

ABC450 Series

AC-DC Open Frame Power Supplies

The ABC450 Series of open-frame power supplies, with its wide universal 90-264 VAC input range and high power density, is available at 450 W of output power and a variety of single and multiple output voltages.

The high efficiency and high power density of the ABC family ensures minimal power loss in end-use equipment, thereby facilitating higher reliability, easier thermal management and meets regulatory approvals for environmentally-friendly end products.

These medical power supplies are ideal for monitoring, home health equipment as well as surgical devices.



Key Features & Benefits

- 4 x 6.5 x 1.61 inches
- Universal AC Input
- 450 W (with airflow), 300 W (without airflow)
- Current Sharing Option
- Cover and Fan Options
- Peak Power Capability
- Low Standby Power
- Side Fan or Top Fan Mounting Option Product
- (-S or -T to be added to model number)
- Current Sharing Option Product (-I to be added to model number)
- ITE Safety Agency Approvals
- RoHS Compliant
- CE marked

Applications

- Instrumentation
- Lighting
- Industrial Applications
- Test and Measurement
- Robotics
- Renewable Energy
- Data Communication
- Applied Computing



bel POWER
SOLUTIONS &
PROTECTION

a bel group

belfuse.com/power-solutions

1. MODEL SELECTION

| MODEL | OUTPUT VOLTAGE | MAX LOAD (CONVECTION) ^{1,2,3} | MAX LOAD (420 LFM) ^{1,2,3} | MINIMUM LOAD | RIPPLE & NOISE ⁴ |
|--------------|----------------|--|-------------------------------------|--------------|-----------------------------|
| ABC450-1T05G | 5 VDC | 31.0 A | 55.0 A | 0.0 A | 2% |
| ABC450-1T12G | 12 VDC | 20.83 A | 37.5 A | 0.0 A | 2% |
| ABC450-1T15G | 15 VDC | 16.66 A | 30.0 A | 0.0 A | 2% |
| ABC450-1T24G | 24 VDC | 12.30 A | 18.75 A | 0.0 A | 2% |
| ABC450-1T30G | 30 VDC | 10.0 A | 15.0 A | 0.0 A | 2% |
| ABC450-1T48G | 48 VDC | 6.25 A | 9.37 A | 0.0 A | 2% |

2. INPUT SPECIFICATIONS

Specifications are for nominal input voltage, 25°C unless otherwise stated.

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATIONS |
|---------------------|---|--|
| Input Voltage | Universal | 90-264 VAC / 120-390 VDC |
| Input Frequency | | 47 to 63 Hz |
| Input Current | 120 VAC: 230 VAC: | 4.5 A max. 2.3 A max. |
| No Load Power | 120 VAC: 230 VAC: | 0.4 W 0.8 W |
| Inrush Current | 120 VAC: 230 VAC: | 40 A max. 75 A max. |
| Leakage Current | Earth Leakage Current Touch Leakage Current | 270 µA 45 µA @120 VAC / 63 Hz |
| Input Protection | Dual fusing, in AC Line and AC Neutral | T8A / 250 V |
| Power Factor | 120 VAC 230 VAC | 0.98 0.95 |
| Switching Frequency | PFC converter: Variable Resonant converter: Variable | 45-160 kHz typical 35-250 kHz, 90 kHz typical |

¹ Combined output power of main output, fan supply and standby supply shall not exceed max. power rating

² Standby output voltage 5 V / 1.5 A (convection) / 2 A (420LFM) with tolerance including set point accuracy, line and load regulation is +/-10%. Ripple and noise is less than 5%.

³ Fan supply output voltage 12 V / 500 mA with tolerance including set point accuracy, line and load regulation is +/-30% and needs min. 1% load on main output to be within regulation band. Ripple and noise is less than 10%.

⁴ 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. Please contact factory/ sales representative for minimum load required for ripple to be within specification.

