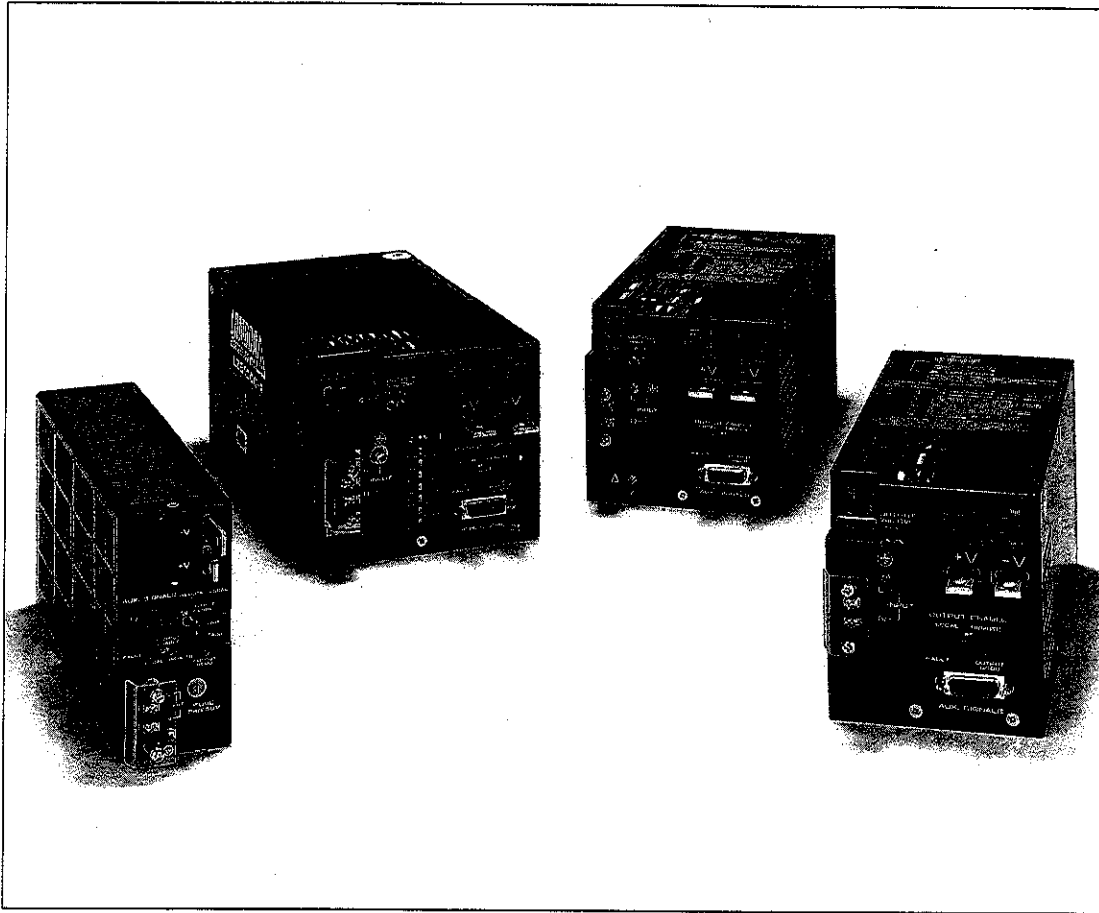


# Part I – AC-to-DC Power Supplies

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## LAMBDA'S LZS SERIES



### Ultra Reliable, High Performance Power Supplies for Rugged Industrial Applications

Lambda's new LZS Series single output power supplies (50W to 2000W) are ideal for worldwide industrial applications requiring reliable performance under harsh operating conditions.

Through temperature extremes, high levels of vibration, shock, and random transients on the AC input, the LZS's rugged construction and advanced design provide reliable performance. Lambda designs these performance features in at the front end – without additional costs.

In order to succeed in today's business environment, a product must meet the performance requirements of the global marketplace. With wide-range input, conducted input EMI, and worldwide safety agency approvals, the LZS Series is designed to meet the diverse standards of the world.

