

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LFS-48 SERIES

SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. For voltage and current ratings see table I below.

TABLE I

MODEL	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE		
		40°C	50°C	60°C
LFS-48-2	2 ± 5%	200.0	185.0	157.0
LFS-48-5	5 ± 5%	200.0	185.0	157.0
LFS-48-6	6 ± 5%	168.0	155.0	132.0
LFS-48-12	12 ± 5%	86.0	79.5	67.5
LFS-48-15	15 ± 5%	70.0	64.5	55.0
LFS-48-20	20 ± 5%	53.0	49.0	41.5
LFS-48-24	24 ± 5%	44.5	40.5	35.0
LFS-48-28	28 ± 5%	38.5	35.0	30.0
LFS-48-48	48 ± 5%	22.5	20.5	17.5

Current range must be chosen to suit the appropriate maximum temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation (line)	0.1% from 95 to 132 VAC or 187 to 265 VAC or 260-370 VDC.
Regulation (load)	0.1% from 0 to full load.
Ripple and Noise	15 mV rms, 75 mV peak-to-peak for LFS-48-2, -5 and -6; 20 mV rms, 150 mV peak-to-peak for LFS-48-12 through LFS-48-28; 35 mV rms, 200 mV peak-to-peak for LFS-48-48 (20 MHz bandwidth measurement system). Ripple specifications apply for output terminals floating or with either positive or negative terminal grounded.
Temperature Coefficient	0.03% per °C
Remote Programming	
External Resistor	Nominal 1000 Ohms/volt output. Increasing resistance increases output voltage. Use a low temperature coefficient resistor to assure most stable operation.
Programming Voltage	One-to-one voltage change. The programming supply must have a reverse current capability of 2 ma min.
Remote Sensing	Provision is made for remote sensing to eliminate the effect of power output lead resistance on DC regulation. Sensing leads should be a twisted pair to minimize AC pickup. A 10 uf elect. capacitor may be required between output terminals and sense terminals to reduce noise pickup. An additional capacitor may also be required across the load to further reduce noise pick up; the value of this capacitor will depend upon the particular application.

OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure.

AC INPUT — 95 to 132 volts AC at 47 to 440 Hz, or 187 to 265 VAC at 47 to 440 Hz. (Refer to connection diagrams for proper connections.) Where applicable, regulatory agency approval applies only for input voltages up to 250 VAC and for input frequencies in the range 47-63 Hz. Leakage current in the ground connection may exceed the limits allowed by the agencies at frequencies above this range.

DC INPUT — 260 to 370 volts DC (unit must be wired in the 187 to 265 VAC configuration). Where applicable, regulatory agency approval only applies for input voltages up to 350 VDC.

EFFICIENCY — LFS-48-2 55% minimum, LFS-48-5 through LFS-48-15 75% minimum, LFS-48-20 through LFS-48-48 80% minimum.

INRUSH LIMITING — Turn on inrush current will not exceed 75 amps peak.

OVERLOAD PROTECTION — Automatic electronic current limiting circuit limits the output to a preset value, thereby providing protection for the load as well as the power supply. The current limit characteristic exhibits a region of constant current behavior (down to approximately 50% V_o (nominal)) followed by a foldback region.

HOLD UP TIME — LFS-48-2, LFS-48-5 and LFS-48-6 models will remain within regulation limits for at least 16.7 msec after loss of AC power when operating at maximum output power and 105 VAC input at 60 Hz, (or when configured for 220 V input: 20 msec holdup when operating at maximum output power and 210 VAC input at 50 Hz),

RECOMMENDED FUSING — 40 A, 250 V normal blow fuse in AC line (not supplied in unit) for 110 VAC input. Use 20A, 250 V for 220 VAC input. If IEC type fuses are used, value should be 75% of recommended current rating.

INPUT AND OUTPUT CONNECTIONS — See outline drawing for location. AC input, sensing and remote on/off connections are made via PC board mounted terminal blocks. Ground connection is made via a chassis mounted terminal. DC output connections are made via heavy duty bus bars. See figures 1-3 for supply-load connections.

