

## DESCRIPTION

The PU400 series of AC-DC switching power supplies in a package of 4 x 7 x 1.58 inches are capable of delivering 400 watts of 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. The units are certified to IEC/EN/UL 60950-1 and suitable for data networking, computer and telecommunication applications.

## FEATURES

- 4 x 7 inch footprint with 1.58 inch low profile
- 100-240 VAC input with active PFC
- 300 watt convection rating up to +50°C
- 400 watt output with 7 CFM forced air
- Standby output 5VDC at 100mA
- EN55022 Class B conducted emissions
- Inhibit - TTL low to disable output
- Standard PS Off and DC OK signals
- Efficiency greater than 88%
- Compliant with RoHS requirements

## INPUT SPECIFICATIONS

|                  |   |
|------------------|---|
| Input voltage:   | 90-264 VAC  |
| Input frequency: | 47-63 Hz  |
| Input current:   | 4.2 A (rms) @115 VAC, 60 Hz<br>2.1 A (rms) @ 230 VAC, 50 Hz |
| Touch current:   | 250 µA max. @ 264 VAC, 63 Hz                                |

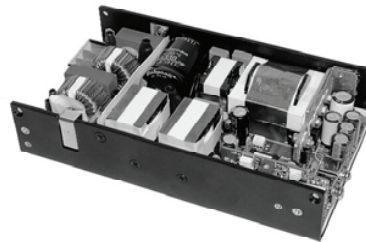
## OUTPUT SPECIFICATIONS

|                          |   |
|--------------------------|---|
| Output voltage/current:  | See rating chart.   |
| Maximum output power:    | See rating chart.   |
| Ripple and noise:        | 1% peak to peak maximum   |
| 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 overtemperature conditions   |
| Temperature coefficient: | All outputs ±0.04% /°C maximum  |
| Transient response:      | Maximum excursion of 4%, recovering to 1% of final value within 500 µs after a 25% step load change |
| Standby power            | 5 V at 100 mA maximum   |
| Fan power                | 12 V at 250 mA maximum  |

## ENVIRONMENTAL SPECIFICATIONS

|                        |  |
|------------------------|--|
| Operating temperature: | -10°C to +70°C   |
| Storage temperature:   | -40°C to +85°C   |
| Relative humidity:     | 5% to 95% non-condensing   |
| Derating:              | Derate from 100% at +50°C linearly to 50% at +70°C, applicable to convection and forced-air cooling conditions |

## PU400 SERIES



  
 CE (LVD)  
 RoHS

## SAFETY STANDARD APPROVALS



UL 60950-1, CSA C22.2 No. 60950-1



TÜV EN 60950-1

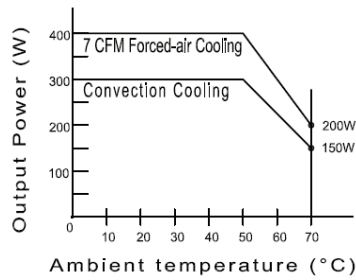
## GENERAL SPECIFICATIONS

|                      |   |
|----------------------|---|
| Switching frequency: | 85 KHz (typical)  |
| Efficiency:          | Typical 89% @ 115 VAC, 92% @ 230 VAC  |
| Hold-up time:        | 12 ms minimum at 110 VAC & 400 W  |
| Line regulation:     | ±0.5% maximum at full load  |
| Inrush current:      | 20 A @ 115 VAC, or 40 A @ 230 VAC, at 25°C cold start   |
| Withstand voltage:   | 3000 VAC from input to output,<br>1500 VAC from input to ground,<br>500 VAC from output to ground |
| MTBF:                | 350,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F                          |
| EMC Performance      |   |
| EN55022:             | 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  |
| 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 and >95% reduction for 10 ms                       |

### INTERFACE SIGNALS

PFD: TTL high for normal operation, low upon loss of input power, turn-on delay time 100-500 ms, turn-off delay time 5 ms minimum  
 Inhibit: TTL low to turn off output  
 DC OK: TTL high when output voltage >95%  
 PS OFF: TTL high to turn off output

