

INSTRUCTION MANUAL

CA 400 RACK ADAPTER

RACK ADAPTER FOR MST SERIES POWER MODULES

KEPCO INC.
An ISO 9001 Company.

MODEL CA 400 RACK ADAPTER

ORDER NO.

REV. NO.

IMPORTANT NOTES:

- 1) This manual is valid for the following Model and associated serial numbers:

MODEL	SERIAL NO.	REV. NO.
-------	------------	----------

- 2) A Change Page may be included at the end of the manual. All applicable changes and revision number changes are documented with reference to the equipment serial numbers. Before using this Instruction Manual, check your equipment serial number to identify your model. If in doubt, contact your nearest Kepco Representative, or the Kepco Documentation Office in New York, (718) 461-7000, requesting the correct revision for your particular model and serial number.
- 3) The contents of this manual are protected by copyright. Reproduction of any part can be made only with the specific written permission of Kepco, Inc.

Data subject to change without notice.

©1997, KEPCO, INC
243-0924



KEPCO, INC. 1 131-38 SANFORD AVENUE 1 FLUSHING, NY. 11352 U.S.A. 1 TEL (718) 461-7000 1 FAX (718) 767-1102
email: hq@kepcopower.com 1 World Wide Web: <http://www.kepcopower.com>

Declaration of Conformity

Application of Council directives: **73/23/EEC (LVD)**
93/68/EEC (CE mark)

Standard to which Conformity is declared:

EN61010-1:2001 (Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1)

Manufacturer's Name and Address: **KEPCO INC.**
131-38 SANFORD AVENUE
FLUSHING, N.Y. 11352 USA

Importer's Name and Address:

REPRESENTATIVE COPY

Type of Equipment: **Rack Adapter**

Model No.: *[PRODUCT MODEL NUMBER]*

Year of Manufacture:

I, the undersigned, declare that the product specified above, when used in conjunction with the conditions of conformance set forth in the product instruction manual, complies with the requirements of the Low Voltage Directive 73/23/EEC, which forms the basis for application of the CE Mark to this product.

Place: **KEPCO, Inc.**
131-38 Sanford Ave.
Flushing, N.Y.11352 USA

Saul Kupferberg
(Full Name)

Date: _____

VP OF SALES
(position)

Conditions of Conformance Rack Adapter products (EN61010-1)

When this product is used in applications governed by the requirements of the EEC, the following restrictions and conditions apply:

1. For European applications, requiring compliance to the Low Voltage Directive, 73/23/EEC, this Rack Adapter is considered a component, designed for "built in" applications. Because it is incomplete in construction, the end product enclosure must provide for compliance to any remaining electrical safety requirements and act as a fire enclosure. (EN61010-1:2001, Cl. 6, Cl. 7, Cl.8, and Cl. 9)
2. This Rack Adapter is designed for stationary installation, with mains power applied via a detachable power supply cord or via direct wiring to the source power terminal block.
3. This Rack Adapter, when properly installed, is considered a Class 1 (earthed) product. It is intended for use as part of equipment meant for test, measurement and laboratory use, and is designed to operate from single phase, three wire power systems. This equipment must be installed within a suitably wired equipment rack, utilizing a three wire (grounded) mains connection. See wiring section of this manual for complete electrical wiring instructions. (EN61010-1:2001, