

Model 1525

High Power CAMAC Crate  
**INSTRUCTION MANUAL**

August, 1992

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*Model 1525*

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**Model 1525**

**SCHEMATIC DRAWINGS NUMBERS**

**B519 Front Display Board #132298-C-6228**  
**B532 Mother Board #32298-C-6227 and #232321-C-6308**  
**B521 Fan Movement Detector #132298-C-5950**  
**B522 Linear Interface Board #132298-C-5983**  
**B513 Crate Dataway #032287-D-5675**  
**B520 Crate Temperature Probe #036298-B-5839**  
**XFA15252NO Linear Transformer Assembly #037283-D-5824**  
**HSA15252NO Linear Heatsink Assembly #132297-D-5985**  
**BPA15252NO Power Supply Base Plate Assembly #038383-D6267**

**Warranty**  
**JKK:rem(WP)**

# CAMAC

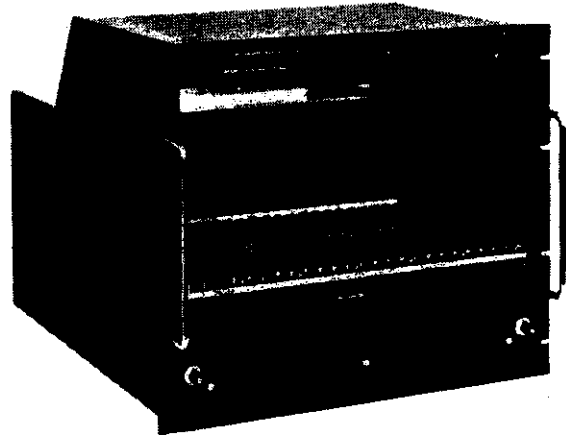
## 1525

### High-power CAMAC Crate

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(Rev. Aug. 92)

#### FEATURES

- 1680 watts total output power
- 100 ampere power supply for each of the 6 volt supplies
- 100/120/220 input voltage options
- Improved ventilation system
- Voltage, current, and status monitoring
- Thermal, overcurrent, and overvoltage protection
- Optional status byte readout via Dataway
- Full conformance with IEEE Std. 583-1982



#### GENERAL DESCRIPTION

The Model 1525 is a high-performance, powered CAMAC crate capable of delivering up to 1680 watts of power to the instrumentation modules mounted in it. A rear-mounted crate power supply converts the ac power source to the mandatory dc CAMAC Dataway voltages (+24V, +6V, -6V, -24V) and also provides the optional +12 and -12 volts. The  $\pm 6$  volt supplies are each rated at 100 amperes (for a total of 200 amperes), and the  $\pm 24$  volt supplies are each rated at 10 amperes. The  $\pm 12$  volt supplies are derived from the  $\pm 24$  volt supplies and must be considered part of the  $\pm 24$  volt load. Total output power is limited to 1680 watts. Separate options are available for 100, 120, and 220 ac input voltage sources.

A front-removable fan tray included with the 1525 contains six high-efficiency, low-magnetic noise blower fans for cooling modules in the crate. The low-magnetic noise feature of the fans provides a good environment for analog input modules which are monitoring low-level signals. Air entering the front of the fan tray is distributed to all 25 slots in the crate and exits at the upper rear of the chassis.

Microprocessor-based circuitry included in the 1525 monitors parameters such as the output voltages and currents, air flow through the crate, and power supply temperature. If any parameter exceeds specified limits, the ac input voltage is removed, and the power supplies shut down. Separately powered front-panel monitoring and display circuitry continues to indicate status information, regardless of the state of the supplies. The 1525 can be optionally provided with a status byte output which is readable from the Dataway. An F(4)-A(0) command reads the status byte. A DIP switch on the crate selects the slot (N) to which the command is to be addressed.

The 1525 is arranged for 19-inch relay rack mounting and includes module mounting holes for CAMAC only. Crates with NIM holes are available by special order. Options are available with a rear I/O mounting bar for affixing 36-contact printed circuit edge connectors. With this option, five sets of I/O adapter blocks are included (for five connectors). Additional adapter block kits can be ordered as Model 5962-Z1A (with five sets of blocks per kit).

 Kinetic Systems  
Corporation

11 Maryknoll Drive • Lockport, IL 60441 • (815) 838 0005 • FAX (815) 838 4424

1525 (continued)

### ORDERING INFORMATION

Model	AC Input	I/O Bar	Status Byte	Size (H x W x D) and Weight
1525-P2A	100 Volts	Yes	Yes	40.2 cm X 48.3 cm X 55.9 cm (15.75" X 19" X 22") 55 kg. (119 lb.)
1525-P2B	120 Volts	Yes	Yes	
1525-P2C	220 Volts	Yes	Yes	

**Accessories**

- Model 5962-Z1A Adapter Kit for 36-contact Rear I/O Connectors
- Model 1950-001 or -002 Rack Mount Support Brackets (pair)

**Model 1525**

**UNPACKING AND VISUAL INSPECTION**

The Model 1525 high-power CAMAC Crate includes the following units:

- A. 1-1525-110 Ventilation/Fan Unit
- B. 1-1525-210 1680 Watt Power Supply
- C. 1-1525-310 Crate Assembly

Option	AC Input
1525-P2A	100 Volts
1525-P2B	120 Volts
1525-P2C	220 Volts

**CAUTION:** The AC input voltage is factory set and should not be changed by the customer without contacting the factory for proper procedures.

Depending on the method of shipment and associated package weight limits, the 1525 will be shipped with the power supply packaged separately from the crate and fan unit. It may be shipped as a single unit occasionally.

**Ventilation Unit Visual Inspection**

Remove ventilation unit from crate assembly. This is accomplished by first loosening the two adjustable grip latches on the front panel (one on each side of the unit). Turn in opposite direction of the lock arrow. When latches are released, slide the unit forward.

Inspect the ventilation unit for possible physical damage. Check that the fan blades rotate freely. Set unit aside.

**Power Supply Visual Inspection**

Inspect power supply unit for any possible physical shipping damage.

The 1525-210 can be equipped for operation from 100, 120, or 220 volts AC (48 to 62 Hz). The voltage selection is made at the factory.

**CHECK TO MAKE SURE THAT THE MARKING ON THE POWER SUPPLY LABEL AGREES WITH THE LOCAL MAIN VOLTAGE.**

If not, contact KineticSystems Corporation. **DO NOT PLUG THE UNIT IN.**

## **Model 1525**

### **Crate Assembly Visual Inspection**

Inspect the crate assembly for any possible physical shipping damage. Check the Dataway connectors to be sure there is no foreign matter in the contact (front) area or pin (rear) area.

**NOTE:** Because of weight, when rack mounting the 1525 High Power CAMAC Crate, mount the crate assembly first, then follow these directions for mounting the power supply and ventilation unit.

