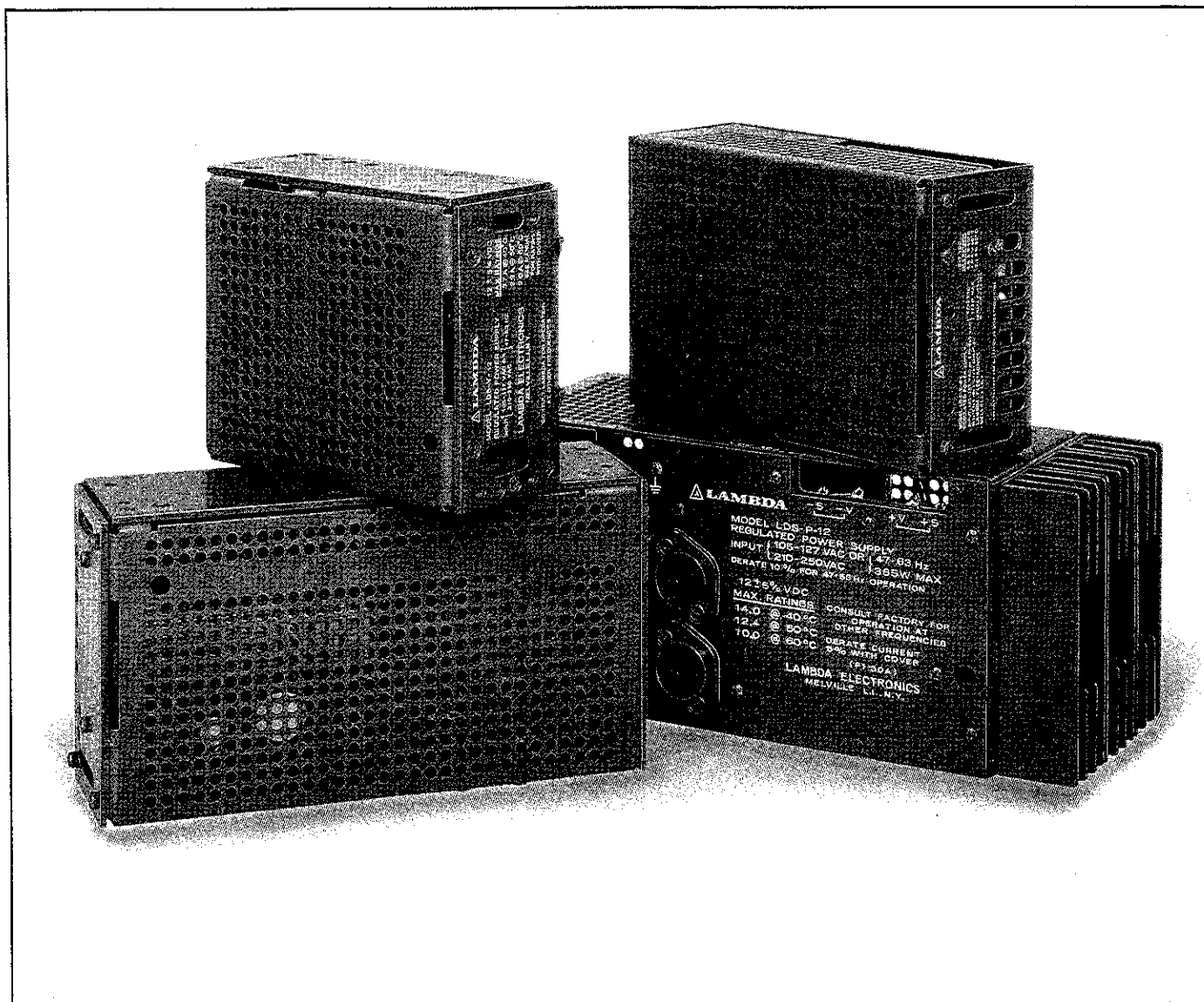


LAMBDA'S MIL-ENVIRONMENT LD SERIES



THE IDEAL CHOICE FOR ULTRA-LOW NOISE APPLICATIONS

Pure DC and precisely controlled outputs are the predominant characteristics of Lambda's LD Series linear power supplies. For the lowest noise requirements, these high density low profile units provide the ultimate performance, achieving less than 1mV peak to peak and 150 μ V RMS ripple specifications. This is accomplished by using only the highest grade components, hermetically sealed power semiconductors, and a unique temperature controlled regulator.

