**DATASHEET**
**Rev. B**

Wall Industries, Inc.

# PSUP500 SERIES

## 90~264VAC (127~370VDC) Input
## Single Output
## Up to 504 Watts
## AC/DC Switching Power Supplies

## FEATURES

- Single Output
- DC Fan
- Withstand 2G Vibration Test
- RoHS Compliant
- Active AC Surge Current Limiting
- Power OK Signal
- Remote Voltage Sense
- 2 Modes for Remote On/Off Control
- High Efficiency and High Reliability
- High Power Density 6.4W/in$^3$
- All Using 105°C Long Life Electrolytic Capacitors
- Universal AC Input Voltage Range
- 400W with Free Air Convection
- 500W with 23.5CFM Forced Air
- High Operating Temperature up to 60°C
- Short Circuit, Over Voltage, Over Load, and Over Temperature Protection

## DESCRIPTION

The PSUP500 series of AC/DC switching power supplies offers up to 403.2W with free air convection and 504W with 23.5CFM forced air. These supplies are housed in a low-profile 10.0 x 5.0 x 1.50 inch U-chassis frame. These supplies have a 90~264VAC (127~370VDC) input voltage range and provide single outputs ranging from 12VDC to 48VDC. Standard features include active power-factor-correction, remote on/off, remote voltage sense, power OK signal, and comprehensive over voltage, short circuit, over load, and over temperature protection. All models are RoHS compliant and have UL/cUL, TUV, CE, and CB approvals.