# LZS SERIES FEATURES

<b>Wide Range Operating Temperature</b>	Guaranteed performance from $-40^{\circ}\text{C}$ to $+71^{\circ}\text{C}$ ensures operation in any industrial environment.
<b>Meets Worldwide EMI Requirements</b>	Conducted EMI to VDE 0871 Curve B, FCC Class B and radiated EMI to FCC Class A (on selected units) ensure reliable system performance.
<b>Low Output Ripple and Noise</b>	The low output ripple and noise of 35mV pk-pk provide more reliable system operation.
<b>Meets Worldwide Safety Requirements</b>	Safety Agency Approvals to UL1950, IEC-950, EN60950 and CSA 234 designed for deliverable equipment worldwide.
<b>85-132/170-265VAC Auto-Selectable Input</b>	Meets worldwide input requirements, minimizing inventory levels and reducing system integration costs.
<b>MIL-STD-810E Vibration/Shock</b>	Performance specifications are maintained even under the harshest industrial conditions.
<b>Auxiliary Monitoring Signals</b>	Inverter Good (above 250W), Input Power Good and DC Good signals provide system capability for real-time monitoring and response.
<b>Wide Range Output Voltage</b>	Adjustable output voltage ranges of: <ul style="list-style-type: none"><li>• 4.5 to 6.3V</li><li>• 10.0 to 15.75V</li><li>• 18.0 to 29.40V</li><li>• 43.0 to 52.0V</li></ul> Provide greater flexibility in addressing system performance changes during the prototype stage.
<b>5 Year Guarantee</b>	Lambda's industry-leading 5 year guarantee includes labor as well as parts.
<b>Input Transient Protection</b>	Provides integral protection per IEC-801-2 (ESD) <ul style="list-style-type: none"><li>-3 (Radiated Susceptibility)</li><li>-4 (Conducted Susceptibility)</li><li>-5 (Lightning Strike, Level 3).</li></ul> IEEE-587, Category A3. This ensures reliable operation for transient conditions typically seen in industrial applications.
<b>Single Wire Current Share (Above 250W)</b>	Simplified integration and increased system reliability for redundant configurations.

# Part I – AC-to-DC Power Supplies

## LZS SERIES SPECIFICATIONS

### AC Input

line ..... 85-265VAC, 47-440Hz on the LZS-50.  
 85-132/170-265VAC auto selectable,  
 47-440Hz on the LZS-100, 150, 250,  
 500, 750, 1000, 1500.  
 187-265VAC, 47-440Hz on the LZS-2000.

### Input Power

Package Model	Efficiency	Inrush Current	
		115VAC	230VAC
LZS-50	70%	20A	40A
LZS-100	70%	20A	40A
LZS-150	70%	20A	40A
LZS-250	72%	20A	40A
LZS-500	75%	20A	40A
LZS-750	75%	40A	80A
LZS-1000	75%	40A	80A
LZS-1500	75%	40A	80A
LZS-2000	75%	40A	80A

(specified values are typical)

### EMI

Conducted EMI conforms to FCC Part 15, Subpart J, Class B; VDE 0871 Curve B; and MIL-STD-461 C, CEO3. Radiated EMI conforms to FCC Class A on selected models.

### Input Transient Protection

IEEE-587, Category A. IEC-801-2, -3, -4, -5 (Level 3).

### DC Input

220-380VDC. 105-330VDC on LZS-50.

### DC Output

Voltage ranges are shown in tables. All outputs are adjustable over the ranges shown.

### Regulated Voltage

regulation, line ..... 0.1% for variations from low line to high line and high line to low line.  
 regulation, load ..... 0.1% for load variations from no load to full load and full load to no load.  
 ripple and noise ..... 10mV RMS, 35mV pk-pk for -1 models.  
 10mV RMS, 50mV pk-pk for -2 models.  
 10mV RMS, 100mV pk-pk for -3 models.  
 20mV RMS, 150mV pk-pk for -4 models.  
 temperature coefficient ..... 0.025%/°C  
 remote programming resistance ..... 1000Ω/volt.  
 remote programming voltage ..... Volt per volt.

### Thermal Protection

Internal thermostat protects the power supply against excessive temperature. AC power must be recycled to restore operation.

### Overcurrent Protection

Internal current limiting circuit resets automatically.

### Overvoltage Protection

Inverter shutdown type OV protection is standard on all models.

### Holdup Time

Output voltage will remain within regulation limits for 26msec upon loss of AC input on -1 models only, when operating at nominal line, full load and output voltage set at 5.25VDC. Consult the factory for -2, -3, -4 models.

### Remote Sensing

Internal circuitry allows for a 1.2V drop in output leads.

### Parallel Operation

3% max current imbalance. Current sharing is achieved through a single wire connection on the LZS-250, 500, 750, 1000, 1500, 2000.

### Led Status Indicators

Overvoltage, Overtemperature LED. Output Good LED.

### Remote On/Off

TTL-compatible, active high.

### Remote Monitoring Signals

(TTL-compatible – conductance)

Output Good signal and AC Fail signal are standard on all models. Inverter Good signal on the LZS-250, 500, 750, 1000, 1500, 2000.

### DC Output Controls

A multi-turn potentiometer is provided for voltage adjustment.

### Input, Output and Signal Connections

AC Input: heavy-duty barrier strip.  
 DC Output: heavy-duty buss bars.  
 Aux. Signals: sub-miniature "D" connector.

