

C H A P T E R ②

Installation & Operation

BEFORE YOU BEGIN

This chapter tells you how to test, install, and operate your OEM300 Power Module. Before you begin installation, we assume you have addressed and solved the following design issues.

- ❑ **HEATSINK** You have chosen a heatsink, or a suitable heat sinking surface. You have selected a way to make good thermal contact between the heatsink and the Power Module's heatplate.
- ❑ **COOLING** You have decided on a method for ventilating the Power Module, and keeping ambient air temperatures within specified limits.
- ❑ **NUMBER OF DRIVES** You have calculated the power required by your system, and have decided how many drives you can connect to each Power Module.

If you need more information about heatsinks and cooling, refer to *Chapter ⑤ Heat & Thermal Management Issues*. For information on how many drives you can connect to the Power Module, refer to *Chapter ⑥ Calculating How Many Drives & Motors the OEM300 Can Operate*.

NOTE: The OEM300 is not a general-purpose power supply, nor is it a laboratory bench supply. It was designed specifically for use with OEM Series drives—it is unsuitable for other purposes.

CAUTION

The OEM300 Power Module should only be used with OEM Series drives. Do not connect it to any other products or equipment.

OEM300 SHIP KIT

Inspect the OEM300 upon receipt for obvious damage to its shipping container. Report any damage to the shipping company. Parker Compumotor cannot be held responsible for damage incurred in shipment. You should receive one or more OEM300 Power Modules, depending upon what you ordered. Compare your order with the units shipped.

<u>Component</u>	<u>Part Number</u>
OEM300 Power Module	OEM300
5 Pin Connector	43-014298-01
6 Pin Connector	43-006606-01
<u>Accessories</u>	
OEM300 User Guide	88-013513-01

User guides are not sent with each product. They are available upon request. Please order user guides as needed.

BENCH TEST

OEM300 Power Modules are tested at the factory before they are shipped. Ordinarily, there is no need to perform a bench test on the Power Module before you install it in your system. If you want to test the Power Module, you can perform the tests listed below.

CAUTION

If you operate the OEM300 without adequate cooling, it may be damaged. Mount the OEM300 to a heatsink. Make sure there is good thermal contact between the Power Module's heatplate and the heatsink. Do not block the openings in the cover. Allow adequate air movement so that convection can cool the Power Module. Remove AC power to the Power Module when you complete your tests.

To test a Power Module:

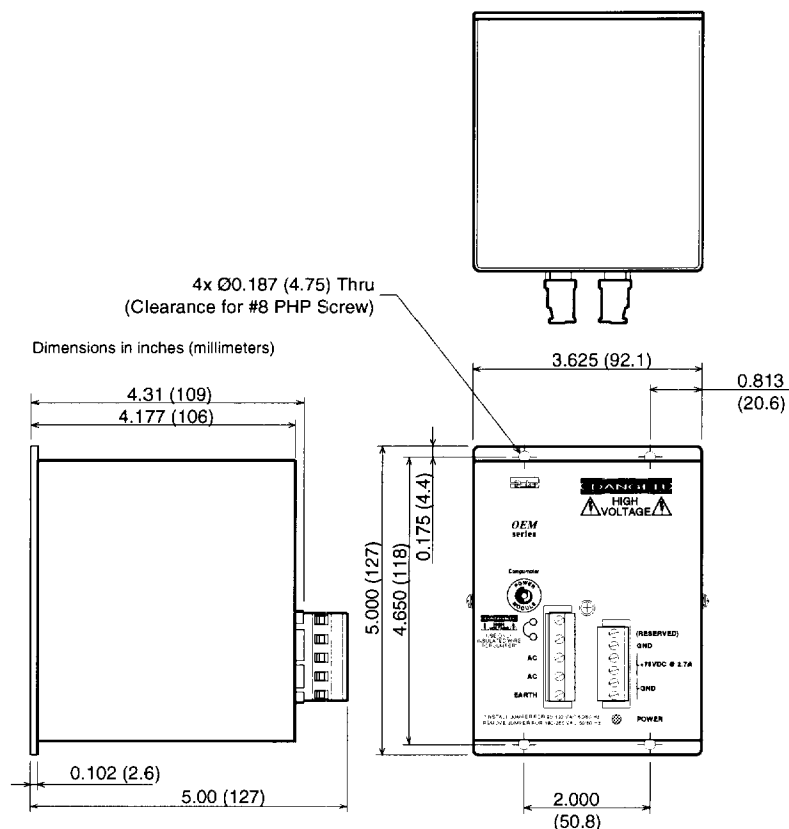
1. Connect AC power to the OEM300 (120VAC with jumper installed; or 220VAC with jumper removed).
2. LED: the green LED should be illuminated. This indicates that the 75VDC power supply in the Power Module is operating correctly.