- Lambda guarantees each unit will meet or exceed all published specifications for the full 5 year guarantee period.
- Output ripple: 150 μ V RMS.
Regulation: .005% line and load.
Temperature coefficient: .005%/°C.
- Lambda's LD Series is the industry choice for ultra low noise applications where ripple and drift must be kept to an absolute minimum.
- Designed to meet MIL-STD-810 environmental specifications for military and industrial applications.
- 4 single output, convection cooled packages. Available in wide and narrow range adjustable outputs... up to 150VDC, up to 22A.
- Lambda's LD Series is manufactured using only the highest grade MIL-type components in conjunction with hermetically sealed power semiconductors and monolithic voltage regulators. This results in the highest reliability for low noise linear applications.
- Grade 1 design.

PART IB—AC-TO-DC LINEAR POWER SUPPLIES

LAMBDA'S MIL-ENVIRONMENT LD SERIES

DC OUTPUT

Voltage range shown in tables.

REGULATED VOLTAGE

regulation, line	0.005% + 0.5mV for line variations from 105 to 127VAC.
regulation, load	0.005% + 0.5mV for load variations from 0 to full load.
ripple and noise (20MHz Bandwidth)	1mV pk-pk, 150 μ V RMS (250 μ V for 100V, 120V, 150V units).
temperature coefficient	$\pm(0.005\% + 10\mu\text{V})/^{\circ}\text{C}$ on wide range models with external programming resistors. $\pm(0.01\% + 10\mu\text{V})/^{\circ}\text{C}$ on wide range models with internal programming resistors and on 5V through 150V units.
remote programming resistance	1000 Ω /volt nominal. Downward programming to voltages less than 1 volt must be accomplished in two steps; first, from original voltage value to 1 volt, and then from 1 volt to final desired value.
remote programming voltage	volt per volt.

AC INPUT

line	105 to 127VAC, 210 to 254VAC (by transformer tap change) 47-440Hz. Derate 40 $^{\circ}\text{C}$ rating 10% for 50Hz operation. Consult factory for 63-440Hz ratings.
power	LDS-Y: 155 watts maximum. LDS-X: 230 watts maximum. LDS-W: 293 watts maximum. LDS-P: 430 watts maximum.

OVERSHOOT

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

OPERATING TEMPERATURE RANGE

Continuous duty from 0 to 60 $^{\circ}\text{C}$ with suitable deratings above 40 $^{\circ}\text{C}$ (see tables).

STORAGE TEMPERATURE

-55 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$.

OVERLOAD PROTECTION ELECTRICAL

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

THERMAL

Thermostat—automatically resets when overtemperature condition is eliminated.

COOLING

All models are convection cooled. No fans or blowers are needed.

DC OUTPUT CONTROLS

Simple screwdriver adjustment over the entire voltage range on fixed voltage models. On wide range models, an adjustable range of 1%- V_o max to V_o max is provided by the internal programming potentiometer; programming over the full 0 to V_o max range can be accomplished by remote programming.

INPUT AND OUTPUT CONNECTIONS

Heavy duty screw terminals on PC board. Solder turrets provide for remote programming operation.

MOUNTING

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

LDS-P—one mounting surface, one mounting position.

REMOTE SENSING

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

FUNGUS PROOFING

All units are fungi inert.

MILITARY SPECIFICATIONS

The LD series has been designed to pass 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 $^{\circ}\text{C}$ 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.

PHYSICAL DATA

Package Model	Lbs. Net	Lbs. Ship	Size Inches
LDS-Y	5	5 1/2	5 5/8 x 4 7/8 x 2 5/8 w/cover 5 5/8 x 4 7/8 x 2 1/2 w/o cover
LDS-X	7 3/4	8 1/4	7 x 4 7/8 x 2 7/8 w/cover 7 x 4 7/8 x 2 3/4 w/o cover
LDS-W	9	9 1/2	9 x 4 7/8 x 2 7/8 w/cover 9 x 4 7/8 x 2 3/4 w/o cover
LDS-P	14	15 1/2	11 x 4 7/8 x 4 13/32 w & w/o cover

All units shipped with cover.

ACCESSORIES

Overvoltage protection (standard on all 5V models).