**THE POWER SUPPLY MUST MOUNT TO THE CRATE ASSEMBLY BEFORE MOUNTING THE VENTILATION UNIT.**

### **POWER SUPPLY MOUNTING**

Slide the power supply on the rear "floor" of the crate assembly until the connectors seat. Tighten the two captive screw fasteners on the back side of the power supply. Once the power supply is secured, reach into the open ventilation area on the lower front side of the crate assembly and plug the monitor flat cable from the crate, into the power supply. This cable is located in the lower right hand corner when looking at the front of the crate assembly. This cable is keyed. When plugged in, Pin 1 (the red line) will be toward the right side of the unit, when viewed from the rear.

### **Ventilation Unit Mounting**

Carefully slide the ventilation unit into the mounting guides on the front of the crate assembly. Once the unit is fully inserted, tighten the adjustable grip latch on each side in the direction of the arrows until the latches are fully seated and locked.

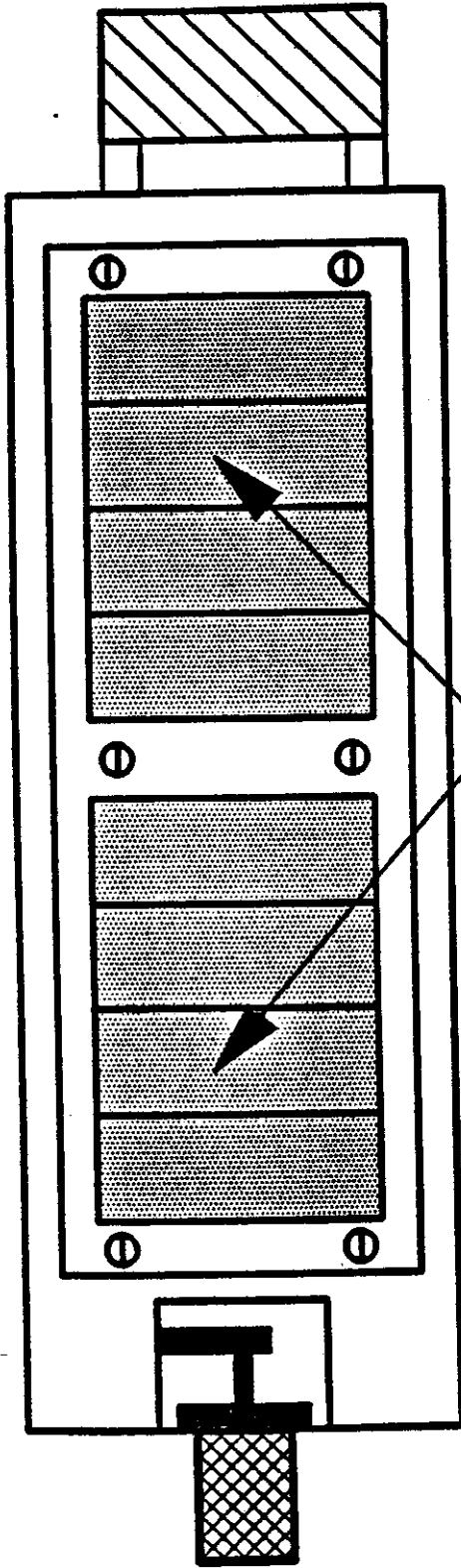
### **Electrical Inspection**

Plug the AC power cord into the main power source and note as follows:

Three screens should appear on the display, one at a time, stopping on the third. The screens are as follows:

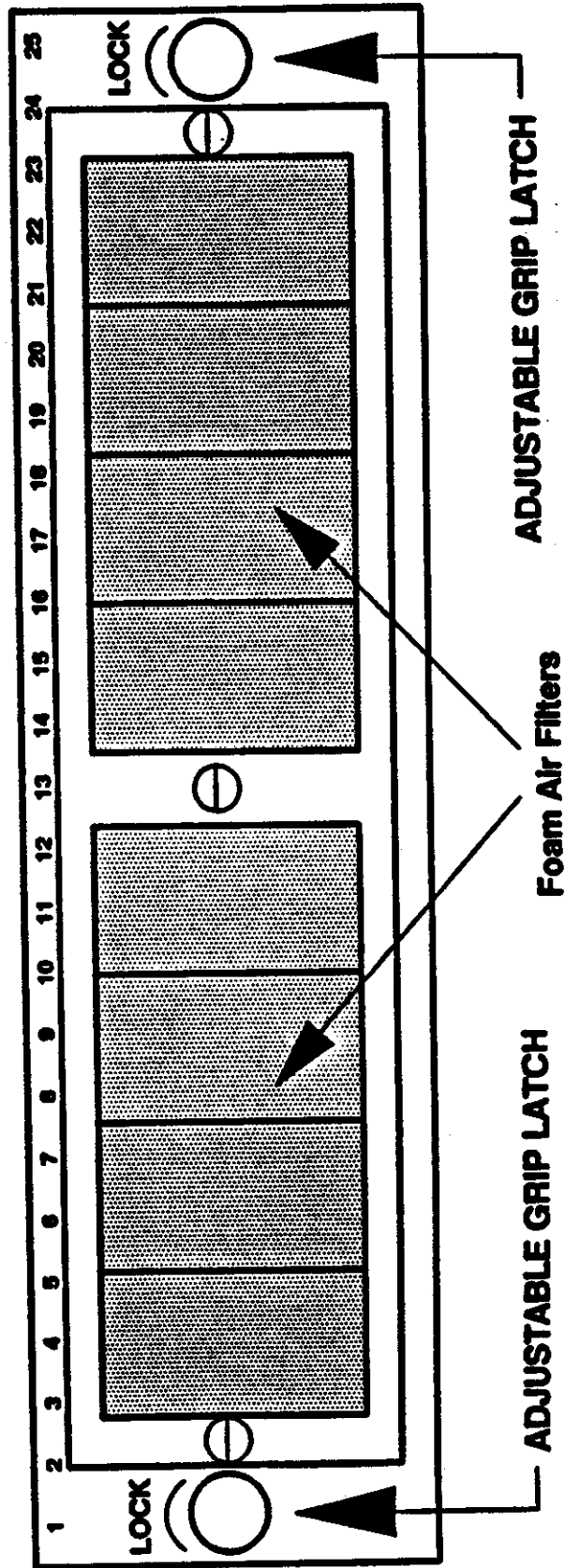
1. KineticSystems 1680 Watt Crate
2. 1525-P2A,B,C, Crate Software (V2.0).
3. Status OK.

If the display doesn't operate, check to see that the flat cable residing on the crate is connected to the power supply.