- Use a voltmeter to measure the voltage at the 75VDC output terminals. It should be 75VDC ± 5%.

INSTALLATION

MOUNTING

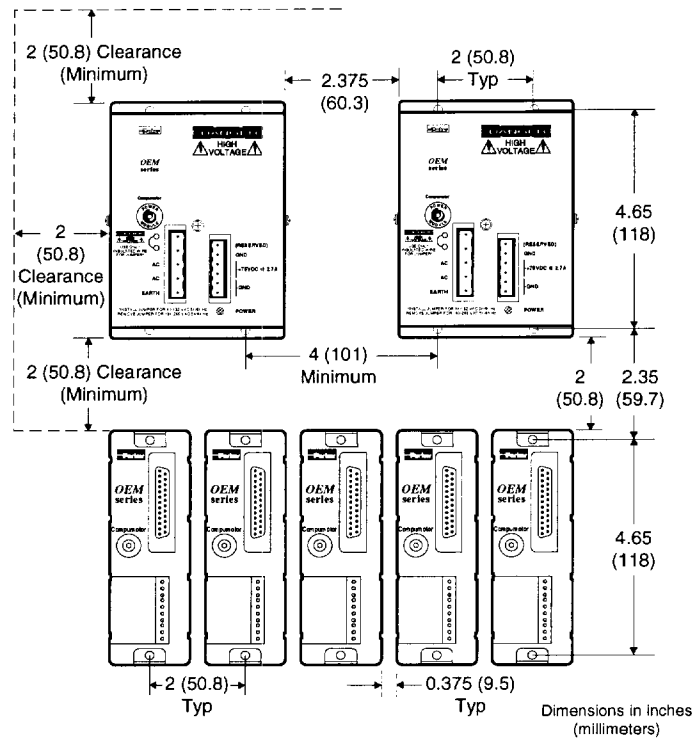
The OEM300 Power Module is designed to minimize panel area, or footprint, in an equipment cabinet. Dimensions are shown in the drawing below.



Dimensions—OEM300 Power Module

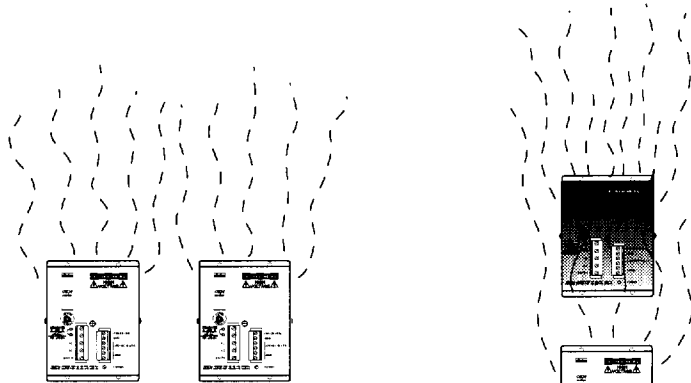
Panel Layout and Minimum Spacing

Do not obstruct the openings in the top and bottom of the OEM300. Provide space for air circulation between the Power Module and other equipment. The figure below shows the minimum spacing required.