### Isolation Ratings

3000V RMS Input to Output. 500V RMS Output to Chassis. 1500V RMS Input to Chassis.

### Overshoot

No overshoot at turn-on, turn-off or input power failure.

### Cooling

The LZS-50, 100 and 150 are convection cooled. Derating is required for flat mounting (consult factory). All other models are forced-air cooled via an internal fan.

### Operating Temperature Range

Operation from -40°C to +71°C, derate above 40°C. Consult the factory for operation below -30°C.

### Storage Temperature Range

-40°C to +85°C.

### Mounting

Two mounting surfaces and two mounting positions on the LZS-50, 100, 150. One mounting surface and multiple mounting positions on all other models.

### Physical Data

Package Model	Weight		Dimensions (inches)
	Lbs. Net	Lbs. Ship	
LZS-50	2.0	3.0	4.75 × 1.50 × 7.00
LZS-100	3.0	3.5	4.75 × 2.00 × 8.00
LZS-150	3.5	4.5	4.75 × 2.25 × 9.25
LZS-250	7.0	8.0	4.75 × 3.38 × 9.00
LZS-500	9.0	10.0	4.75 × 4.25 × 10.25
LZS-750	11.0	12.0	4.75 × 5.00 × 10.38
LZS-1000	15.0	17.5	4.75 × 5.50 × 10.50
LZS-1500	18.0	19.0	4.75 × 8.00 × 11.00
LZS-2000	22.0	25.0	4.75 × 8.00 × 11.00

### Military Specifications

Shock – MIL-STD-810E, Method 516.3 Proc. I, II, IV, VI.  
 Vibration – MIL-STD-810E, Method 514.3 Category 1, 9.

### Safety Agency Approvals

The LZS Series is presently under evaluation for UL1950, CSA 234, IEC-950, EN60950. SELV on all models below 48VDC output.

### Guaranteed For 5 Years

Five year guarantee includes labor as well as parts. Guarantee applies to operation at full published specifications at the end of five years.

# Rugged Environment Ratings Table—Single Output

## LZS SERIES

- Worldwide AC Input
- EMI Meets VDE, FCC Curve B
- Wide Range Outputs

## LR SERIES

- Convection Cooled
- EMI Meets VDE, FCC Curve A
- MRS Output Ripple Filters Available

## LD/LN SERIES

- Linear Power Supplies
- Low Output Ripple
- Low Leakage Current

MAX CURRENT AMPS (MAX POWER WATTS) <sup>1</sup> AT AMBIENT TEMPERATURE OF				V <sub>out</sub> ADJ. RANGE	COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY			MODEL	
40°C	50°C	60°C	71°C			1	10	25		
<b>5V OUTPUT</b>										
10.00(52.5)	8.50(44.6)	7.00(36.7)	5.50(28.8)	4.50-6.30	10	215	205	195	LZS-50-1	
20.00(105.0)	16.00(84.0)	12.00(63.0)	8.00(42.0)	4.50-6.30	10	325	310	295	LZS-100-1	
30.00(158.8)	24.00(126.0)	18.00(95.0)	12.00(63.0)	4.50-6.30	10	365	350	335	LZS-150-1	
50.00(263.0)	45.00(236.0)	40.00(210.0)	30.00(158.0)	4.50-6.30	10	520	495	470	LZS-250-1	
100.00(525.0)	90.00(473.0)	80.00(420.0)	65.00(341.0)	4.50-6.30	10	850	810	770	LZS-500-1	
150.00(788.0)	135.00(709.0)	120.00(630.0)	90.00(473.0)	4.50-6.30	10	1025	975	925	LZS-750-1	
200.00(1050.0)	190.00(998.0)	160.00(840.0)	120.00(630.0)	4.75-6.30	10	1130	1075	1025	LZS-1000-1	
300.00(1575.0)	270.00(1418.0)	240.00(1260.0)	180.00(945.0)	4.50-6.30	10	1450	1380	1310	LZS-1500-1	
400.00(2100.0)	360.00(1890.0)	320.00(1680.0)	240.00(1260.0)	4.50-6.30	10	1550	1475	1400	LZS-2000-1	
<b>12V OUTPUT</b>										
4.20(53.0)	3.90(48.7)	3.40(42.5)	2.40(30.0)	10.00-15.75	10	215	205	195	LZS-50-2	
8.40(105.0)	6.70(84.0)	5.00(63.0)	3.40(42.0)	10.00-15.75	10	325	310	295	LZS-100-2	
12.50(158.0)	10.00(126.0)	7.50(95.0)	5.00(63.0)	10.00-15.75	10	365	350	335	LZS-150-2	
21.00(263.0)	18.90(236.0)	16.80(210.0)	12.60(158.0)	10.00-15.75	10	520	495	470	LZS-250-2	
42.00(525.0)	37.50(473.0)	33.50(420.0)	27.00(341.0)	10.00-15.75	10	850	810	770	LZS-500-2	
63.00(788.0)	56.60(709.0)	50.00(630.0)	37.50(473.0)	10.00-15.75	10	1025	975	925	LZS-750-2	
83.00(1050.0)	80.00(998.0)	67.00(840.0)	50.00(630.0)	11.40-15.75	10	1130	1075	1025	LZS-1000-2	
125.00(1575.0)	112.50(1418.0)	100.00(1260.0)	75.00(945.0)	10.00-15.75	10	1450	1380	1310	LZS-1500-2	
167.00(2100.0)	150.00(1890.0)	133.50(1680.0)	100.00(1260.0)	10.00-15.75	10	1550	1475	1400	LZS-2000-2	

