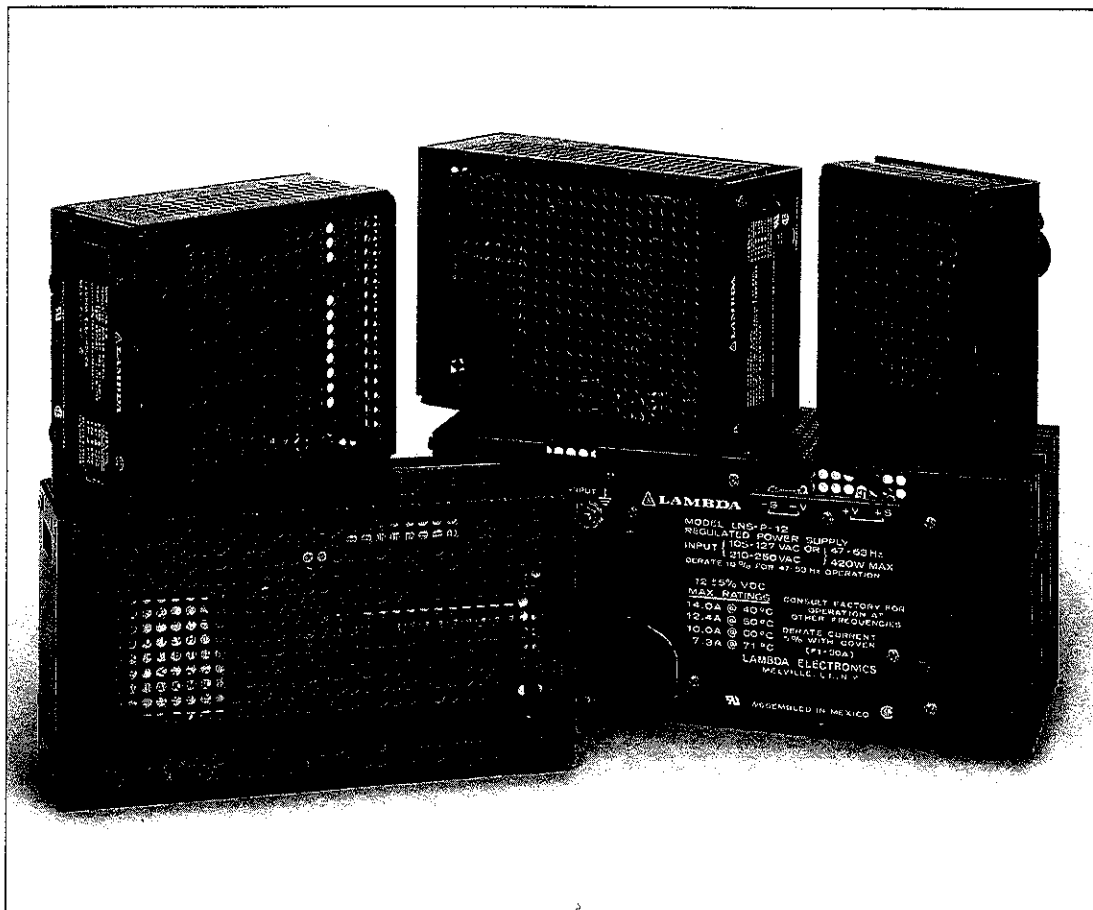


Part I – AC-to-DC Power Supplies

LAMBDA'S and LN SERIES



High Reliability Linear Solutions for Low Noise Applications

Lambda's LD and LN Series linear power supplies are designed to meet the ever increasing requirements of high reliability and ease of use in today's modern equipment. They feature extremely low output ripple and noise – ideal for medical and industrial applications, and test equipment employing sensitive analog circuits.

Lambda's LD and LN Series are manufactured using only the highest-grade components. And our stringent in-house component derating ensures that the LD and LN Series provide the highest reliability for any low-noise, high-stability requirement.

and LN SERIES FEATURES

MIL-STD-810 C Specifications	The LD and LN Series have passed tests in accordance with the stringent specifications of MIL-STD-810 C. This ensures that your design can meet the requirements of even the most rigorous environments.
Lowest Output Ripple and Noise	Featuring output ripple as low as 150 μ V RMS, the LD and LN Series are ideal for sensitive communication and high-gain, wide bandwidth applications.
High Line and Load Stability	With line and load regulation as precise as 0.005% + 5mV, the LD and LN Series are well suited for applications where unstable line voltages are prevalent and stable output voltages are required.
High Temperature Operation	The LN Series is capable of operation in ambient temperatures as high as 71°C.
Five Year Guarantee	Lambda's LD and LN Series are guaranteed to operate at published specifications for five years.
AC Inputs	The LD and LN Series can be configured for 220VAC operation via a transformer tap change providing low noise solutions for worldwide applications.
Cooling	All models are convection cooled. No fans are required to operate at rated output. Additional power can be obtained by removing the cover. Contact the factory for further information.
Remote Sensing	Load leads can significantly degrade the performance of a power supply by picking up emissions which increase output ripple. Load current can cause resistive voltage drops which alter the effective voltage at the load. The remote sensing capability of the LD and LN Series compensates for these effects ensuring a low noise exact voltage at your load.

