EOS

# LFMWLT450 SERIES

450 Watt Enclosed with Fan Power Supply

Measures: 4.00 x 6.50 x 1.61""

## Features

- 4 x 6.5 x 1.61 inches
- Approval to EN60601 3rd Edition
- Dual Fusing
- Current Sharing Option
- Cover and Fan Options
- Peak Power Capability
- Class B EMI & Medical (BF) Safety Approvals

## Electrical Specifications

| | | |
|---|---|---|
| Input Voltage | 90–264 VAC/120–390 VDC, Universal | |
| Input Frequency | 47–63 Hz | |
| Input Current | 120 VAC: 4.5 A max. | 230 VAC: 2.3 A max. |
| Input Protection | Dual Fusing, T8A/250 V in Live & Neutral | |
| No Load Power | 120 VAC: 0.4 | 230 VAC: 0.8 |
| Inrush Current | 120 VAC: 40 A max. | 230 VAC: 75 A max. |
| Leakage Current | Earth Leakage Current - 270 µA, Touch Leakage Current - 45 µA @ 120 VAC / 63 Hz | |
| Efficiency | 120 VAC: 88% (24 V, 48 V, 30 V) 86% (12 V) 83% (5 V) Typical 230 VAC: 90% (24 V, 48 V, 30 V) | |
| Hold-up Time | 120 VAC: 10 ms | 230 VAC: 10 ms |
| Power Factor | 120 VAC: 0.98 | 230 VAC: 0.95 |
| Output Power | 155 to 450 W (475 W for 24 V, 30 V & 500 W for 48 V model only for 5 seconds max.) | |
| 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% | |
| Output Adjustability | +/–3% | |
| Over Current Protection | 120 to 150%, Hic-Up Type | |
| Over Voltage Protection | 114%, Latch Type | |
| Short Circuit Protection | Short term, autorecovery | |
| Over Temperature Protection | 130°C primary heat sink, autorecovery | |
| Current Share | Upto 2 Supplies connected in parallel (optional) | |
| Switching Frequency | PFC converter:Variable, 45-160 kHz typical<br>Resonant converter:Variable, 35–250 kHz;90 kHz typical | |
| Operating Temperature | –0 to +70°C, refer derating curve | |
| Storage Temperature | –40 to +85°C | |
| Relative Humidity | 95% Rh, noncondensing | |
| Altitude | Operating: 10,000 ft.; Nonoperating: 40,000 ft. | |
| MTBF | > 250 kh; Bellcore TR–332 | |
| Isolation Voltage | 2MOPP 5940 VDC between input to output,1MOPP 2121 VDC input to Earth (Ref. Note: 9) | |
| Cooling | Convection: 300 W; 420 LFM: 450 W (24 V, 30 V & 48 V model)<br>Convection: 250 W; 420 LFM: 450 W (12 V & 15 V model)<br>Convection: 155 W; 420 LFM: 275 W (5 V model) | |

# LFMWLT450 SERIES

450 Watt Enclosed with Fan Power Supply

Measures: 4.00 x 6.50 x 1.61""