REMOTE TURN-ON/TURN-OFF — T²L compatible signal enables remote turn-on/off of the power supply. A voltage of 2.8 to 5.0 V applied between “+R” and “-R” will initiate turn-off. Open circuit or short circuit condition, or a zero to 0.5 volt signal will cause turn-on.

COOLING — Unit is fan cooled. Fan failure circuit shuts down inverter in event of fan failure or interference of fan rotation. LED overtemperature indicator will light. AC input power must be momentarily interrupted to restore output after fault condition is corrected.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to +60°C ambient with corresponding load current ratings for all modes of operation. Unit will start up at -10°C, but may not meet published specs until internal heating raises temperature to 0°C.

STORAGE TEMPERATURE — -55°C to +85°C

DC OUTPUT CONTROL — Screwdriver voltage adjust control permits adjustment of DC output voltage. See outline drawing for location of control.

WARRANTY — 3 year warranty from date of shipment . . . materials and labor

PHYSICAL DATA

Size 11" x 5" x 4.875"
Weight 12 lbs. 5 oz. net; 15 lbs. 5 oz. shipping
Finish Gray, FED.STD.595 No. 26081

MOUNTING — One mounting surface. Forced air cooling will permit multiple mounting positions.

OVERVOLTAGE PROTECTION — Standard on all models. When output voltage increases above the maximum overvoltage detect level of the unit and inverter drive is removed, input power must be removed. Maximum overvoltage detect level: LFS-48-2 4.2 V, LFS-48-5 6.85 V, LFS-48-6 7.6 V, LFS-48-12 14.9 V, LFS-48-15 19.3 V, LFS-48-20 26.5 V, LFS-48-24 31.5 V, LFS-48-28 36.7 V, LFS-48-48 60.6 V. Allow 2.6 min. for the overvoltage detector to reset and then reconnect input power for normal operation of the unit.

ISOLATION RATINGS — Input terminals to output: 3750 V rms
Input terminals to ground: 1500 V rms
Output terminals to ground: 500 V rms

ACCESSORIES

Rack Adapters. Rack adapters LRA-15 and LRA-17, with or without chassis slides, are available for all LFS units.

Standard Power Systems All LFS power supplies can be integrated into the Lambda standard power system assembly which provides panel mounted pilot light, voltage control, fuse and output metering for the power supply as desired.

EMI — LFS-48 power supplies can be made to meet FCC docket 20780, class A conducted EMI compliance with the addition of LAMBDA filter ARA-00-021 or NEMIC-LAMBDA filter MBS-1220-33/L1. Filter required for meeting VDE 0871 class A compliance with 187-260 VAC input voltage is LAMBDA filter ARA-00-023 or CORCOM filter No. 15ET1.

