

PART 1A—AC-TO-DC SWITCHING POWER SUPPLIES

LAMBDA'S INDUSTRIAL SMM/SMS and ADC SERIES



IDEAL FOR APPLICATIONS FROM 150 TO 1500W

The SMM/SMS and ADC Series are designed with fully regulated, wide range adjustable outputs...ideal for multiple output requirements with conventional or odd voltage combinations—from 150 to 1500W. Redundancy is easily achieved using externally supplied diodes for applications requiring guaranteed uptime.

- 16 unique models in four power ranges—up to 1500W.
- Wide range adjustability on auxiliary outputs.
- All outputs fully regulated and capable of parallel operation.
- All outputs have indefinite current limit protection.
- 100% burn-in at full load at 40°C.
- Power fail signal standard on all units.
- Worldwide safety agency approvals UL, CSA, TUV, BABT.
- Overvoltage protection on main outputs (all outputs of 1500W units).
- EMI filtering to FCC Docket 20780 Class B and VDE 0871 Class B.
- Power factor correction, power sharing, and power good signal standard on 1500W units.
- Grade 2 design.

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DC OUTPUT

Voltage range shown in tables.
All outputs are preset at factory.

REGULATED VOLTAGE

regulation, line see tables.
regulation, load see tables.
ripple and noise 1% pk-pk.
minimum load 4A on main output of SMM 300. 6A on main output of SMM 500 20A on main output and 5% on all other outputs of SMM 1500.

AC INPUT

line 98-132/196-254VAC, 48-440Hz, (customer selectable). 176-264VAC, 48-65Hz on SMM/1500 and SMS1500.
92-132/185-264VAC on ADC 150.

OUTPUT POWER

ADC 150—135W at 50°C with DC Input.
150W at 50°C with AC Input.
SMM 300—250W at 50°C convection cooled.
300W at 50°C with forced air.
SMM 500—500W at 50°C convection cooled.
SMM/1500, SMS 1500—1500W at 40°C.

DC INPUT

48VDC available on SMM 300 package. Consult factory. 24 or 48VDC on ADC 150 depending on model.

DUAL INPUT

92-132/185-264VAC and 24VDC or 48VDC on ADC 150 Series only.

EFFICIENCY

80% minimum on all models at full load.

POWER FACTOR CORRECTION

Active power factor correction circuit on SMM/1500, SMS 1500 corrects power factor to 0.95 minimum between 50% and 100% load at 48-65Hz input on SMM/SMS 1500.

OPERATING TEMPERATURE RANGE

Continuous duty from 0 to 70°C. Derating above 50°C (40°C for SMM 1500) to 50% power at 70°C.

OVERLOAD PROTECTION ELECTRICAL

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

SMM/1500 and SMS 1500 contain a fan fail circuit to protect the power supply in the event of a fan malfunction.

OVERVOLTAGE PROTECTION

Over voltage protection is provided on the main 5V outputs, and on all outputs of the SMM/1500 and SMS 1500.

COOLING

The SMM 300 is convection cooled or forced air cooled for increased output power. All other SMM/SMS models are fan cooled. The ADC 150 is convection cooled.

IN-RUSH CURRENT LIMITING

The turn-on in-rush current will not exceed 20A peak from a cold start, 50A on ADC 150.

INPUT AND OUTPUT CONNECTIONS

All input, output, power fail, sensing, inhibit and power good connections are made via barrier strips. The main output of the SMM 1500 and all SMS 1500 outputs are through studs. The power good, power fail, current share, inhibit and main sense connections on the SMM/1500 and SMS 1500 are through a Molex connector.

MOUNTING

4 mounting surfaces: one mounting position. 2 mounting surfaces on SMM/SMS 1500.

POWER SHARING

An active power sharing circuit allows connection of up to 5 SMS 1500 units (or the main output of 5 SMM 1500 units) in parallel.

HOLD UP TIME

20ms at 110 or 215VAC input for SMM 300.
10ms at 100 or 190VAC input for SMM 300.
10ms at 110 or 215VAC input for SMM 500.
20ms for SMM/SMS 1500.

AC FAIL SIGNAL

When the input is no longer sufficient to guarantee the output will be within specification for more than another 5 msec, a power fail signal (included on many models) will provide a logic "0" to logic "1" change. The polarity of this signal can be changed on the ADC 150 only via an internal link.