### OUTPUT POWER DERATING CURVE



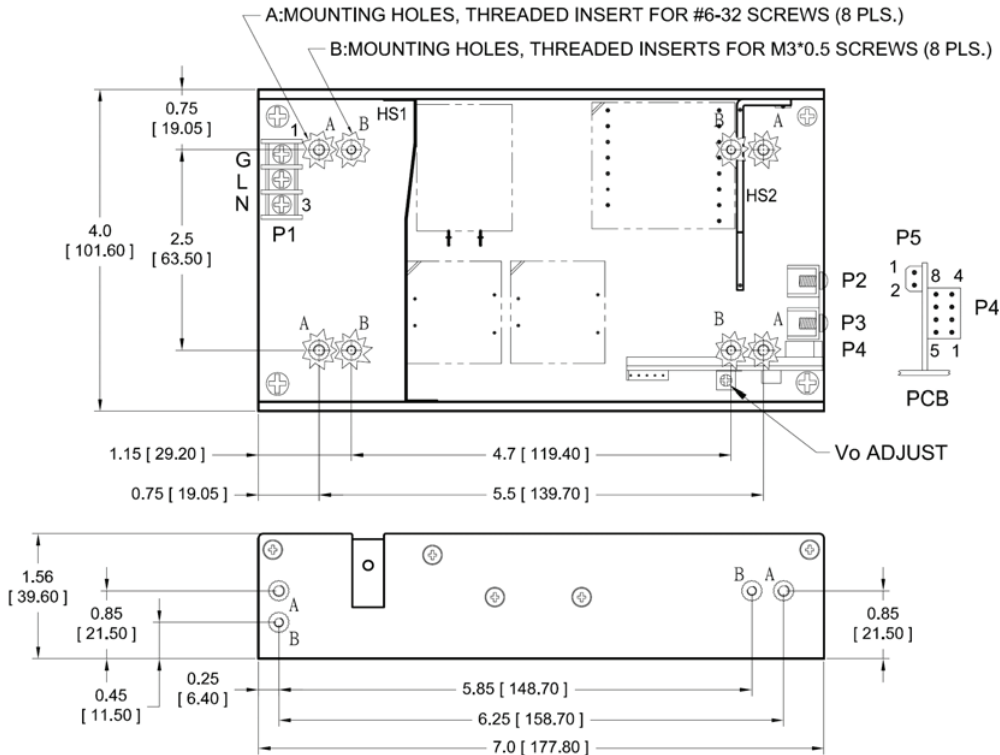
### OUTPUT VOLTAGE/CURRENT RATING CHART

| Model <sup>(1)</sup> | Output |              |                            |                                      |      |                               |                   | Efficiency (typical)   |                        |
|----------------------|--------|--------------|----------------------------|--------------------------------------|------|-------------------------------|-------------------|------------------------|------------------------|
|                      | V1     | Min. Current | Max. Current at convection | Max. Current at 7 CFM <sup>(2)</sup> | Tol. | Ripple & Noise <sup>(3)</sup> | Max. Output Power | @ 300 W<br>115/230 Vac | @ 400 W<br>115/230 Vac |
| PU400-12B            | 12 V   | 0 A          | 25.00 A                    | 33.34 A                              | ±2%  | 120 mV                        | 300 W/400 W       | 90/92 %                | 88/91 %                |
| PU400-13B            | 15 V   | 0 A          | 20.00 A                    | 26.67 A                              | ±2%  | 150 mV                        | 300 W/400 W       | 90/92 %                | 88/91 %                |
| PU400-13-1B          | 18 V   | 0 A          | 16.67 A                    | 22.23 A                              | ±2%  | 180 mV                        | 300 W/400 W       | 90/92 %                | 88/91 %                |
| PU400-14B            | 24 V   | 0 A          | 12.50 A                    | 16.67 A                              | ±2%  | 240 mV                        | 300 W/400 W       | 90/92 %                | 89/92 %                |
| PU400-15B            | 28 V   | 0 A          | 10.72 A                    | 14.29 A                              | ±2%  | 280 mV                        | 300 W/400 W       | 90/92 %                | 89/92 %                |
| PU400-17B            | 36 V   | 0 A          | 8.34 A                     | 11.12 A                              | ±2%  | 360 mV                        | 300 W/400 W       | 90/92 %                | 89/92 %                |
| PU400-18B            | 48 V   | 0 A          | 6.25 A                     | 8.34 A                               | ±2%  | 480 mV                        | 300 W/400 W       | 90/92 %                | 89/92 %                |

- NOTES:
- Change suffix "B" for U-Bracket form to "C" for enclosed form with cover-and-fan assembly, e.g. PU400-14C.
  - 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
  - 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.