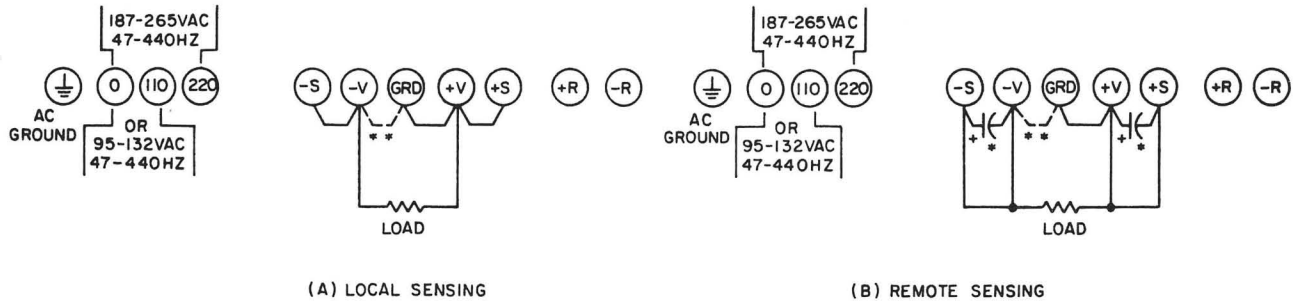


Figure 1. DC Output Connections

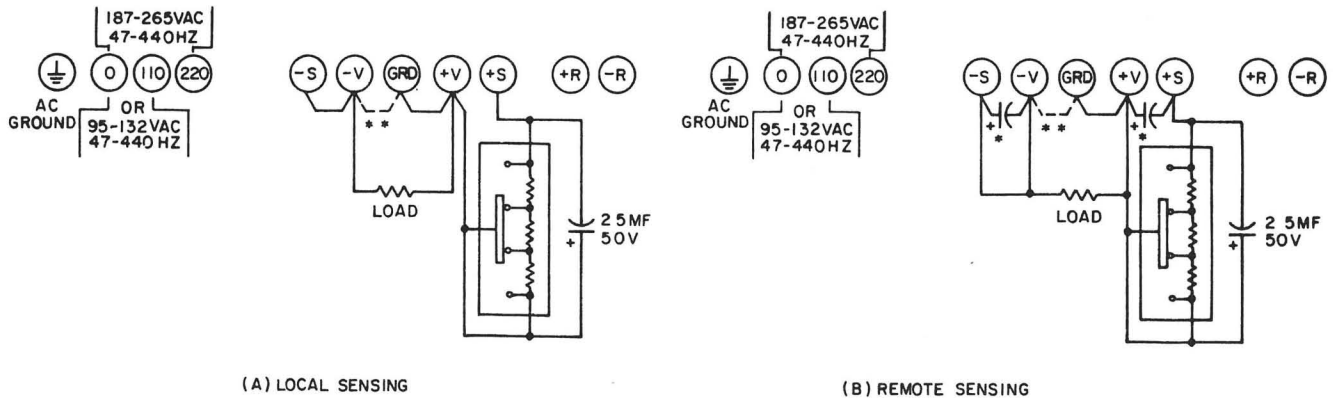
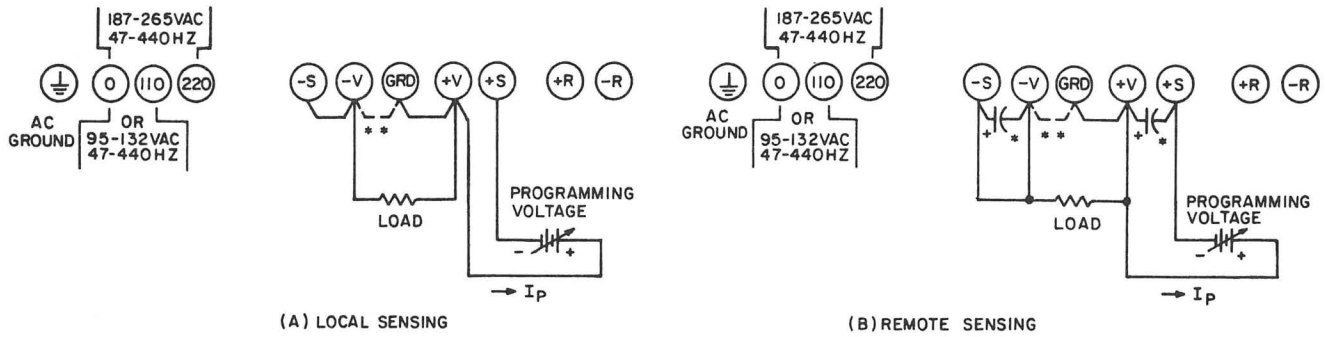
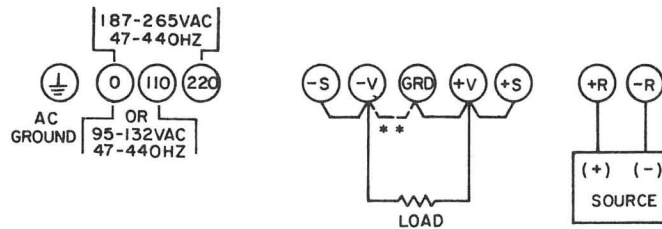


Figure 2. Programmable Voltage, With External Resistor



- * A IOMF, ELECT., CAP. MAY BE REQUIRED.
- ** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 3. Programmable Voltage, With External Voltage Source



SOURCE AT 2.8 TO 5V WILL INITIATE TURN-OFF;
 SOURCE AT 0 TO 0.5V, OPEN CIRCUIT, OR SHORT CIRCUIT AT
 +R TO -R WILL INITIATE TURN-ON.

- ** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 4. Remote Turn-on/Turn-off

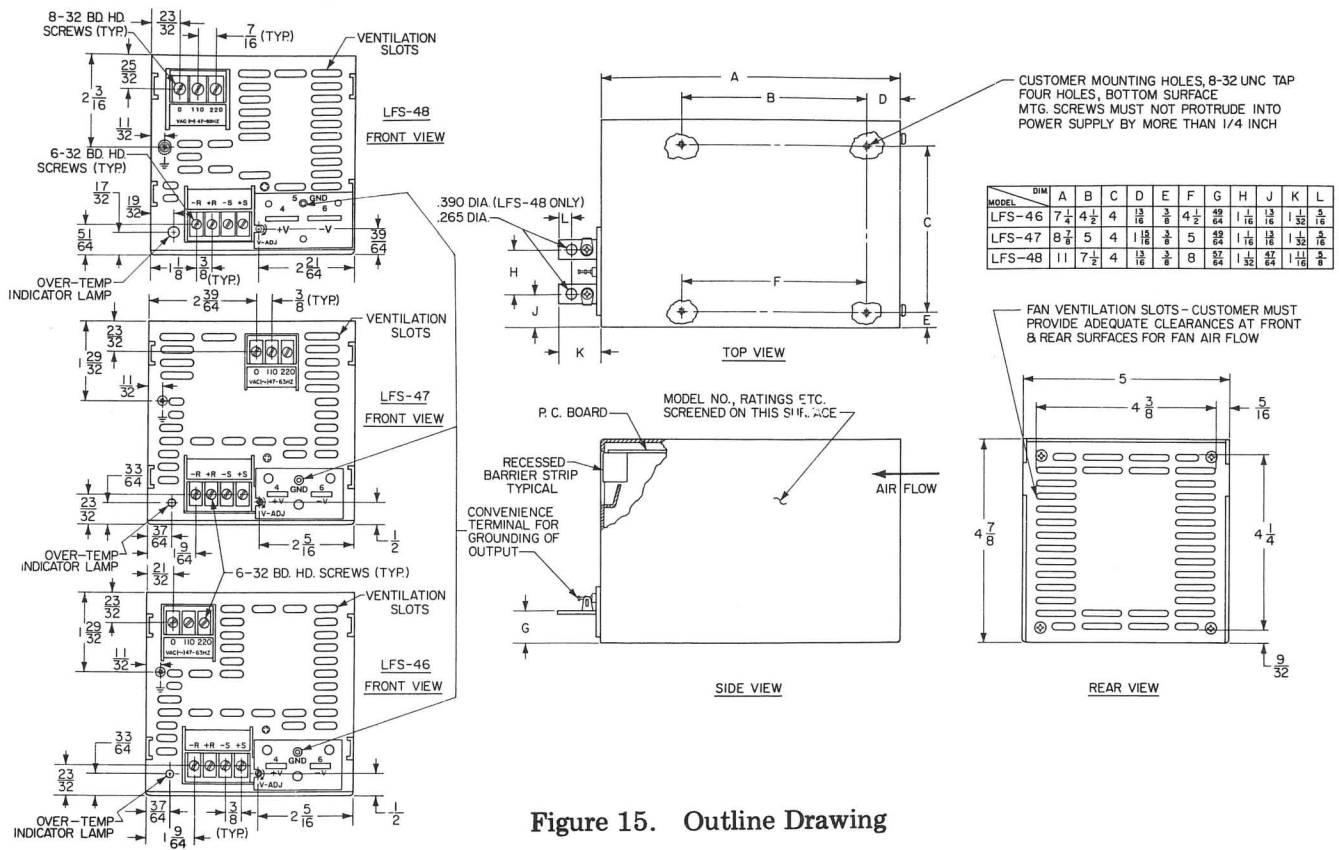
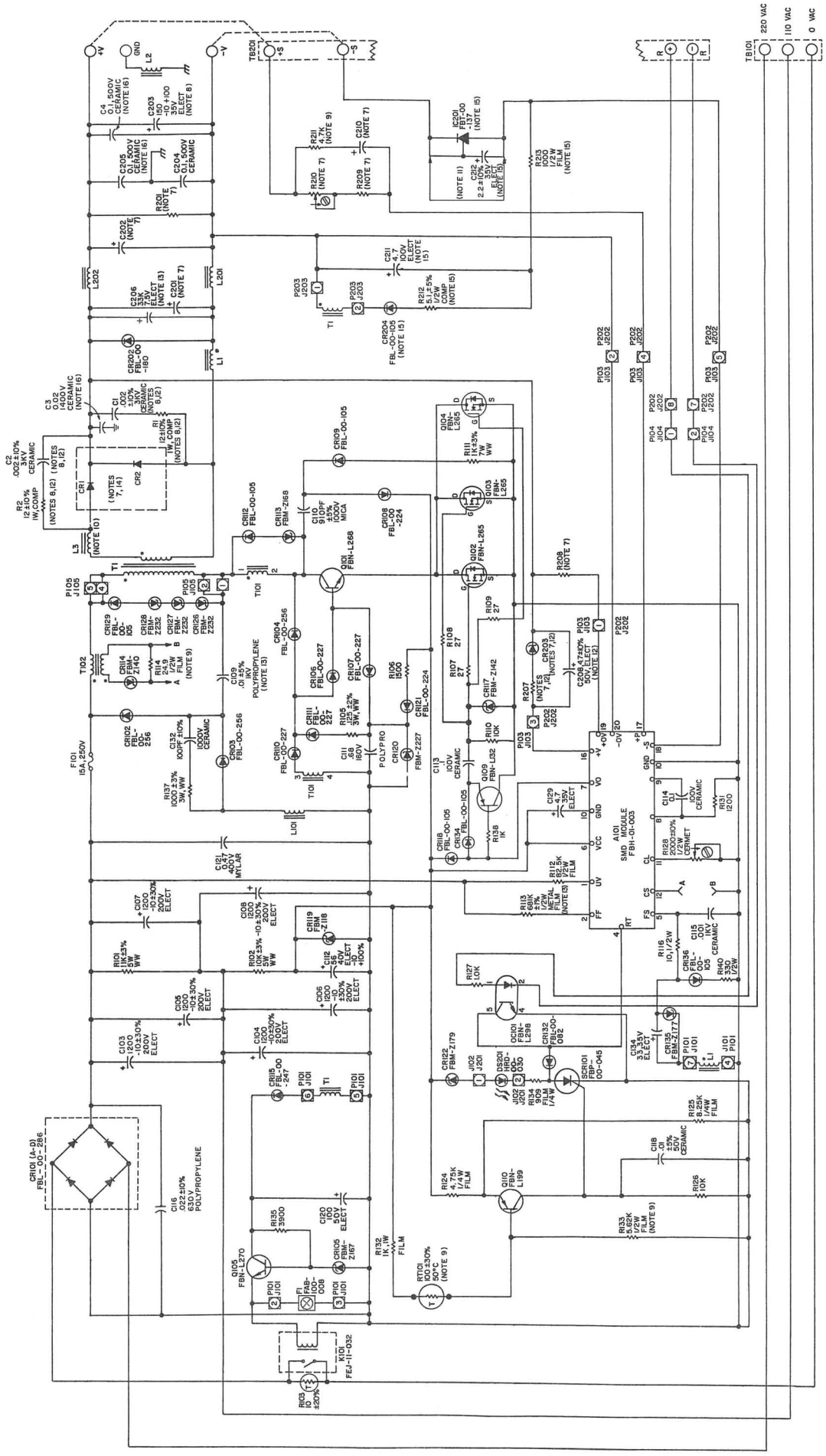