3. OUTPUT SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | | SPECIFICATIONS |
|-----------------------------|---|---------------------------------------|---------------------------|
| Output Power ⁵ | 475 W for 24 V, 30 V & 500 W for 48 V model only for 5 seconds max. | | 155 to 450 W |
| Efficiency (Full Load) | 120 VAC | 24 V, 48 V, 30 V 12 V, 15 V 5 V | 88% 86% 83% typical |
| | 230 VAC | 24 V, 48 V, 30 V | 90% |
| | 120 / 230 VAC | | 10 ms |
| Line Regulation | | | +/-0.5% |
| Load Regulation | | | +/-3% |
| Transient Response | <10%, 50% to 100% load change, 50 Hz, 50% duty cycle, 0.1 A/μs | | Recovery time < 5 ms |
| Rise Time | | | < 100 ms |
| Set Point Tolerance | | | +/-1% |
| Voltage Adjustment | V1 | | ± 3 % |
| Over Voltage Protection | Latch Type | | >114% |
| Over Current Protection | Hic-Up type | | 120 to 150% |
| Short Circuit Protection | Short term, auto recovery | | |
| Over Temperature Protection | Automatic recovery | | 130°C primary heat sink |
| Current Share | Up to 2 supplies connected in parallel (optional) | | |

4. SIGNALS

| PARAMETER | DESCRIPTION / CONDITION |
|-------------------|---|
| Power Good Signal | TTL signal goes high after main output is within regulation band, delay is 0.1 to 0.3 s |
| Remote Sense | Compensates for 200 mV drop |
| Remote on/off | To turn on PSU short remote pin to ground |

5. EMC SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|------------------------------------|--|----------------------|
| Conducted Emissions | EN55032-B, CISPR22-B, FCC PART15-B | Pass |
| Radiated Emissions | EN 55032 A; with external core (King core K5B RC 25x12x15-M in input cable) | Pass Level B |
| Input Current Harmonics | EN 61000-3-2 | Class D |
| Voltage Fluctuation and Flicker | EN 61000-3-3 | Pass |
| ESD Immunity | EN 61000-4-2 | Level 3, Criterion A |
| Radiated Field Immunity | EN 61000-4-3 | Level 3, Criterion A |
| Electrical Fast Transient Immunity | EN 61000-4-4 | Level 3, Criterion A |
| Surge Immunity | EN 61000-4-5 | Level 3, Criterion A |
| Conducted Immunity | EN 61000-4-6 | Level 3, Criterion A |
| Magnetic Field Immunity | EN 61000-4-8 | Level 3, Criterion A |
| Voltage Dips, Interruptions | EN 61000-4-11 | Criterion A & B |

⁵ Derate output power linearly to 80% from 90 VAC to 80 VAC input.

6. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATIONS |
|-----------------------|---|-------------------------------------|
| Operating Temperature | Refer to derating curve (<i>Figure 1</i>) | 0 to +70°C |
| Storage Temperature | | -40 to 85° C |
| Humidity | Non Condensing | 95% HR |
| Altitude | Operating: Non-Operating: | 10,000 ft. 40,000 ft. |
| Cooling | 5 V model | Convection: 155 W 420 LFM: 275 W |
| | 12 V & 15 V models | Convection: 250 W 420 LFM: 450 W |
| | 24 V, 30 V & 48 V models | Convection: 300 W 420 LFM: 450 W |
| Reliability | MTBF according to Telcordia -SR332-Issue 3 | 1.28 million hours |

7. SAFETY SPECIFICATIONS

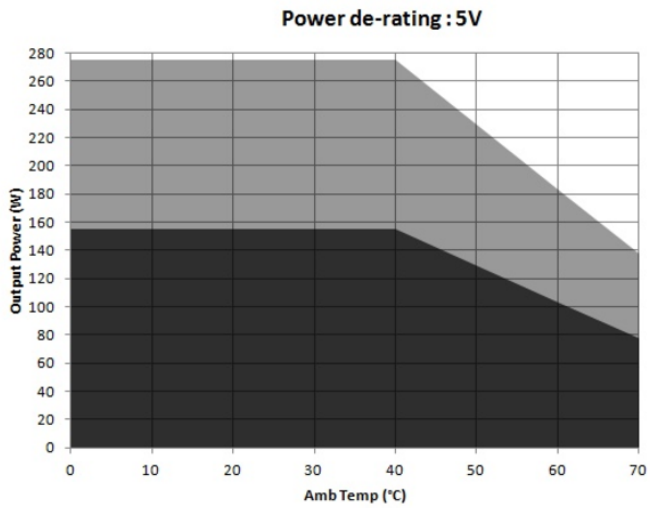
| PARAMETER | DESCRIPTION / CONDITION | SPECIFICATION |
|-------------------|--|----------------------|
| Isolation Voltage | Input to Output Input to Earth | 4242 VDC 2121 VDC |
| Safety Standards | Approved to the latest edition of the following standards: CSA/UL60950-1, EN60950-1 and IEC60950-1; Class1 SELV | |
| Agency Approvals | Nemko, Nemko-CCL | |
| CE mark | Complies with LVD Directive | |