Part I – AC-to-DC Power Supplies

and LN SERIES SPECIFICATIONS

AC Input

line 105 to 127VAC, 210 to 254VAC (by transformer tap change), 47-440Hz.
Consult factory for operation at frequencies other than 57-63Hz.

DC Output

Voltage range shown in tables.

Regulated Voltage

	LD SERIES	LN SERIES
regulation, line	0.005% + 5mV	0.1% (0.15% for LNS-Z)
regulation, line	0.005% + 5mV	0.1%, (0.15% for LNS-Z)
ripple and noise	150μV RMS, 1mV pk-pk, 250μVRMS for 100V, 120V & 150V units	1.5mV RMS, 5mV pk-pk, 5mV RMS, 15mV pk-pk for LNS-P-48
temperature coefficient	(0.01% + 10μV)/°C (0.005% + 10μV)/°C on wide range models with external programming resistors	0.03%/°C
remote programming resistance	1000 ohms/volt Programming to less than 1 volt on wide range models must be done in two steps; first to 1 volt and then to desired value	200 ohms/volt (not on LND)
remote programming voltage	volt per volt	volt per volt (not on LND)

Tracking Accuracy (Dual Tracking Models Only)

3% absolute voltage difference, 0.2% change for all conditions of line, load and temperature.

Electrical Overload Protection

External overload protection, automatic electronic current limiting circuit limits the output current to a preset value, thereby providing protection for the load as well as the power supply.

Thermal Overload Protection

Thermostat – automatically reset when overtemperature condition is eliminated.

Overvoltage Protection

Overvoltage protection module crowbars output when trip level is exceeded – standard on all 5V models.

Isolation Rating

Minimum, 10 Megohm isolation from DC to ground at 750VDC.

Overshoot

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

Remote Sensing

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

Cooling

All units are convection cooled. No external heat sinking or forced air is required.

Operating Temperature Range

Continuous operation from 0° to +71°C on LN Series and 0° to +60°C on LD Series with suitable derating above +40°C. Consult the factory for derating below 0°C.

Storage Temperature Range

–55°C to +85°C.

Input and Output Connections

Heavy-duty screw terminals on printed circuit board.

Mounting

LN/LDS-Y, X, W – three mounting surfaces, three mounting positions (Two mounting surfaces on wide range and 48V models when used with optional LH OV).

LN/LDS-P – one mounting surface, one mounting position.

Finish

Gray, Fed. Std. 595, No. 26081.

Transformer

MIL-T-27C, Grade 6; Electrostatic shield; 4000VAC input/output isolation.

Fungus Proofing

No fungi nutrient material used.

Military Specifications

The LD and LN Series have passed the following tests in accordance with MIL-STD-810C.

- 1) Low Pressure – Method 500.1, Procedure I.
 - 2) High Temperature – Method 501.1, Procedures I & II.
 - 3) Low Temperature – Method 502.1, Procedure I.
 - 4) Temperature Shock – Method 503.1, Procedure I.
 - 5) Temperature-Altitude – Method 504.1, Procedure I.
Class 2 (0°C operating)
 - 6) Humidity – Method 507.1, Procedures I & II.
 - 7) Fungus – Method 508.1, Procedure I.
 - 8) Vibration – Method 514.2, Procedures X & XI.
 - 9) Shock – Method 516.2, Procedures I & III.
- MIL-I-6181D – Conducted and radiated EMI with one output terminal grounded.

Accessories

For rack adapters and other accessories, see Part IV of this catalog.