**Foam Air Filters  
Typical Both Sides**

**Model 1525-100 Crate Ventilation Unit - Side View**



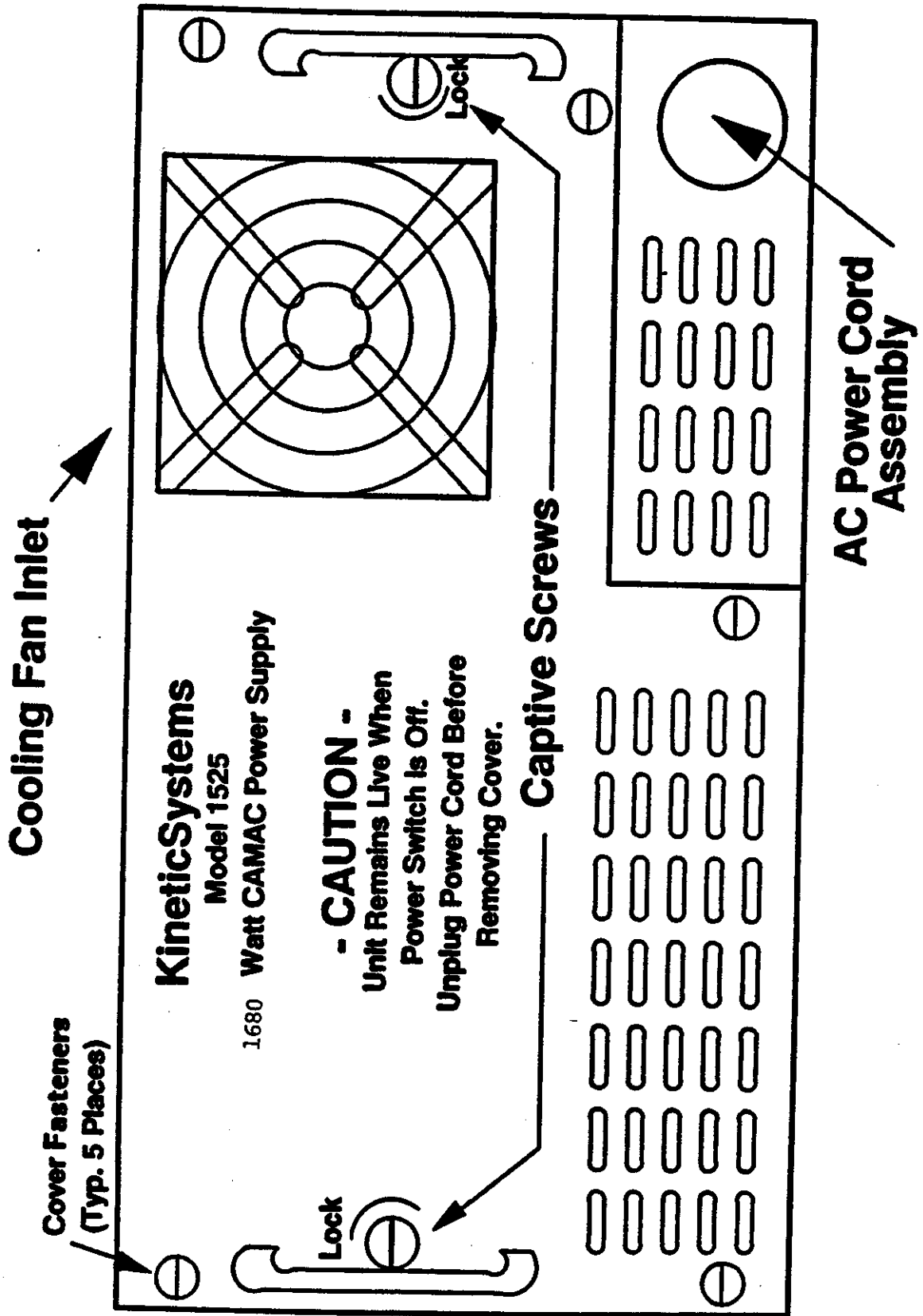
**ADJUSTABLE GRIP LATCH**

**Foam Air Filters**

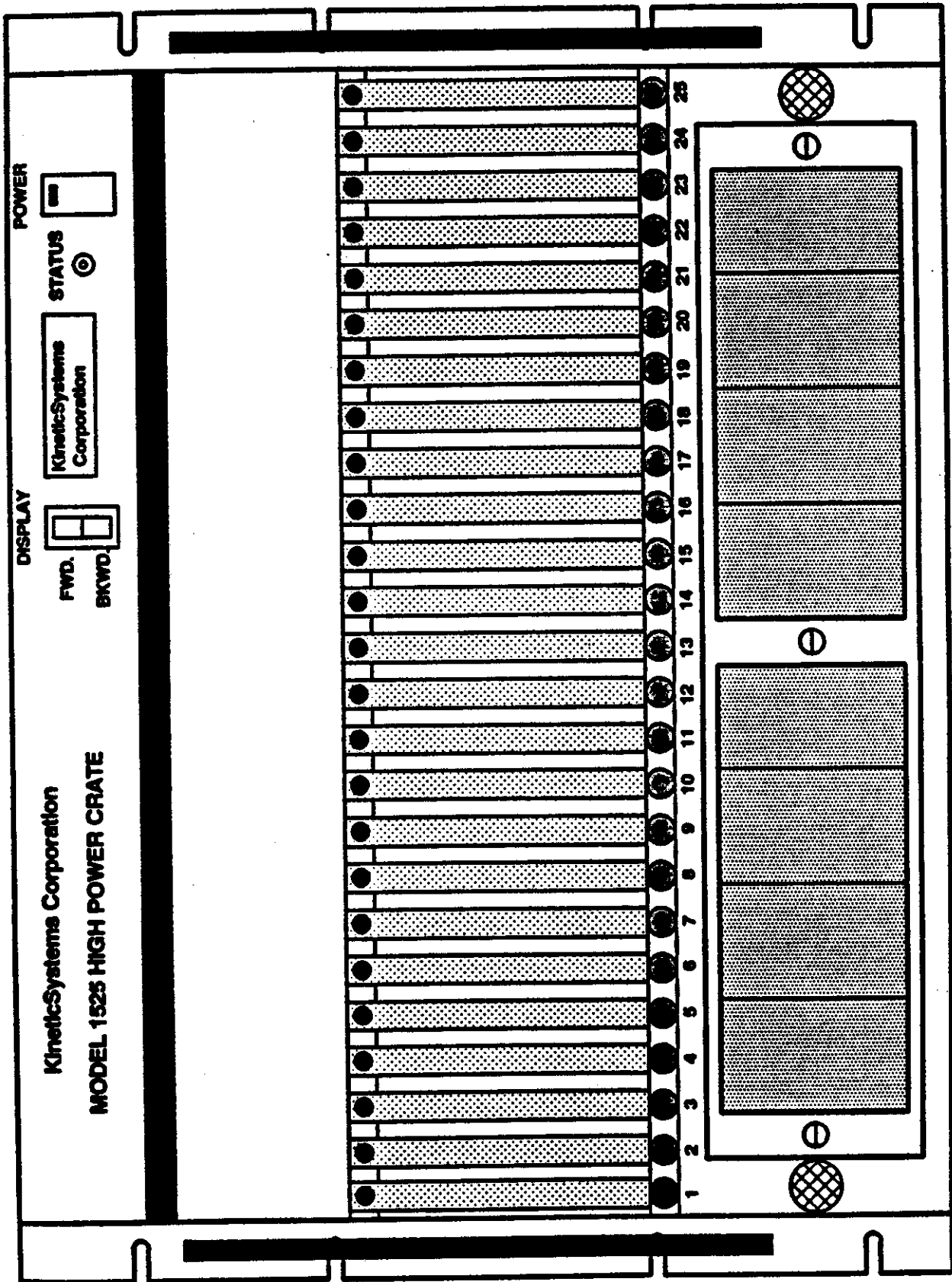
**ADJUSTABLE GRIP LATCH**

**Model 1525-100 Crate Ventilation Unit - Front View**



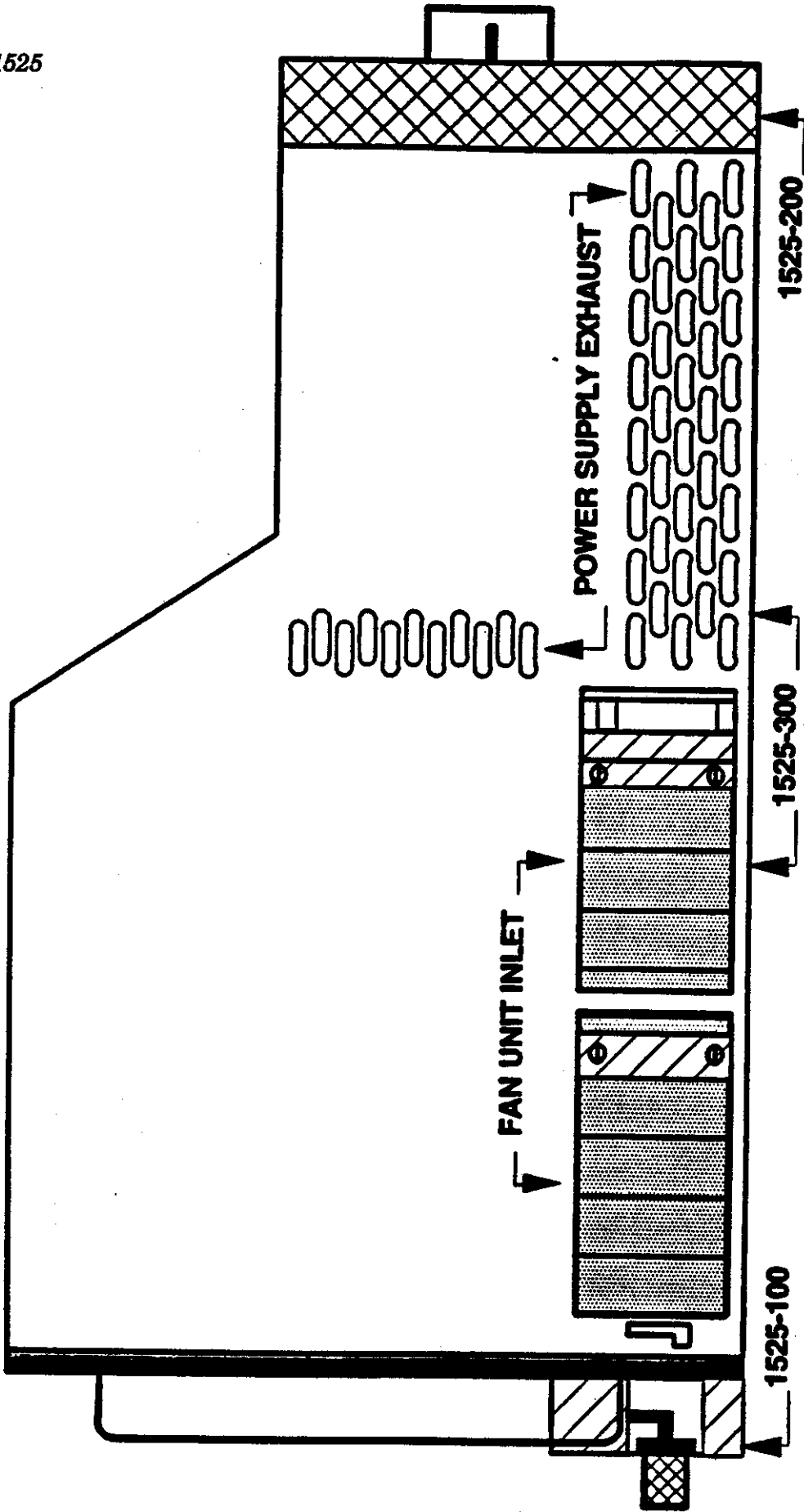


**Model 1525-200 Power Supply - Rear View**



**Model 1525-300 Crate Assembly - Front View**

Model 1525



**Model 1525 High Power Crate Assembly**  
**Side View**

## OPERATION

The 1525 camac crate is controlled by state of the art processor based instrumentation circuitry known as the "control and monitor". The "control and monitor" monitors the following parameters:

- AC input voltage level
- DC output voltage levels
- DC output current levels
- Cooling fan movement
- Ambient air temperature
- Power supply temperature
- Crate exhaust air temperature

These parameters are displayed on an LCD located on the crate front panel. Aside from displaying the system parameters, the "control and monitor" checks all parameters against references in the system firmware. When one or more parameters becomes out of tolerance, the "control and monitor" shuts down the DC power to the dataway. (The control and monitor continues to function). The limits of the system parameters are as follows: There are two set points, grey and black. If a grey set point is exceeded, the crate still functions but the operator is warned via the display and status byte. The display continues to update information. The parameter that is out of tolerance will blink on the display screen. When a black set point is exceeded, the DC power to the dataway (modules) is shut down. All parameters at this time are "frozen" on the display so the operator may easily determine the fault that has caused the shut down. The parameter that has caused the fault will be displayed automatically. The system parameter limits are as follows:

### GREY

- ± 6V <5.5 or> 6.5
- ± 12V <11 or > 13
- ± 24V <23 or > 25
- I 6V >100 amp
- + 12,24 >10 A tot.
- 12,24 >10 A tot.

### BLACK

- <5 or > 7.0
- <10 or > 14
- <22 or > 26
- >103 amp
- >11 A tot.
- >11 A tot.

- Crate exit temperature >50 degrees C. >60 degrees C.
- Fan unit ambient temp. >38 degrees C. >40 degrees C.
- Power supply temperature >60 degrees C. >70 degrees C.

## **Model 1525**

When the crate is plugged in, the "control and monitor" performs a self test and then displays the model number (based on voltage configuration), firmware version number, and the system status. Before power can be applied to the Dataway, the crate monitors the AC line, and the system temperatures, (fan unit, power supply, and exit ducts) and checks to see that the signals are within operating specifications. If the LCD displays "warning error", manipulate the display switch to scan through the status screens slowly. The function that has caused the error will be blinking. If a fatal error is detected, the unit will not power-up. The parameter that has caused the error will be automatically displayed and will be blinking.

If all parameters are within specification, status will read "OK". When status reads "OK", press power switch to power-up unit. Manipulate the display switch and scan through the status screens to assure all voltages are present. (+6,+12, +24,-6,-12,-24). Six fans in the cooling tray and one in the power supply should be operating. The failure of a fan will be detected and cause the power supply to shut down. The number of the failing fan will blink on the fan detect display screen. If after power-up, voltages are present and status reads Ok, then unit is ready to use. If after power-up, unit automatically powers down, the function that has caused the error will be automatically displayed and will be blinking.