8. CONNECTOR & PIN DESCRIPTION

| CONNECTOR | PIN | DESCRIPTION / CONDITION | MANUFACTURER / PN |
|----------------------|-----|---|--|
| AC Input Connector | J1 | Pin 1 AC line Pin 3 AC neutral Pin 5 Earth | Tyco: 1-1123724-3 Mating: 1-1123722-5 |
| DC Output Connector | J2 | Lug 1 +V1 Lug 2 RTN | 6-32 inches Screw Pan HD Mating: 16 AWG wire crimped to Ring Tongue Terminal AMP: 8-31886-1 |
| Signals ⁶ | J3 | Pin 1 NC Pin 2 Power Fail Pin 3 Power Good Pin 4 DC Return Pin 5 +5Vstby Pin 6 +VE Remote Sense Pin 7 -VE Remote Sense Pin 8 CS Pin 9 DC Return Pin 10 Remote On/Off | Molex: 22-23-2081 Mating: 22-01-2087; Pins: 08-50-0113 |
| Fan | J4 | Pin 1 +VE Pin 2 -VE | Mating Connector: Molex 22-01-2025 Pins = 08-50-0113 |
| Earth ⁷ | J5 | | Molex: 19705-4301 Mating: 190030001 |

⁶ PSU is supplied with J3, pin-9 and pin-10 shorted to enable main output without remote on/off feature

⁷ The J5 (Earth) spade connector can be used for U-Channel option products only. When fan options are required the earth connection provided in the input AC connector should be used (Pin 5 – J1)



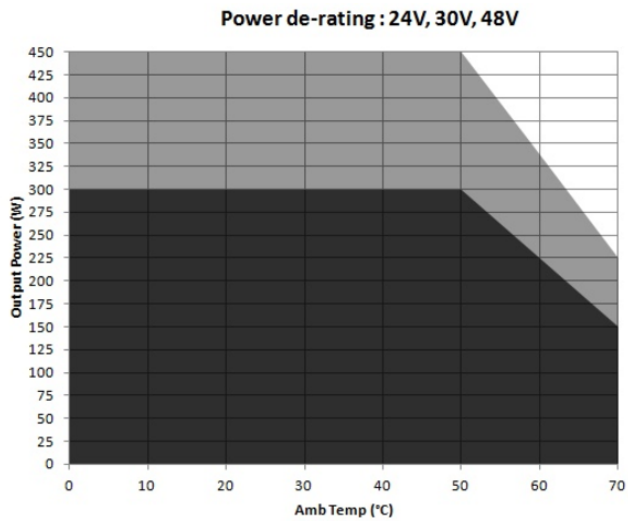
Convection load: 155 W up to 40 °C
De-rate above 40 °C @ 1.67% per °C

Forced air cooled load: 275 W up to 40°C
De-rate above 40 °C @ 1.67% per °C



Convection load: 250 W up to 40 °C
De-rate above 40 °C @ 1.67% per °C

Forced air cooled load: 450 W up to 40°C
De-rate above 40 °C @ 1.67% per °C



Convection load: 300 W up to 50 °C
De-rate above 50 °C @ 2.5% per °C

Forced air cooled load: 450 W up to 50°C
De-rate above 50 °C @ 2.5% per °C

Figure 1. Derating Curves

9. MECHANICAL SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION |
|------------|--|
| Weight | 900 g (1.98 lbs) |
| Dimensions | 101.6 x 165.0 x 41.0 mm (4.0 x 6.5 x 1.6 inch) |

