FSP350 Medical

Features

- 5 x 3 x 1 Inches Form factor
- 350 Watts with Forced Air Cooling & 200 Watts Convection Cooling
- Efficiencies upto 94%
- -40 to 70 degree operating temperature*
- 12V / 0.5A Fan Output, Thermal Shut-Down feature
- 2.56m Hours, Telcordia -SR332-issue 3 MTBF
- Standby Power < 0.5W
- Approved to EN60601-1 3rd Edition
- Medical (BF) Safety Approvals

Electrical Specifications

Input Voltage	90-264 VAC/390 VDC, Universal (Derate from 100% at 100V AC to 90% at 90V AC)
Input Frequency	47–63 Hz
Input Current	115 VAC: 3.6 A max. 230 VAC: 1.8 A max.
No Load Power	less than 0.5W typical
Inrush Current	115 VAC – 25 A, 230 VAC – 45 A, 264 VAC – 75 A
Leakage Current	300 uA Typical Touch current <100uA
Efficiency	94%(48V,58V), 93%(24V,30V), 92%(12V,15V)
Hold-up Time	Full Load > 8 ms typical Convection Load > 14 ms typical
Power Factor	exceeds 0.95 with Full Load
Output Power	upto 350W with 375 LFM, upto 200W Convection
Output Voltage Adjustability	+/-3%
Line Regulation	+/-0.5%
Load Regulation	+/-1%
Transient Response	50-100% step load change, at 0.1A/uS slew rate, 50% duty cycle, 50Hz=5% , recovery time < 5 ms
Rise Time	55 ms typical
Set Point Tolerance	+/–1%
Over Current Protection	>110%, Hiccup mode / Auto Recovery
Over Voltage Protection	110 to 140%, Hiccup mode / Auto Recovery
Short Circuit Protection	Hiccup mode / Auto Recovery
Switching Frequency	PFC – 70 to 130 KHz ,PWM – 50-80 KHz
Operating Temperature	–40 to +70°C, * –40 to 0°C startup is guaranteed with spec deviation (ref note 6)
Storage Temperature	–40 to +85°C
Relative Humidity	5% to 95%, noncondensing
Altitude	Operating: 16,000 ft.; Nonoperating: 40,000 ft.
MTBF	2.56m Hours, Telcordia -SR332-issue 3
Isolation Voltage	Input to Output – 4000 VAC medical applications.
	Input to GND - 1500 VAC , Output to GND- 1500VAC for type BF , 500 VAC for type B
Cooling	350W with 375 LFM forced air cooling at 100 to 264VAC 200W with natural convection cooling at 100 to 264VAC.

Model Number	Description	Voltage	Max. Load (Convection)	Max. Load (375 LFM)	Min. Load	Ripple[1]
FSP350-1K20M1	with Screw Terminal	12V	15A	25A	0.0A	1%
FSP350-1K21M1	with Molex Connector	12V	15A	18.75A	0.0A	1%
FSP350-1K30M1	with Screw Terminal	15V	12A	21.67A	0.0A	1%
FSP350-1K31M1	with Molex Connector	15V	12A	18A	0.0A	1%
FSP350-1K40M1	with Screw Terminal	24V	8.33A	14.60A	0.0A	1%
FSP350-1K41M1	with Molex Connector	24V	8.33A	14.60A	0.0A	1%
FSP350-1K80M1	with Screw Terminal	48V	4.17A	7.30A	0.0A	1%
FSP350-1K81M1	with Molex Connector	48V	4.17A	7.30A	0.0A	1%
FSP350-1K50M1	with Screw Terminal	30V	6.67A	11.67A	0.0A	1%
FSP350-1K51M1	with Molex Connector	30V	6.67A	11.67A	0.0A	1%
FSP350-1K70M1	with Screw Terminal	58V	3.45A	6.04A	0.0A	1%
FSP350-1K71M1	with Molex Connector	58V	3.45A	6.04A	0.0A	1%
FSP350-CK metal cover kit accessory						

Connectors		
J1	Pin 1	AC LINE
	Pin 2	NOT FITTED
	Pin 3	AC NEUTRAL
J2 Option 1 (Screw Terminal)	Pin 1	V1 +VE
	Pin 2	V1 -VE
J2 Option 2 (Molex Connector)	Pin 1,2,3,4	V1 +VE
	Pin 5,6,7,8	V1 -VE
J3	Pin 1	FAN +VE
	Pin 2	FAN -VE