POWER SUPPLY SERIES	OV SERIES
LDS-Y-12V through 28V models	L-6A-OV (Fixed)
LDS-X-12V through 28V models	L-12A-OV (Fixed)
LDS-W-12V through 28V models	Consult Factory
LDS-P-12V through 28V models	Consult Factory
All 01, 02, 03 and 48V models	LHOV (Adjustable)

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

OPTIONS

AC Input: Unit can be rewired for 210 to 254VAC at 47-440Hz. Consult factory for operation above 63Hz.

FINISH

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

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.

PART IB—AC-TO-DC POWER SUPPLIES

MIL-ENVIRONMENT LINEAR SELECTOR GUIDE

AC Input. Single Output. Fixed Voltage.

MAX CURRENT AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	LAMBDA'S CHOICE (Δ)*	QTY. 1	PRICE QTY. 10	QTY. 25	MODEL
40°C	50°C	60°C	71°C								
5V \pm 5% ADJ.											
5.4(5.0)	4.4(4.0)	3.3(3.0)	—	79	179	5 $\frac{5}{8}$ \times 4 $\frac{7}{8}$ \times 2 $\frac{5}{8}$	Δ	311	297	284	LDS-Y-5-OV ⁽¹⁾⁽⁴⁾
10.0(8.5)	8.6(7.3)	7.0(6.0)	—	79	179	7 \times 4 $\frac{7}{8}$ \times 2 $\frac{7}{8}$	Δ	385	367	353	LDS-X-5-OV ⁽¹⁾⁽⁴⁾
14.0(11.9)	11.7(9.9)	9.1(7.7)	—	79	179	9 \times 5 \times 2 $\frac{7}{8}$	Δ	469	447	429	LDS-W-5-OV ⁽¹⁾⁽⁴⁾
22.0(20.9)	18.8(18.0)	15.6(14.8)	—	79	179	11 \times 4 $\frac{7}{8}$ \times 4 $\frac{13}{32}$	Δ	584	556	533	LDS-P-5-OV ⁽¹⁾⁽⁴⁾
12V \pm 5% ADJ.											
3.7(3.4)	2.9(2.55)	2.0(1.75)	—	79	179	5 $\frac{5}{8}$ \times 4 $\frac{7}{8}$ \times 2 $\frac{5}{8}$	Δ	299	285	273	LDS-Y-12 ⁽⁴⁾
6.5(5.5)	5.5(4.7)	4.5(3.8)	—	79	179	7 \times 4 $\frac{7}{8}$ \times 2 $\frac{7}{8}$	Δ	370	353	338	LDS-X-12 ⁽⁴⁾
8.5(7.2)	7.0(6.0)	5.3(4.5)	—	79	179	9 \times 5 \times 2 $\frac{7}{8}$	Δ	451	430	412	LDS-W-12 ⁽⁴⁾
14.0(13.3)	12.4(11.8)	10.0(9.5)	—	79	179	11 \times 4 $\frac{7}{8}$ \times 4 $\frac{13}{32}$	Δ	570	544	522	LDS-P-12 ⁽⁴⁾
15V \pm 5% ADJ.											
3.25(3.0)	2.5(2.25)	1.7(1.55)	—	79	179	5 $\frac{5}{8}$ \times 4 $\frac{7}{8}$ \times 2 $\frac{5}{8}$	Δ	299	285	273	LDS-Y-15 ⁽⁴⁾
5.5(4.7)	4.6(3.9)	3.6(3.1)	—	79	179	7 \times 4 $\frac{7}{8}$ \times 2 $\frac{7}{8}$	Δ	370	353	338	LDS-X-15 ⁽⁴⁾
7.7(6.55)	6.2(5.3)	4.7(4.0)	—	79	179	9 \times 5 \times 2 $\frac{7}{8}$	Δ	451	430	412	LDS-W-15 ⁽⁴⁾
12.0(11.4)	10.6(10.0)	8.5(8.1)	—	79	179	11 \times 4 $\frac{7}{8}$ \times 4 $\frac{13}{32}$	Δ	570	544	522	LDS-P-15 ⁽⁴⁾
20V \pm 5% ADJ.											
2.5(2.25)	2.0(1.8)	1.5(1.35)	—	79	179	5 $\frac{5}{8}$ \times 4 $\frac{7}{8}$ \times 2 $\frac{5}{8}$	Δ	299	285	273	LDS-Y-20 ⁽⁴⁾
4.4(3.7)	3.6(3.1)	2.6(2.2)	—	79	179	7 \times 4 $\frac{7}{8}$ \times 2 $\frac{7}{8}$	Δ	370	353	338	LDS-X-20 ⁽⁴⁾
6.1(5.2)	5.0(4.3)	3.8(3.2)	—	79	179	9 \times 5 \times 2 $\frac{7}{8}$	Δ	451	430	412	LDS-W-20 ⁽⁴⁾
10.0(9.5)	8.9(8.5)	7.0(6.6)	—	79	179	11 \times 4 $\frac{7}{8}$ \times 4 $\frac{13}{32}$	Δ	570	544	522	LDS-P-20 ⁽⁴⁾