Notes: <sup>1</sup>Max output power cannot exceed rating in parenthesis within specified output voltage range.

<sup>2</sup>Currents are 10-15% higher when used without a cover. Consult the factory.

# Rugged Environment Ratings Table—Single Output

## LZS SERIES

- Worldwide AC Input
- EMI Meets VDE, FCC Curve B
- Wide Range Outputs

## LR SERIES

- Convection Cooled
- EMI Meets VDE, FCC Curve A
- MRS Output Ripple Filters Available

## LD/LN SERIES

- Linear Power Supplies
- Low Output Ripple
- Low Leakage Current

MAX CURRENT AMPS (MAX POWER WATTS) <sup>1</sup> AT AMBIENT TEMPERATURE OF				V <sub>out</sub> ADJ. RANGE	COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY			MODEL
40°C	50°C	60°C	71°C			1	10	25	
<b>15V OUTPUT</b>									
4.20(52.5)	3.90(48.7)	3.40(42.5)	2.40(30.0)	10.00-15.75	10	215	205	195	LZS-50-2
8.40(105.0)	6.70(84.0)	5.00(63.0)	3.40(42.0)	10.00-15.75	10	325	310	295	LZS-100-2
10.50(157.5)	8.40(126.0)	6.30(94.5)	4.20(63.0)	10.00-15.27	10	365	350	335	LZS-150-2
17.50(262.5)	15.70(236.0)	14.00(210.0)	10.50(158.0)	10.00-15.75	10	520	495	470	LZS-250-2
35.00(525.0)	31.50(473.0)	28.00(420.0)	22.70(341.0)	10.00-15.75	10	850	810	770	LZS-500-2
52.50(787.5)	47.30(709.0)	42.00(630.0)	31.50(473.0)	10.00-15.75	10	1025	975	925	LZS-750-2
70.00(1050.0)	66.50(998.0)	56.00(840.0)	42.00(630.0)	10.00-15.75	10	1130	1075	1025	LZS-1000-2
105.00(1575.0)	94.50(1418.0)	84.00(1260.0)	63.00(945.0)	10.00-15.75	10	1450	1380	1310	LZS-1500-2
140.00(2100.0)	126.00(1890.0)	112.00(1680.0)	84.00(1260.0)	10.00-15.75	10	1550	1475	1400	LZS-2000-2
<b>24V OUTPUT</b>									
2.50(53.0)	2.00(48.3)	1.90(39.9)	1.40(29.4)	18.00-29.40	10	215	205	195	LZS-50-3
5.00(105.0)	4.00(84.0)	3.00(63.0)	2.00(42.0)	18.00-29.40	10	325	310	295	LZS-100-3
7.50(158.0)	6.00(126.0)	5.00(95.0)	3.00(63.0)	18.00-29.40	10	365	350	335	LZS-150-3
12.50(263.0)	11.30(236.0)	10.00(210.0)	7.50(158.0)	18.00-29.40	10	520	495	470	LZS-250-3
25.00(525.0)	22.50(473.0)	20.50(420.0)	16.50(341.0)	18.00-29.40	10	850	810	770	LZS-500-3
37.50(788.0)	33.50(709.0)	30.00(630.0)	22.50(473.0)	18.00-29.40	10	1025	975	925	LZS-750-3
50.00(1050.0)	48.00(998.0)	40.00(840.0)	30.00(630.0)	18.00-29.40	10	1130	1075	1025	LZS-1000-3
75.00(1575.0)	67.50(1418.0)	60.00(1260.0)	45.00(945.0)	18.00-29.40	10	1450	1380	1310	LZS-1500-3
100.00(2100.0)	90.00(1890.0)	80.00(1680.0)	60.00(1260.0)	18.00-29.40	10	1550	1475	1400	LZS-2000-3

Notes: <sup>1</sup>Max output power cannot exceed rating in parenthesis within specified output voltage range.