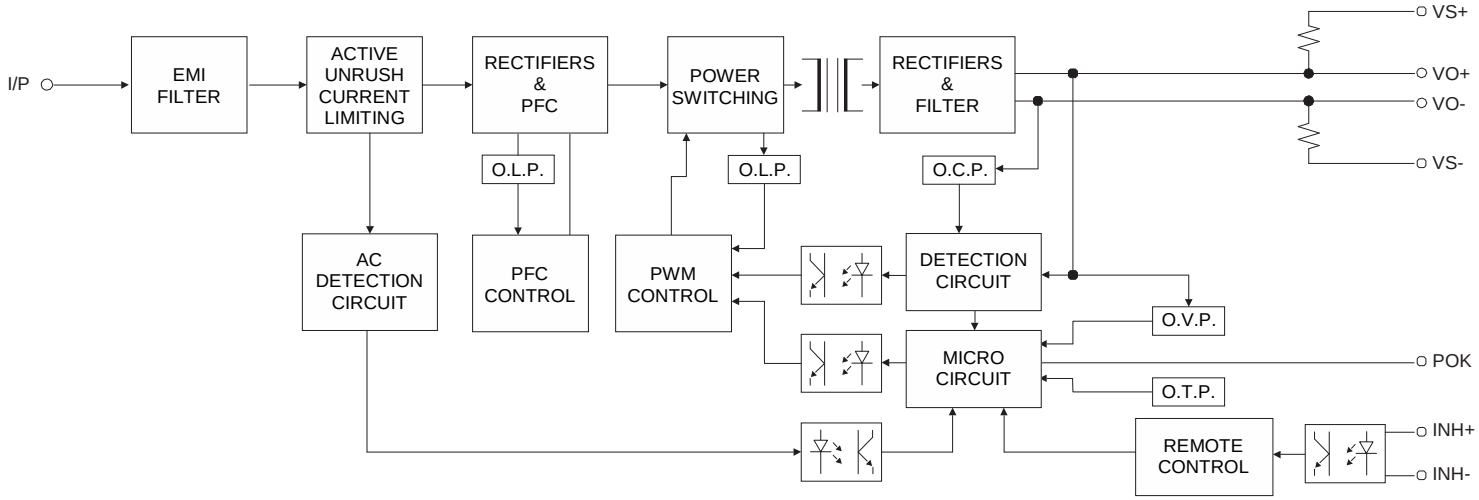
| SPECIFICATIONS: PSUP500 SERIES | |
|---|---|
| All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.<br>We reserve the right to change specifications based on technological advances. | |
| **INPUT SPECIFICATIONS** | |
| Input Voltage Range *(see note 3)* | 90 ~ 264VAC (127 ~ 370VDC) |
| Input Frequency | 47 ~ 63Hz |
| AC Current (typical) | 6A @ 115VAC; 3A @ 230VAC |
| Inrush Current (typical) | 30A @ 115VAC; 50A @ 230VAC |
| Remote Voltage Sense *(see page 5)* | Compensates for wire voltage drop |
| Remote On/Off *(see page 5)* | 2 modes setup for remote on/off |
| Power Factor (typical) | yes |
| **OUTPUT SPECIFICATIONS** | |
| Output Voltage | See Table |
| Output Power | See Table |
| Output Voltage Adjustability | ±10% |
| Voltage Tolerance *(see note 2)* | ±2% |
| Load Regulation | ±2% |
| Line Regulation | ±1% |
| Output Current | See Table |
| Ripple & Noise *(see note 1)* | 150mVp-p |
| Setup, Rise Time | 600ms at full load, 30ms at full load |
| Hold-Up Time (typical) | 16ms @ 230VAC and full load |
| Temperature Coefficient | ±0.03% / °C (0 ~ 50°C) |
| **PROTECTION** | |
| Short Circuit Protection | yes |
| Over Voltage Protection | 115% ~ 150% rated output voltage<br>Protection type: latch-off mode |
| Over Load Protection | > 105% rated output power<br>Protection type: constant current limiting. For output voltage less than 50% rated DC voltage range the unit will shutdown after 500ms. |
| Over Temperature Protection | 90°C ±5°C with N2 sense by T1 core; 95°C ±5°C with TH1 sense near D26 heatsink |
| **GENERAL SPECIFICATIONS** | |
| Efficiency | See Table |
| Withstand Voltage | 4242VDC (input to output); 2121VDC (input to FG) for 1 minute |
| Isolation Resistance | 100MΩ @ 500VDC (input to output, input to FG, output to FG) |
| Leakage Current | < 2mA @ 230VAC |
| Power OK Signal *(see page 5)* | Open drain. 30VDC / 0.1A max. |
| **ENVIRONMENTAL SPECIFICATIONS** | |
| Working Temperature | -20°C to +60°C (see output load derating curve) |
| Storage Temperature | -40°C to +85°C |
| Working Humidity | 20% to 90% RH (non-condensing) |
| Storage Humidity | 10% to 95% RH |
| Vibration | 10 ~ 500Hz, 2G 10 min./1cycle, period for 60 min. for each along X, Y, Z axes |
| Cooling | Free air convection for 400W; 23.5CFM fan for 500W |
| **PHYSICAL SPECIFICATIONS** | |
| Weight, Packing | 60oz (1700g); 12pcs/20.4kg |
| Dimensions (L x W x H) | 10.0 x 5.0 x 1.50 inches (254 x 127 x 38 mm) |
| Connection | Input: 3P / 9.5mm terminal block with cover<br>Output: 8P / 9.5mm terminal block with cover |
| **SAFETY & EMC *(see note 4)*** | |
| Safety Standards | UL60950-1, 2nd Edition, TUV EN60950-1: 2006+A11 Approved |
| EMI Conduction & Radiation | EN55022: 2006 Class B |
| Harmonic Current | EN61000-3-2: 2006 Class A, EN61000-3-3: 1995+A1: 2001+A2: 2005 |
| EMS Immunity | EN61204-3: 2000, EN55024: 1998+A1: 2001+A2: 2003 light industry level, criteria A |

| MODEL SELECTION TABLE | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model Number | Input Voltage Range | Output Voltage | Output Current | | Output Power | | Efficiency |
| | | | Convection | 10.5CFM Fan | Convection | 10.5CFM Fan | |
| PSUP-500-12 | 90 ~ 264 VAC (127 ~ 370 VDC) | 12 VDC | 33.3 A | 42 A | 399.6 W | 504 W | 90% |
| PSUP-500-15 | 90 ~ 264 VAC (127 ~ 370 VDC) | 15 VDC | 26.7 A | 33.5 A | 400.5 W | 502.5 W | 90% |
| PSUP-500-24 | 90 ~ 264 VAC (127 ~ 370 VDC) | 24 VDC | 16.7 A | 21 A | 400.8 W | 504 W | 90% |
| PSUP-500-48 | 90 ~ 264 VAC (127 ~ 370 VDC) | 48 VDC | 8.4 A | 10.5 A | 403.2 W | 504 W | 91% |

