

400 WATT ITE POWER SUPPLIES

DESCRIPTION

This AC-DC switching power supplies in a package of 4 x 7 x 1.58 inches are capable of delivering 400 watts continuous power at 7 CFM forced air cooling or 300 watts at convection cooling. The units are constructed on a printed circuit board with a U-bracket for mechanical support and heat sinking. A cover-and-fan assembly can be added during manufacturing for 400 watt output without the change of any dimension. PSU is suitable for audio & video, Information, networking & industrial application.

FEATURES

- Class-I design
- Low inrush current
- 5Vaux at 100mA
- Fan power 12Vdc at 250 mA
- Inhibit & PS Off input signal to disable output
- DC OK & PFD status output signals

INPUT SPECIFICATIONS

Input voltage: 90-264 VAC
 Input frequency: 47-63 Hz
 Input current: 4.2 A (rms) @115 VAC, 60 Hz
 2.1 A (rms) @ 230 VAC, 50 Hz
 Earth leakage current: 750 µA max. @ 264 VAC, 63 Hz
 Touch current: 100 µA max. @ 264 VAC, 63 Hz
 Inhibit signal: TTL low input to turn off output
 PS OFF signal: TTL high input to turn off output

OUTPUT SPECIFICATIONS

Output voltage/current: See rating chart.
 Maximum output power: See rating chart.
 Ripple and noise: 1% peak to peak maximum
 Remote sense Compensation for cable losses up to 0.5V
 Overvoltage protection: Set at 115-140% of nominal output voltage
 Overcurrent protection: Protected to output short circuit conditions
 Thermal shutdown Protected to over temperature conditions
 Temperature coefficient: All outputs $\pm 0.04\%$ / $^{\circ}\text{C}$ maximum
 Transient response: Maximum excursion of 4%, recovering to 1% of final value within 500 us after a 25% step load change
 Standby power 5 V at 100 mA maximum
 Fan power 12 V at 250 mA maximum
 PFD (Power Failed) signal:
 TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1ms prior to V1 output dropping 5% below its nominal value. This signal also provides a minimum delay of 100 ms after V1 is within regulation
 DC OK signal: TTL high when output voltage > 95% rating

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: -10°C to $+70^{\circ}\text{C}$
 Storage temperature: -20°C to $+85^{\circ}\text{C}$
 Relative humidity: 5% to 95% non-condensing
 Derating: Derate from 100% at $+50^{\circ}\text{C}$ linearly to 50% at $+70^{\circ}\text{C}$, applicable to convection and forced-air cooling conditions

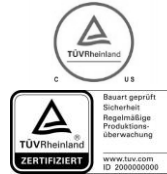
FSP400-1K SERIES



RoHS



SAFETY STANDARD APPROVALS



UL 62368-1, CSA C22.2 No. 62368-1

TÜV EN 62368-1

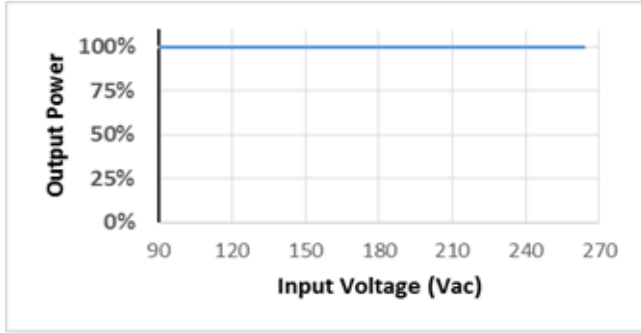
GENERAL SPECIFICATIONS

Power on delay time: 1 Sec max. @ typical load
 Power Factor: 0.98 typical
 Efficiency: Typical 89% @ 115 VAC, 92% @ 230 VAC
 Hold-up time: 12 ms minimum at 110 VAC & 400 W
 Line regulation: $\pm 0.5\%$ maximum at full load
 Inrush current: 20 A @ 115 VAC, at 25°C cold start
 40 A @ 230 VAC, at 25°C cold start
 Operation altitude: 5000 meters above sea level
 Withstand voltage: 4242 VDC from input to output,
 2500 VDC from input to ground,
 700 VDC from output to ground
 Isolation resistance: Input to output 100M ohm @ 500Vdc, 25°C
 MTBF: 250,000 hours at full load at 25°C ambient,
 calculated per MIL-HDBK-217F