POWER GOOD SIGNAL

The SMM/SMS1500 provides a power good signal indicating that the main output has been high for at least 100 msec. The ADC 150 has the capability of providing a signal which can change polarity via an internal link.

BATTERY CHARGER

The internal battery charger on the ADC 150 has a 10W max constant current/constant voltage characteristic which may be adjusted to suit lead acid or NiCad batteries.

DC BATTERY LOW

A TTL compatible signal on the ADC 150 changes from 1 to 0 when the DC battery input (with AC not present) falls below 88.5% \pm 2% of nominal 24V or 48V (depending on the model). The polarity of the signal can be changed via an internal link.

EMI

Conducted EMI conforms to VDE0871 Curve B (Curve A for the SMM 300) The SMM 300 also meets BS800. The SMM 500 meets FCC Docket 20780 Curve B and BS6527 Curve B. The ADC 150 also meets FCC Curve A for conducted and VDE0871 Curve A and FCC Curve A for radiated EMI.

COVERS

All models are provided with metal covers.

PHYSICAL DATA

Package Model	Lbs. Net	Size Inches
ADC 150	4.4	10.57 × 4.78 × 2.76
SMM 300	6.5	11.81 × 7.48 × 2.56
SMM 500	8.15	11.81 × 7.48 × 3.94
SMM/1500, SMS 1500	19.8	8.00 × 5.00 × 11.00

GUARANTEED FOR ONE YEAR

One year guarantee includes labor as well as parts. Guarantee applies to operation at full published specifications at the end of one year.

SAFETY AGENCY APPROVALS

SELV for output voltages up to 24VDC on SMM/SMS Series. Most models have the following approvals: UL, CSA, VDE/IEC, BABT and EN 60-950. Consult the factory for information on specific models.

PART IA — AC-TO-DC SWITCHING POWER SUPPLIES

INDUSTRIAL SWITCHING SELECTOR GUIDE

SMM300 Series. Triple and Pent Output. 98-132/196-254VAC Input.

Model No.	PRICING				Maximum Output Power Watts	Voltage and max current ratings for subsidiary outputs at 50°C**				
	QTY. 1	QTY. 10	QTY. 25	QTY. 100		Output 1	Output 2	Output 3	Output 4	Output 5
SMM300C/PF1 *	\$535	\$508	\$492	\$454	250 convection cooled or	*5V 40A	12-24V 6A	12-15V 6A	12-15V 6A	5-15V 4A
SMM300SB/C/PF1	535	508	492	454	300 forced air cooled	*5V 50A	—	12-5V 6A	12-15V 6A	—
Performance Specifications										
Line regulation ($\pm 15\%$ line voltage change)						$\pm 0.25\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.5\%$
Load regulation (60% \pm 40% load change)						$\pm 0.25\%$	$\pm 1\%$	$\pm 1\%$	$\pm 1\%$	$\pm 1\%$
Cross regulation ($\pm 40\%$ load change on any other output)						$\pm 0.1\%$	$\pm 0.2\%$	$\pm 0.2\%$	$\pm 0.2\%$	$\pm 0.2\%$
Max temp coeff/°C (0-50°C)						0.02%	0.04%	0.04%	0.04%	0.04%
Short circuit protection						current limit	current limit	current limit	current limit	current limit
Overvoltage protection						6.2V \pm 10%	—	—	—	—
Initial setting ($\pm 1\%$)						5.0V	24.0V	12.0V	12.0V	5.0V 48V
Available adjustable range						4.7-5.3V	12-24V	12-15V	12-15V	48V-52V
Circuit reference of pre-set control						RV1	RV61	RV81	RV101	RV121

*Requires forced cooling airflow at 0.5 meter/sec. Current reduces to 30A and 40A if convection cooled.

General Electrical Specifications for SMM300 are on page 45.

Mechanical Specifications for SMM300 are on page 168.

Consult factory for operating information.

**Other output combinations available. Consult the factory to discuss your requirements.

SMM500 Series. Pent Output. 98-132/196-254VAC Input.

