.6 ~ 28.4V	34.2 ~37.8V	45.6 ~50.4V
	VOLTAGE TOLERANCE Note.3		±3.0%	±3.0%	±2.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION		±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%
	SETUP, RISE TIME		1000ms, 30ms/230VAC 1500ms, 30ms/115VAC at full load					
	HOLD UP TIME (Typ.)		16ms/230VAC 12ms/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.)		91.5%	92%	93%	93.5%	93%	94%
	AC CURRENT (Typ.)		4.2A/115VAC 2.1A/230VAC					
	INRUSH CURRENT (Typ.)		COLD START 40A/115VAC 80A/230VAC					
	LEAKAGE CURRENT Note.5		Earth leakage current <250 μA/264VAC , 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	26.4 ~ 31.2V	29.7 ~ 35.1V	39.6 ~ 46.8V	52.8 ~ 62.4V
			Protection type : Shut down o/p voltage, re-power on to recover					
	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.)					
	FAN SUPPLY		12V@0.5A for driving a fan ; tolerance ±10%					
	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., HUMIDITY		-40 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT		±0.03%/℃ (0 ~ 50℃)					
	VIBRATION		10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 6)	SAFETY STANDARDS		ANSI/AAMI ES60601-1, TUV EN60601-1, IEC60601-1 approved					
	ISOLATION RESISTANCE		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		Compliance to EN55011 (CISPR11) Class B, EN61000-3-2,-3					
	EMC IMMUNITY		Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN60601-1-2, medical level, criteria A					
OTHERS	MTBF		194.1Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION		RPS-400:127*76.2*35mm (L*W*H) ; RPS-400-C:130*86.6*43mm (L*W*H)					
	PACKING		RPS-400:0.39Kg; 36pcs/15Kg/1.03CUFT; RPS-400-C:0.51Kg; 24pcs/13.2Kg/0.77CUFT					

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 0.1uf & 47uf 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 power supply is considered a component which will be installed into a final equipment. All the Class I (with FG) EMC test are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The Class II (without FG) EMC test is been executed by mounting the unit on a 130mm*86.6mm metal plate with 1mm of thickness. 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 http://www.meanwell.com)

MEAN WELL

400W Single Output Green Medical Type

RPS-400 series

SPECIFICATION

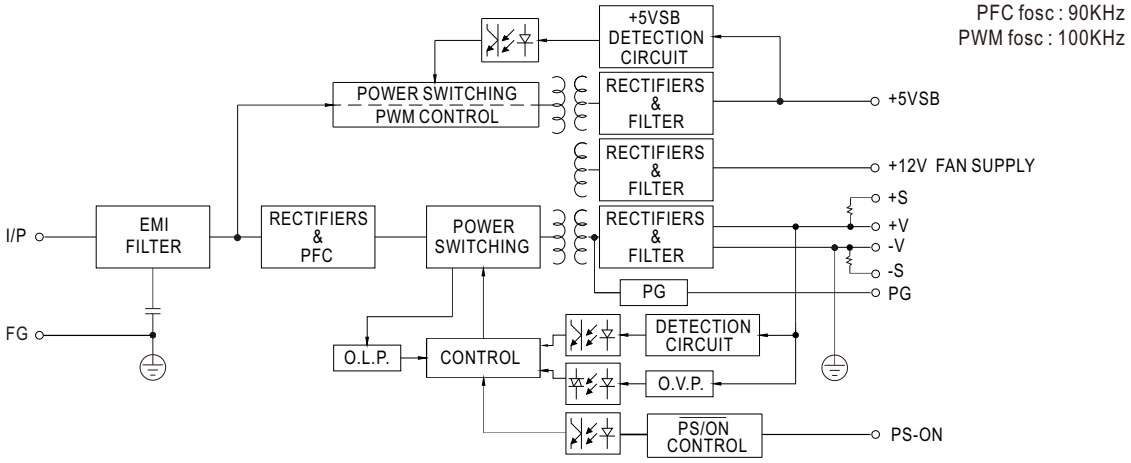
RPS-400-xx☐ ☐=TF,SF ; TF=Top Fan With Cover ; SF=Side Fan With Cover