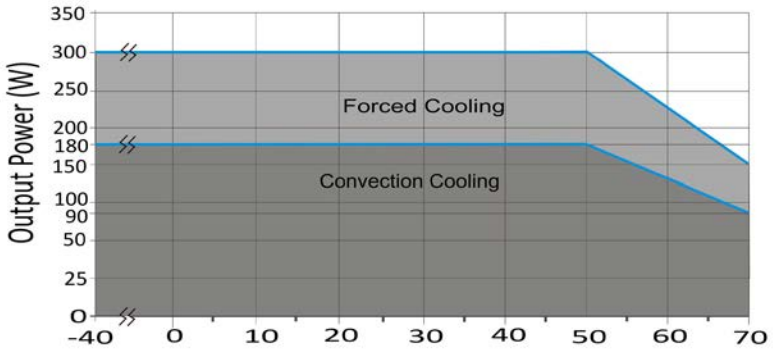
Notes

1. Ripple is peak to peak with 20 MHz bandwidth and 10 µF (Tantalum capacitor) in parallel with a 0.1 µF capacitor at rated line voltage and load ranges.
2. Combined output power of main output, fan supply shall not exceed max. Power rating.
3. Fan supply output voltage tolerance including set point accuracy, line and load regulation is +/-10% and Ripple and noise is less than 10%.
4. Specifications are for nominal input voltage, 25°C unless otherwise stated.
5. Thermal shutdown feature : The power supply goes in hiccup mode when the temperature of PCB exceeds 110 °C (+/-10 °C).
6. Output ripple can be more than 10% of the output voltage.

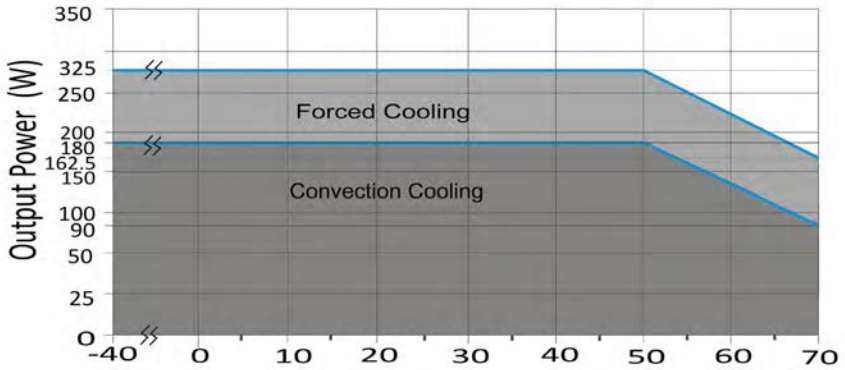
Mechanical Specifications	
AC Input Connector (J1)	Molex: 26–60–4030 Mating: 09–50–3031; Pins: 08–50–0106
Earth (J4)	Molex: 19705-4301 Mating: 19003-0001
DC Output Connector (J2) Option 1 (Screw Terminal)	6-32 inches Screw Pan HD Mating: Designed to accept Ring Tongue Terminal AMP : 8-31886-1, wherein one 16 AWG(max) wire can be crimped. Note : One Ring Tongue Terminal with 16 AWG is recommended for current upto 11A only. Use multiple tongue terminals with wire for more current.
DC Output Connector (J2) Option 2 (Molex Connector)	Molex: 26-60-4080 Mating: 09-50-3081; Pins: 08-50-0106
Aux (Fan) Output(J3)	AMP :640456-2 Mating: 640440-2
Dimensions	5 x 3 x 1 inches (127 x 76.2x 25.4 mm)
Weight	300 gm approx
EMC	
CE Mark	Complies with LVD Directive
Conducted Emissions	EN55022–B, CISPR22–B, FCC PART15–B
Static Discharge	EN61000–4–2, Level–3
RF Field Susceptibility	EN61000–4–3, Level–3
Fast Transients/Bursts	EN61000–4–4, Level–3
Radiated Emissions	Level A radiated, Level B radiated with external core (King core K5B RC 25x12x15-M in input cable)
Surge Susceptibility	EN61000–4–5, Level–3
Harmonic Current	EN61000–3–2, Class D
Safety	
Safety Standard(s)	EN60601-1, IEC 60601-1 (ed.3), ANSI / AAMI ES 60601 - 1, CSA C22.2 No. 60601-1
Approval Agency	Nemko, UL, C-UL
Safety File Number(s)	UL: Certificate Number 20150302-E173812 Nemko: Certificate No.P15219413 IEC Ref. Certif. No.: NO85143