Model No.	PRICING				Maximum Output Power Watts	Voltage and max current ratings at 50°C**				
	QTY. 1	QTY. 10	QTY. 25	QTY. 100		Output 1	Output 2	Output 3	Output 4	Output 5
SMM500 00 00 00/PF1	\$888	\$845	\$824	\$755	500	5V 60A	12-24V 6A	12-15V 6A	5-15V 6A	5-15V 4A
Performance Specifications										
Line regulation ($\pm 15\%$ line voltage change)						$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.25\%$
Load regulation (10 to 100% loading)						0.25%	0.5%	0.5%	0.5%	0.5%
Cross regulation (20 to 100% load change on any other output)						$\pm 0.1\%$	$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.25\%$
Temperature variation ($\pm 25^\circ\text{C}$ change)						$\pm 0.7\%$	$\pm 0.7\%$	$\pm 0.7\%$	$\pm 0.7\%$	$\pm 0.7\%$
Short circuit protection						Trip and restart	Constant current limit	Constant current limit	Constant current limit	Constant current limit
Overvoltage protection						6.2V \pm 10%	—	—	—	—
Initial setting ($\pm 1\%$)						5V	24V	12V	12V	5V
Adjustment range available						4.7-5.3V	12-24V	12-15V	5-15V	5-15V
Circuit reference of pre-set control						RV1	RV61	RV81	RV101	RV121

General Electrical Specifications for SMM500 are on page 45.

Mechanical Specifications for SMM500 are on page 168.

Contact factory for operating information.

**Other output combinations available. Consult the factory to discuss your requirements.

PART IA — AC-TO-DC SWITCHING POWER SUPPLIES

INDUSTRIAL SWITCHING SELECTOR GUIDE

SMM/SMS 1500 Series. Single and Pent Output. 176-264VAC Input.

Model No.	PRICING				Maximum Output Power Watts	Voltage and max current ratings for DC outputs at 40°C				
	QTY. 1	QTY. 10	QTY. 25	QTY. 100		Output 1	Output 2	Output 3	Output 4	Output 5
SMM1500 00 00	\$2139	\$2032	\$1972	\$1819	1500	+5V 200A Remote Sense	+24V 12A	+12 to 15V 12A	-12 to -15V 6A	-5.2V 12A
SMS 1500 05 00 01	1984	1885	1829	1687	1500	5V 300A	—	—	—	—
SMS 1500 12 00 01	1864	1771	1718	1584	1500	12V 125A	—	—	—	—
SMS 1500 15 01 00	1864	1771	1718	1584	1500	15V 100A	—	—	—	—
SMS 1500 24 01 00	1864	1771	1718	1584	1500	24V 62.5A	—	—	—	—
SMS 1500 50 01 00	1864	1771	1718	1584	1500	50V 30A	—	—	—	—
Performance Specifications										
Line regulation ($\pm 15\%$ line voltage change)						$\pm 0.25\%$	$\pm 0.25\%$	$\pm 0.25\%$ across total		$\pm 0.25\%$
Load regulation (60% \pm 40% load change)						$\pm 0.25\%$	$\pm 0.25\%$	See Note 1		$\pm 0.25\%$
Cross regulation ($\pm 40\%$ load change on any other output)						$\pm 0.1\%$	$\pm 0.2\%$			$\pm 0.2\%$
Max temp coeff/°C (0–40°C)						0.02%	0.04%	0.04% across total		0.02%
Short circuit protection						current limit	current limit	current limit	current limit	current limit
Overvoltage protection						6.2V	28.5V	18V	18V	6.2V
Initial Setting ($\pm 1\%$)						5V	24V	12V	12V	5.2V
Adjustable range available						4.7–5.3V	22–26V	11–16V	11–16V	4.7–5.5V
Circuit reference of pre-set control						RV6 mother board	RV1	RV2		RV3
Aux O/P module										
Note 1: Outputs 3 & 4 regulated across the sum of the \pm outputs. The maximum deviation of outputs 3 & 4 from nominal is $\pm 10\%$ for any load combination above 10% of rating.										
General Electrical Specifications for SMM/SMS 1500										

General Electrical Specifications for SMM/SMS 1500 are on page 45.

Mechanical Specifications for SMM/SMS 1500 are on page 168.

Contact the factory for detailed operating information.

ADC 150 Series. Dual 92-132, 185-264VAC and 24VDC or 48VDC Input.

