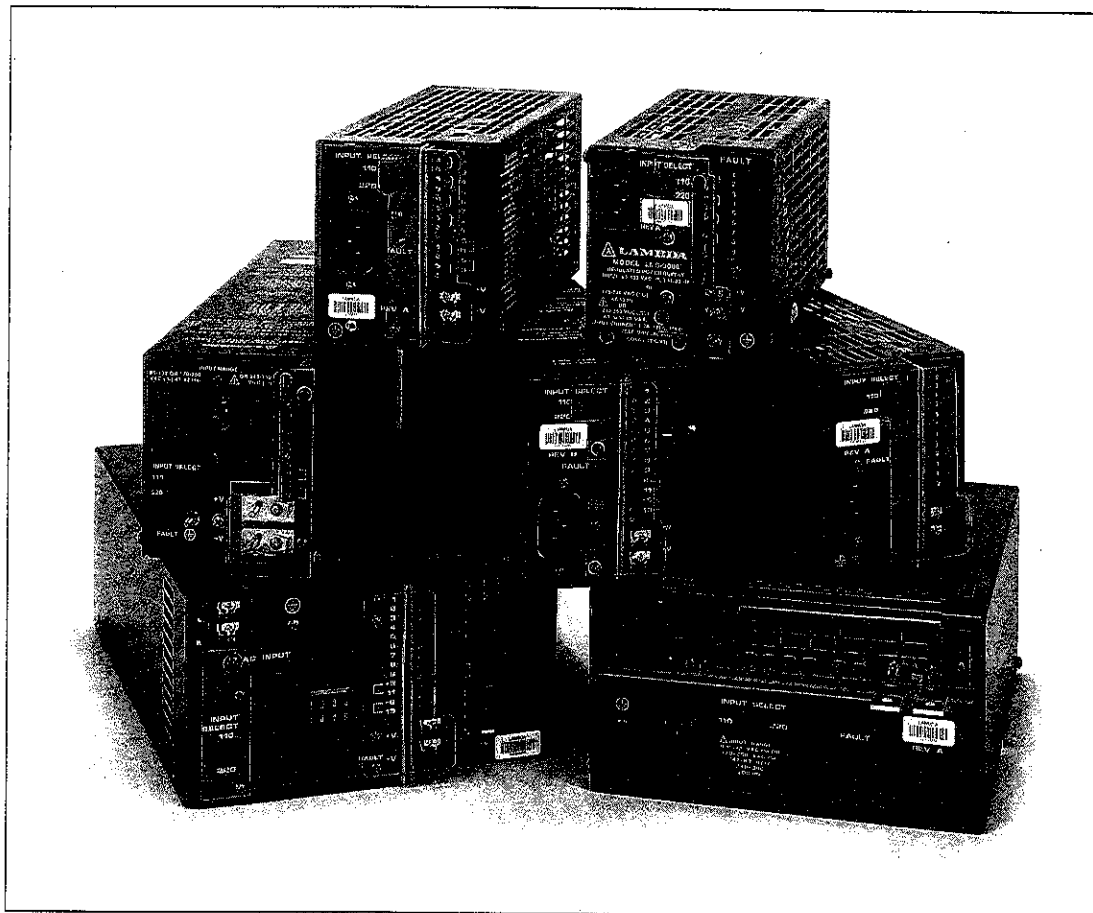


## Part I – AC-to-DC Power Supplies

### LAMBDA'S LMS SERIES



#### Programmable Power for Constant Voltage/Current Applications

Lambda's zero-up LMS Series remote programmable power supplies provide 39 modular solutions for wide range voltage applications from 0-300V, up to 100A, up to 800W. The versatility and flexibility of the LMS Series is ideal to meet the changing requirements of in-house test and deliverable test equipment, and reduces the cost of subsequent systems.

The LMS Series features adjustable overvoltage protection, constant voltage/constant current operation and overvoltage/overtemperature indicators. Integral EMI filtering to meet FCC 20780 Class A and VDE 0871 Class A; user selectable 110/220VAC, input surge protection and worldwide safety agency approvals ensure trouble-free operation in any system environment.

# LMS SERIES SPECIFICATIONS

## AC Input

line ..... 85 to 132VAC or 170 to 265VAC, user selectable. 47-440 Hz.