Power Supply Series	OV Series
LNS-Z, LNS-Y, LDS-Y-12V through 28V models	L-6A-OV
LNS-X, LND, LDS-X-12V through 28V models	L-12A-OV
LNS-W, LDS-W-12V through 28V models	Consult Factory
LNS-P, LDS-P-12V through 28V models	Consult Factory
LD All 01, 02, 03 and 48V models	LHOV (Adjustable)

Physical Data

Package Model	Lbs. Net	Lbs. Ship	Size Inches
LN-Z	3	3¼	4⅞ × 4 × 1¾ (w/cover) 4⅞ × 4 × 1⅝ (w/o cover)
LN-Y, LDS-Y	5	5½	5⅝ × 4⅞ × 2⅝ (w/cover) 5⅝ × 4⅞ × 2½ (w/o cover)
LN-X, LDS-X	7¾	8¼	7 × 4⅞ × 2⅞ (w/cover) 7 × 4⅞ × 2¾ (w/o cover)
LN-W, LDS-W	9	9½	9 × 4⅞ × 2⅞ (w/cover) 9 × 4⅞ × 2¾ (w/o cover)
LNS-P, LDS-P	14	15½	11 × 4⅞ × 4⅜ (w & w/o cover)
LND-P	15½	17	11 × 4⅞ × 4⅜ (w & w/o cover)

Guaranteed For 5 Years

5-year guarantee includes labor as well as parts. Guarantee applies to operation at full published specifications at the end of 5 years.

UL/CSA

UL Recognized. CSA Certified.

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) ¹ AT AMBIENT TEMPERATURE OF			V _{out} ADJ. RANGE	COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY			MODEL
	50°C	60°C	71°C			1	10	25	
5V OUTPUT									
2.70	2.40	2.10	1.50	4.75-5.25	16	\$ 171	\$ 164	\$ —	LNS-Z-5-OV
5.40	4.60	3.80	2.80	4.75-5.25	16	250	237	—	LNS-Y-5-OV ²
8.50	7.60	6.20	4.50	4.75-5.25	16	318	302	—	LNS-X-5-OV ²
11.90	10.40	8.50	6.40	4.75-5.25	16	376	359	—	LNS-W-5-OV ²
20.90	18.50	15.70	12.40	4.75-5.25	16	470	447	—	LNS-P-5-OV ²
12V OUTPUT									
1.55	1.45	1.40	1.20	11.40-12.60	16	161	153	—	LNS-Z-12
3.60	3.15	2.60	2.00	11.40-12.60	16	235	225	—	LNS-Y-12 ²
5.50	4.70	3.80	2.80	11.40-12.60	16	293	280	—	LNS-X-12 ²
7.20	6.10	5.00	3.60	11.40-12.60	16	354	336	—	LNS-W-12 ²
13.30	11.80	9.50	6.94	11.40-12.60	16	428	407	—	LNS-P-12 ²

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

²Currents 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) ¹ AT AMBIENT TEMPERATURE OF				V _{out} ADJ. RANGE	COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY			MODEL
40°C	50°C	60°C	71°C			1	10	25	
15V OUTPUT									
1.30	1.20	1.10	0.90	14.25-15.75	16	\$ 161	\$ 153	\$ —	LNS-Z-15 ²
3.10	2.80	2.35	1.80	14.25-15.75	16	235	225	—	LNS-Y-15 ²
4.70	4.10	3.35	2.40	14.25-15.75	16	293	280	—	LNS-X-15 ²
6.55	5.70	4.70	3.15	14.25-15.75	16	354	336	—	LNS-W-15 ²
11.40	10.10	8.10	6.00	14.25-15.75	16	428	407	—	LNS-P-15 ²
24V OUTPUT									
0.81	0.68	0.55	0.36	22.80-25.20	16	161	153	—	LNS-Z-24 ²
2.10	1.90	1.50	1.00	22.80-25.20	16	235	225	—	LNS-Y-24 ²
3.25	2.75	2.00	1.20	22.80-25.20	16	293	280	—	LNS-X-24 ²
4.60	3.90	3.10	2.10	22.80-25.20	16	354	336	—	LNS-W-24 ²
8.60	7.60	6.40	4.80	22.80-25.20	16	428	407	—	LNS-P-24 ²

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

²Currents 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) ¹ AT AMBIENT TEMPERATURE OF				V _{out} ADJ. RANGE	COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY			MODEL
40°C	50°C	60°C	71°C			1	10	25	
28V OUTPUT									
0.75	0.60	0.45	0.32	26.60-29.40	16	161	153	—	LNS-Z-28 ²
1.80	1.65	1.35	0.90	26.60-29.40	16	235	225	—	LNS-Y-28 ²
2.90	2.50	1.50	1.00	26.60-29.40	16	293	280	—	LNS-X-28 ²
4.00	3.40	2.75	1.90	26.60-29.40	16	354	336	—	LNS-W-28 ²
7.60	6.75	5.70	4.30	26.60-29.40	16	428	407	—	LNS-P-28 ²

48V OUTPUT

4.28	3.80	3.20	2.38	45.60-50.40	16	524	499	—	LNS-P-48 ²
------	------	------	------	-------------	----	-----	-----	---	-----------------------