<sup>2</sup>Currents are 10-15% higher when used without a cover. Consult the factory.

# Rugged Environment Ratings Table—Single Output

## LZS SERIES

- Worldwide AC Input
- EMI Meets VDE, FCC Curve B
- Wide Range Outputs

## LR SERIES

- Convection Cooled
- EMI Meets VDE, FCC Curve A
- MRS Output Ripple Filters Available

## LD/LN SERIES

- Linear Power Supplies
- Low Output Ripple
- Low Leakage Current

40°C	MAX CURRENT AMPS (MAX POWER WATTS) <sup>1</sup> AT AMBIENT TEMPERATURE OF			V <sub>out</sub> ADJ. RANGE	COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY			MODEL
	50°C	60°C	71°C			1	10	25	
<b>28V OUTPUT</b>									
1.90(52.5)	1.70(48.3)	1.40(39.9)	1.10(29.4)	18.00-29.40	10	215	205	195	LZS-50-3
3.80(105.0)	3.00(84.0)	2.30(63.0)	1.50(42.0)	18.00-29.40	10	325	310	295	LZS-100-3
5.60(157.5)	4.50(126.0)	3.40(94.5)	2.30(63.0)	18.00-29.40	10	365	350	355	LZS-150-3
9.40(262.5)	8.40(236.0)	7.50(210.0)	5.60(158.0)	18.00-29.40	10	520	495	470	LZS-250-3
18.80(525.0)	16.90(473.0)	15.00(420.0)	12.20(341.0)	18.00-29.40	10	850	810	770	LZS-500-3
28.10(287.5)	25.30(709.0)	22.50(630.0)	16.90(473.0)	18.00-29.40	10	1025	975	925	LZS-750-3
37.50(1050.0)	35.60(998.0)	30.00(840.0)	22.50(630.0)	18.00-29.40	10	1130	1075	1025	LZS-1000-3
56.30(1575.0)	50.60(1418.0)	45.00(1260.0)	33.80(945.0)	18.00-29.40	10	1450	1380	1310	LZS-1500-3
75.00(2100.0)	67.50(1890.0)	60.00(1680.0)	45.00(1260.0)	18.00-29.40	10	1550	1475	1400	LZS-2000-3
<b>48V OUTPUT</b>									
0.90	0.70	0.50	0.40	45.60-50.40	20	250	237	227	LRS-50-48
1.13(52.5)	0.90(41.5)	0.75(34.6)	0.40(18.4)	43.00-52.00	10	215	205	195	LZS-50-4
2.30(105.0)	1.84(84.0)	1.38(63.0)	0.92(42.0)	43.00-52.00	10	325	310	295	LZS-100-4

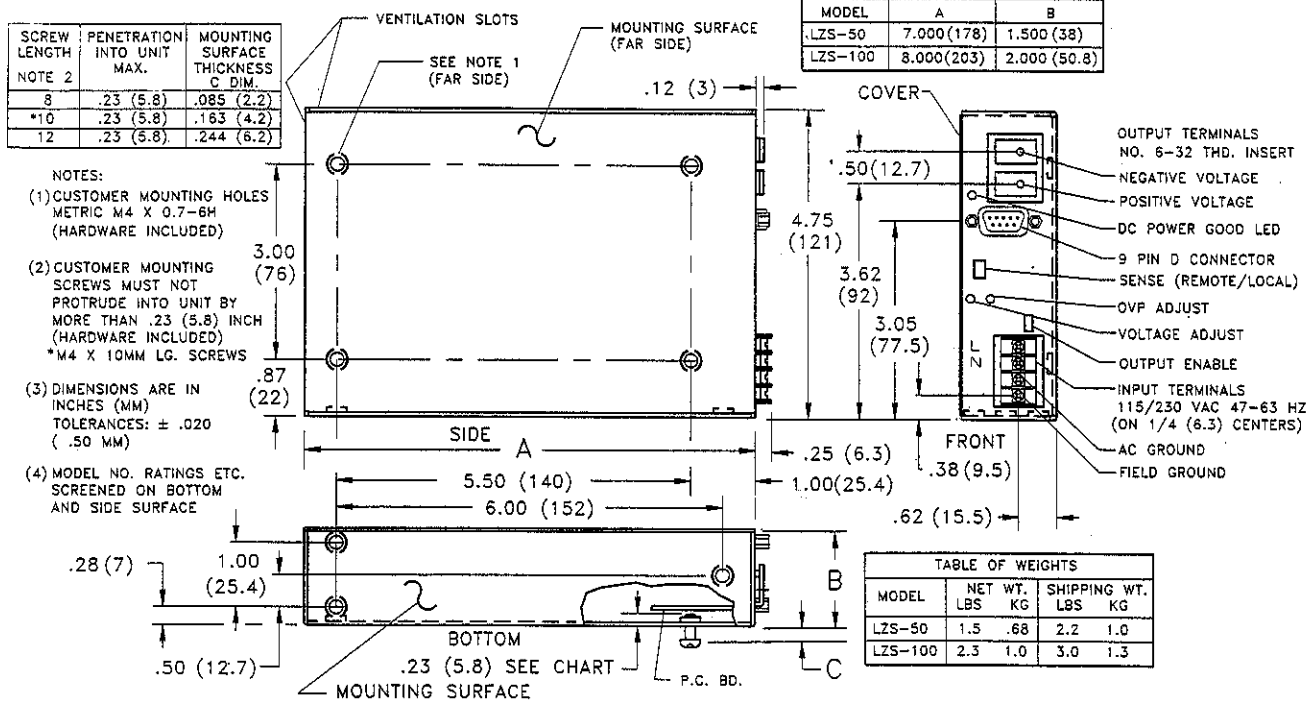
Notes: <sup>1</sup>Max output power cannot exceed rating in parenthesis within specified output voltage range.

<sup>2</sup>Currents are 10-15% higher when used without a cover. Consult the factory.

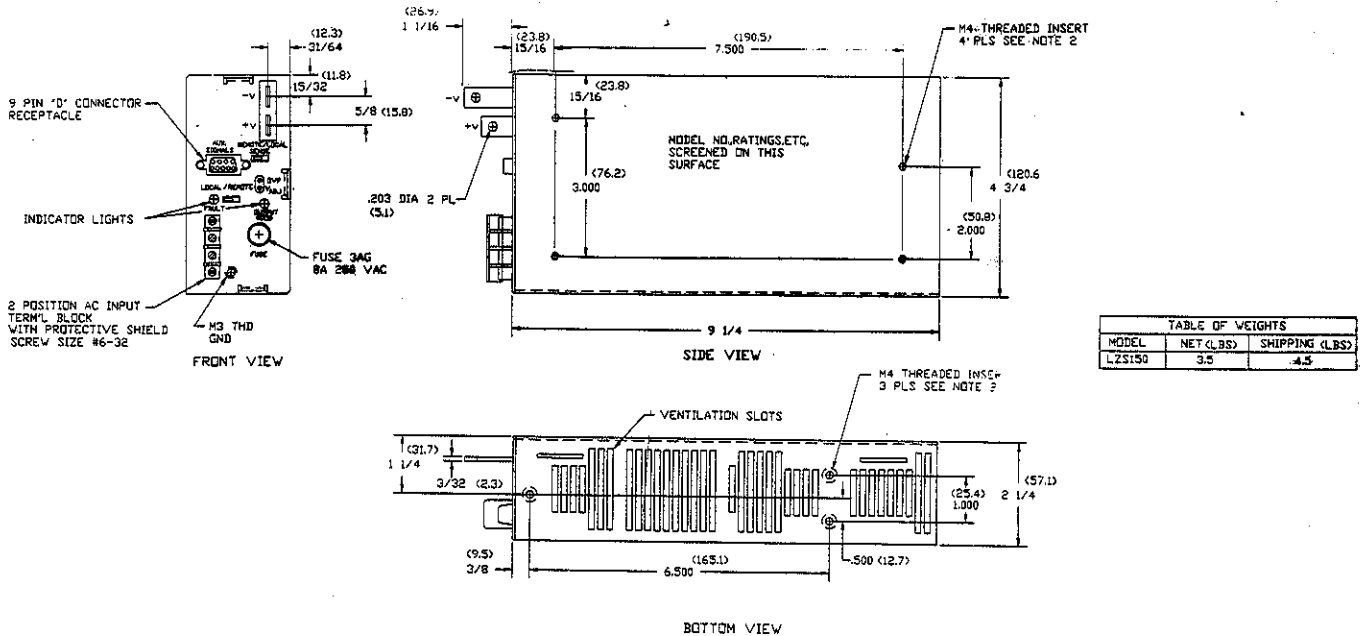
# LZS SERIES MECHANICAL DRAWINGS

LZS-50  
LZS-100

AC/DC Power Supplies



LZS-150

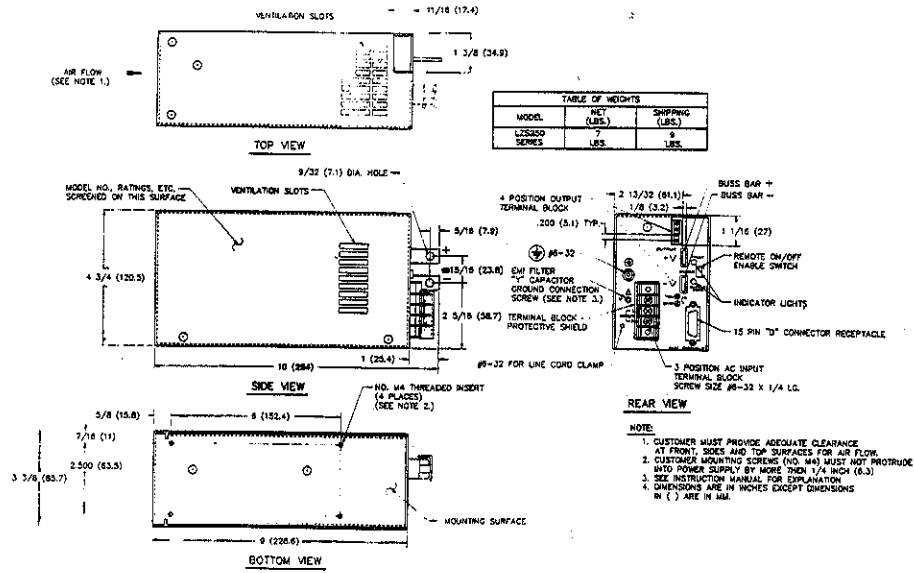


- NOTES:**  
 1. CUSTOMER MUST PROVIDE ADEQUATE CLEARANCE AT FRONT, SIDES AND TOP SURFACES FOR AIR FLOW.  
 2. CUSTOMER MOUNTING SCREWS (M4) MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 1/4 INCH (6.3)  
 3. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS IN ( ) WHICH ARE IN MM.