## **SPECIFICATIONS**

### **Thermal Monitoring**

Temperature of the cooling air is monitored in 4 places. Ambient air temperature is monitored in the cooling tray. The acceptable limits of the ambient air temperature is 40 degrees C. Power supply temperature is also monitored. The acceptable limit of the power supply temperature is 70 degrees C. Finally the crate exhaust air is monitored at the exit duct on each side. The acceptable limit of the exit temperature is 60 degrees C.

### **Cooling**

Each 6 volt supply has its own internal fan and over temperature protection. The  $\pm 12$ , and  $\pm 24$  volt supplies share a 5 inch fan which is monitored by the control and monitor for stall protection. Aside from the stall protection, the  $\pm 12$ ,  $\pm 24$  volt heatsink has its own internal thermal protection in the way of thermal overload switches on the heatsink.

The 1525-110 cooling tray contains six 5 inch fans, each capable of moving 145CFM of air. The larger fans insure better distribution of air and reduces the number of dead spots in the crate. When the crate is turned off, power is removed from the dataway (modules), but the fans in the cooling tray will continue to run until the exit duct temperatures are less than 10 degrees C above ambient. Each fan in the cooling tray is monitored by the control and monitor for stall protection. If any fan is reduced to 75% of its power, power supplied to the Dataway is shut down.

### **Output Protection**

All voltages and currents are monitored by the "control and monitor" circuitry. If a fault is detected, the DC power to the Dataway will shut down and the fault is displayed. Aside from the over/under voltage and over current protection set by the "control and monitor", over voltage, over current, and voltage reversal protection is provided for each DC output by means of the hardware.

**Model 1525**

**Output Power**

Total output power .....	1680 watts
+6 volt output current .....	100 amps
-6 volt output current .....	100 amps
+24 volt output current .....	10 amps
-24 volt output current .....	10 amps

$\pm 12$  volt outputs are derived from the  $\pm 24$  volt outputs and must be considered part of the  $\pm 24$  volt load.

**Mechanical**

Dimensions:           Height=40.2CM (15.75 inches)  
                              Width=48.3CM (19 inches)  
                              Depth=55.9CM (22 inches)  
                              Weight=118 lbs.

**Environmental**

Ambient operating temperature:   40 degrees C MAX.  
Storage temperature:               -20 degrees C to 85 degrees C.

**Input Power Requirements**

The 1525 is equipped for operation at 100, 120, or 220 volt A.C. RMS, 48 to 60HZ.

The voltage selection is made at the factory and should not be changed by the customer without contacting the factory for proper procedures.

The input power requirements are as follows:

Model	Input Voltage	Fuse or Breaker
1525-P2A	100 Vac	30 Amp
1525-P2B	120 Vac	30 Amp
1525-P2C	220 Vac	15 Amp

The 1525-P2B (120 volt option) is supplied with a standard (Nema L5-30P) 30 amp 120 volt plug, requiring a 120 volt 30 amp receptacle (Nema L5-30R).

**Input Protection**

The AC line voltage is monitored by the "control and monitor". If low line or high line parameters (105Vac, 130Vac) are exceeded, AC power is removed from the supplies. The control and monitor circuitry continues to function.

## Model 1525

The main AC "hot" input is internally fused at 30 amp on the 100 volt and 120 volt options and 15 amp on the 220 volt option. This fuse is "F12", and is a "little fuse" BLN-30 or BLN-15 "midget" style fuse.

The  $\pm 12$  and  $\pm 24$  volt linear transformer is fused at both the primary and secondaries.

The primary fuse is "F11" and is a 3AB style (ceramic only) 250 volt 10 amp slo-blo. The two secondary power windings are fused as "F9" and "F10". These are both 3AB style (ceramic only) 20 amp fast acting. A third and fourth low power secondary is fused as "F6" and "F7", and are "littlefuse Pico II" style, .5 amp, Littlefuse 255500.

The control and monitor circuitry is fused as follows:

120V	AC HOT	= F8	= 1 amp	Littlefuse	255001
+5V	RAW	= F1	= 3 amp	Littlefuse	255003
+40V		= F4	= .25 amp	Littlefuse	255250
-40V		= F1	= .25 amp	Littlefuse	255250
+15V	RAW	= F2	= .5 amp	Littlefuse	255500
-15V		= F3	= .5 amp	Littlefuse	255500

These are all "Littlefuse Pico II" style fuses and are located on the power supply motherboard.

## Remote Sensing

All outputs are "sensed" to the center of the Dataway. Spare Dataway connection Y1 is connected to the -6V output, and Y2 is connected to the +6V output. Y1 and Y2 may be used at the customer's discretion for additional  $\pm 6$  volt power.

## Voltage Adjustability

$\pm 5\%$  min all outputs.

$\pm 6$  volt supplies are adjustable on top of power supply unit with cover off.

$\pm 12$ ,  $\pm 24$  volt supplies are adjustable from the rear of the power supply with the cover off.

## Regulation

Better than .1% on all outputs for all line and load conditions.



**Model 1525**

**Noise**

Noise is expressed as a peak-to-peak value from DC to 50 megahertz, (output loaded).

- ± 6 volt output=30 MV**
- ± 12 volt output=15 MV**
- ± 24 volt output=15 MV**

*Model 1525*

**LAMBDA POWER SUPPLY INSTRUCTION MANUAL**

# INSTRUCTION MANUAL

## REGULATED POWER SUPPLIES

### LFS-46 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-46-2	2 ± 5%	120.0	112.0	93.5
LFS-46-5	5 ± 5%	120.0	112.0	93.5
LFS-46-6	6 ± 5%	101.0	94.5	79.0
LFS-46-12	12 ± 5%	51.5	48.0	40.0
LFS-46-15	15 ± 5%	42.0	39.0	33.0
LFS-46-20	20 ± 5%	32.0	30.0	25.0
LFS-46-24	24 ± 5%	27.0	25.0	21.0
LFS-46-28	28 ± 5%	23.0	21.5	18.0
LFS-46-48	48 ± 5%	13.5	12.5	10.5

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-46-2, -5 and -6; 20 mV rms, 150 mV peak-to-peak for LFS-46-12 through LFS-46-28; 35 mV rms, 200 mV peak-to-peak for LFS-46-48 (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 µf 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 these 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-46-2 55% minimum, LFS-46-5 through LFS-46-15 75% minimum, LFS-46-20 through LFS-46-48 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-46-2, LFS-46-5 and LFS-46-6 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** — 25 A, 250 V normal blow fuse in AC line (not supplied in unit) for 110 VAC input. Use 12A, 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** — T<sup>2</sup>L 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** — 1 year warranty from date of shipment. . materials and labor

#### PHYSICAL DATA

Size	7.25" x 5.0" x 4.875"
Weight	8 lbs. 12 oz. net; 11 lbs. 12 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. If output voltage increases above a preset level, inverter drive is removed. Input power must be removed from the unit for 2 minutes after overvoltage shutdown in order to restore operation. Maximum overvoltage detect level: LFS-46-2 4.2 V, LFS-46-5 6.85 V, LFS-46-6 7.6 V, LFS-46-12 14.9 V, LFS-46-15 19.3 V, LFS-46-20 26.5 V, LFS-46-24 31.5 V, LFS-46-28 36.7 V, LFS-46-48 60.6 V.