| Model Number | Type | Voltage | Max. Load (Convection) | Max. Load (420 LFM) | Min. Load | Ripple[2] |
|---|---|---|---|---|---|---|
| LFMWLT450-1000 | U-Channel | 5 V | 31.0 A | 55.0 A | 0.0 A | 2% |
| LFMWLT450-1000-I | U-Channel + OR-ing MOSFET | 5 V | 31.0 A | 55.0 A | 0.0 A | 2% |
| LFMWLT450-1000-T | Top Fan | 5 V | 31.0 A | 55.0 A | 0.0 A | 2% |
| LFMWLT450-1000-I-T | Top Fan + OR-ing MOSFET | 5 V | 31.0 A | 55.0 A | 0.0 A | 2% |
| LFMWLT450-1000-S | Side Fan | 5 V | 31.0 A | 55.0 A | 0.0 A | 2% |
| LFMWLT450-1000-I-S | Side Fan + OR-ing MOSFET | 5 V | 31.0 A | 55.0 A | 0.0 A | 2% |
| LFMWLT450-1001 | U-Channel | 12 V | 20.83 A | 37.5 A | 0.0 A | 2% |
| LFMWLT450-1001-I | U-Channel + OR-ing MOSFET | 12 V | 20.83 A | 37.5 A | 0.0 A | 2% |
| LFMWLT450-1001-T | Top Fan | 12 V | 20.83 A | 37.5 A | 0.0 A | 2% |
| LFMWLT450-1001-I-T | Top Fan + OR-ing MOSFET | 12 V | 20.83 A | 37.5 A | 0.0 A | 2% |
| LFMWLT450-1001-S | Side Fan | 12 V | 20.83 A | 37.5 A | 0.0 A | 2% |
| LFMWLT450-1001-I-S | Side Fan + OR-ing MOSFET | 12 V | 20.83 A | 37.5 A | 0.0 A | 2% |
| LFMWLT450-1002 | U-Channel | 15 V | 16.66 A | 30.0 A | 0.0 A | 2% |
| LFMWLT450-1002-I | U-Channel + OR-ing MOSFET | 15 V | 16.66 A | 30.0 A | 0.0 A | 2% |
| LFMWLT450-1002-T | Top Fan | 15 V | 16.66 A | 30.0 A | 0.0 A | 2% |
| LFMWLT450-1002-I-T | Top Fan + OR-ing MOSFET | 15 V | 16.66 A | 30.0 A | 0.0 A | 2% |
| LFMWLT450-1002-S | Side Fan | 15 V | 16.66 A | 30.0 A | 0.0 A | 2% |
| LFMWLT450-1002-I-S | Side Fan + OR-ing MOSFET | 15 V | 16.66 A | 30.0 A | 0.0 A | 2% |
| LFMWLT450-1003 | U-Channel | 24 V | 12.3 A | 18.75 A | 0.0 A | 2% |
| LFMWLT450-1003-I | U-Channel + OR-ing MOSFET | 24 V | 12.3 A | 18.75 A | 0.0 A | 2% |
| LFMWLT450-1003-T | Top Fan | 24 V | 12.3 A | 18.75 A | 0.0 A | 2% |
| LFMWLT450-1003-I-T | Top Fan + OR-ing MOSFET | 24 V | 12.3 A | 18.75 A | 0.0 A | 2% |
| LFMWLT450-1003-S | Side Fan | 24 V | 12.3 A | 18.75 A | 0.0 A | 2% |
| LFMWLT450-1003-I-S | Side Fan + OR-ing MOSFET | 24 V | 12.3 A | 18.75 A | 0.0 A | 2% |
| LFMWLT450-1004 | U-Channel | 48 V | 6.25 A | 9.37 A | 0.0 A | 2% |
| LFMWLT450-1004-I | U-Channel + OR-ing MOSFET | 48 V | 6.25 A | 9.37 A | 0.0 A | 2% |
| LFMWLT450-1004-T | Top Fan | 48 V | 6.25 A | 9.37 A | 0.0 A | 2% |
| LFMWLT450-1004-I-T | Top Fan + OR-ing MOSFET | 48 V | 6.25 A | 9.37 A | 0.0 A | 2% |
| LFMWLT450-1004-S | Side Fan | 48 V | 6.25 A | 9.37 A | 0.0 A | 2% |
| LFMWLT450-1004-I-S | Side Fan + OR-ing MOSFET | 48 V | 6.25 A | 9.37 A | 0.0 A | 2% |
| LFMWLT450-1005 | U-Channel | 30 V | 10.0 A | 15.0 A | 0.0 A | 2% |
| LFMWLT450-1005-I | U-Channel + OR-ing MOSFET | 30 V | 10.0 A | 15.0 A | 0.0 A | 2% |
| LFMWLT450-1005-T | Top Fan | 30 V | 10.0 A | 15.0 A | 0.0 A | 2% |
| LFMWLT450-1005-I-T | Top Fan + OR-ing MOSFET | 30 V | 10.0 A | 15.0 A | 0.0 A | 2% |
| LFMWLT450-1005-S | Side Fan | 30 V | 10.0 A | 15.0 A | 0.0 A | 2% |
| LFMWLT450-1005-I-S | Side Fan + OR-ing MOSFET | 30 V | 10.0 A | 15.0 A | 0.0 A | 2% |

| Connectors | | |
|---|---|---|
| J1 | Pin 1 | AC LINE |
| | Pin 3 | AC NEUTRAL |
| | Pin 5 | EARTH |
| Spade Connector (J5) | | |
| J2 | Pin 1 | V1 |
| | Pin 2 | RTN |
| J3 | Pin 1 | NC |
| | Pin 2 | PF OK |
| | Pin 3 | POWER GOOD |
| | Pin 4 | DC RETURN |
| | Pin 5 | +5 VSTBY |
| | Pin 6 | +VE REMOTE SENSE |
| | Pin 7 | -VE REMOTE SENSE |
| | Pin 8 | CS |
| | Pin 9 | DC RETURN |
| | Pin 10 | REMOTE ON/OFF |
| J4 (FAN OUTPUT) | Pin 1 | + VE |
| | Pin 2 | - VE |