## Input Power and Current

| Package Model | Max Power (Watts) | Max Current (A RMS) |
|---------------|-------------------|---------------------|
| LMS-3000      | 62                | 1.20                |
| LMS-4000      | 79                | 1.35                |
| LMS-5000      | 135               | 2.70                |
| LMS-6000      | 245               | 4.00                |
| LMS-7000      | 450               | 7.50                |
| LMS-8000      | 620               | 10.00               |
| LMS-9000      | 1100              | 17.50               |

## Efficiency

| Package Model                                                  | Minimum Efficiency at Max P <sub>OUT</sub> |
|----------------------------------------------------------------|--------------------------------------------|
| LMS-3000                                                       | 45%                                        |
| LMS-4008, 4018                                                 | 55%                                        |
| LMS-4040, 4060, 4120, 4300, 5008, 5018                         | 60%                                        |
| LMS-5040, 5060, 5120, 5300, 6008, 6018, 6040, 6060, 6120, 6300 | 65%                                        |
| LMS-8008, 8018                                                 | 68%                                        |
| LMS-7008                                                       | 70%                                        |
| LMS-8040, 8060, 8120, 9008                                     | 73%                                        |
| LMS-7040, 7060, 7120, 9018, 9040                               | 75%                                        |
| LMS-9060, 9120, 9300                                           | 78%                                        |

## EMI

All units meet FCC 20780 Class A and VDE 0871 Class A.

## DC Output

Voltage range shown in tables.

## Regulated Voltage Constant

|                                    |                                                                                                                                                                                                                                 |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| regulation, line                   | 0.05% for line variations from 85 to 132VAC or 170 to 265VAC. 0.01% + 1mV for LMS-3000.                                                                                                                                         |
| regulation, load                   | 0.05% for load variations from 0 to full load. 0.01% + 1mV on LMS-3000 Series.                                                                                                                                                  |
| remote programming resistance      | Customer adjustable from 200Ω/volt to 1000Ω/volt. 200Ω/volt on LMS-3008, LMS-3060. 400Ω/volt on LMS-3120. 1000Ω/volt on LMS-4300, LMS-5300, LMS-6300 and LMS-9300.                                                              |
| remote programming voltage         | volt per volt or 0-5 volt isolated signal for zero to full voltage out, customer selectable.                                                                                                                                    |
| ripple and noise (20MHz Bandwidth) | 5mV RMS, 35mV pk-pk on 8V and 18V models. 10mV RMS, 75mV pk-pk on 40V and 60V models. 20mV RMS, 150mV pk-pk on 120V and 300V models. 1mV RMS, 5mV pk-pk on all LMS-3000 models. 35mV RMS, 300mV pk-pk on LMS-4300 and LMS-5300. |
| temperature coefficient            | 0.03%/°C. 0.01%/°C on LMS-3000 Series.                                                                                                                                                                                          |

## Constant Current

(Current regulated line and load) Automatic Crossover.

|                            |                                                                                                                                                                                                                             |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| current range              | .5% to full load current. 1% for LMS-3000 models.                                                                                                                                                                           |
| regulation, line           | 0.3% of I <sub>O</sub> (max) for line variations from 85 to 132VAC or 170 to 265VAC. 2.5mA or 0.1% (whichever is greater) on LMS-3000. 2.5mA or 0.3% (whichever is greater) on LMS-4000 models. 2.5mA on LMS-5300.          |
| regulation, load           | 0.3% of I <sub>O</sub> (max) for load variations from short circuit to rated DC voltage. 2.5mA or 1% (whichever is greater) on LMS-3000 models. 2.5mA or 0.3% (whichever is greater) on LMS-4000 models. 2.5mA on LMS-5300. |
| remote programming current | 0-5V isolated signal for zero to I <sub>O</sub> (max).                                                                                                                                                                      |
| current ripple             | 1.0% I <sub>O</sub> (max) RMS.                                                                                                                                                                                              |

## Thermal Overload Protection

Internal temperature sensing circuit protects unit from excessive ambient temperature on the LMS-3000, 4000, 5000 and 7000 Series. The LMS-6000, 8000 and 9000 Series are protected from inadequate air velocity by an internal airflow sensing circuit. When shutdown occurs, a front panel LED indicator will turn on. AC power must be momentarily removed from the unit after thermal shutdown in order to restore operation.

## Electrical Overload Protection

Adjustable, automatic electronic self-resetting current-limiting circuit. Current-limiting setability to 100% of rated current via an externally accessible potentiometer. An internal peak inverter current limit circuit protects the power supply during load transients.