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

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

Rugged Environment Ratings Table

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

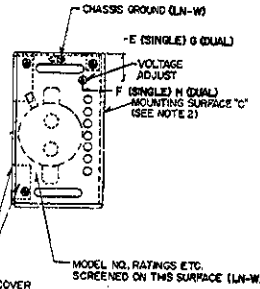
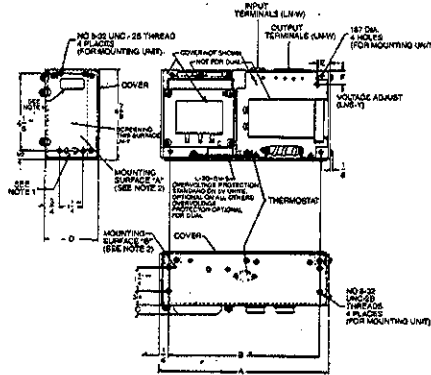
- Linear Power Supplies
- Low Output Ripple
- Low Leakage Current

VOLT Vo	MAX CURRENT (AMPS) AT AMBIENT TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	UNIT PRICE PER DELIVERED QUANTITY		MODEL
	40°C	50°C	60°C	71°C		1	10	
DUAL OUTPUT. DUAL TRACKING.								
± 15V TO ± 12V ADJ. (Dual Tracking) (Also used as 24 to 30 VDC)								
± 15 to	0.50	0.50	0.40	0.30	16	\$184	\$175	LND-Z-152 ²
± 12	0.50	0.50	0.40	0.30				
± 15 to	1.20	1.00	0.80	0.50	16	257	247	LND-Y-152 ²
± 12	1.00	0.90	0.70	0.40				
± 15 to	2.10	1.80	1.40	0.90	16	338	323	LND-X-152 ²
± 12	2.00	1.60	1.20	0.80				
± 15 to	3.00	2.80	2.30	1.80	16	383	365	LND-W-152 ²
± 12	2.80	2.50	2.10	1.40				
± 15 to	5.00	4.50	3.70	2.70	16	512	498	LND-P-152 ²
± 12	4.40	3.80	3.10	2.40				

Notes: 2 currents are 10-15% higher when used without a cover. Consult the factory.

LN SERIES MECHANICAL DRAWINGS

LNS-W
LNS-Y
LND-W, LND-Y



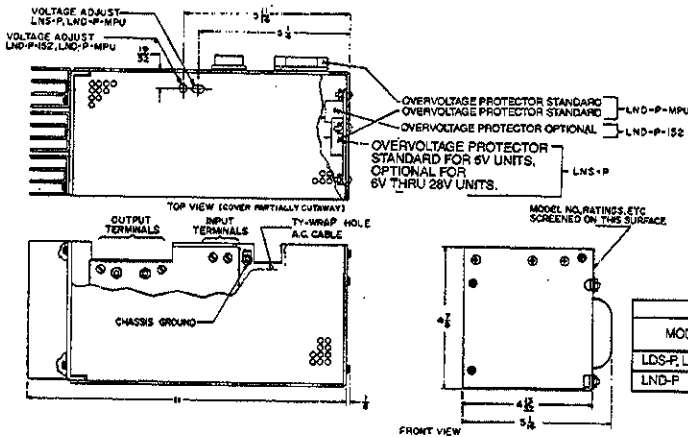
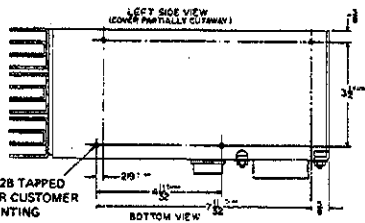
NOTES

1. CUSTOMER MUST PROVIDE CLEARANCE IN HIS MOUNTING SURFACE FOR VENT HOLES TO ALLOW FOR AIR CIRCULATION.
2. WHEN USING SURFACE "C" AS MOUNTING SURFACE, COVER MUST BE ASSEMBLED TO UNIT AFTER UNIT IS BOLTED DOWN. FOR SURFACES "A" & "B", COVER MAY BE PRE-ASSEMBLED TO UNIT.
3. COVER SCREWS ARE INDICATED BY \odot AND THEY MUST BE REMOVED BEFORE REMOVING COVER.