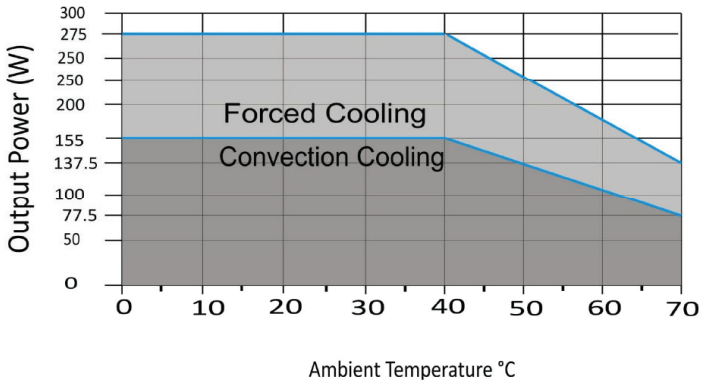
## Notes

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 and standby supply shall not exceed max. power rating.
3. Standby output voltage 5 V/ 1.5A(convection) / 2A(420LFM) with tolerance including set point accuracy, line and load regulation is +/–10%. Ripple and noise is less than 5%.
4. Fan supply output voltage 12V/ 500mA 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%.
5. Specifications are for nominal input voltage, 25°C unless otherwise stated.
6. PSU is supplied with J3, pin–9 and pin–10 shorted to enable main output without remote on/off feature.
7. Derate output power linearly to 80% from 90 VAC to 80 VAC input.
8. For ordering current sharing with OR-ing option add –I suffix with the model number.
9. Output to GND- 1500VAC for type BF.
10. 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)

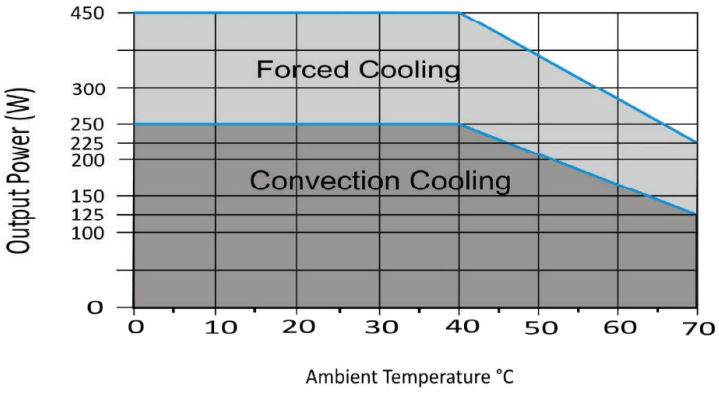
| Mechanical Specifications | |
|---|---|
| AC Input Connector (J1) | Tyco: 1-1123724-3<br>Mating: 1-1123722-5 |
| EARTH (J5) | Molex: 19705-4301<br>Mating: 190030001 |
| DC Output Connector (J2) | 6-32 inches Screw Pan HD<br>Mating: 16 AWG wire crimped to Ring Tongue Terminal AMP: 8-31886-1 |
| Signal Connector (J3) | Molex: 22-23-2081<br>Mating: 22-01-2087; Pins: 08-50-0113 |
| Dimensions | 4.0 x 6.5 x 1.61 inches<br>(101.6 x 165.1 x 41.0 mm) |
| Weight | 900 g |
| **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 | EN55022-B, CISPR22-B, FCC PART15-B<br>To be controlled in end system |
| 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,<br>CSA C22.2 No. 60601-1 |
| Approval Agency | Nemko, UL, C-UL |
| Safety File Number(s) | NEMKO: P14218171, NO79068 UL: E173812 |
| **Signal(s)** | |
| 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 |