MODEL		RPS-400-12☐	RPS-400-15☐	RPS-400-24☐	RPS-400-27☐	RPS-400-36☐	RPS-400-48☐
	DC VOLTAGE	12V	15V	24V	27V	36V	48V
	CURRENT	33.3A	26.7A	16.7A	14.9A	11.2A	8.4A
	RATED POWER	399.6W	400.5W	400.8W	402.3W	403.2W	403.2W
OUTPUT	RIPPLE & NOISE (max.) Note.2	120mVp-p	150mVp-p	200mVp-p	200mVp-p	250mVp-p	250mVp-p
	VOLTAGE ADJ. RANGE(MAIN OUTPUT)	11.4~12.6V	14.3~15.8V	22.8~25.2V	25.6 ~ 28.4V	34.2 ~37.8V	45.6 ~50.4V
	VOLTAGE TOLERANCE Note.3	±3.0%	±3.0%	±2.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±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%
	SETUP, RISE TIME	1000ms, 30ms/230VAC 1500ms, 30ms/115VAC at full load					
	HOLD UP TIME (Typ.)	16ms/230VAC 12ms/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.)	91.5%	92%	93%	93.5%	93%	94%
	AC CURRENT (Typ.)	4.2A/115VAC 2.1A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 40A/115VAC 80A/230VAC					
	LEAKAGE CURRENT Note.5	Earth leakage current <250 μA/264VAC , Touch current < 100 μA/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	26.4 ~ 31.2V	29.7 ~ 35.1V	39.6 ~ 46.8V	52.8 ~ 62.4V
		Protection type : Shut down o/p voltage, re-power on to recover					
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down					
FUNCTION	5V STANDBY	5VSB : 5V@0.6A tolerance ±2%, ripple : 120mVp-p(max.)					
	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., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 6)	SAFETY STANDARDS	ANSI/AAMI ES60601-1, TUV EN60601-1, IEC60601-1 approved					
	ISOLATION RESISTANCE	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	Compliance to EN55011 (CISPR11) Class B, EN61000-3-2,-3					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN60601-1-2, medical level, criteria A					
OTHERS	MTBF	194.1Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	RPS-400-TF:130*86.6*66.5mm (L*W*H) ; RPS-400-SF:151*86.6*43mm (L*W*H)					
	PACKING	RPS-400-TF: 0.58Kg; 24pcs/14.9Kg/0.86CUFT; RPS-400-SF:0.64Kg; 24pcs/16.4Kg/0.91CUFT					

NOTE

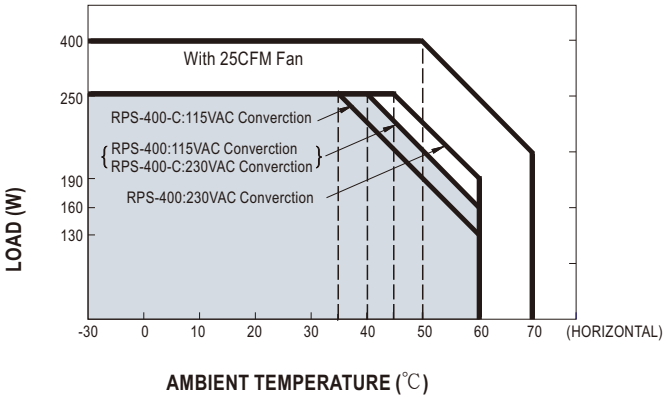
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation 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 power supply is considered a component which will be installed into a final equipment. All the Class Ⅰ (with FG) EMC test are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The Class Ⅱ (without FG) EMC test is been executed by mounting the unit on a 130mm*86.6mm metal plate with 1mm of thickness. 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 http://www.meanwell.com)