**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.

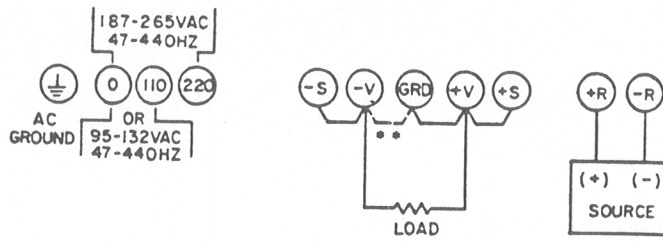
Standard Power Systems . . . . . All LFS power supplies can be integrated into the Lambda standard power system assembly which provides panel mounted pilot light, voltage control, fuse and output metering for the power supply as desired.

**EMI** — LFS-46 power supplies can be made to meet FCC docket 20780, class A conducted EMI 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 with 187-250 VAC input voltage is LAMBDA filter ARA-00-023 or CORCOM filter No. 15ET1.

TABLE II  
SCHEMATIC DATA REFERENCES MODELS LFS-46-2 - LFS-46-48

		SCHEMATIC COMPONENTS													
MODELS	C1,C2	C109	C201, C202	C208	C210	CR1A,B	CR1, CR2	R1,R2	R113	R114	R201	R207	R208	R209	R210
LFS-46-2	±20% CERAMIC .01 mf 1.0K vdc	±5% 1000 vdc POLY PROP	±20% ELECT 32K mf	NOT USED 35 vdc ELECT	±20% 1k vdc CERAMIC	*FBL-00- 230	*FBL-00- NOT USED	±5% 1/2 W COMP	±1% 1/2 W FILM	±1% 1/4 W FILM	±5% 5 W WW	±5% 1/2 W CARB-F	±1% 1/4 W FILM	±1% 1/2 W FILM	±10% 1/2 W CERMET
LFS-46-5	.01 mf 1.0K vdc	.0068 mf	33K mf	NOT USED	10 mf 35 vdc ELECT	230	NOT USED	5.1	845K	40.2	10	NOT USED	1,620 42W	2,100	1,000
LFS-46-6	.01 mf 1.0K vdc	.0068 mf	33K mf	NOT USED	10 mf 35 vdc ELECT	230	NOT USED	5.1	787K	37.4 1/2W	20	NOT USED	1,910	2,490 1/4W	2,000
LFS-46-12	.01 mf 1.0K vdc	3,300 pf	15K mf	10 mf 63 vdc	0.1 mf	265	NOT USED	6.8	500K	37.4 1/2W	50	680	4,700	8,060	5,000
LFS-46-15	0.1 mf 1.0K vdc	3,300 pf	15K mf	10 mf 63 vdc	0.1 mf	265	NOT USED	6.8	500K	37.4 1/2W	75	680	6,340	10,200	5,000
LFS-46-20	.0047 mf 250 vdc	4,700 pf	8,200 mf	10 mf 63 vdc	0.1 mf	NOT USED	186	68 ±10% 2W	500K	40.2	150 ±3% 7W	680	9,890	15,400	5,000
LFS-46-24	.0047 mf 250 vdc	4,700 pf	8,200 mf	10 mf 63 vdc	0.1 mf	NOT USED	186	68 ±10% 2W	787K	40.2	250 ±3%	1,000	11,000	16,900	10,000
LFS-46-28	.0047 mf 250 vdc	4,700 pf	8,200 mf	10 mf 63 vdc	0.1 mf	NOT USED	186	68 ±10% 2W	500K	37.4 1/2W	250 ±3%	1,200	13,000	22,600	10,000
LFS-46-48	.001 mf 0.1K vdc	.0068 mf	3,900 mf	1.0 mf ±10% 60 vdc	0.1 mf	216	NOT USED	68 ±10% 2W	500K	40.2	500 ±3% 7W	2,700	22,000	41,200 1W	10,000

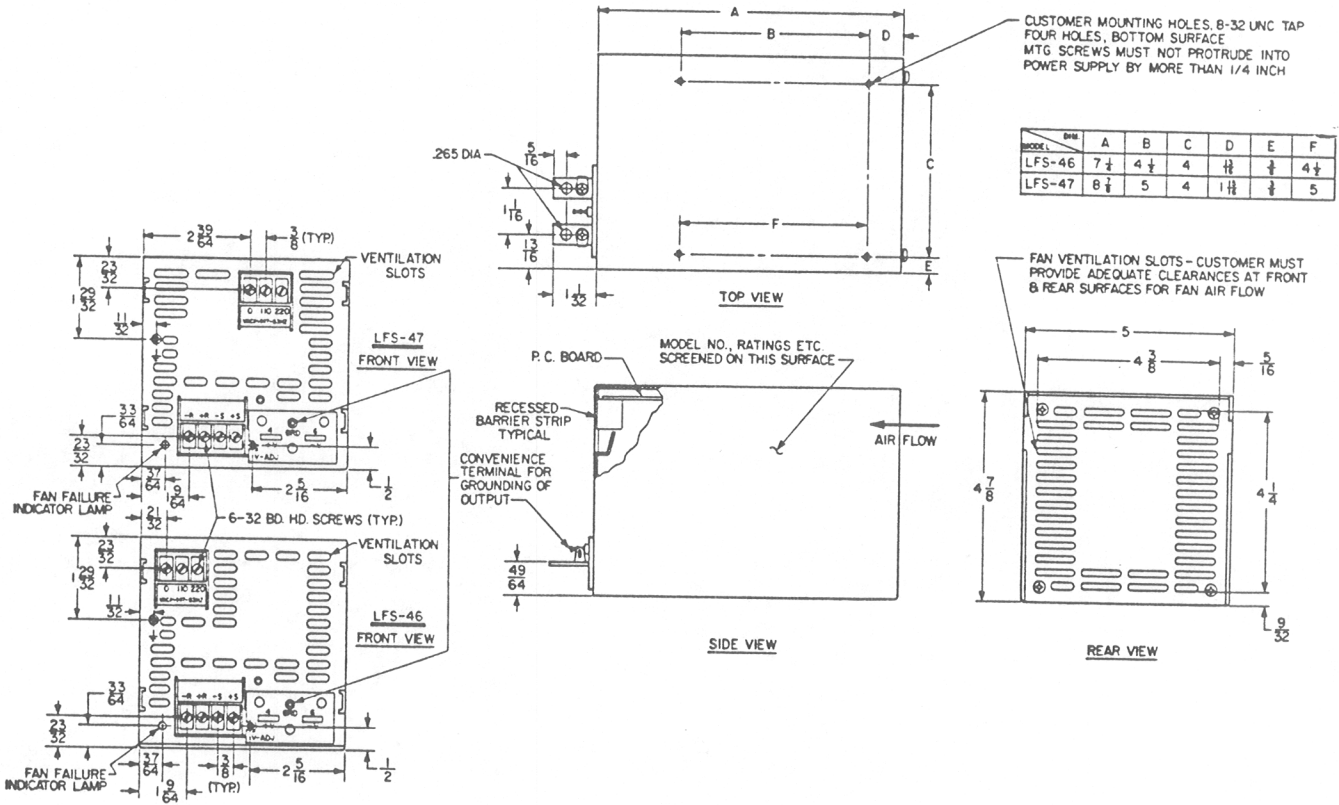
\*Lambda Part No.

