

## FEATURES

## 20W AC/DC Medical Open-Frame

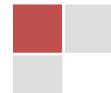
## SP-M20 series

Universal AC input / Full range	Withstand 2G vibration test
Cooling by free air convection	Green design, No-load power consumption < 0.3W
Brown-out ( Low AC Input voltage )	100% full load burn-in test
Medical safety approved	Protections: Short circuit / Over load / Over voltage
Isolation class II	3 Year Warranty
All using 105°C long life electrolytic capacitors	High operation temperature up to 70 C



## SPECIFICATION

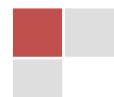
Model	SP-M20-05	SP-M20-12	SP-M20-15	SP-M20-24
Output Requirements	Voltage (1)	5V	12V	15V
	Rated Current	4A	1.66A	1.33A
	Current Range	0~4A	0 ~ 1.66A	0 ~ 1.33A
	Rated Power	20W	19.92W	19.95W
	Ripple & Noise (Max) (2)	80 mv	150 mv	150 mv
	Voltage Adjustment Range	±10%		
	Voltage Tolerance (3)	± 2%	± 1%	± 1%
	Line Regulation	±0.5%	±0.5%	±0.5%
	Load Regulation	± 1%	±0.5%	±0.5%
	Setup, Rise Time	1000ms, 35ms/230VAC 1000ms, 25ms/115VAC at full load		
Input Requirements	Hold Time	60ms / 230VAC 18ms / 115VAC at full load		
	Voltage (4)	85V ~ 264VAC 125 ~ 373VDC		
	Frequency	47Hz ~ 63Hz		
	Efficiency (Typ.)	77%	82%	84%
	AC Current (max.)	0.6 A / 115VAC 0.15A / 230VAC		
Protection	Inrush Current (Typ.)	Cold Start 30A / 115VAC 65A / 230VAC		
	Over Load	Above 110% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed		
	Over Voltage	115% ~ 150% rated output voltage Protection type : latch-off mode		
	Operating Temperature	-20°C ~ +70°C (Refer to output load de-rating curve)		
Environmental Conditions	Operating Humidity	20 ~ 90% RH non-condensing		
	Storage Temperature, Humidity	- 40 +85°C / 10 ~ 95% R.H		
	Temperature Coefficient	±0.03%/°C (0 ~ 50°C)		
	Vibration	10 ~ 500HZ, 2G 10min./ 1 cycle, period for 60 min. Each along X,Y,Z axes		



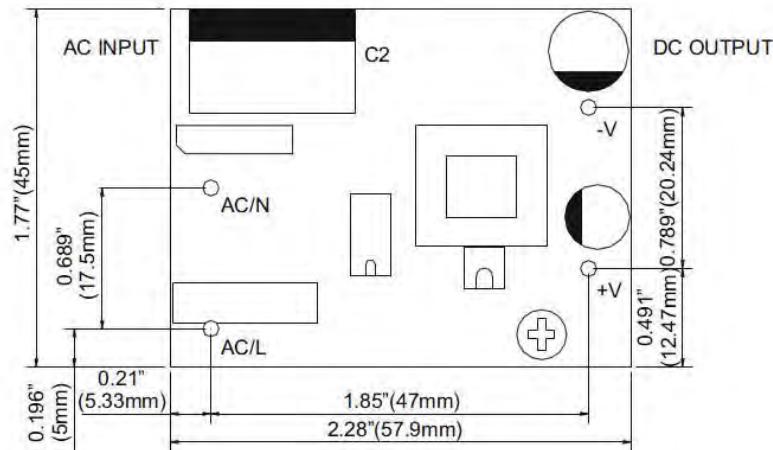
Model	SP-M20-05	SP-M20-12	SP-M20-15	SP-M20-24
Safety & EMC (5)	Safety Standards	UL60601-1 / TUV EN60601-1 / IEC60601-1 Approved		
	Green Energy	ENERGY STAR® Compliant Single Voltage External AC – DC and AC – AC Power Supplies Eligibility Criteria ( Version 1.1 )		
	Withstand Voltage	I/P -O/P: 4KVAC		
	Isolation Resistance	I/P -O/P : 100M Ohms / 500VDC		
	EMI Conduction & Radiation	EN55011: 2007+A2: 2007 Class B		
	Harmonic Current	EN61000-3-2: 2006 Class A, EN61000-3-3: 1995+A1: 2001+A2: 2005		
Others	EMS Immunity	EN60601-1-2: 2001+A1: 2006, IEC61000-4-2,3,4,5,6,8,11 light industry level, criteria A		
	MTBF	188.3K HRS Compliance: MIL-HDBK-217F		
	Dimension (W*H*D)	88.9 x 50.8 x 19.3(mm) or 3.5 x 2 x 0.76(inches)		
	Packing	0.076kg ; 100Pcs/7.6kg		

**NOTES:**

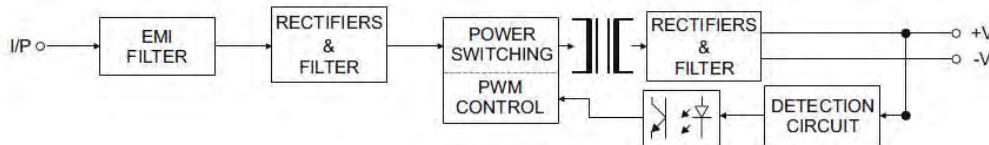
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47 uf parallel capacitor.
3. Tolerance: includes set up tolerance, line regulation and load regulation.
4. Line regulation is measured from low line to high line at rated load.
5. Load regulation is measured from 0% to 100% rated load.
6. The power supply is considered a component which will be installed into a final system. The final system must be re-tested to meet EMC directives.
7. Length of set up time is measured at cold first start. Turning ON/OFF the power supply very quickly may lead to increase of the setup time      °C



## ■ Mechanical Specification



## ■ Block Diagram



## ■ De-rating Curve