## Overvoltage Protection

Built-in, adjustable overvoltage protection is standard on all sets. When pre-set voltage is exceeded, the overvoltage protector removes the inverter drive. AC power must be momentarily removed from unit after overvoltage shutdown in order to restore operation.

| Package Model                                | Overvoltage Protection Adjustable Ranges V <sub>OV</sub> (Min) | V <sub>OV</sub> (Max) |
|----------------------------------------------|----------------------------------------------------------------|-----------------------|
| LMS-3008, 4008, 5008, 6008, 7008, 8008, 9008 | 4V                                                             | 11V                   |
| LMS-3018, 4018, 5018, 6018, 7018, 8018, 9018 | 4V                                                             | 24V                   |
| LMS-3040, 4040, 5040, 6040, 7040, 8040, 9040 | 8V                                                             | 50V                   |
| LMS-3060, 4060, 5060, 6060, 7060, 8060, 9060 | 8V                                                             | 70V                   |
| LMS-3120, 4120, 5120, 6120, 7120, 8120, 9120 | 20V                                                            | 130V                  |
| LMS-4300, 5300                               | 200V                                                           | 330V                  |
| LMS-6300, 9300                               | 55V                                                            | 330V                  |

## In-rush Current Limiting

Limits in-rush current at turn-on to 20A when connected for 110VAC input and 40A when connected for 220VAC input. 90A on LMS-3000 Series. 30A on LMS-7000.

## Cooling

The LMS-3000, 4000 and 5000 Series are convection cooled. The LMS-6000, LMS-7000, LMS-8000 and LMS-9000 are fan cooled. Leave adequate clearance for air intakes and exhausts.

## Operating Temperature Range

Continuous duty from 0°C to 71°C with appropriate derating from 40°C to 71°C (0°C to 60°C for LMS-3000, 4000, 5000 Series).

## Storage Temperature Range

-55°C to +85°C.

## Remote Sensing

Provision is made for remote sensing to eliminate effect of power output lead resistance on DC regulation.

## Remote On/Off

A TTL compatible isolated source or contact closure low voltage or short enables the unit. A TTL compatible high voltage or open circuit turns the unit off.

## Series/Parallel Operation

Due to the nature of test applications, expandability is a critical design parameter. The LMS Series allows series or parallel operation with like units in order to address the growing power or voltage requirements of test applications.

## DC Output Controls

Simple screwdriver adjustment over the entire voltage range.

## Input and Output Connections

Input connections via an IEC power line connector. DC output connections via heavy duty, PC board mounted barrier strips (bus bars on LMS-9008 and LMS-9018 units). (AC mating connector available, consult factory.)

## Led Status Indicator

Overvoltage or overtemperature indicator on rear panel.

## Accessories

Rack adapters and line cords available.

## Physical Data

| Package Model | Lbs. Net | Lbs. Ship | Size Inches           |
|---------------|----------|-----------|-----------------------|
| LMS-3000      | 6        | 7         | 4 9/32 × 3 13/16 × 8  |
| LMS-4000      | 4.5      | 5.5       | 4 9/32 × 3 13/16 × 9  |
| LMS-5000      | 7        | 8         | 4 9/32 × 3 13/16 × 10 |
| LMS-6000      | 7.25     | 8         | 4 9/32 × 3 13/16 × 11 |
| LMS-7000      | 8.6      | 9.3       | 4 9/32 × 3 13/16 × 13 |
| LMS-8000      | 12.2     | 16.7      | 4 9/32 × 8 × 9.5      |
| LMS-9000      | 14.5     | 19        | 4 9/32 × 8 × 11 1/8   |

## Safety Agency Approvals

The LMS-3000, 4000, 5000 and 6000 are UL recognized, CSA certified and TUV licensed. The LMS-7000, 8000 and 9000 are under evaluation.

## Guaranteed For 3 Years

3 year guarantee includes labor as well as parts. Guarantee applies to operation at full published specifications at end of 3 years.