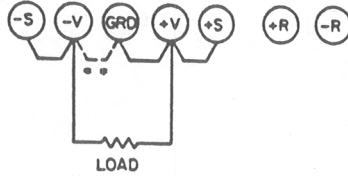
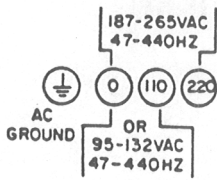


SOURCE AT 2.8 TO 5V WILL INITIATE TURN-OFF;  
 SOURCE AT 0 TO 0.5V, OPEN CIRCUIT, OR SHORT CIRCUIT AT  
 +R TO -R WILL INITIATE TURN-ON.

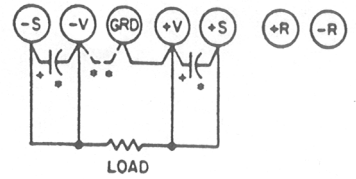
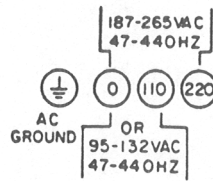
- FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM  
 TERMINALS GRD AND +V AND RECONNECT TO  
 TERMINALS GRD AND -V.

Figure 4. Remote Turn-on/Turn-off





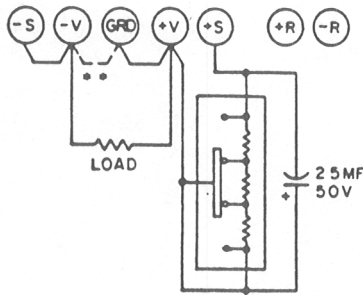
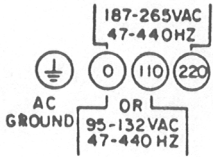
(A) LOCAL SENSING



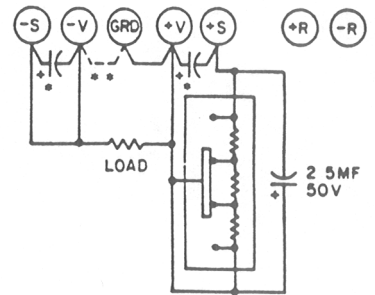
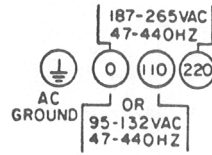
(B) REMOTE SENSING

- A 10MF, ELECT., CAP. MAY BE REQUIRED.
- FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 1. DC Output Connections



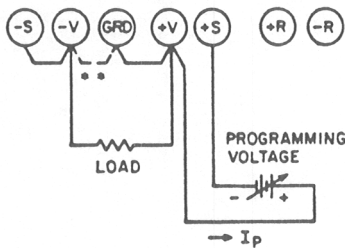
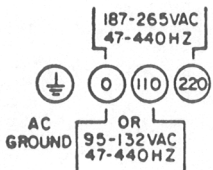
(A) LOCAL SENSING



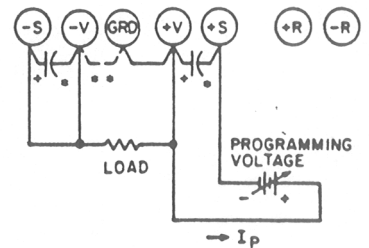
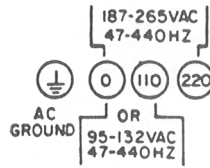
(B) REMOTE SENSING

- A 10MF, ELECT., CAP. MAY BE REQUIRED.
- FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 2. Programmable Voltage, With External Resistor