Figure 15. Outline Drawing

TABLE II
SCHEMATIC DATA REFERENCES MODELS LFS-48-2 - LFS-48-48

MODEL	SCHEMATIC COMPONENTS								
	C201, C202	C210	CR1, CR2	CR203	R201	R207	R208	R209	R210
	±20% ELECT	±10% 80 VDC MYLAR	FBL-00-*	FBM-*	±5% 5W WW	±5% 1/2W CARB FILM	±1% 1/4W FILM	±1% 1/2W FILM	±10% 1/2W VAR CERMET
LFS-48-2	33K mf 7.5 vdc	.10 mf	230 DUAL	NOT USED	1.5 ±3%	NOT USED	196	1.65K	1,000
LFS-48-5	33K mf 7.5 vdc	.10 mf	230 DUAL	NOT USED	4.0 7W	NOT USED	1,620	2,100	1,000
LFS-48-6	33K mf 7.5 vdc	.22 mf	230 DUAL	NOT USED	10.0	NOT USED	1,910	2,490	2,000
LFS-48-12	15K mf 20 vdc	.10 mf	276 DUAL	Z137	75	470	4,700	8,060	5,000
LFS-48-15	15K mf 20 vdc	.10 mf	276 DUAL	Z196	75	680	6,340	10.2K	5,000
LFS-48-20	8,200 mf 35 vdc	.10 mf	276 DUAL	Z177	150	1,200	9,090	15.4K	5,000
LFS-48-24	8,200 mf 35 vdc	.22 mf	235 235	Z188	100 ±3% 7W	1,200	11K	16.9K	10K
LFS-48-28	8,200 mf 35 vdc	.22 mf	186 186	Z181	350	1,500	13K	22.6K	10K
LFS-48-48	3,900 mf 63 vdc	NOT USED	217 217	Z184	900	2,700	22K	41.2K	10K

*Lambda Part No.



NOTES:

- RESISTORS ARE 1/4W CARBON FILM WITH VALUES IN OHMS UNLESS OTHERWISE NOTED
- CAPACITOR VALUES ARE IN MICROFARADS
- RESISTOR TOLERANCES: CARBON FILM 5%
- CAPACITOR TOLERANCES: ELECTROLYTIC 20%, OTHERS 5% UNLESS OTHERWISE NOTED
- SYMBOLS: * INDICATES ACTUAL UNIT MARKING; † INDICATES CLOCKWISE ROTATION OF SHAFT

INDICATES TERMINAL ON PRINTED WIRING BOARD OR TERMINAL BOARD

CALL OUTS ARE IN MICROFARADS OR IN OHMS UNLESS OTHERWISE NOTED

SEE INSTRUCTION MANUAL

DESIGNATIONS ARE LAMBDA PART NO.

7. SEE TABLE I FOR COMPONENT VALUES

8. ARE 1000MΩ ±50%; C203 & C204 ±10%; C205 ±20%

9. C1, C2, C3, C4 ARE ONLY USED ON 2V UNIT

10. C1, C2, C3, C4 ARE ONLY USED ON 2V UNIT

11. JUMPER CR22 ON 2V THRU 12V UNITS ONLY

12. NOT USED ON 2V-6V UNITS

13. CR103 IS 0.022μF CERAMIC

14. CR1, CR2 ARE SEPARATE DIODES ON THE 2V, 2V AND 6V UNITS AND IS A DUAL-DIODE

15. ONLY USED ON 2V UNIT

16. C1, C2, C3, C4 ARE ONLY USED ON 2V UNIT

FOR WIRING OF POWER SUPPLY TO LOAD, REFER TO LOAD WIRING INSTRUCTION MANUAL. LOCAL SENSING CONNECTIONS INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTIONS.

**SCHMATIC DIAGRAM
REGULATED POWER SUPPLY
LFS-48**



DIVISION OF **Keco** INSTRUMENTS INC