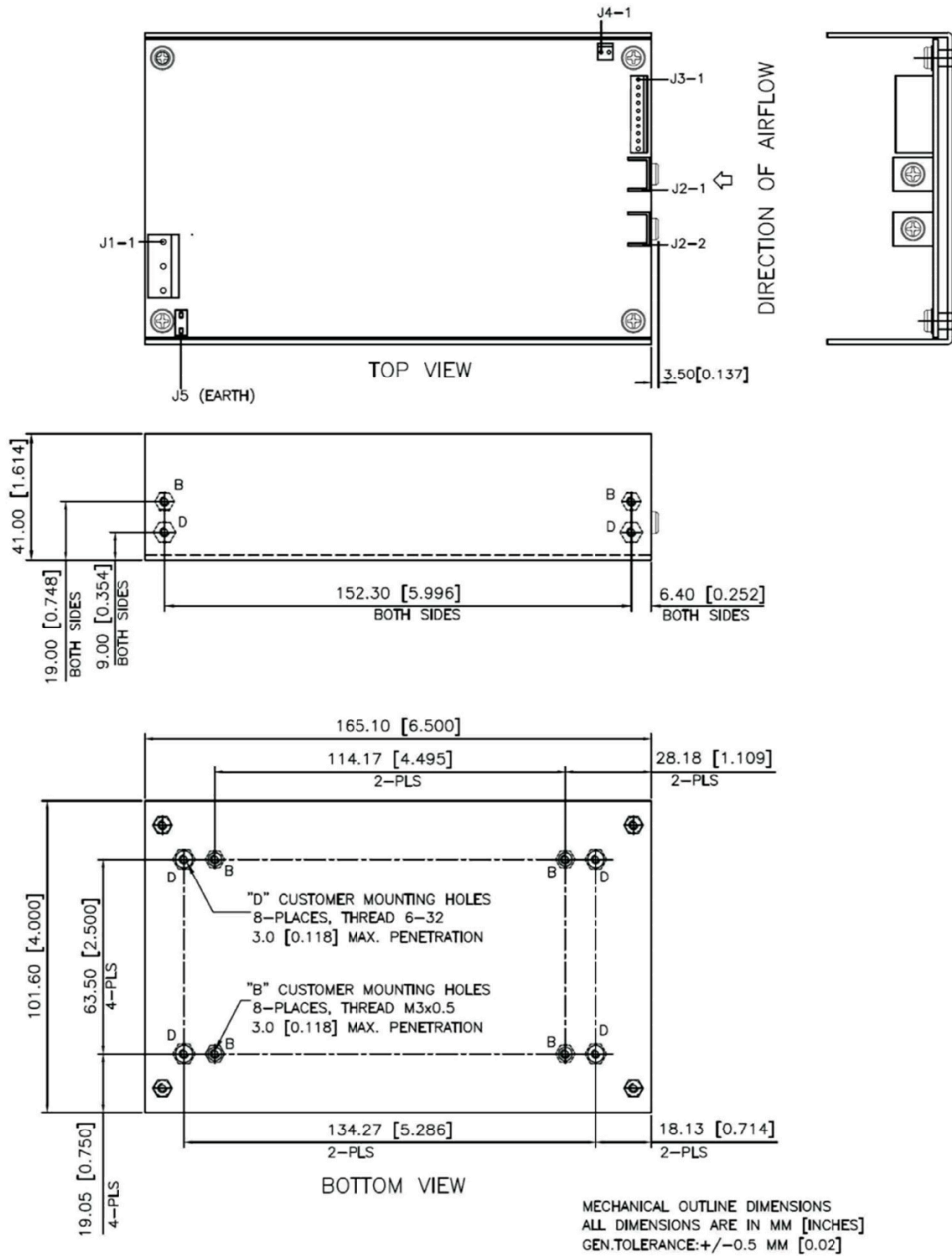


Figure 2. Mechanical Drawing (Without Fan Mounting)