Panel Layout—OEM300 Power Modules with OEM Series Drives

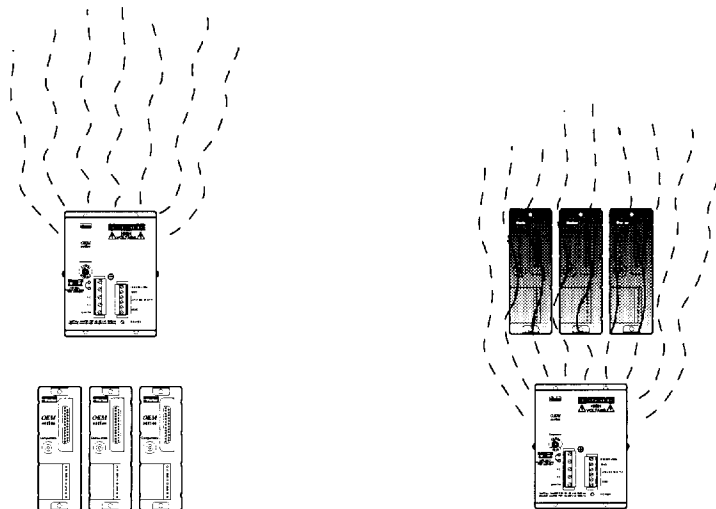
If you are using several OEM300s in an equipment cabinet, mount them side by side. This configuration provides good heat dissipation. Do not mount units above each other in a vertical configuration—heat rises from the lower units to the upper units, which may cause excessive heat buildup in the upper units. This is shown in the next drawing.



Mount Power Modules Side by Side....
....Not One Above the Other

Side by Side Mounting is Preferred

When you position equipment and components, place those that produce the most heat above those that are cooler. The figure below illustrates this.



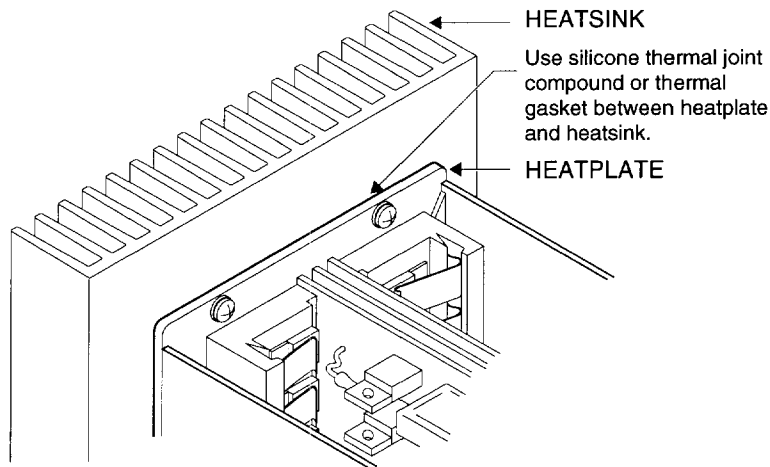
Mount Heat Sensitive Equipment
Below the Power Module....

....Not Above It

Heat Sensitive Equipment—Preferred Mounting

Attachment to Heatsink

You **must** attach the heatplate of the Power Module to a heatsink or suitable heat sinking surface. The heatplate is the pathway through which you can remove much of the excess heat generated by the Power Module.



Attaching Heatplate to Heatsink

When you attach the Power Module to a heatsink, observe the following guidelines:

- Use silicone thermal joint compound or a thermal gasket to ensure good thermal contact between the heatsink and the Power Module's heatplate.
- Make sure there are no voids or air pockets between the heatsink and heatplate.
- Verify that the heatsink is not warped (a warped surface will not make a good thermal interface).

CAUTION

You **must** attach the heatplate of the Power Module to a heatsink or suitable heat sinking surface. Use silicone thermal joint compound or a thermal gasket to provide a good thermal interface.