MODEL	W	A	B	C	D	E	F	G	H
LDS-W, LNS-W, LND-W	8	8	14	20 1/2	10 1/2	4 1/2	1 1/4	—	—
LDS-Y, LNS-Y, LND-Y	5 1/2	4 1/2	7 1/2	2 1/4	1 1/4	1/2	—	—	—

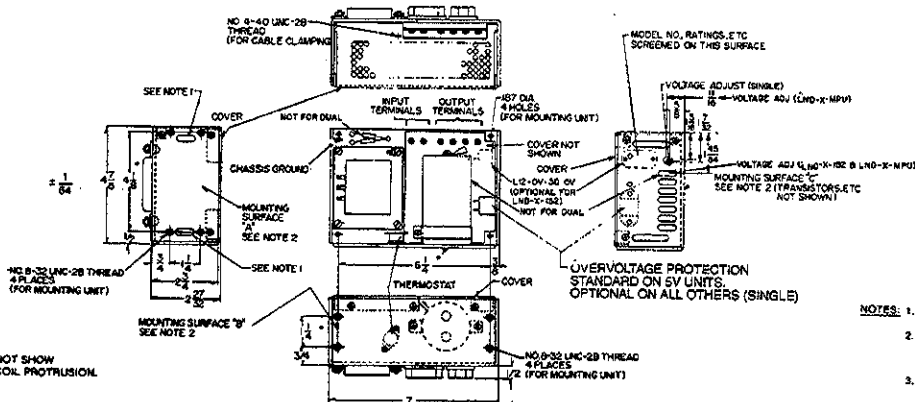
LNS-P
LND-P

- NOTES:
1. CUSTOMER MOUNTING SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 1/16".
 2. COVER SCREWS ARE INDICATED BY \odot AND \odot AND MUST BE REMOVED BEFORE COVER IS REMOVED (6 PLACES).
 3. SIDE VIEWS DO NOT SHOW TRANSFORMER COIL PROTRUSION.



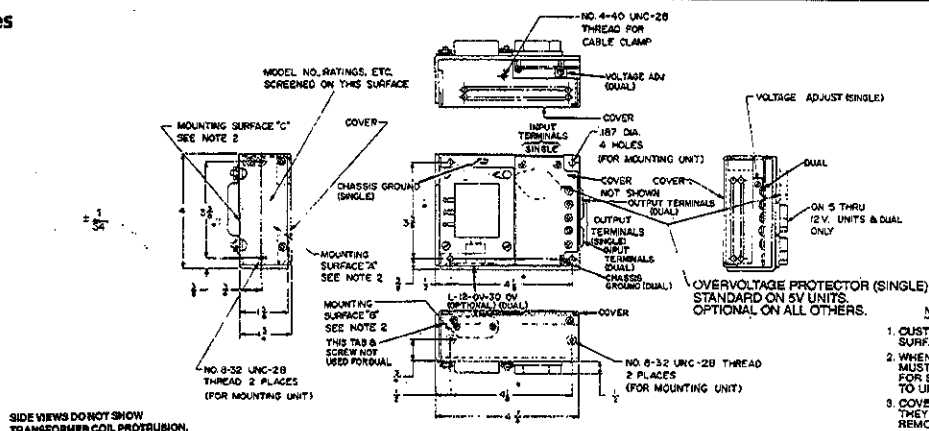
MODEL	NET WT. (LBS)	SHIPPING WT. (LBS)
LDS-P, LNS-P	14	15 1/2
LND-P	15 1/2	17

LNS-X
LND-X



- NOTES:
1. CUSTOMER MUST PROVIDE CLEARANCE IN HIS MOUNTING SURFACE FOR VENT HOLES TO ALLOW FOR AIR CIRCULATION.
 2. WHEN USING SURFACE "C" AS A MOUNTING SURFACE, COVER MUST BE ASSEMBLED TO UNIT AFTER UNIT IS BOLTED DOWN FOR SURFACES "A" & "B". COVER MAY BE PRE-ASSEMBLED TO UNIT.
 3. COVER SCREWS ARE INDICATED BY \odot AND THEY MUST BE REMOVED BEFORE REMOVING COVER (7 PLACES).

LN-Z Series



NOTES

1. CUSTOMER MUST PROVIDE CLEARANCE IN HIS MOUNTING SURFACE FOR VENT HOLES TO ALLOW FOR AIR CIRCULATION.
2. WHEN USING SURFACE "C" AS A MOUNTING SURFACE, COVER MUST BE ASSEMBLED TO UNIT AFTER UNIT IS BOLTED DOWN FOR SURFACES "A" & "B". COVER MAY BE PRE-ASSEMBLED TO UNIT.
3. COVER SCREWS ARE INDICATED BY \odot AND THEY MUST BE REMOVED BEFORE REMOVING COVER.

LAMBDA ELECTRONICS INC. Δ

515 Broad Hollow Rd., Melville, NY 11747-3700 • 1-800-LAMBDA-4