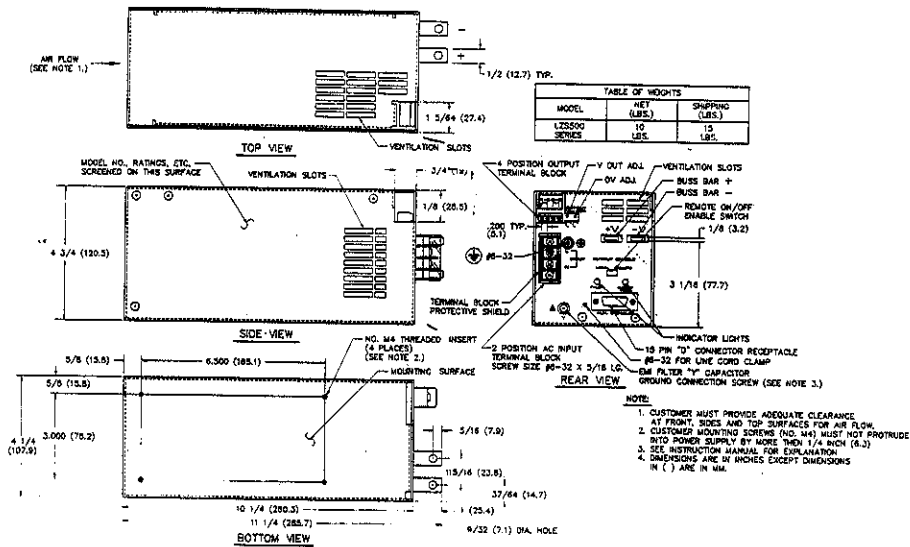
# Part I – AC-to-DC Power Supplies

## LZS SERIES MECHANICAL DRAWINGS

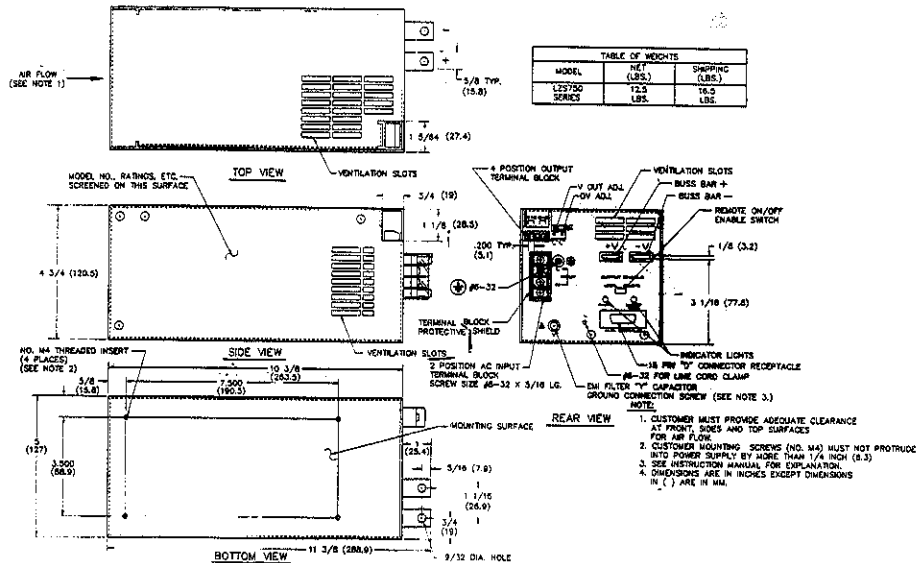