## Derating Curve (From 90 V to 264 V AC I/P)

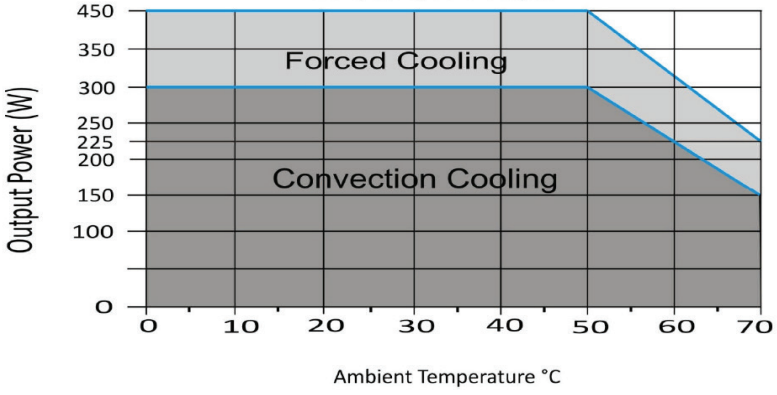
5 V Output




12 V, 15 V Output

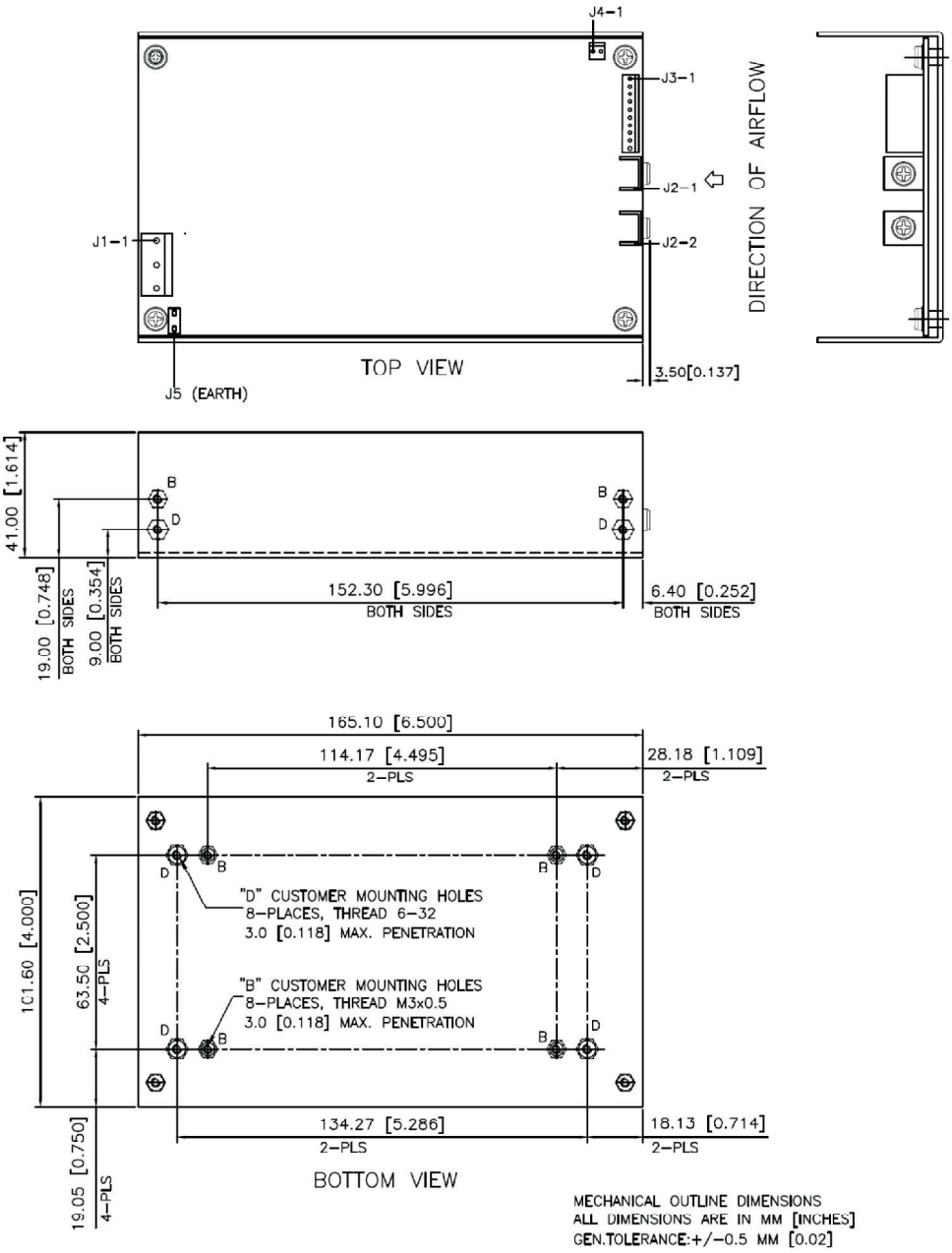



24 V, 30 V, 48 V Output