Model No.	PRICING			DC Input Voltage	DC voltage and maximum continuous current rating for main and subsidiary outputs.					Battery Charger
	QTY. 1	QTY. 10	QTY. 25		Output 1 Reg.	Output 2 Semi Reg.	Output 3 Reg.	Output 4 Reg.	Output 5 Reg.	
ADC 150 24 00	\$954	\$906	\$878	24V	+5.1V 20A	+12V 5A	-12V 1.5A	-5.2V 1A	24V 2A	
ADC 150 48 00	954	906	878	48V	+5.1V 20A	+12V 5A	-15V 1.5A	-5.2V 1A	24V 2A	
Line regulation ($\pm 15\%$ line voltage change)					$\pm 0.15\%$	$\pm 0.4\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.5\%$	Constant current — fully regulated
Load regulation (60% \pm 40% load change)					$\pm 1.5\%$	$\pm 1.5\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 0.06V$	
Cross regulation					$\pm 0.25\%$	$\pm 2.0\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.2\%$	
Maximum temp coeff/°C					$\pm 0.02\%$	$\pm 0.05\%$	$\pm 0.05\%$	$\pm 0.05\%$	$\pm 0.02\%$	
Short circuit protection					Trip and restart	Trip and restart	Constant current	Constant current	Trip and restart	
Overvoltage protection					6.2V \pm 10% fully regulated	— semi regulated	— fully regulated	— fully regulated	— fully regulated	N/A
Regulation										
Output noise (pk-pk) 50% load, nominal input Wideband (10Hz to 30MHz)					50mV	1.0%	2.0%	2.0%	1.0% or 50mV whichever is greater	

General Electrical Specifications for ADC 150 Series are on page 45.

Mechanical Specifications for ADC 150 Series are on page 169.

PART V—MECHANICAL DRAWINGS

SMM SERIES AND SMS SERIES

SMM 300

NOTES:

- (1) "B" holes are for M4 tapitite screws.
Max depth 9/32".
- (2) Dimensions are in inches.
- (3) 4 mounting surfaces

AC INPUT CONNECTOR

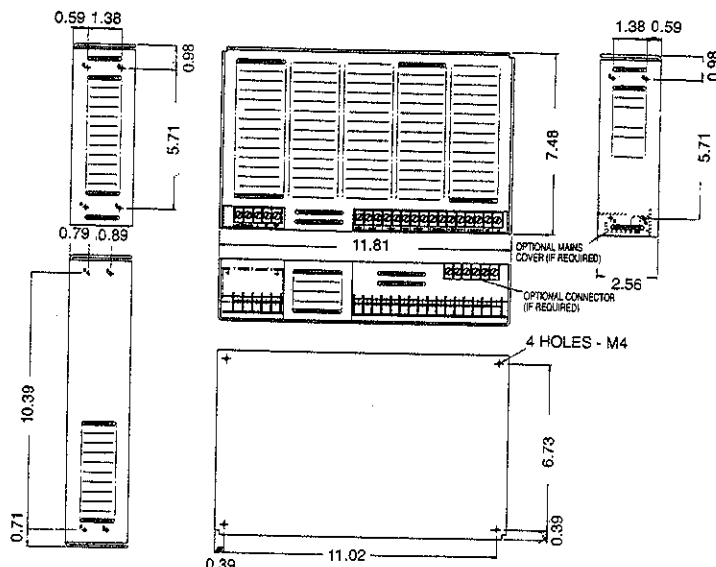
5 way block with UNC 6-32 screw terminals.

- 1 Link for 115V operation
- 3 (L) line
- 4 (N) neutral
- 5 (E) ground

DC OUTPUT TERMINALS

16 way block with UNC 6-32 screw terminals.

- | | |
|-----------------|---------------------|
| (1) op1 + sense | (9) op3 pos |
| (2) op1 pos | (10) op3 neg |
| (3) op1 pos | (11) op4 pos |
| (4) op1 neg | (12) op4 neg |
| (5) op1 neg | (13) op5 pos |
| (6) op1 - sense | (14) op5 neg |
| (7) op2 pos | (15) power fail |
| (8) op2 neg | (16) power on reset |



SMM 500

NOTES:

- (1) "B" holes are for M4 tapitite screws.
Max depth 9/32".
- (2) Dimensions are in inches.
- (3) 4 mounting surfaces

AC INPUT CONNECTOR

5 way block with UNC 6-32 screw terminals.