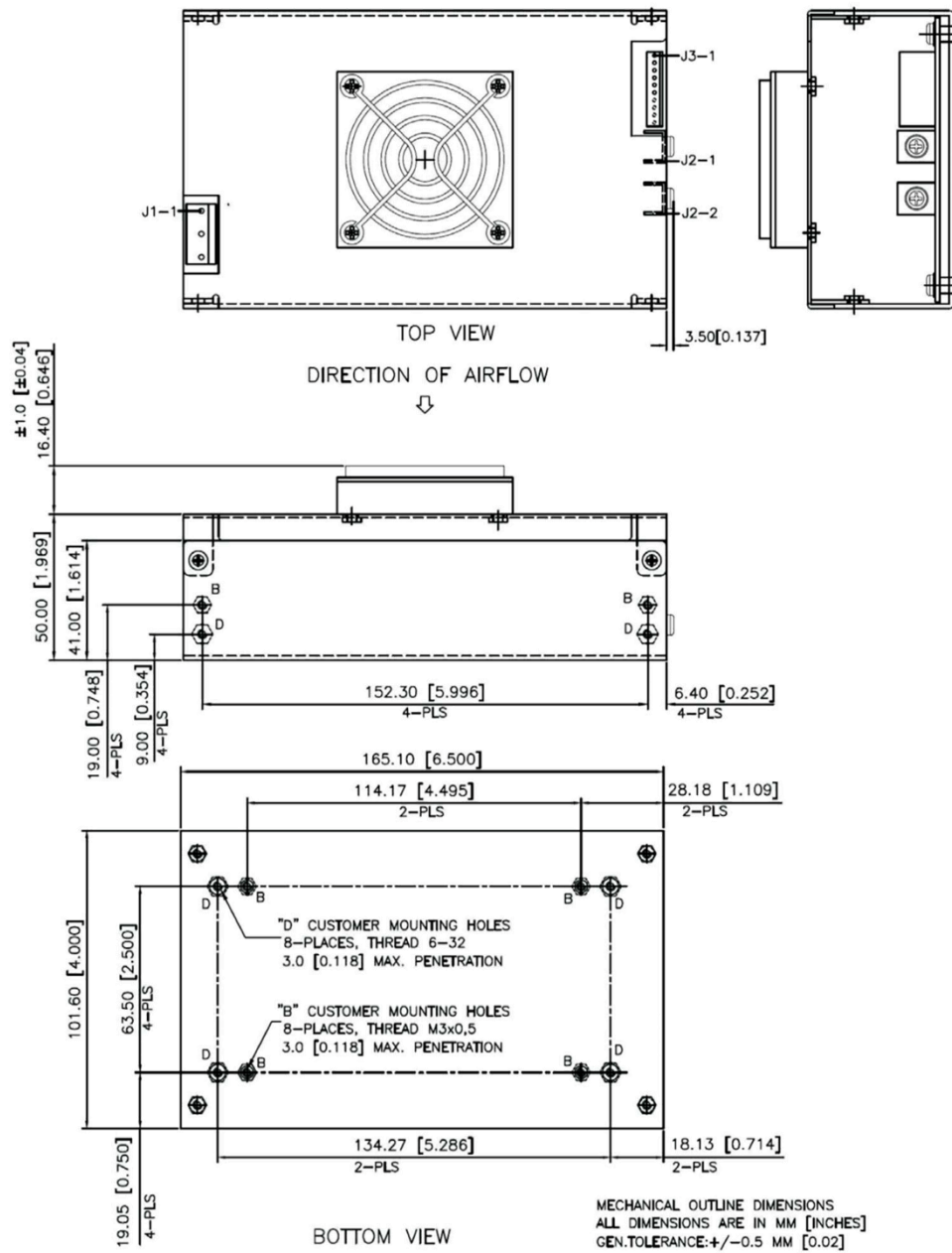


Figure 3 - Mechanical Drawing (With Top Fan Mounting)