■ Block Diagram

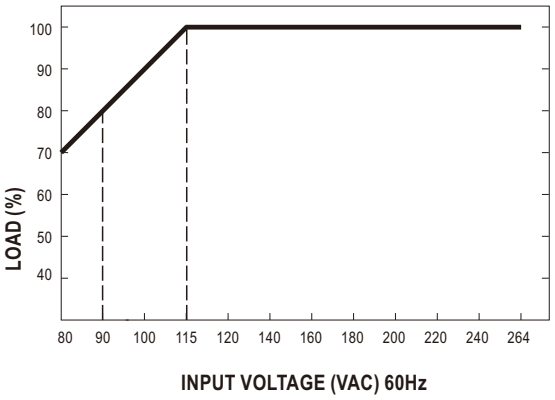


■ Derating Curve

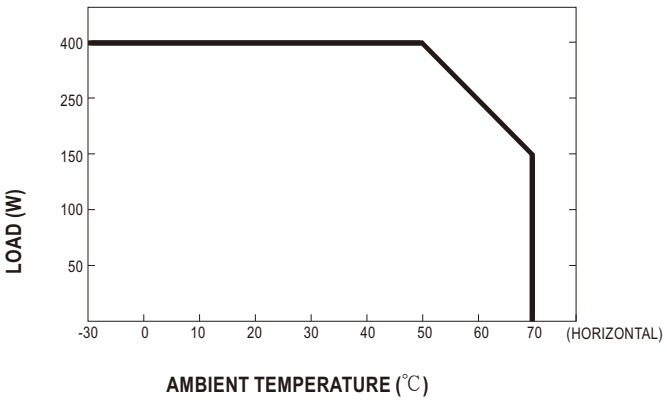
◎ RPS-400(-C)

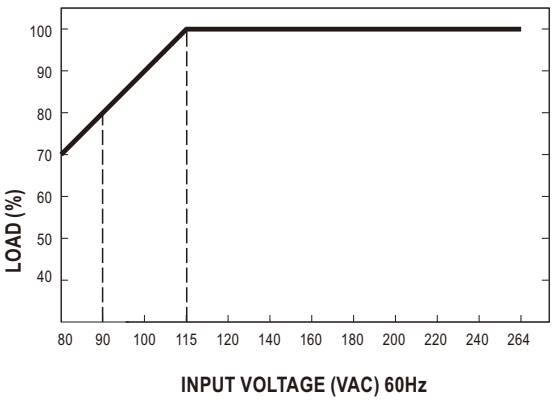


■ Output Derating VS Input Voltage



◎ RPS-400-TF/SF



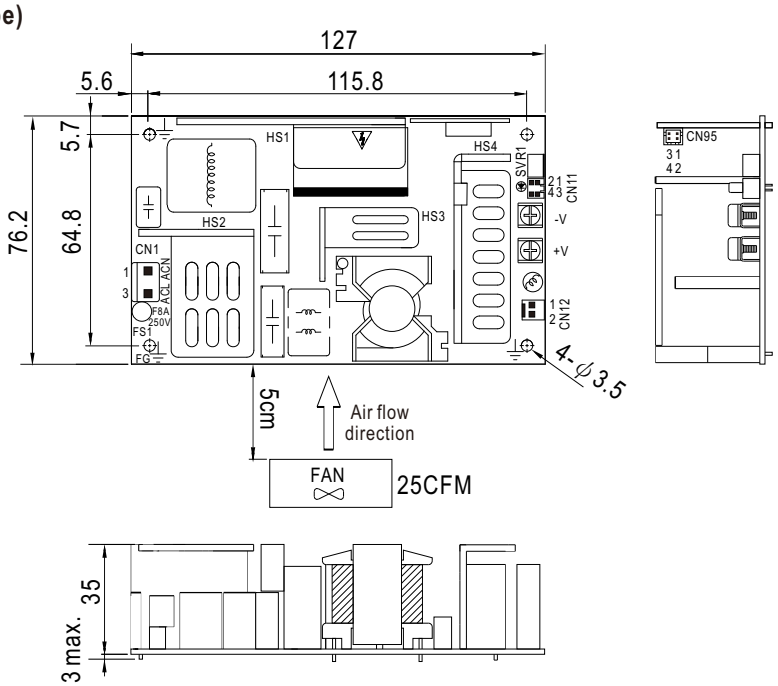


	RPS-400	RPS-400-C	RPS-400-TF	RPS-400-SF
Without Fan Watt	250W	250W	---	---
With Fan Watt	400W	400W	400W	400W