Derating Curve

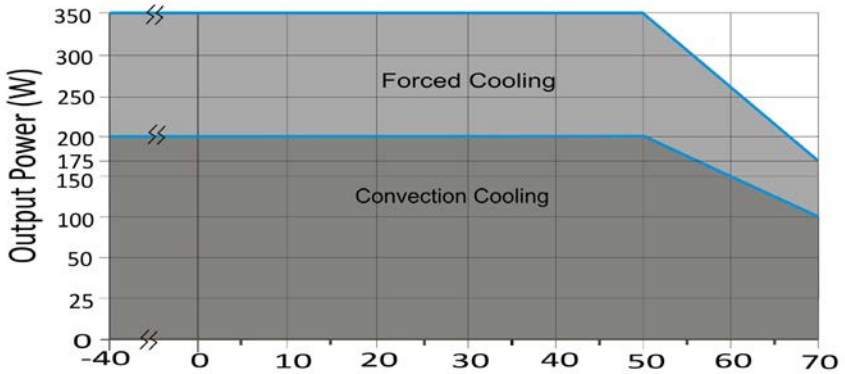
12V Output



15V Output



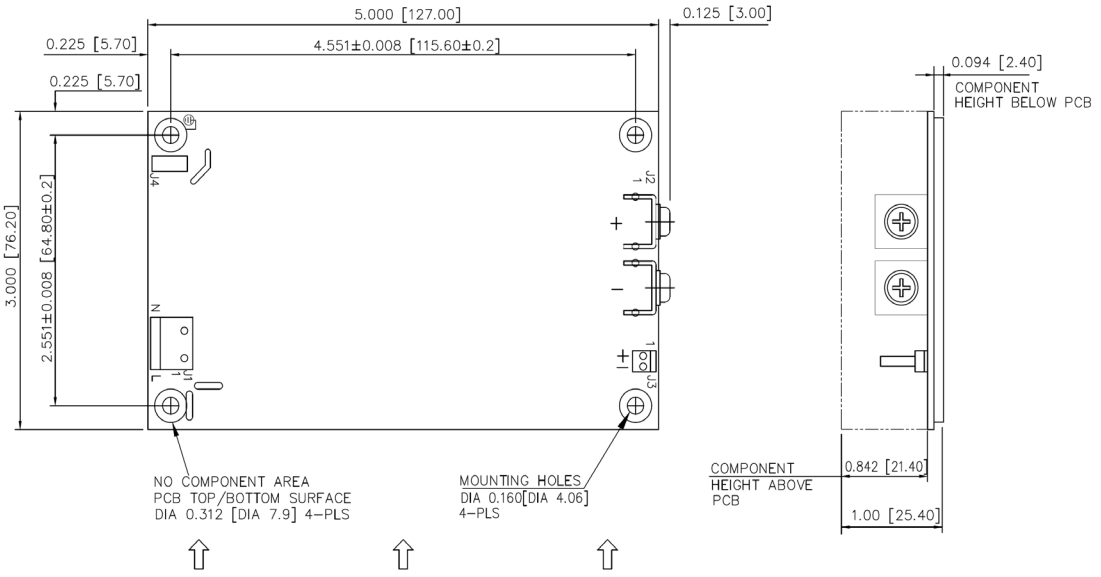
All Outputs with Po max = 350W



Derating Curve Note : Between –40 to 0°C startup is guaranteed with spec deviation (ref note 6)

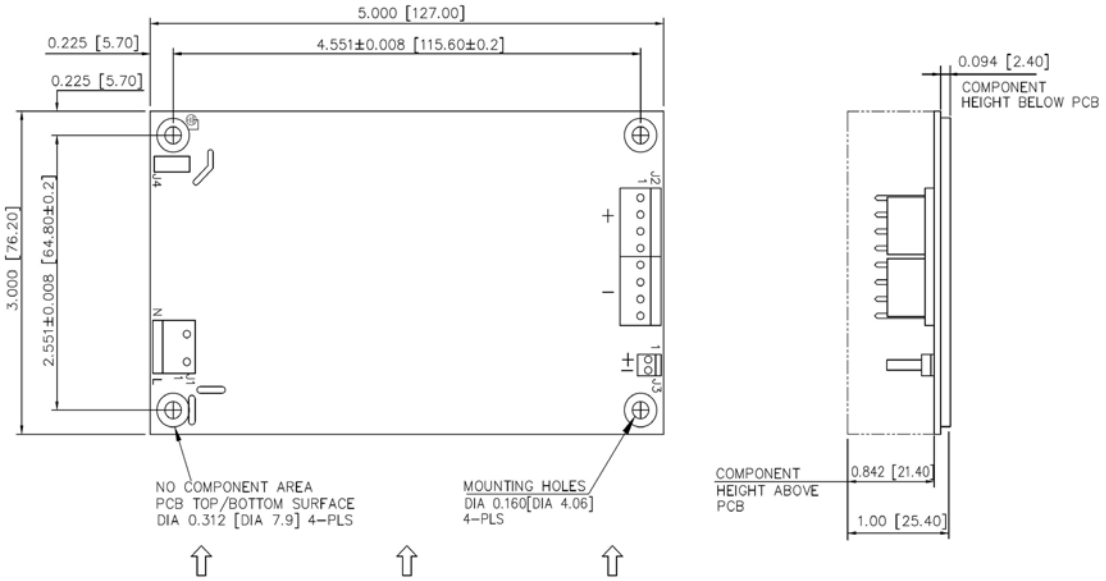
Mechanical Drawing

Option 1
−10XX Suffix.



MECHANICAL OUTLINE DIMENSIONS
ALL DIMENSIONS ARE IN INCHES[MM]
GEN TOLERANCE : +/−0.04[1.0MM]

Option 2
−13XX Suffix.



MECHANICAL OUTLINE DIMENSIONS
ALL DIMENSIONS ARE IN INCHES[MM]
GEN TOLERANCE : +/−0.04[1.0MM]