LZS-250



LZS-500



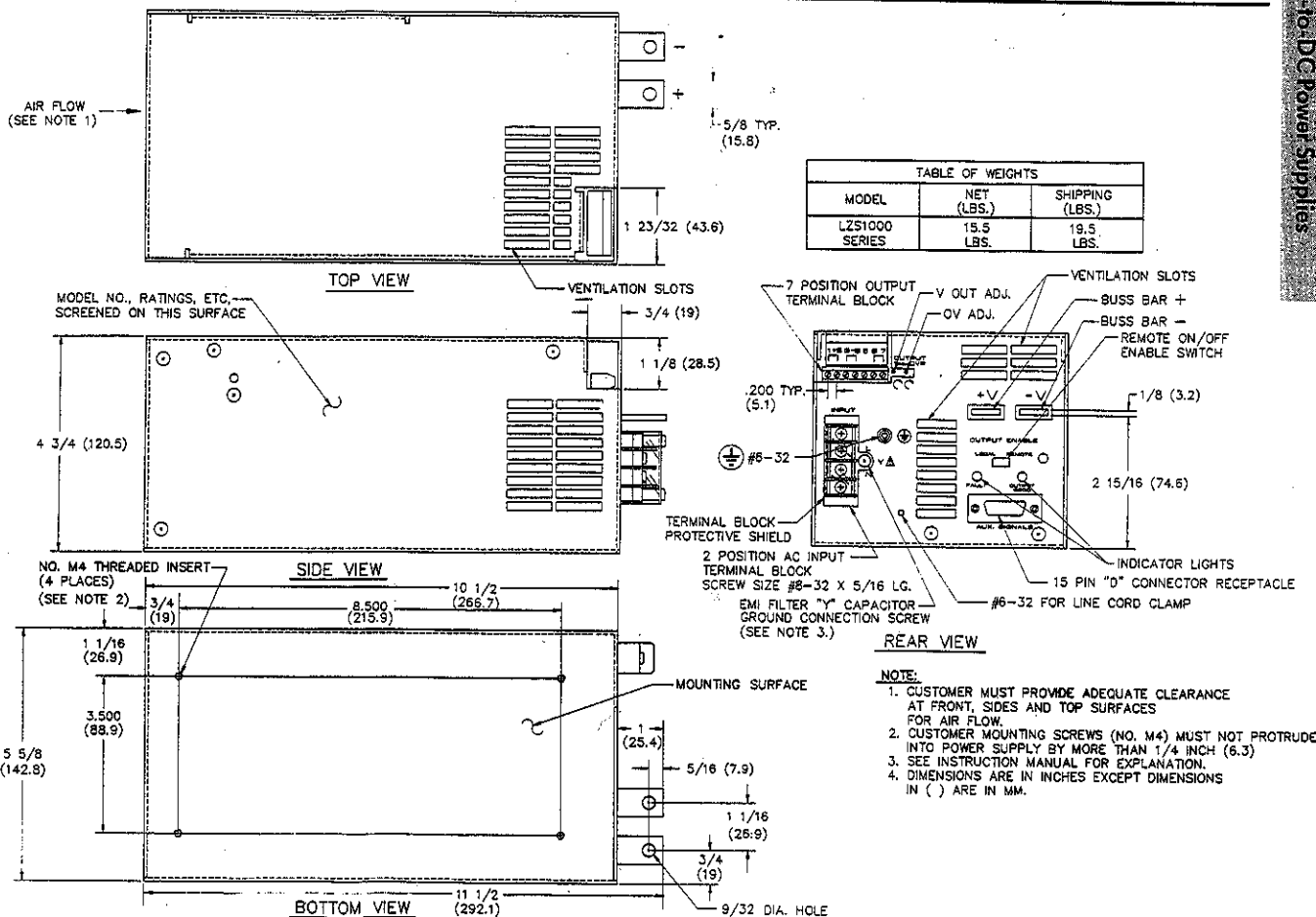
LZS-750





# LZS SERIES MECHANICAL DRAWINGS

**LZS-1000**



**LZS-1500  
LZS-2000**