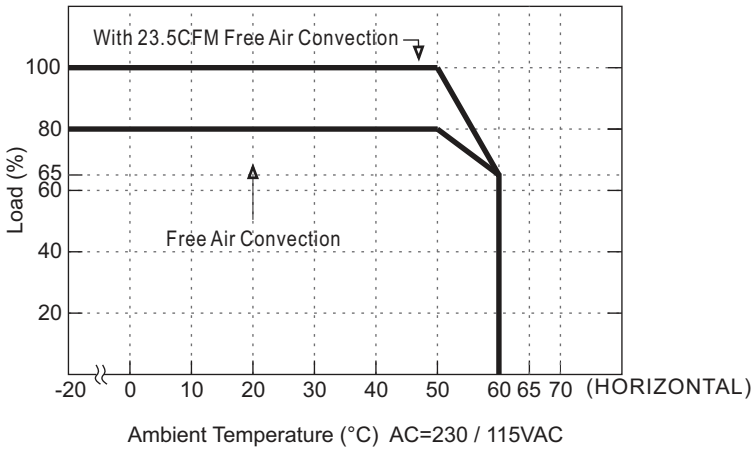
## NOTES

1. Ripple & noise is measured at 20MHz bandwidth by using a 12" twisted pair-wire terminated with a 0.1µF capacitor and a 47µF capacitor in parallel.
2. Tolerance includes set up tolerance, line regulation, and load regulation.
3. Derating may be needed under low input voltages. Please check the derating curve for more details.
4. The power supply is considered a component which will be installed into final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
5. When in parallel operation only one unit might operate if the total output load is less than 5% of the rated load condition.