For more information about choosing a heatsink, refer to *Chapter © Heat & Thermal Management Issues*.

Ventilation

The OEM300 depends on ventilation to remove much of its excess heat. Mount the Power Module so that air can circulate around it. Follow the guidelines for minimum spacing that were shown earlier in this section. Make sure the openings in the top and bottom of the cover are not blocked.

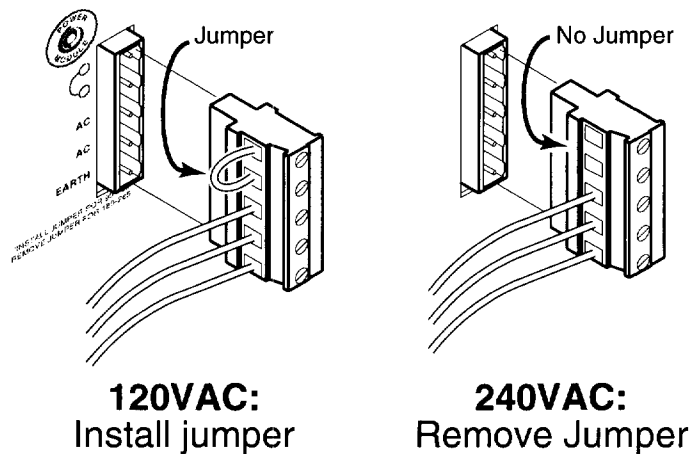
If you have high ambient temperature conditions, or heat-producing equipment near the OEM300, you may need to provide a fan for air circulation and cooling. For more information about ventilation, refer to *Chapter ⑤ Heat & Thermal Management Issues*.

AC POWER CONNECTION

Use AC input power in the range of 90-132VAC or 180-265VAC to operate the OEM300, and configure the jumper wire on the power connector to match your input voltage.

Voltage in the intermediate range (132-180VAC) **MUST NOT** BE USED!

There are two terminals on the 5-pin AC input connector that require the installation or removal of a jumper wire, depending upon the input voltage you use. The following illustration shows how to configure the jumper for your voltage.



AC Input Connector–Jumper Configurations

120VAC Operations

The OEM300 is shipped from the factory configured for input voltage in the 90-132VAC range, with the jumper in place on the connector. Leave the jumper in place if you operate in this range. Operating without a jumper will cause poor system performance.

Line voltage is present on the jumper. For safety reasons, use only insulated wire for the jumper.

WARNING

High voltage is present on the jumper. Use insulated wire for safety.

240VAC Operations

If you use input power in the 180-265VAC range, remove the jumper. Do not operate the OEM300 in the 180-265VAC range with the jumper in place. Doing so can produce high internal voltages which could cause severe system damage.

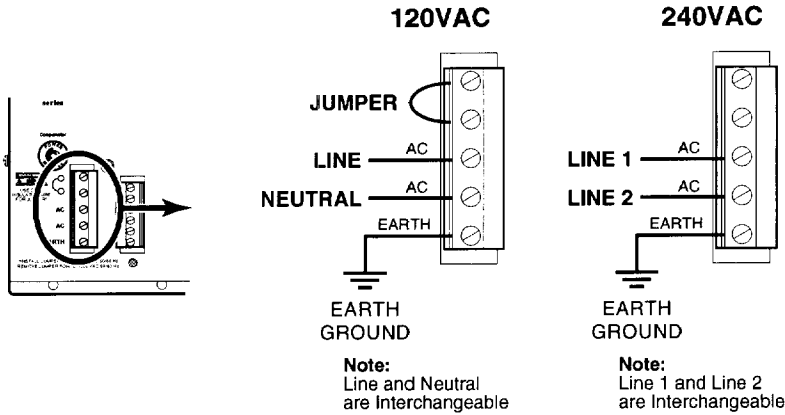
CAUTION

Do not use a jumper when using AC input voltage in the 180-265VAC range. If a jumper is in place, input voltage in this range will cause the OEM300 to generate high internal voltages which could result in system damage.