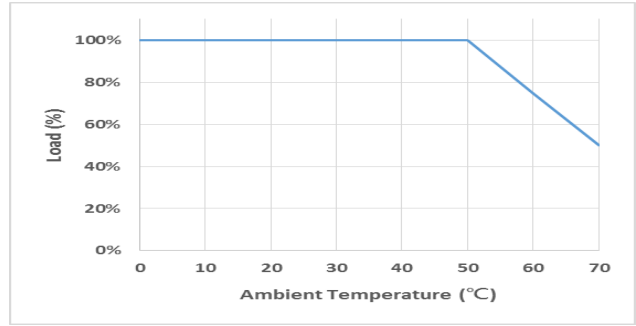
EMC Performance

EN55032: Class B conducted, class A radiated
 FCC: Class B conducted, class A radiated
 VCCI: Class B conducted, class A radiated
 EN61000-3-2: Harmonic distortion, class A and D
 EN61000-3-3: Line flicker
 EN 55024
 EN61000-4-2: ESD, ± 8 KV air and ± 4 KV contact
 EN61000-4-3: Radiated immunity, 3 V/m
 EN61000-4-4: Fast transient/burst, ± 1 KV
 EN61000-4-5: Surge, ± 1 KV diff., ± 2 KV com
 EN61000-4-6: Conducted immunity, 3 Vrms
 EN61000-4-8: Magnetic field immunity, 1 A/m
 EN61000-4-11: Voltage dip immunity,
 30% reduction for 500 ms, criteria A
 >95% reduction for 10 ms, criteria A
 >95% reduction for 5000 ms, criteria B

INPUT VOLTAGE DERATING CURVE



OUTPUT POWER DERATING CURVE



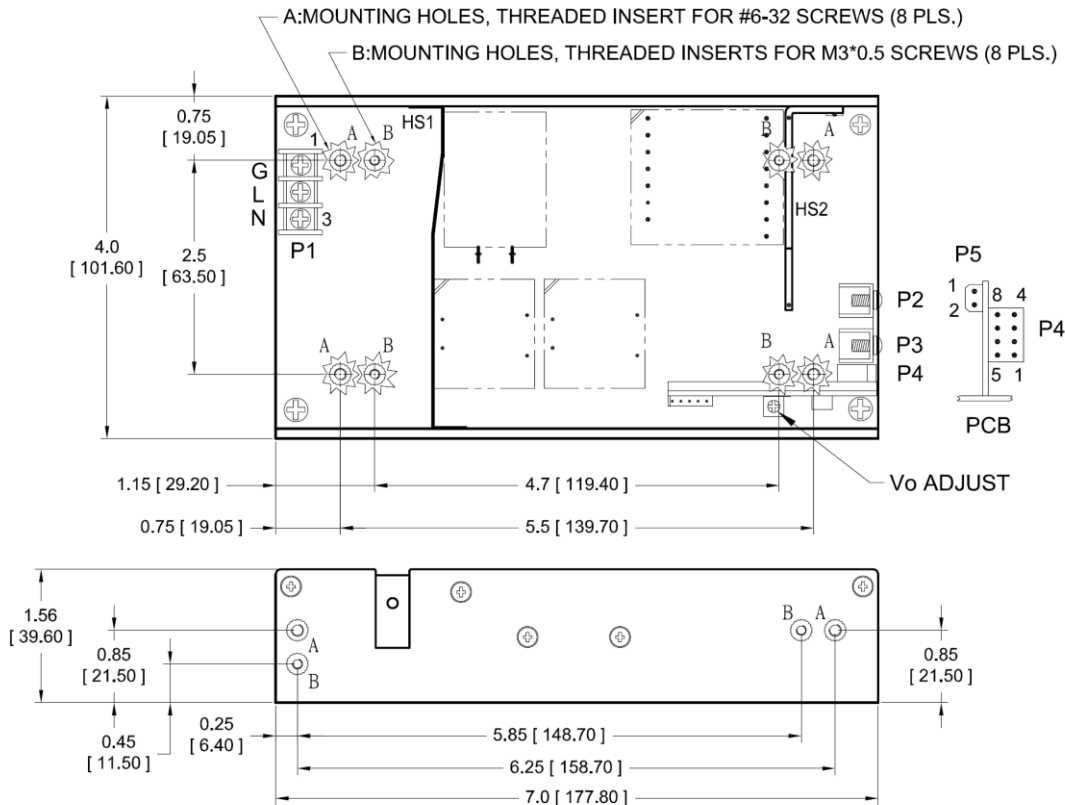
OUTPUT VOLTAGE/CURRENT RATING CHART

Model no. ⁽¹⁾	Output							Efficiency (typical) 115 / 230 Vac
	V1	Min. Current ⁽⁴⁾	Max. Current at convection	Max. Current at 7 CFM ⁽²⁾	Tol.	Ripple & Noise ⁽³⁾	Max. Output Power	
FSP400-1K20B	12 V	0.1 A	25.00 A	33.34 A	±2%	120 mV	300W / 400W	90 / 92%
FSP400-1K30B	15 V	0.1 A	20.00 A	26.67 A	±2%	150 mV	300W / 400W	90 / 92%
FSP400-1K31B	18 V	0.1 A	16.67 A	22.23 A	±2%	180 mV	300W / 400W	90 / 92%
FSP400-1K40B	24 V	0.1 A	12.50 A	16.67 A	±2%	240 mV	300W / 400W	89 / 91%
FSP400-1K50B	28 V	0.1 A	10.72 A	14.29 A	±2%	280 mV	300W / 400W	89 / 91%
FSP400-1K70B	36 V	0.1 A	8.34 A	11.12 A	±2%	360 mV	300W / 400W	90 / 92%
FSP400-1K80B	48 V	0.1 A	6.25 A	8.34 A	±2%	480 mV	300W / 400W	90 / 92%