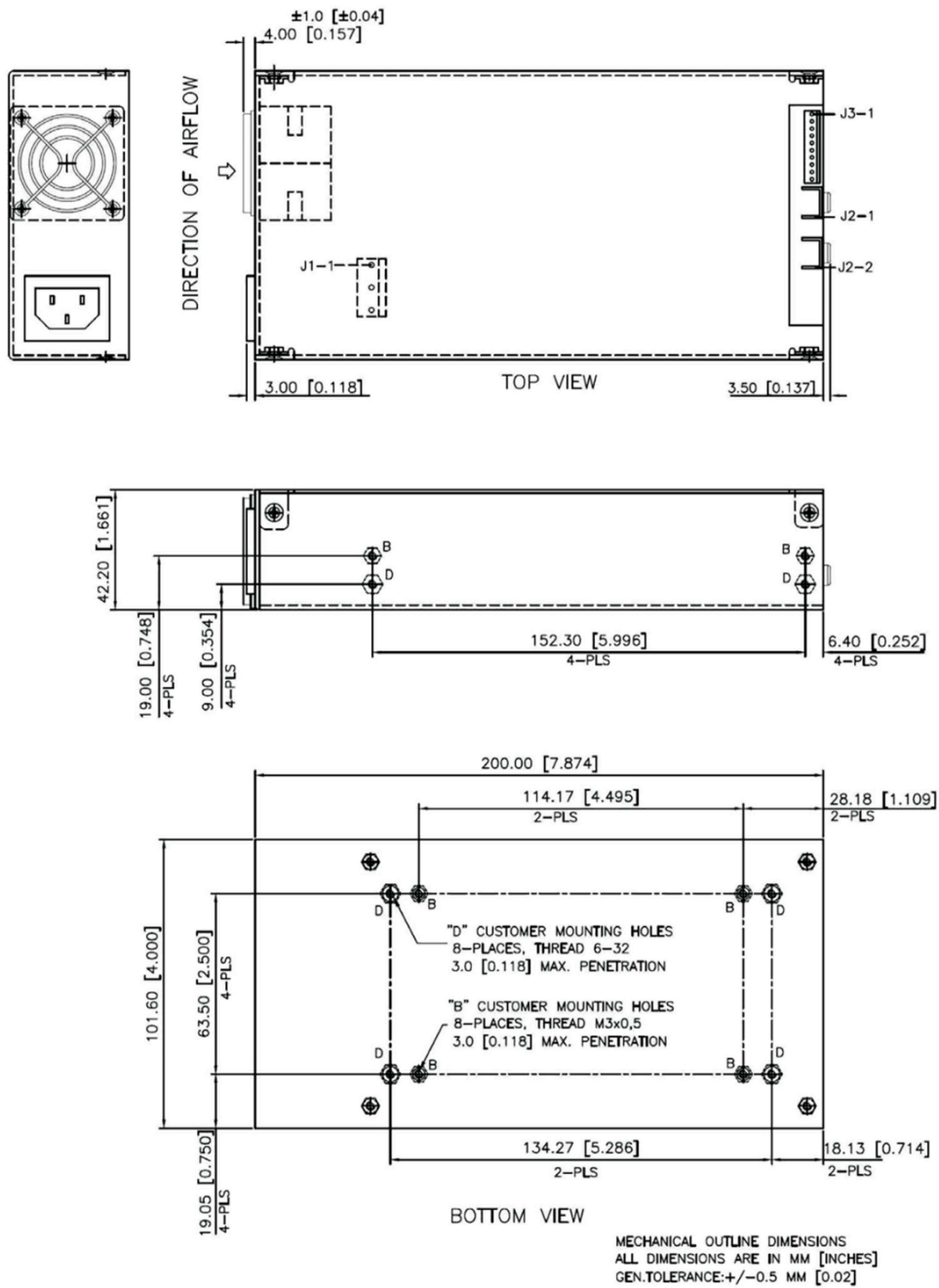


Figure 4 - Mechanical Drawing (With Side Fan Mounting)

10. INSTALLATION INSTRUCTION FOR CURRENT SHARING

During the installation and setup of parallel supplies in a system it is important that a single remote sense point be used for all the supplies.

The remote sense voltage between the supplies must be adjusted to within 2% to ensure the supplies are inside the 3% capture window.

If the supplies are not initially adjusted inside the capture window the supplies will not current share.

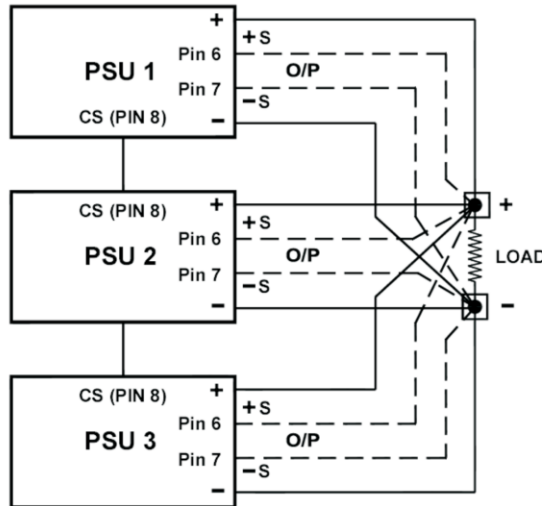
NOTE:

“CURRENT SHARING “ facility is inclusive with the unit only with ordering of the “ CURRENT SHARING “ option unit i.e. ABC450-1XXX-I or ABC450-1XXX-I.

SET-UP PROCEDURE:

- 1 Connect load cables to the outputs of each supply.
- 2 Connect the remote sense lines to the load in twisted style. (A common remote sense point must be used for all the supplies in parallel).
- 3 Connect all the “current share” pins on the J3 connector between the supplies.
- 4 Adjust remote sense voltage of each supply to within 1% of rated output voltage or readjust to required set point. (Adjustment to be done with all other parallel supplies off).
- 5 Current sharing between the supplies can be verified by monitoring the output current of each supply with a hall effect DC current probe. The supplies should share to within 10% of the total load current.
- 6 The current share circuit has a capture window voltage of +/- 3% of the rated output voltage. If the output remote sense voltage of one of the supplies is adjusted outside the 3% window the supplies will not current share.

CURRENT SHARING BLOCK DIAGRAM



For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Bel Power Solutions:

[ABC450-1T30G](#) [ABC450-1T24G](#) [ABC450-1T48G](#)