AC input information is summarized below:

Input Voltage:	90VAC-132VAC	Jumper installed
	180VAC-265VAC	Jumper removed
Forbidden Range:	132VAC-180VAC	
Wire Size:	16 AWG (1.5 mm ²) minimum	
Input Connector:	5-pin removable connector (Phoenix P/N GMVSTBR 2.5/5-ST)	

The following illustration shows the AC input connector properly configured for both voltage ranges.



AC Input Connections

CAUTION

Do not use AC input voltage in the range of 132-180VAC. AC voltage in this range can cause excessive voltages to be generated within the OEM300, and may damage the unit.

DC OUTPUT CONNECTION

For convenience, multiple pins are provided for 75VDC and for GROUND (GND). The two 75VDC pins are identical—use either one, or use both, whichever your needs require. Similarly, the three GROUND pins are identical—use as many as you need.

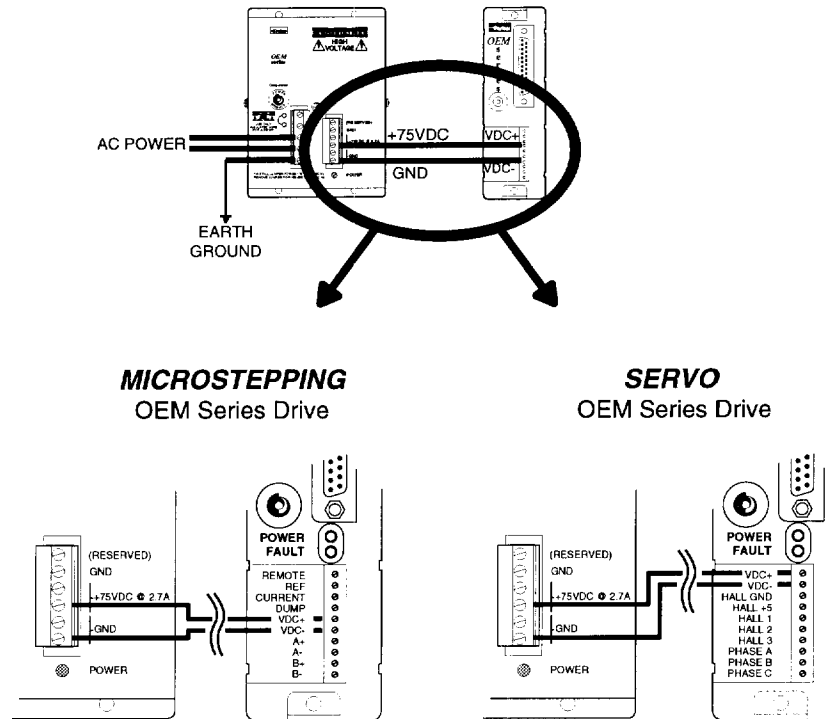
Output Pins:	+75VDC	Two provided
	GROUND	Three provided
	RESERVED	One provided; Do not use

Output Connector: 6-Pin Removable connector
(Phoenix P/N MVSTBR 1.5/6-ST)

Wire Size: 16 AWG (1.5 mm²) if less than 10 ft. (3m)
14 AWG (2.5 mm²) if more than 10 ft. (3m)

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The following drawing illustrates typical power cabling for various OEM Series drives.