- 1 Link for 115V operation
- 3 (L) line
- 4 (N) neutral
- 5 (E) ground

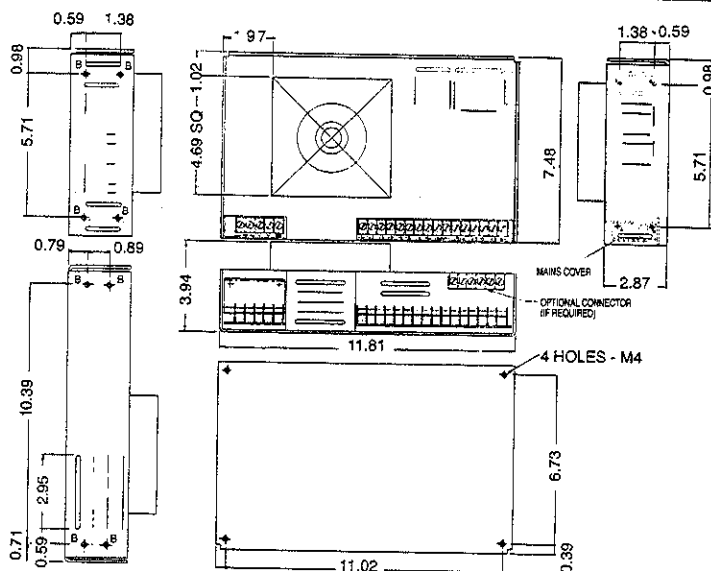
DC OUTPUT CONNECTOR

16 way block with UNC 6-32 screw terminals.

- | | |
|-----------------|--------------|
| (1) op1 + sense | (9) op2 pos |
| (2) op1 pos | (10) op2 neg |
| (3) op1 pos | (11) op3 pos |
| (4) op1 pos | (12) op3 neg |
| (5) op1 neg | (13) op4 pos |
| (6) op1 neg | (14) op4 neg |
| (7) op2 neg | (15) op5 pos |
| (8) op2 - sense | (16) op5 neg |

AUXILIARY OUTPUTS

4 way block with UNC 6-32 screw terminals



SMM/SMS 1500

NOTES:

- (1) Holes are for M4 screws, 8 each for chassis mounting. Max depth 1/4".
- (2) Dimensions are in inches.
- (3) 2 mounting surfaces.

AC INPUT CONNECTOR

3 way block with screw terminals (4BA).

- 1 (L) line
- 2 (N) neutral
- 3 (E) ground

DC OUTPUT CONNECTOR

Main output - M8 studs

AUXILIARY OUTPUTS

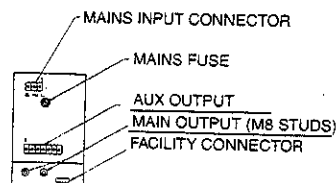
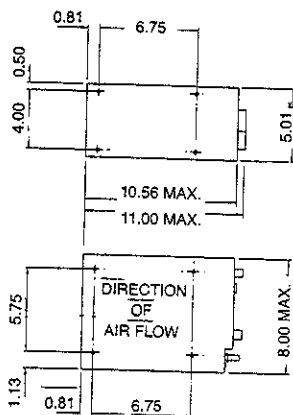
7 way block with UNC-32 screw terminals.

- | | |
|------------|------------|
| (1) op5 | (5) op3 |
| (2) common | (6) common |
| (3) op4 | (7) op2 |
| (4) common | |

FACILITY CONNECTOR

10 way Molex type 22-05-7108

- | | |
|------------------|-------------------|
| (1) power good + | (6) inhibit 1 |
| (2) power good - | (7) inhibit 2 |
| (3) power fail + | (8) current share |
| (4) power fail - | (9) op1 + sense |
| (5) N/C | (10) op1 - sense |



PART V—MECHANICAL DRAWINGS

SMLC AND ADC SERIES

SMLC 50R

NOTES:

- (1) "A" holes are M3, 7 each for chassis mounting. Max depth 5/32".
- (2) Dimensions in inches.
- (3) 2 mounting surfaces.