### MECHANICAL SPECIFICATIONS

U-bracket Form



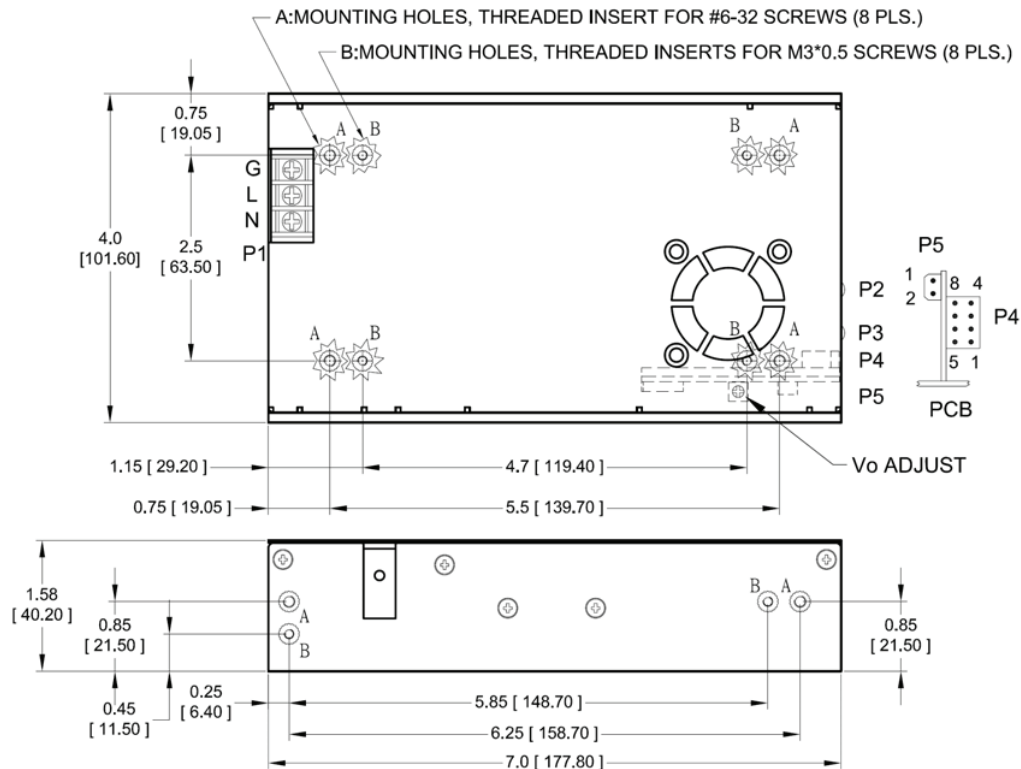
Specifications are subject to change without notice. It is responsibility of each customer to thoroughly test each product and part number under their unique parameters and environments to ensure a product will work properly and reliably.

Click below for more details, to buy on-line or request volume pricing:  
<http://power.sager.com/protek-PU400-power-supply.html>

**(866) 588-1750**  
[power@sager.com](mailto:power@sager.com)  
<http://power.sager.com>

## MECHANICAL SPECIFICATIONS

Enclosed Form



### NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35-B01W-03, with nickel plated M3 screws.
- P2, P3: M3 x 0.5 screw connectors
- Connector P4: Molex header 87833-08 or equivalent, mating with Molex housing 51110-0850 or equivalent.
- Fan connector P5: Molex header 53048-0210 or equivalent, mating with Molex housing 51021-0200 or equivalent.
- Weight: 1.0 Kg (2.23 lbs.) approx. for U-bracket form, 1.14 Kg (2.52 lbs.) approx. for enclosed form
- Maximum penetration depth of fixing screws is 4 mm from the outer surface of chassis.

### PIN CHART

| MODEL       | CONN<br>PIN | P1 (AC) |      |         | P2  | P3               | P5          |                  |
|-------------|-------------|---------|------|---------|-----|------------------|-------------|------------------|
|             |             | 1       | 2    | 3       |     |                  | 1           | 2                |
| PU400-12B   | PU400-15B   | Ground  | Live | Neutral | +V1 | Common<br>Return | +12V<br>Fan | Common<br>Return |
| PU400-13B   | PU400-17B   |         |      |         |     |                  |             |                  |
| PU400-13-1B | PU400-18B   |         |      |         |     |                  |             |                  |
| PU400-14B   |             |         |      |         |     |                  |             |                  |

| MODEL       | CONN<br>PIN | P4               |           |           |     |         |                |       |        |
|-------------|-------------|------------------|-----------|-----------|-----|---------|----------------|-------|--------|
|             |             | 1                | 2         | 3         | 4   | 5       | 6              | 7     | 8      |
| PU400-12B   | PU400-15B   | Common<br>Return | +V1 Sense | -V1 Sense | PFD | Inhibit | +5V<br>Standby | DC OK | PS OFF |
| PU400-13B   | PU400-17B   |                  |           |           |     |         |                |       |        |
| PU400-13-1B | PU400-18B   |                  |           |           |     |         |                |       |        |
| PU400-14B   |             |                  |           |           |     |         |                |       |        |

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