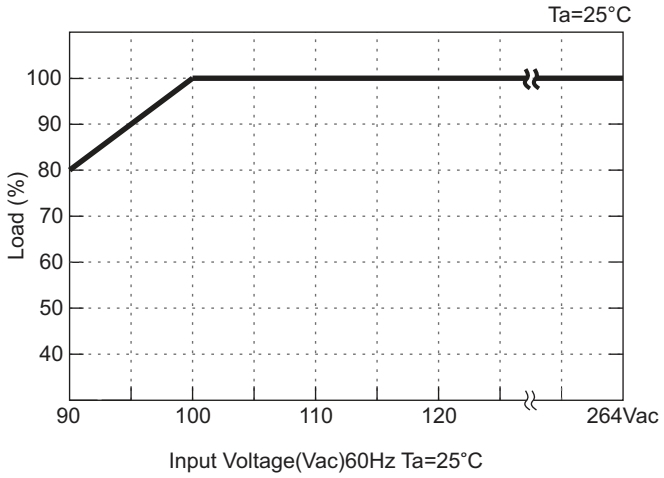
## BLOCK DIAGRAM



## DERATING CURVE

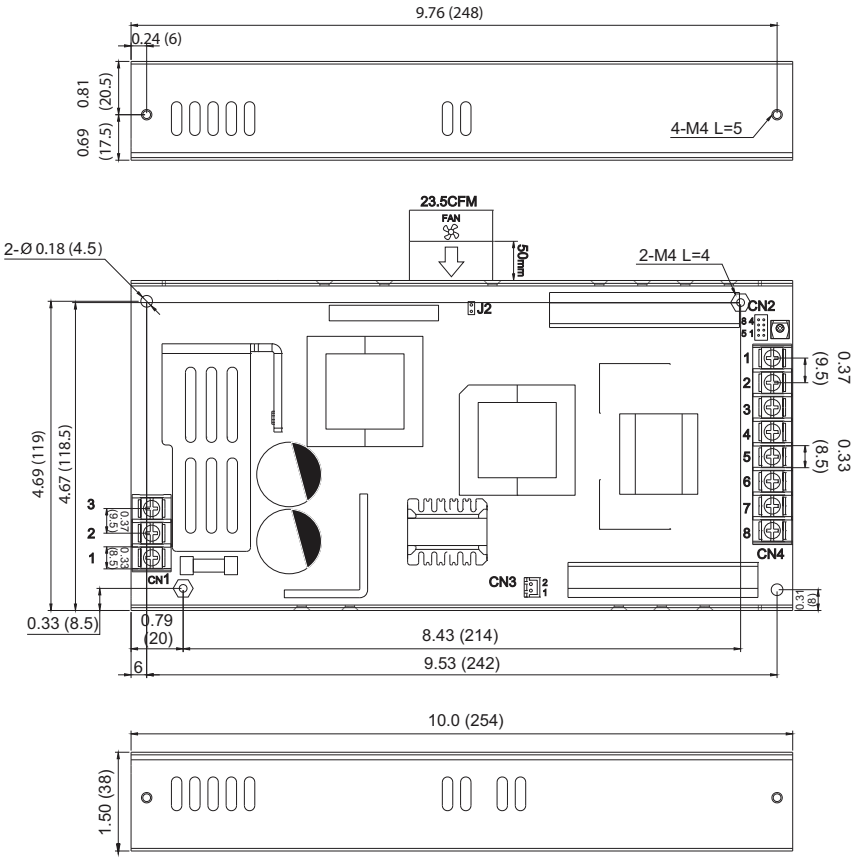



## STATIC CHARACTERISTICS




## MECHANICAL DRAWING

Unit: inches (mm)




| AC Input Terminal (CN1): Pitch: 9.5mm | | |
|---|---|---|
| Pin No | Assignment | |
| 1 | Live | AC/L |
| 2 | Neutral | AC/N |
| 3 | Ground/Earth | FG |

| Connector Pin Number Assignment (CN2): JST B8B-PHDSS or Equivalent | | | |
|---|---|---|---|
| Pin No | Assignment | Mating Housing | Terminal |
| 1 | VS + | JST PHD-08VS or equivalent | JST SPHD-002T-P05 or equivalent |
| 2 | SGND | | |
| 3 | INH- | | |
| 4 | NC | | |
| 5 | VS- | | |
| 6 | POK | | |
| 7 | INH+ | | |
| 8 | VS- | | |

| External FAN Power Connector (CN3) | | | |
|---|---|---|---|
| Pin No | Assignment | Mating Housing | Terminal |
| 1 | SGND | JST XHP-2 or equivalent | JST SXH-001T-0.6 or equivalent |
| 2 | 12V+ | | |

| DC Output Connector (CN5/CN6): JST B9P-VHx2 or Equivalent | | |
|---|---|---|
| Pin No. | Assignment | |
| 1 | VO- | Return |
| 2 | VO- | Return |
| 3 | VO- | Return |
| 4 | VO- | Return |
| 5 | VO+ | +Main Output |
| 6 | VO+ | +Main Output |
| 7 | VO+ | +Main Output |
| 8 | VO+ | +Main Output |

## FUNCTION DESCRIPTION OF CN2, CN3

| CN2 PIN CONNECTIONS | | |
|---|---|---|
| **Pin** | **Assignment** | **Description** |
| 1 | VS + | Remote Sense VO(+) |
| 2 | SGND | Signal Common |
| 3 | INH- | Remote ON/OFF Signal (-) |
| 4 | NC | NC |
| 5 | VS- | Remote Sense VO (-) |
| 6 | POK | Power OK Signal Control |
| 7 | INH+ | Remote ON/OFF Signal (+) |
| 8 | VS- | Remote Sense VO (-) |

| CN3 PIN CONNECTIONS | | |
|---|---|---|
| **Pin** | **Assignment** | **Description** |
| 1 | SGND | Return |
| 2 | 12V + | FAN Voltage 0.8A max. |

