

# 220 WATT MEDICAL POWER SUPPLIES

## DESCRIPTION

The series of AC/DC switching power supplies can deliver 220 watts maximum continuous output power. High efficiency with an IEC320/C14 or IEC320/C8 inlet to mate with interchangeable AC cord for world-wide use. All models meet EN55011, EN55022 and FCC class B emission limits.

## FEATURES

- Both Class-I & Class-II models are provided
- Compact dimension 197 x 88 x 44 mm
- Meet EN55011/EN55022 and FCC class B emission
- OVP, OCP, OTP protection
- High efficiency compliant with Energy Star efficiency level V requirements
  - \* No load power consumption less than 0.5 W
  - \* Average active efficiency greater than 87%
- Optional output connectors

## INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	2.5 A (rms) for 115 VAC 1.2 A (rms) for 230 VAC
Earth leakage current:	300 µA max. @ 264 VAC, 63 Hz
Touch current:	100 µA max. @ 264 VAC, 63 Hz

## OUTPUT SPECIFICATIONS

Output voltage /current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	1% peak to peak maximum
Protection:	OVP Latch off OCP & Shorted Auto recovery OTP Latch off
Temperature coefficient:	±0.04% /°C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 us after a 25% step load change

## ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0°C to +40°C
Storage temperature:	-20°C to +80°C
Relative humidity:	10% to 90% non-condensing

## FSP220 SERIES



RoHS



## SAFETY STANDARD APPROVALS



UL ES 60601-1, CSA C22.2 No. 60601-1  
File No. E178020



TÜV EN 60601-1

## GENERAL SPECIFICATIONS

Hold-up time:	12 ms minimum at 100 VAC
Turn on delay time:	3 Sec maximum at 100 VAC
Power Factor:	0.95 typical
Efficiency:	See rating chart
Line regulation:	±0.5% maximum at full load
Inrush current:	100 A @ 115 VAC or 200 A @ 230 VAC at 25°C cold start
Withstand voltage:	Class-I models 5600 VDC from input to output, 2100 VDC from input to ground, 700 VDC from output to ground (To verify AC strength, get correct test method to avoid power supply damage.) Class-II model 4000 VAC from input to output
MTBF:	100,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
EN55011/EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±8 KV air and ±6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±2 KV com
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms, and >95% reduction for 10 ms

## OUTPUT VOLTAGE/CURRENT RATING CHART

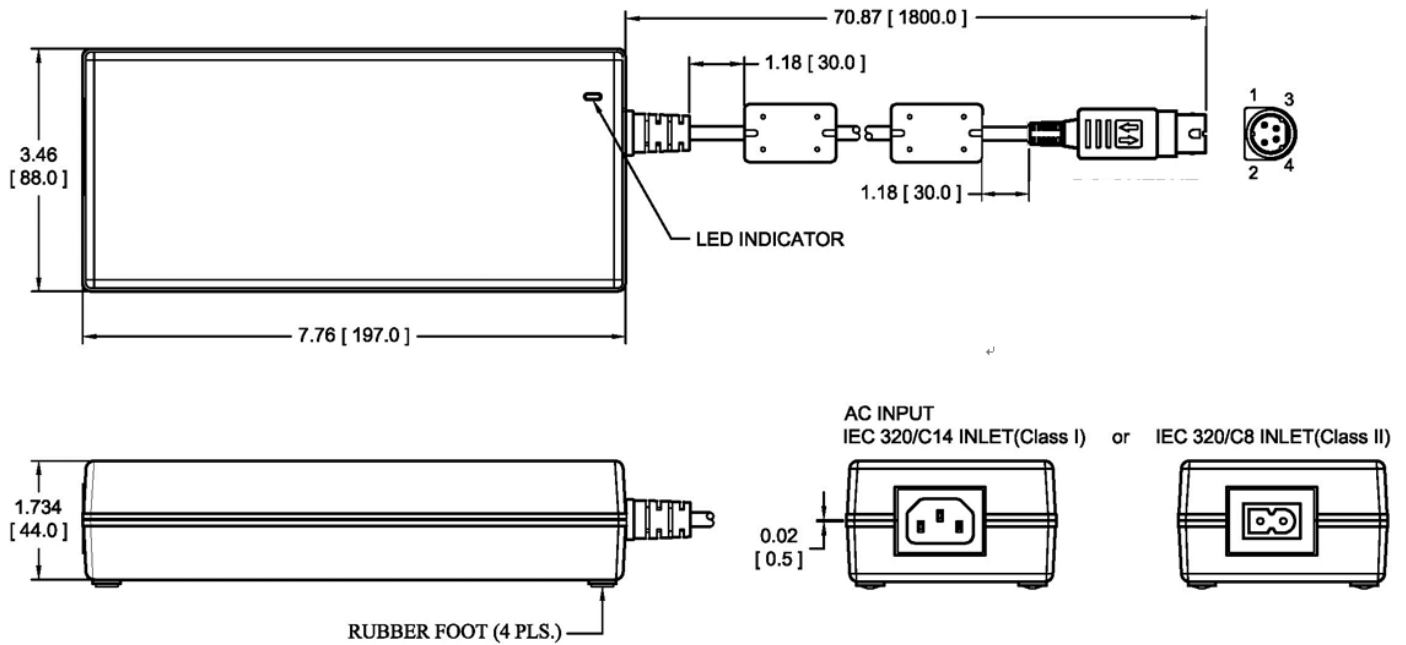
Model <sup>(1)</sup>		Output						Average Active Efficiency (typical) @ 115 / 230 Vac
Class I	Class II	V1	Min. Current <sup>(3)</sup>	Max. Current	Tol.	Ripple & Noise <sup>(2)</sup>	Max. Power	
FSP200-KBAM1	FSP200-KBCM1	19 V	0.1 A	10.53 A	±5%	190 mV	200 W	87 /87%
FSP220-KAAM1	FSP220-KACM1	24 V	0.1 A	9.17 A	±5%	240 mV	220 W	90 /92%
FSP220-KKAM1	FSP220-KKCM1	28 V	0.1 A	7.86 A	±5%	280 mV	220 W	90 /92%
FSP220-KEAM1	FSP220-KECM1	36 V	0.1 A	6.11 A	±5%	360 mV	220 W	90 /92%

**NOTES:**

- Class I models are equipped with IEC320/C14 inlet, and class II models with IEC320/C8 inlet.
- Ripple and noise is maximum peak to peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 47 µF electrolytic capacitor in parallel with a 0.1 µF ceramic capacitor across the output.
- All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to the burst-mode operation of the control IC in them for energy saving.

## MECHANICAL SPECIFICATIONS

## OUTPUT POWER DERATING CURVE



**NOTES:**

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Output connector is 4-pin plug with lock, Kycon P/N KPPX-4P or equivalent, mating with 4-pin socket, Kycon P/N KPJX-4S-S or equivalent.

## PIN CHART

Pin No.	1	2	3	4	Shell of Connector	
					Class I	Class II
<b>Polarity</b>	+V1	V1 Return	AC Ground	NC		

**Weight:** 1.0 kg (2.2 lbs.) approx.