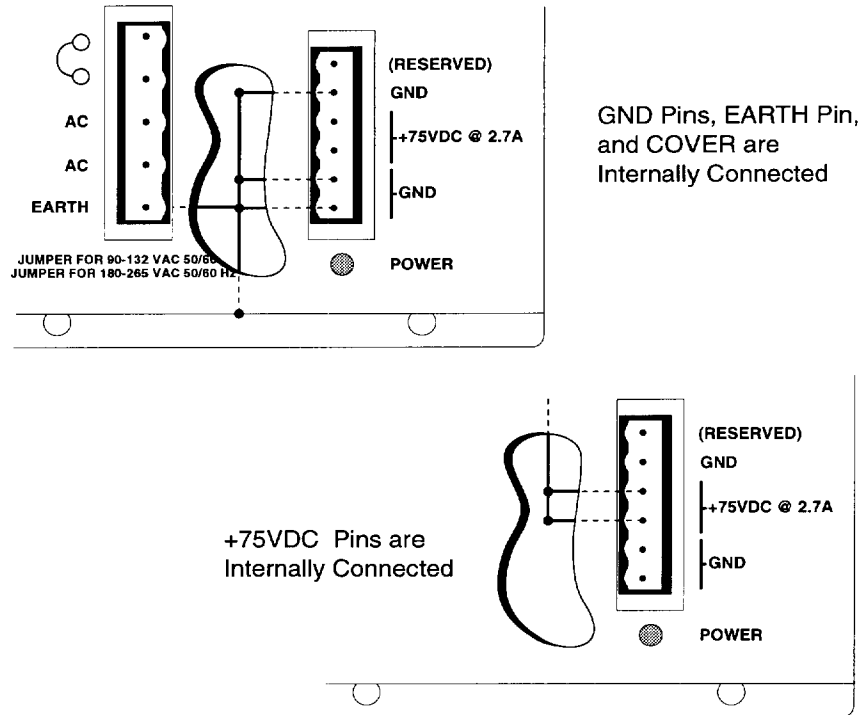


Power Connections to Various Drives

OUTPUT POWER CABLE LENGTH

Make the output power cables as short as possible. Voltage drops occur in cables over 3 feet long, and cause a reduction in power delivered to the drive. To minimize cable length, mount the OEM300 close to the drive.

The next drawing shows that the 75VDC output pins are connected together internally. It also shows the internal connections of the ground pins and cover.



Internal Connections

GROUNDING FOR SAFETY

Inside the OEM300, the 75VDC output grounds are connected to each other, to the AC input ground (which is labeled EARTH), and to the cover of the OEM300. For safety considerations, connect the EARTH terminal of the Power Module to an external EARTH GROUND.

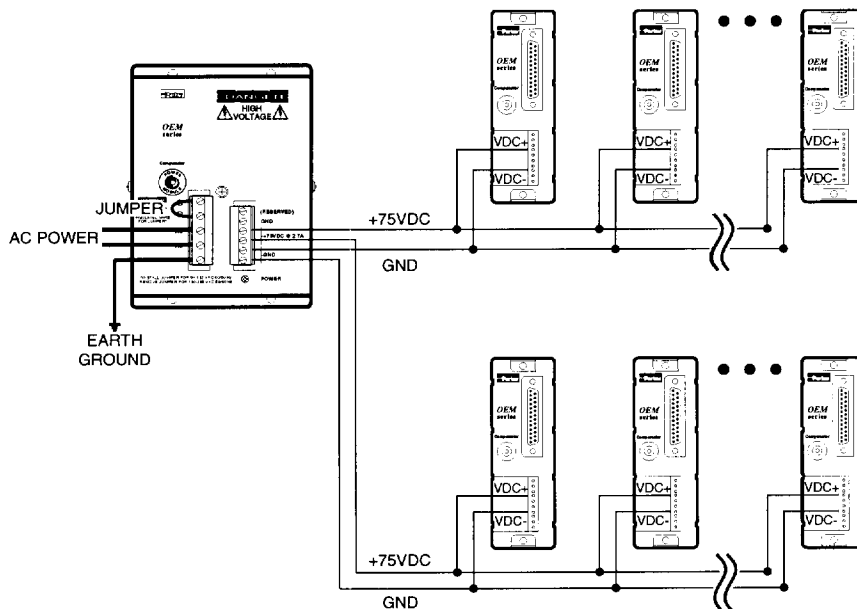
Do not create ground loops when you connect cables to your system.

HOW MANY DRIVES CAN BE CONNECTED TO ONE OEM300?