*LAMBDA'S RECOMMENDED CHOICE FOR NEW DESIGN REQUIREMENTS.

- NOTES: (1) Includes fixed overvoltage protection.
 (2) All LX Series models have fungus proofing standard and is included in model notation and price.
 (3) \pm 15 to \pm 12 Volts are dual tracking unit outputs.
 (4) Ratings in parenthesis for LD and LN Series when cover is used.
 (A) All outputs continuously adjustable over entire range.
 (B) Current rating is from zero to I_{max} . With exception of LND Series, current rating applies over entire output voltage range.
 (C) LD, LC, LN, and LX Series power modules are available for operation at 360-440Hz. Consult factory for ratings and specifications. For 50Hz operation, derate LC Series by 10%; for LX Series delete 40°C rating.
 (D) Prices are U.S.A. list prices only, E.O.B. Melville, N.Y.; McAllen, Texas; Tucson, Arizona. All prices and specifications are subject to change without notice.

PART IB—AC-TO-DC LINEAR POWER SUPPLIES

MIL ENVIRONMENT LINEAR SELECTOR GUIDE

AC Input. Single Output. Fixed Voltage.

MAX CURRENT AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	LAMBDA'S CHOICE (Δ)*	QTY. 1	PRICE QTY. 10	QTY. 25	MODEL
40°C	50°C	60°C	71°C								
24V ±5% ADJ.											
2.1(1.9)	1.7(1.55)	1.3(1.15)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	299	285	273	LDS-Y-24 ⁽⁴⁾
3.8(3.2)	3.2(2.7)	2.4(2.0)	—	79	179	7 × 4 ⁷ / ₈ × 2 ⁷ / ₈	Δ	370	353	338	LDS-X-24 ⁽⁴⁾
5.4(4.6)	4.4(3.7)	3.3(2.8)	—	79	179	9 × 5 × 2 ⁷ / ₈	Δ	451	430	412	LDS-W-24 ⁽⁴⁾
9.0(8.5)	8.0(7.6)	6.0(5.7)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	570	544	522	LDS-P-24 ⁽⁴⁾
28V ±5% ADJ.											
1.9(1.65)	1.5(1.35)	1.1(1.0)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	299	285	273	LDS-Y-28 ⁽⁴⁾
3.4(2.9)	2.9(2.5)	2.2(1.9)	—	79	179	7 × 4 ⁷ / ₈ × 2 ⁷ / ₈	Δ	370	353	338	LDS-X-28 ⁽⁴⁾
4.7(4.0)	4.0(3.4)	3.1(2.6)	—	79	179	9 × 5 × 2 ⁷ / ₈	Δ	451	430	412	LDS-W-28 ⁽⁴⁾
8.0(7.6)	7.1(6.7)	5.2(4.9)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	570	544	522	LDS-P-28 ⁽⁴⁾
48V ±5% ADJ.											
1.36(1.2)	1.05(0.95)	0.75(0.70)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	311	297	284	LDS-Y-48 ⁽⁴⁾
2.1(1.9)	1.8(1.6)	1.4(1.2)	—	79	179	7 × 4 ⁷ / ₈ × 2 ⁷ / ₈	Δ	385	367	353	LDS-X-48 ⁽⁴⁾
3.0(2.6)	2.6(2.2)	2.0(1.7)	—	79	179	9 × 5 × 2 ⁷ / ₈	Δ	469	447	426	LDS-W-48 ⁽⁴⁾
4.5(4.28)	4.0(3.8)	3.4(3.2)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	584	556	533	LDS-P-48 ⁽⁴⁾
100V ±5% ADJ.											
0.55(0.55)	0.45(0.45)	0.35(0.35)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	329	315	302	LDS-Y-100 ⁽⁴⁾
1.6(1.6)	1.4(1.4)	1.2(1.2)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	606	577	544	LDS-P-100 ⁽⁴⁾
120V ±5% ADJ.											
.45(.45)	.35(.35)	.25(.25)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	329	315	302	LDS-Y-120 ⁽⁴⁾
1.4(1.4)	1.2(1.2)	1.0(1.0)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	606	577	544	LDS-P-120 ⁽⁴⁾
150V ±5% ADJ.											
.35(.35)	.25(.25)	.15(.15)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	329	315	302	LDS-Y-150 ⁽⁴⁾
1.1(1.1)	.9(.9)	.8(.8)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	606	577	544	LDS-P-150 ⁽⁴⁾