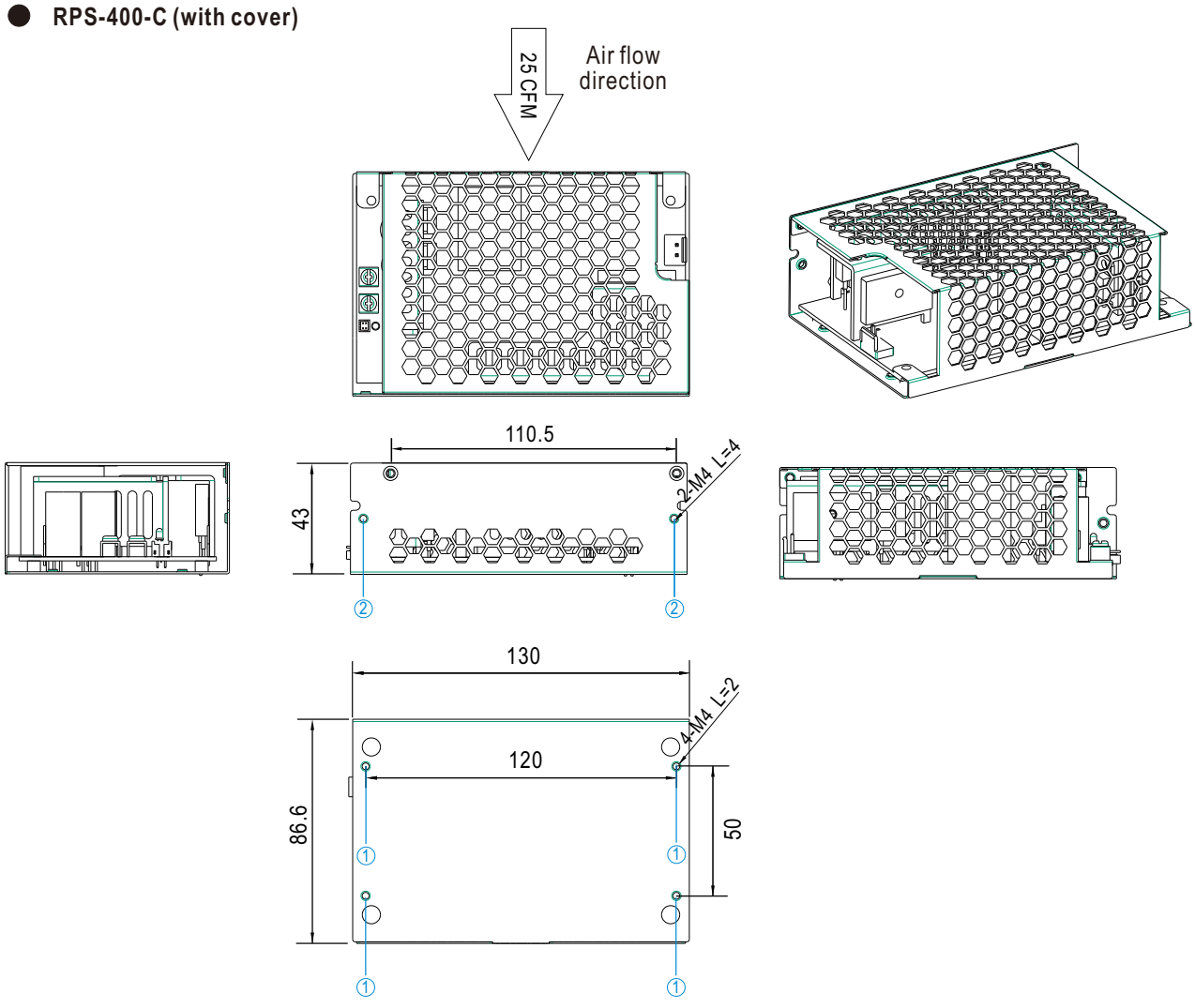
■ Mechanical Specification

Unit:mm

● RPS-400 (PCB Type)