The OEM300 can deliver power to many different combinations of drives, indexers, and the motors they operate. Determine the power demanded by your application, and verify that the OEM300 will supply the amount of power needed. You may need multiple OEM300 Power Modules; or, you may be able to use fewer Power Modules than anticipated. For details on how to calculate the power output required of the OEM300, refer to *Chapter 6 Calculating the Number of Drives & Motors the OEM300 Can Operate*.

CONNECTING MULTIPLE DRIVES TO THE OEM300

Consult the following figure for guidelines on how to connect more than one drive to the OEM300. You can make a single power bus or you can use the extra pins in the DC output connector to make a second power bus.



Power Cabling Options

You can connect OEM650 Microstepping Drives and OEM670 Servo Drives to the same OEM300 Power Module.

USING MORE THAN ONE OEM300 POWER MODULE

The OEM300 is not designed for current sharing. Each unit is designed as a standalone Power Module. Do not attempt to connect multiple OEM300s together in parallel. Instead, connect drives directly to individual Power Modules.

CAUTION

Do not connect multiple OEM300 Power Modules in parallel. Connect drives directly to individual Power Modules.

ELECTRICAL NOISE CONTROL

The OEM300 Power Module contains a switching power supply. Internally, it rapidly switches several high voltage components on and off. This rapid switching creates electrical noise, which is a standard characteristic of switching power supplies.

You may need to reduce electrical noise, depending on your application and the sensitivity of the equipment in your system. The following information is provided to help with your noise reduction efforts. For additional information about controlling electrical noise, consult the technical reference section in Compumotor's catalog.

Switching Frequencies

- Primary Switching Frequency: 118 kHz \pm 9 kHz
- AC Line Switching Frequency: 48-72 Hz, plus harmonics
(AC line frequency varies by country)

Input Filter

Internally, the OEM300 has an AC input filter. This filter reduces the electrical noise that is conducted from the Power Module to the AC power line. If you need to further reduce the noise sent out over the AC lines, you can install an external filter at the point where AC power is connected to the Power Module. A variety of filters are commercially available from many different vendors.

Output Filter

We recommend that no external filters be placed between the output of the OEM300 Power Module and any equipment connected to it.

The OEM300 Power Module should be connected directly to Compumotor OEM Series drives. It is designed to respond rapidly to power demands from drives and their loads. Any external filters, such as EMI filters or extra capacitors, may seriously impede the response and performance of the Power Module.

Output Cables

Noise can be coupled from the output cables to sensitive equipment by means of electromagnetic radiation. This type of noise problem is known as *Electro Magnetic Interference*, or *EMI*.

If you need to reduce EMI emanating from the power cables, use shielded power cables and properly ground the shield. You can achieve additional reductions in EMI if you run cables in conduit or steel pipe. Cables should be as short as possible. Keep cables away from sensitive equipment.

If you run separate wires for power cables (POS and GND, or + and -), both wires should be parallel, immediately adjacent to each other, and twisted together. This will minimize circuit inductance and radiated noise.

Proper Application of the OEM300

In extreme cases and unusual applications, sensitive equipment can be highly susceptible to electrical noise problems. In situations like this, a switching power supply might be the wrong type of power supply to use.

If your system cannot tolerate the amount of electrical noise generated by the OEM300, and noise reduction techniques fail to reduce noise to tolerable levels, then you may need to consider using a linear power supply, such as the Compumotor DC 4. Linear supplies are virtually noise free, and give excellent results in noise-sensitive applications. Unfortunately, in comparison to switching supplies, linear supplies are large, heavy, and dissipate more power. They also suffer from poor output regulation, which may affect the high-speed performance of your system.

OPERATION

The OEM300 Power Module is intended to be hardwired within your system. Therefore, it does not have an ON/OFF switch, AC input cables, or DC output cables. You should provide a means for turning the OEM300 on and off, connecting input AC power, and delivering DC output power to your drives.

During operation, a green LED on the front panel is illuminated to indicate the 75VDC section is functioning.