- NOTES: 1. Change suffix "B" for U-Bracket form to "C" for enclosed form with cover-and-fan assembly, e.g. FSP400-1K40C.
 2. 300 W without moving air or 400 W with 7 CFM forced air provided by user for "B" version, 400 W for "C" version with cover-and-fan assembly
 3. 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 10 μF tantalum capacitor in parallel with a 0.1 μF ceramic capacitor across the output.
 4. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to the burst-mode operation for energy saving.

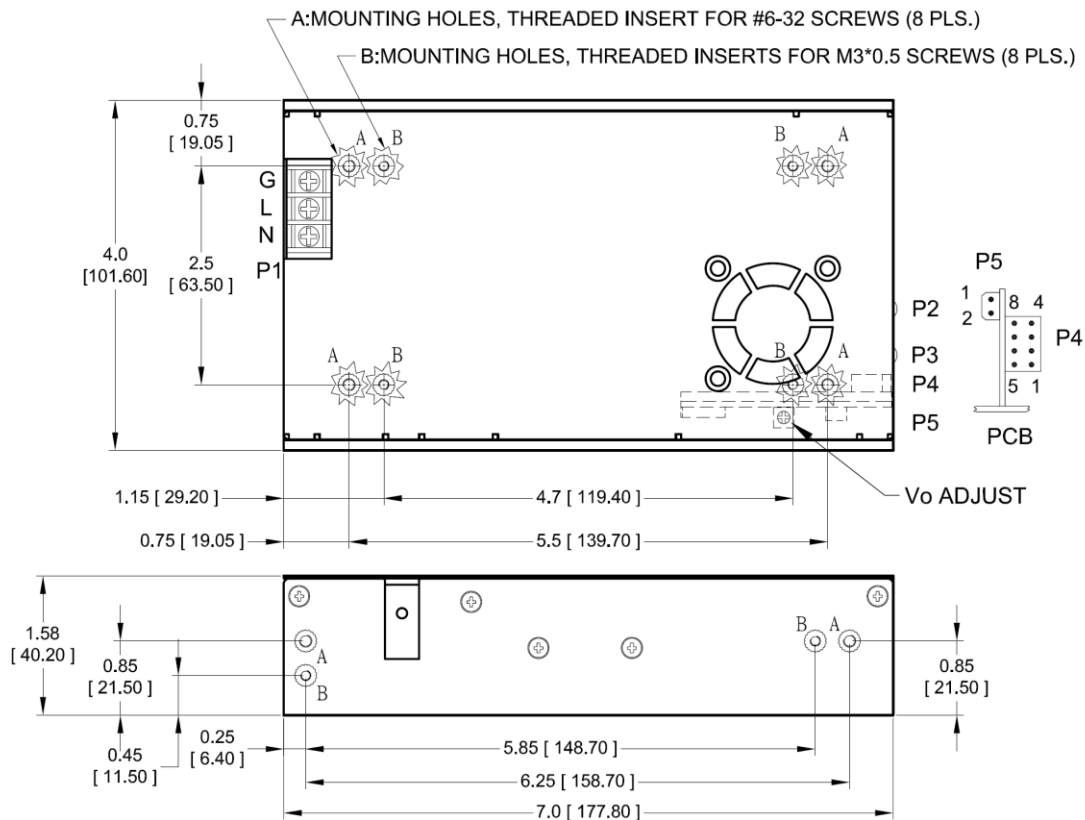
MECHANICAL SPECIFICATIONS

U-bracket Form



MECHANICAL SPECIFICATIONS

Enclosed Form



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle terminal P/N DT-35-B01W-03, with nickel plated M3 screws.
4. P2, P3: M3 x 0.5 screw connectors
5. Connector P4: Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
6. Fan connector P5: JST header S2B-ZR-3.4 or equivalent, mating with JST housing ZHR-2 or equivalent.
7. Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kg (2.52 lbs.) approx. for enclosed form
8. Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

PIN CHART

CONNECTOR	P1 (AC)			P2	P3	P5	
	1	2	3			1	2
OUTPUT	Ground	Live	Neutral	+V1	Common Return	+12V Fan	Common Return

CONNECTOR	P4							
	1	2	3	4	5	6	7	8
OUTPUT	Common Return	Inhibit	+V1 Sense	+5V Standby	-V1 Sense	DC OK	PFD	PS OFF