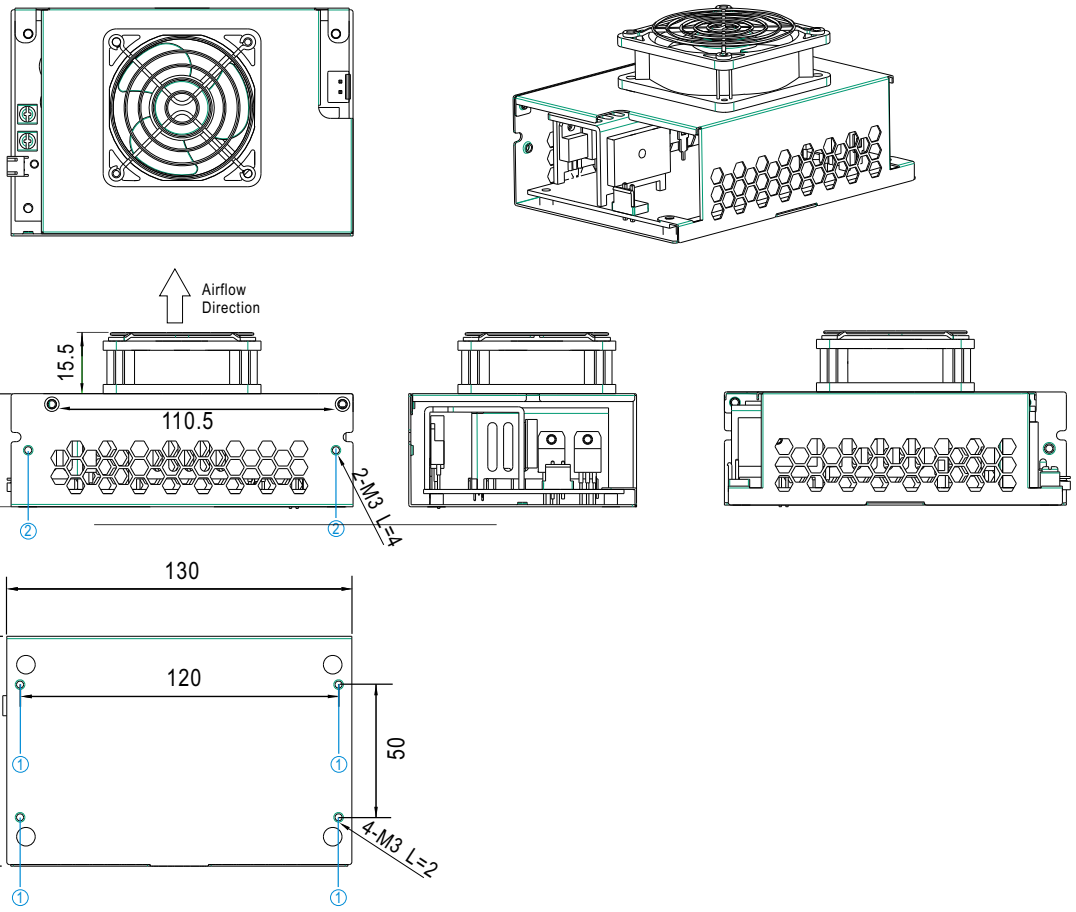


● RPS-400-C (with cover)