*LAMBDA'S RECOMMENDED CHOICE FOR NEW DESIGN REQUIREMENTS.

- NOTES: (1) Includes fixed overvoltage protection.
 (2) All LX Series models have fungus proofing standard and is included in model notation and price.
 (3) ±15 to ±12 Volts are dual tracking unit outputs.
 (4) Ratings in parenthesis for LD and LN Series when cover is used.
 (A) All outputs continuously adjustable over entire range.
 (B) Current rating is from zero to I_{max} . With exception of LND Series, current rating applies over entire output voltage range.
 (C) LD, LC, LN, and LX Series power modules are available for operation at 360-440Hz. Consult factory for ratings and specifications. For 50Hz operation, derate LC Series by 10%; for LX Series delete 40°C rating.
 (D) Prices are U.S.A. list prices only; F.O.B. Melville, N.Y.; McAllen, Texas; Tucson, Arizona. All prices and specifications are subject to change without notice.

PART IB—AC-TO-DC LINEAR POWER SUPPLIES

MIL ENVIRONMENT LINEAR SELECTOR GUIDE

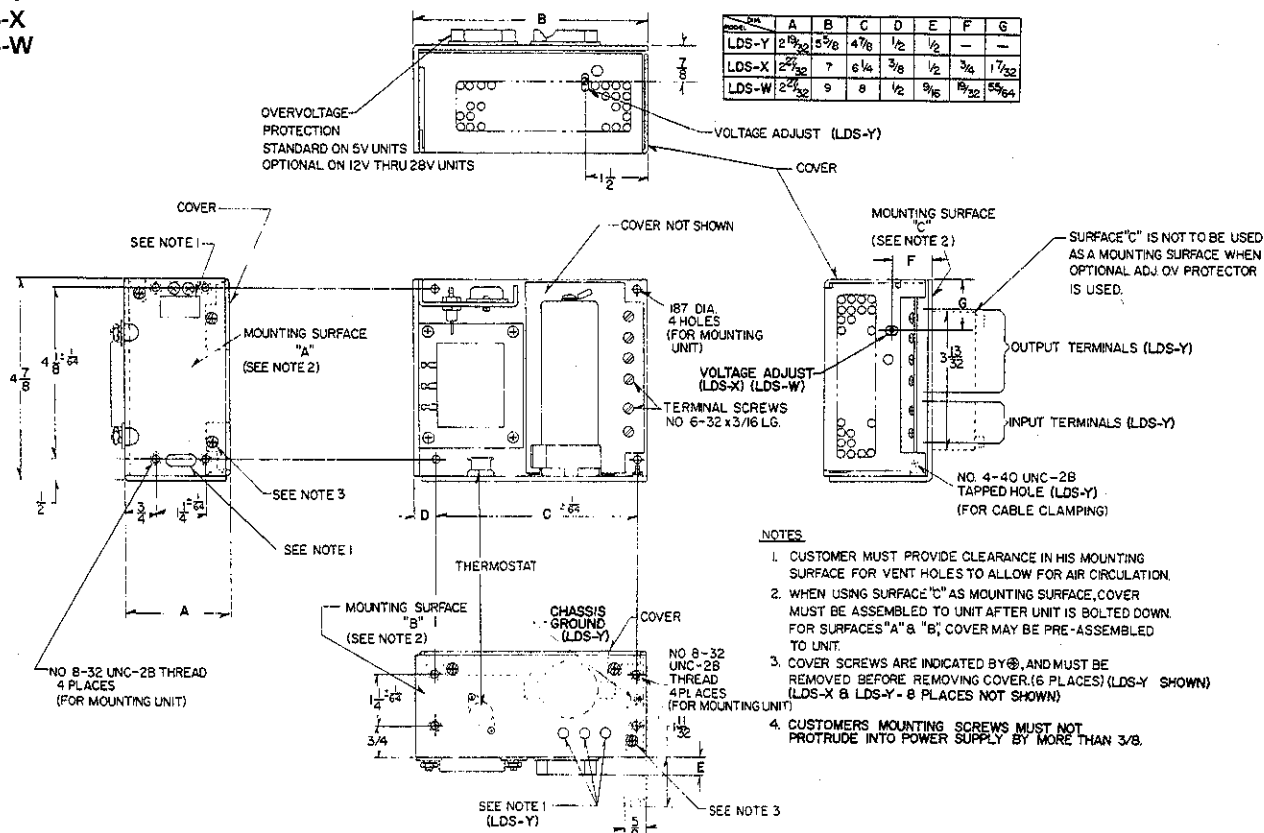
AC Input. Single Output. Wide Range

MAX CURRENT AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	LAMBDA'S CHOICE (Δ)*	QTY. 1	PRICE QTY. 10	QTY. 25	MODEL
40°C	50°C	60°C	71°C								
0-7 VOLTS ADJ.											
3.4(3.4)	2.9(2.85)	2.4(1.8)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	\$311	\$297	\$284	LDS-Y-01(4)
4.8(4.1)	4.0(3.4)	3.1(2.6)	—	79	179	7 × 4 ⁷ / ₈ × 2 ⁷ / ₈	Δ	385	367	353	LDS-X-01(4)
6.6(5.6)	5.7(4.8)	4.5(3.8)	—	79	179	9 × 5 × 2 ⁷ / ₈	Δ	469	447	429	LDS-W-01(4)
9.5(9.0)	8.5(8.0)	7.5(7.1)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	584	556	533	LDS-P-01(4)
0-18 VOLTS ADJ.											