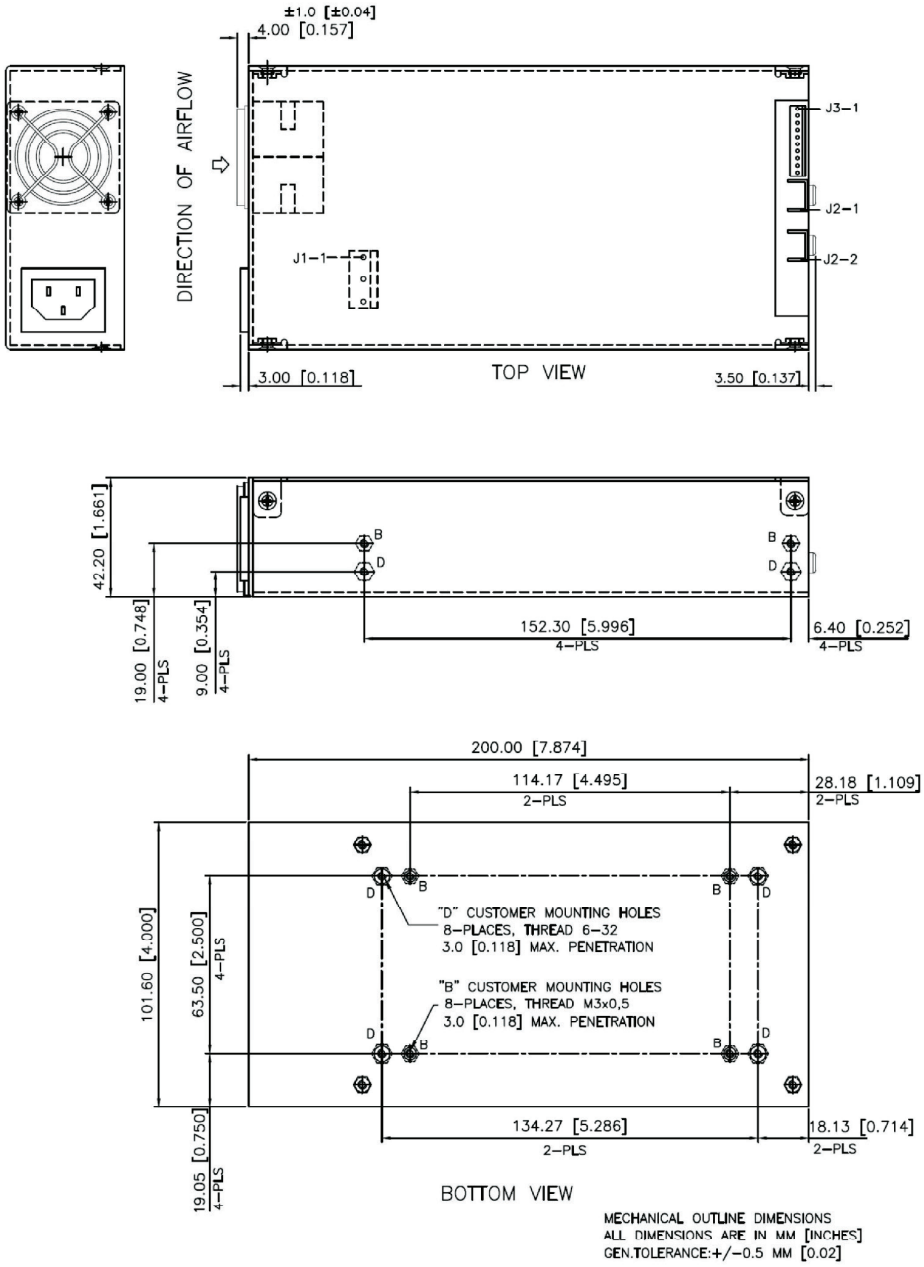
Mechanical Drawing

# Option 1: Without Fan Mounting



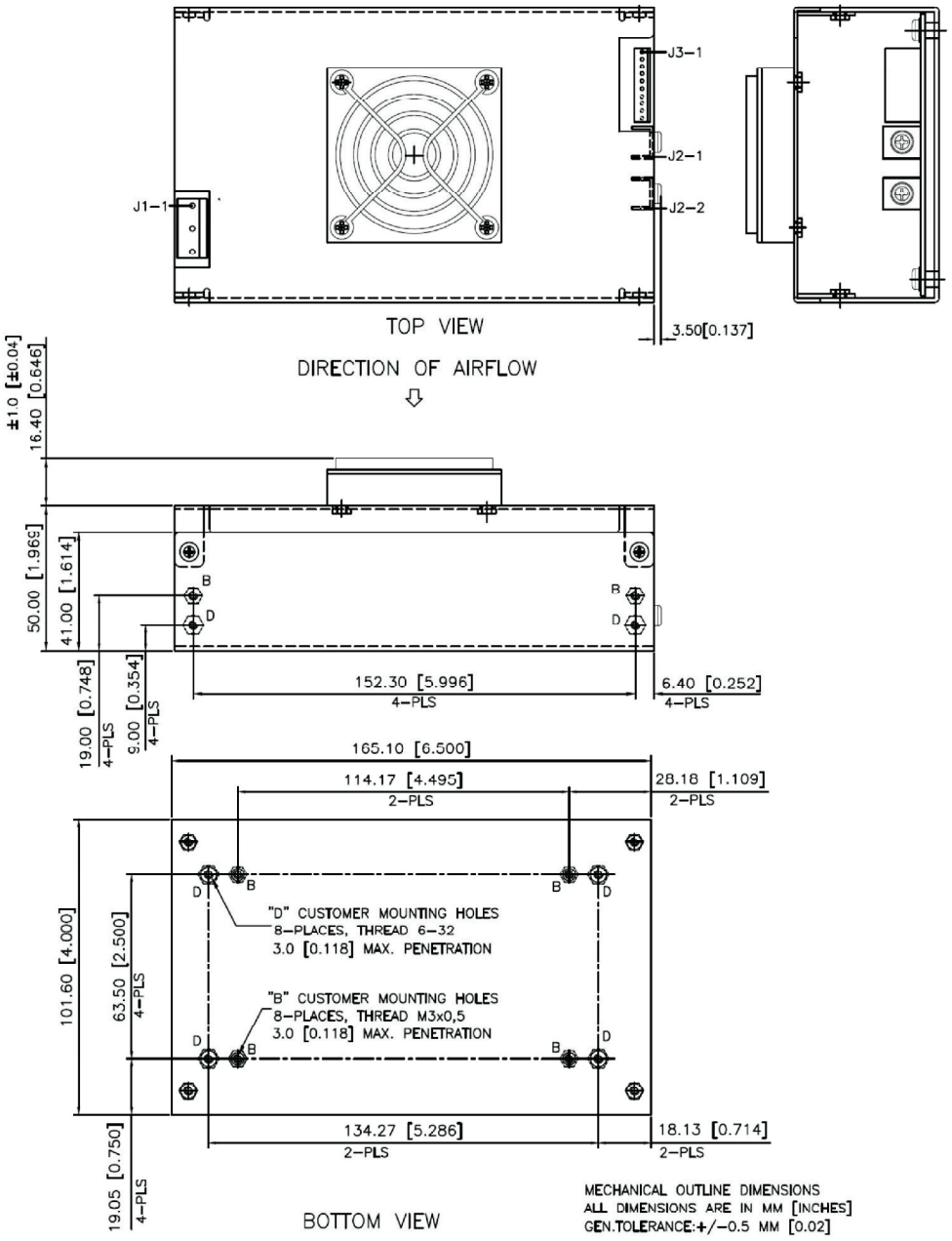
## Mechanical Drawing

# Option 2: Side Fan Mounting



Mechanical Drawing

# Option 3: Top Fan Mounting



## Installtion 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. LFWLT450-1XXX-I or LF(M)WLT450-1XXX-I.

## Set-Up Procedures:

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