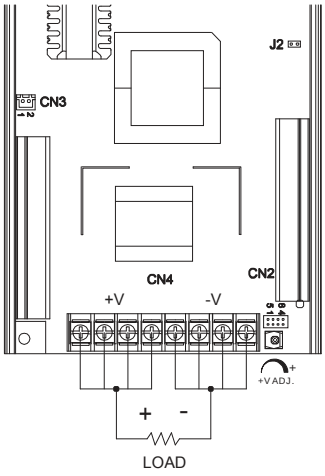
## FUNCTION DESCRIPTION OF J2

### 1. Remote Control

The PSU can be turned ON/OFF by using the "Remote Control" function.

| J2 PIN & CN2 CONNECTIONS | | |
|---|---|---|
| **J2** | **INH+(7 PIN) / INH-(3 PIN)** | **OUTPUT STATUS** |
| Open | SW ON (>2.5V) | ENABLE |
| Open | SW OFF (<0.8V) | DISABLE |
| Close | SW ON (>2.5V) | DISABLE |
| Close | SW OFF (<0.8V) | ENABLE |

(Default Setting)



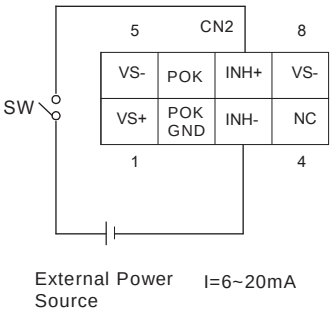
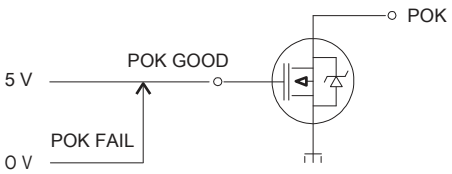



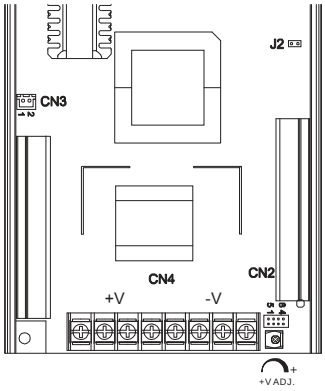

Fig 1.1

## FUNCTION DESCRIPTION OF CN2

### 2. POK Control

POK Signal use open drain MOSFET control
Max: 30VDC, 0.1A



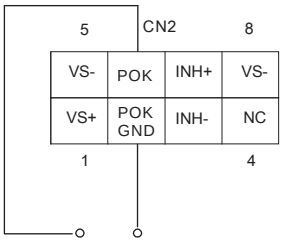
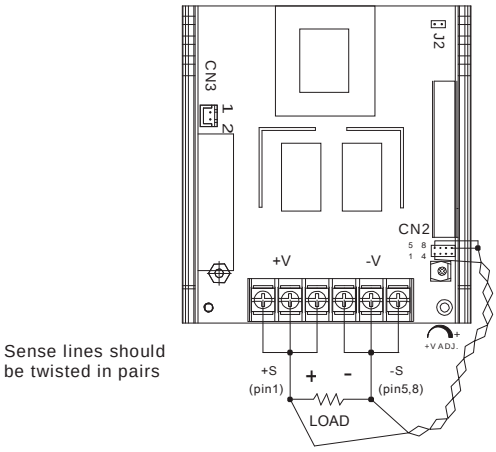




Fig 2.1

## 3. Remote Sense

The remote sensing compensates voltage drop on the load wiring up to 0.5V



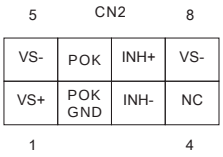




Fig 3.1

## COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 5 Watson Brook Rd.
Exeter, NH 03833