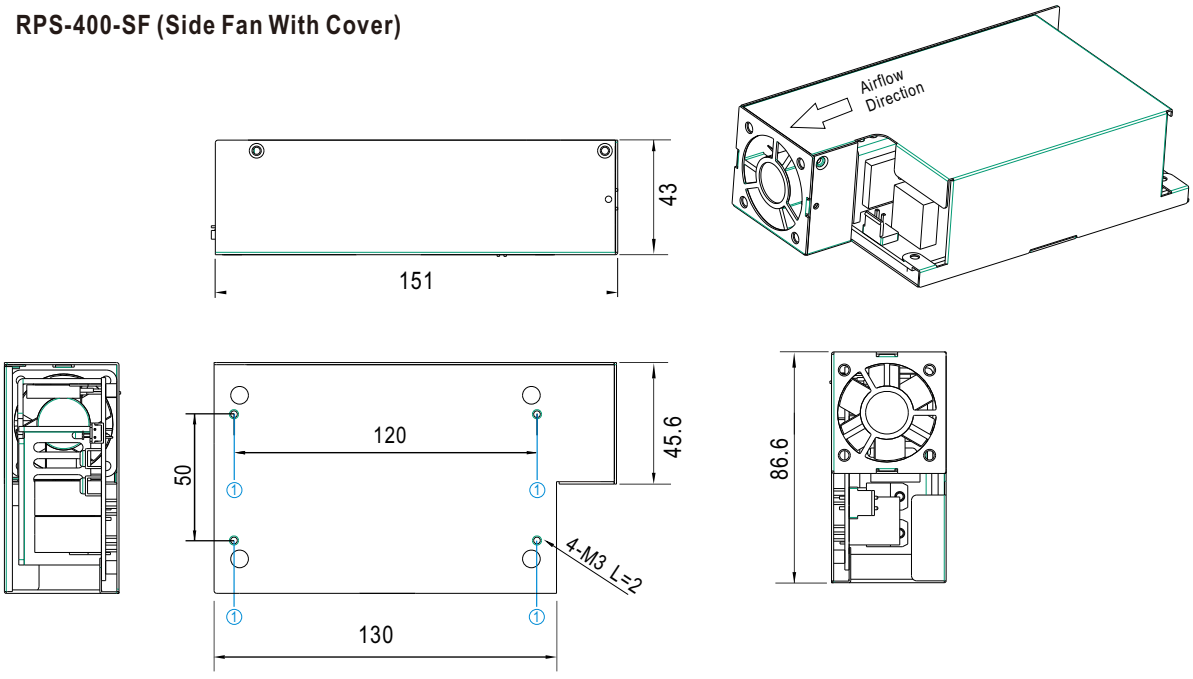


RPS-400-TF (Top Fan with Cover)

Unit:mm

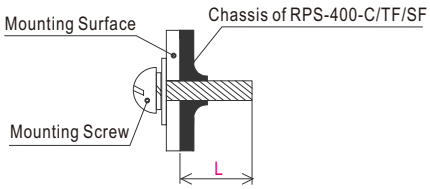


RPS-400-SF (Side Fan With Cover)



※ Mounting Instruction

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



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

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

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-400-TF/SF)

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

DC Output Connector (CN2,CN3)

Pin No.	Assignment	Output Terminals
CN2	-V	M4 Pan HD screw in 2 positions Torque to 8 lbs-in(90cNm)max.
CN3	+V	

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		

⏚ Grounding Required

⚠ HS1,HS2,HS3,HS4 can not be shorted

※ Note: 1. When the input voltage is AC 230V the PCB type (Black Type) model delivers EMI Class B for both conducted emission and radiated emission for the power supply, When the input voltage is AC110V the PCB type (Black Type) model delivers EMI Class B for conducted emission ,Class A for radiated emission for the power supply.
It delivers Class A for conduted emission and radiated emission, when configured into Class II (without FG) system.

2. The Enclosed type (-C/TF/SF type) model are not suitable for configuration within a Class II (without FG) system, but suggested within a Class I (with FG) system.

3. Mounting Instruction for Enclosed type.

■ Installation Manual

Please refer to : http://www.meanwell.com/webnet/search/InstallationSearch.html