1.8(1.8)	1.6(1.6)	1.4(0.9)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	311	297	284	LDS-Y-02(4)
2.3(1.95)	1.9(1.6)	1.5(1.3)	—	79	179	7 × 4 ⁷ / ₈ × 2 ⁷ / ₈	Δ	385	367	353	LDS-X-02(4)
3.2(2.7)	2.8(2.4)	2.2(1.9)	—	79	179	9 × 5 × 2 ⁷ / ₈	Δ	469	447	429	LDS-W-02(4)
4.5(4.3)	4.0(3.8)	3.3(3.1)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	584	556	533	LDS-P-02(4)
0-32 VOLTS ADJ.											
1.1(1.1)	1.0(0.95)	0.8(0.6)	—	79	179	5 ⁵ / ₈ × 4 ⁷ / ₈ × 2 ⁵ / ₈	Δ	311	297	284	LDS-Y-03(4)
1.5(1.25)	1.3(1.1)	1.1(0.95)	—	79	179	7 × 4 ⁷ / ₈ × 2 ⁷ / ₈	Δ	385	367	353	LDS-X-03(4)
2.1(1.8)	1.9(1.5)	1.4(1.2)	—	79	179	9 × 5 × 2 ⁷ / ₈	Δ	469	447	429	LDS-W-03(4)
2.7(2.5)	2.5(2.4)	2.3(2.2)	—	79	179	11 × 4 ⁷ / ₈ × 4 ¹³ / ₃₂	Δ	584	556	533	LDS-P-03(4)

- NOTES: (1) Includes fixed overvoltage protection.
 (2) All LX series models have fungus proofing standard and is included in model notation and price.
 (3) ±15 to ±12 Volts are dual tracking unit outputs.
 (4) Ratings in parenthesis for LD and LN series when cover is used.
 (A) All outputs continuously adjustable over entire range.
 (B) Current rating is from zero to I_{max}. With exception of LND Series, current rating applies over entire output voltage range.
 (C) LD, LC, LN, and LX Series power modules are available for operation at 360-440Hz. Consult factory for ratings and specifications. For 50Hz operation, derate LC Series by 10%; for LX Series delete 40°C rating.
 (D) Prices are U.S.A. list prices only, E.O.8. Melville, N.Y.; McAllen, Texas; Tucson, Arizona. All prices and specifications are subject to change without notice.

LDS-Y, LDS-X, LDS-W AND LDS-P

LDS-Y
LDS-X
LDS-W



LDS-P Series