# Industrial Ratings Table – Wide Range Output

| MAX CURRENT (AMPS)<br>AT OPERATING TEMPERATURE OF |       |       |      | COMPLETE<br>ELEC. SPEC.<br>PG. | QTY.<br>1 | PRICE      | QTY.<br>25 | MODEL    |
|---------------------------------------------------|-------|-------|------|--------------------------------|-----------|------------|------------|----------|
| 40°C                                              | 50°C  | 60°C  | 71°C |                                |           | QTY.<br>10 |            |          |
| 0-8V OUTPUT                                       |       |       |      |                                |           |            |            |          |
| 3.50                                              | 2.90  | 1.75  | —    | 43                             | \$ 282    | \$ 268     | \$ 263     | LMS-3008 |
| 5.00                                              | 4.30  | 3.20  | —    | 43                             | 418       | 397        | 386        | LMS-4008 |
| 10.00                                             | 7.90  | 6.30  | —    | 43                             | * 495     | 472        | 455        | LMS-5008 |
| 20.00                                             | 20.00 | 16.50 | 13.5 | 43                             | * 664     | 632        | 611        | LMS-6008 |
| 35.00                                             | 35.00 | 30.00 | 25.0 | 43                             | * 810     | 771        | 745        | LMS-7008 |
| 50.00                                             | 47.00 | 41.00 | 33.7 | 43                             | * 959     | 911        | 880        | LMS-8008 |
| 100.00                                            | 90.00 | 78.00 | 57.0 | 43                             | 1261      | 1200       | 1158       | LMS-9008 |
| 0-18V OUTPUT                                      |       |       |      |                                |           |            |            |          |
| 1.60                                              | 1.30  | 0.80  | —    | 43                             | 282       | 268        | 263        | LMS-3018 |
| 2.40                                              | 2.10  | 1.50  | —    | 43                             | 418       | 397        | 386        | LMS-4018 |
| 4.50                                              | 3.50  | 2.80  | —    | 43                             | 495       | 472        | 455        | LMS-5018 |
| 9.00                                              | 9.00  | 8.20  | 6.6  | 43                             | 664       | 632        | 611        | LMS-6018 |
| 16.00                                             | 16.00 | 13.50 | 11.0 | 43                             | 810       | 771        | 745        | LMS-7018 |
| 24.00                                             | 22.20 | 20.50 | 18.0 | 43                             | 959       | 911        | 880        | LMS-8018 |
| 45.00                                             | 40.00 | 33.00 | 25.0 | 43                             | 1261      | 1200       | 1158       | LMS-9018 |
| 0-40V OUTPUT                                      |       |       |      |                                |           |            |            |          |
| 0.70                                              | 0.60  | 0.35  | —    | 43                             | 282       | 268        | 263        | LMS-3040 |
| 1.00                                              | 1.00  | 0.85  | —    | 43                             | 418       | 397        | 386        | LMS-4040 |
| 2.00                                              | 1.60  | 1.30  | —    | 43                             | 495       | 472        | 455        | LMS-5040 |
| 4.00                                              | 4.00  | 3.80  | 3.1  | 43                             | 664       | 632        | 611        | LMS-6040 |
| 7.00                                              | 7.00  | 6.00  | 5.0  | 43                             | 810       | 771        | 745        | LMS-7040 |
| 10.00                                             | 9.80  | 9.20  | 8.0  | 43                             | 959       | 911        | 880        | LMS-8040 |
| 20.00                                             | 18.00 | 15.00 | 11.0 | 43                             | 1261      | 1200       | 1158       | LMS-9040 |
| 0-60V OUTPUT                                      |       |       |      |                                |           |            |            |          |
| 0.50                                              | 0.42  | 0.25  | —    | 43                             | 282       | 268        | 263        | LMS-3060 |
| 0.70                                              | 0.70  | 0.60  | —    | 43                             | 418       | 397        | 386        | LMS-4060 |
| 1.40                                              | 1.10  | 0.90  | —    | 43                             | 495       | 472        | 455        | LMS-5060 |
| 2.80                                              | 2.80  | 2.60  | 2.1  | 43                             | 664       | 632        | 611        | LMS-6060 |
| 4.80                                              | 4.80  | 4.10  | 3.4  | 43                             | 810       | 771        | 745        | LMS-7060 |
| 7.00                                              | 6.60  | 6.10  | 5.3  | 43                             | 959       | 911        | 880        | LMS-8060 |
| 14.00                                             | 12.00 | 10.00 | 8.0  | 43                             | 1261      | 1200       | 1158       | LMS-9060 |
| 0-120V OUTPUT                                     |       |       |      |                                |           |            |            |          |
| 0.25                                              | 0.21  | 0.13  | —    | 43                             | 282       | 268        | 263        | LMS-3120 |
| 0.36                                              | 0.36  | 0.30  | —    | 43                             | 418       | 397        | 386        | LMS-4120 |
| 0.70                                              | 0.55  | 0.45  | —    | 43                             | 495       | 472        | 455        | LMS-5120 |
| 1.40                                              | 1.40  | 1.30  | 1.0  | 43                             | 664       | 632        | 611        | LMS-6120 |
| 2.40                                              | 2.40  | 2.10  | 1.7  | 43                             | 810       | 771        | 745        | LMS-7120 |
| 3.50                                              | 3.40  | 3.20  | 2.7  | 43                             | 959       | 911        | 880        | LMS-8120 |
| 7.00                                              | 6.00  | 5.00  | 4.0  | 43                             | 1261      | 1200       | 1158       | LMS-9120 |
| 0-300V OUTPUT                                     |       |       |      |                                |           |            |            |          |
| 0.14                                              | 0.12  | 0.11  | —    | 43                             | 482       | 459        | 447        | LMS-4300 |
| 0.28                                              | 0.22  | 0.18  | —    | 43                             | 568       | 540        | 522        | LMS-5300 |
| 0.56                                              | 0.56  | 0.52  | 0.40 | 43                             | 830       | 789        | 762        | LMS-6300 |
| 2.80                                              | 2.40  | 2.00  | 1.60 | 43                             | 1640      | 1558       | 1503       | LMS-9300 |