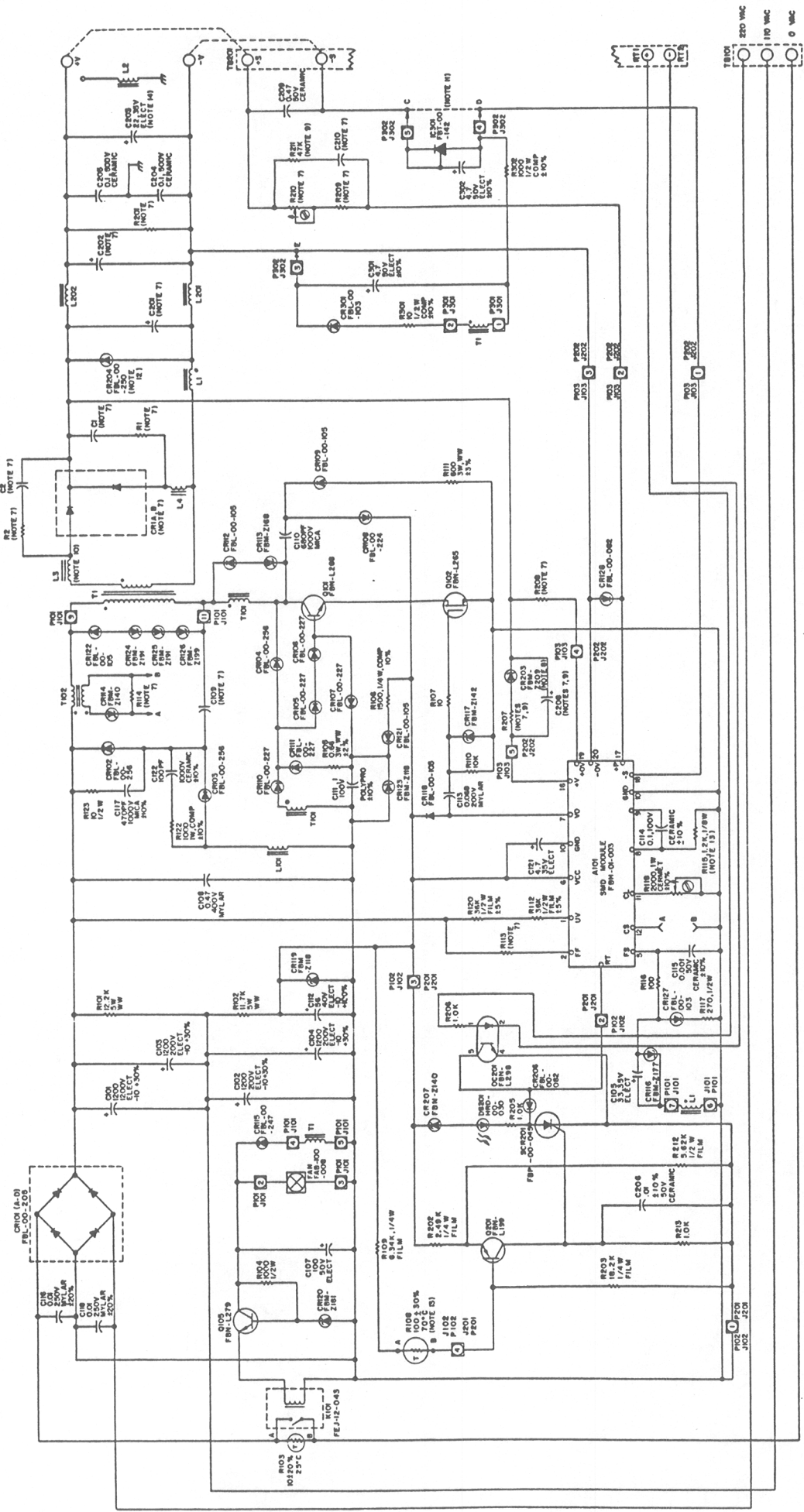
(A) LOCAL SENSING



(B) REMOTE SENSING

- A 10MF, 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



**SCHMATIC DIAGRAM  
REGULATED POWER SUPPLY  
LFS-46**

**LAMBDA**  
ELECTRONIC SERVICES  
MELVILLE, NEW YORK

DIVISION OF INSTRUMENTS INC.

FOR VALUES OF POWER SUPPLY TO LOAD, REFER TO LOAD WIRING DIAGRAMS. DOTTED CONNECTIONS SHOWN AT OUTPUT TERMINALS INDICATE JUMPERS IN PLACE FOR LOCAL SERVICING CONNECTIONS.

- 1. RESISTORS ARE LOW CARBON FILM WITH VALUES IN OHMS UNLESS OTHERWISE NOTED
- 2. ALL CAPACITORS ARE POLYMER ELECTROLYTIC UNLESS OTHERWISE NOTED
- 3. RESISTOR TOLERANCES: CARBON FILM 5% UNLESS OTHERWISE NOTED
- 4. CAPACITOR TOLERANCES: ELECTROLYTIC 20%, POLYMER ELECTROLYTIC 10%, CERAMIC 5% UNLESS OTHERWISE NOTED
- 5. ALL OTHER UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 6. ALL OTHER UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 7. UNLESS OTHERWISE SPECIFIED, ALL UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 8. UNLESS OTHERWISE SPECIFIED, ALL UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 9. UNLESS OTHERWISE SPECIFIED, ALL UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 10. UNLESS OTHERWISE SPECIFIED, ALL UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 11. UNLESS OTHERWISE SPECIFIED, ALL UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 12. UNLESS OTHERWISE SPECIFIED, ALL UNITS ARE AS SHOWN ON REV. 469 ONLY; UNLESS OTHERWISE SPECIFIED
- 13. R15 IS 250 OHMS AND R10B IS RATED AT 50°C ON 2V UNIT.
- 14. C103 IS 210V, 100V VDC ON 48V UNIT.



## Warranty

KineticSystems Corporation warrants its standard hardware products to be free of defects in workmanship and materials for a period of one year from the date of shipment to the original end user. Software products manufactured by KineticSystems are warranted to conform to the Software Product Description (SPD) applicable at the time of purchase for a period of ninety days from the date of shipment to the original end user. Products purchased for resale by KineticSystems carry the original equipment manufacturer's warranty.

KineticSystems will, at its option, either repair or replace products that prove to be defective in materials or workmanship during the warranty period.

Transportation charges for shipping products to KineticSystems shall be prepaid by the purchaser, while charges for returning the repaired product to the purchaser, if located in the United States and Switzerland, shall be paid by KineticSystems. Return shipment will be made by UPS, where available, unless the purchaser requests a premium method of shipment at their expense. The selected carrier shall not be construed to be the agent of KineticSystems, nor will KineticSystems assume any liability in connection with the services provided by the carrier.

The product warranty may vary outside the United States or Switzerland and does not include shipping, customs clearance, or any other charges. Consult your local authorized representative for more information regarding specific warranty coverage and shipping details.

KINETICSYSTEMS SPECIFICALLY MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY EITHER EXPRESSED OR IMPLIED, EXCEPT AS IS EXPRESSLY SET FORTH HEREIN. PRODUCT FAILURES CREATED BY UNAUTHORIZED MODIFICATIONS, PRODUCT MISUSE, OR IMPROPER INSTALLATION ARE NOT COVERED BY THIS WARRANTY.

THE WARRANTIES PROVIDED HEREIN ARE THE PURCHASER'S SOLE AND EXCLUSIVE REMEDIES ON ANY CLAIM OF ANY KIND FOR ANY LOSS OR DAMAGE ARISING OUT OF, CONNECTED WITH, OR RESULTING FROM THE USE, PERFORMANCE OR BREACH THEREOF, OR FROM THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, OR REPAIR OR USE OF ANY PRODUCTS COVERED OR FURNISHED BY KINETICSYSTEMS INCLUDING BUT NOT LIMITED TO ANY CLAIM OF NEGLIGENCE OR OTHER TORTIOUS BREACH, SHALL BE THE REPAIR OR REPLACEMENT, FOB FACTORY, AS KINETICSYSTEMS MAY ELECT, OF THE PRODUCT OR PART THEREOF GIVING RISE TO SUCH CLAIM, EXCEPT THAT KINETICSYSTEMS' LIABILITY FOR SUCH REPAIR OR REPLACEMENT SHALL IN NO EVENT EXCEED THE CONTRACT PRICE ALLOCABLE TO THE PRODUCTS OR PART THEREOF WHICH GIVES RISE TO THE CLAIM. IN NO EVENT SHALL KINETICSYSTEMS BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS.

Products will not be accepted for credit or exchange without the prior written approval of KineticSystems. If it is necessary to return a product for repair, replacement or exchange, a Return Authorization (RA) Number must first be obtained from the Repair Service Center prior to shipping the product to KineticSystems. The following steps should be taken before returning any product:

1. Contact KineticSystems and discuss the problem with a Technical Service Engineer.
2. Obtain a Return Authorization (RA) Number.
3. Initiate a purchase order for the estimated repair charge if the product is out of warranty.
4. Include a description of the problem and your technical contact person with the product.
5. Ship the product prepaid with the RA Number marked on the outside of the package to:

USA, Canada, and Mexico  
KineticSystems Corporation  
Repair Service Center  
900 North State Street  
Lockport, IL 60441

Telephone: (815) 838-0005  
Facsimile: (815) 838-4424

Europe  
Kinetic Systems International S.A.  
Repair Service Center  
3 chemin Tavernay  
CH-1218 Geneva, Switzerland

Telephone: [41] (22) 798 44 45  
Facsimile: [41] (22) 798 05 25