AC INPUT CONNECTOR

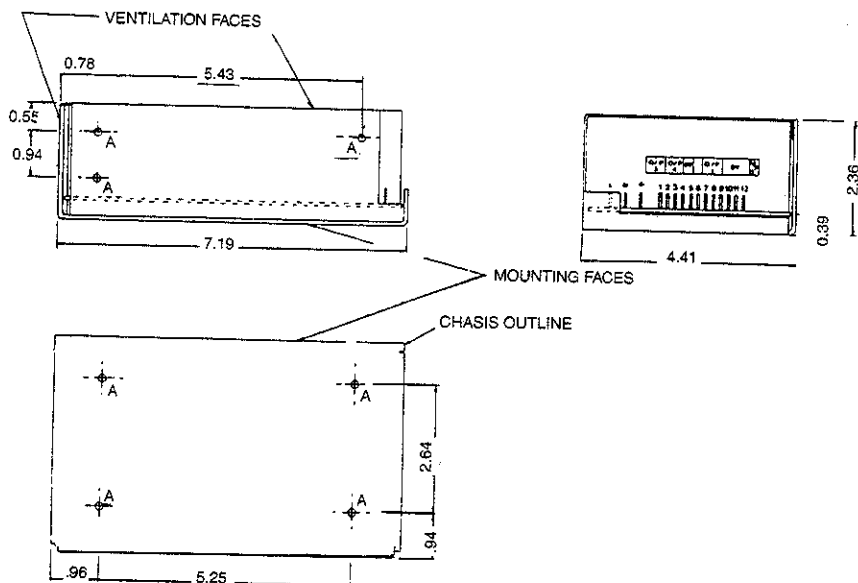
Molex 5 way 2391

- 1 (L) line
- 3 (N) neutral
- 5 (E) ground

DC OUTPUT CONNECTOR

Molex 12 way 2391

- (1) op3 neg (7) op1 pos
- (2) op3 pos (8) op1 pos
- (3) op4 neg (9) common op1 & op2
- (4) op4 pos (10) common op1 & op2
- (5) power fail (11) common op1 & op2
- (6) N/C (12) op2 pos



SMLC 75R

NOTES:

- (1) "A" Holes are M3, 7 each for chassis mounting. Max depth 5/32".
- (2) Dimensions in inches.
- (3) 2 mounting surfaces.

AC INPUT CONNECTOR

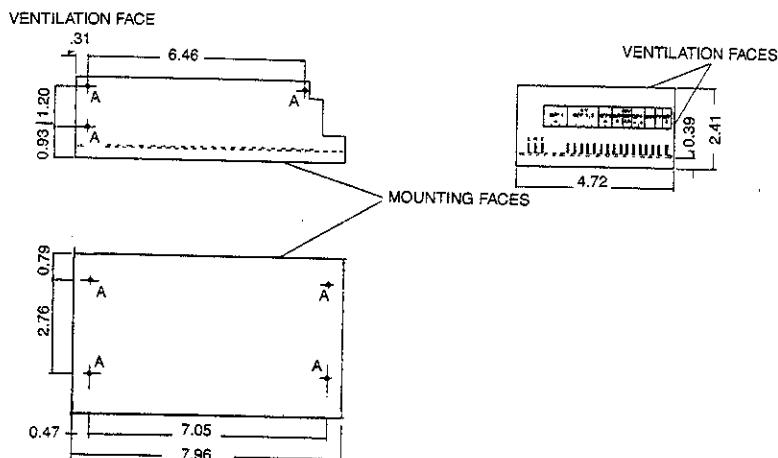
Molex 5 way 2630

- 1 (L) line
- 3 (N) neutral
- 5 (E) ground

DC OUTPUT CONNECTOR

Molex 16 pin 2630

- (1) +5V (9) op2 pos
- (2) +5V (10) op3 neg
- (3) +5V (11) op3 pos
- (4) common (12) op4 neg
- (5) common (13) op4 pos
- (6) common (14) inhibit
- (7) common (15) power fail
- (8) op2 pos (16) N/C



ADC 150

NOTES:

DC INPUT CONNECTOR

2 Terminal Barrier Strip UNC6-32

- (1) - Vin
- (2) + Vin

AC INPUT CONNECTOR

5 Terminal Barrier Strip UNC6-32

- 1 (E) Ground
- 2 (N) Neutral
- 3 (L) Line
- 4 Link for 115V Operation
- 5 Link for 115V Operation

DC OUTPUT CONNECTOR

9 Terminal Barrier Strip UNC6-32

- (1) +5v (6) -12V
 - (2) +5v (7) -5V
 - (3) Common (8) -24V
 - (4) Common (9) +24V
 - (5) +12V
- Floating Output

SIGNAL OUTPUTS

Molex 5 Way 6410

- (1) Common (4) Power Fail
- (2) Inhibit (5) N/C
- (3) Power Fail

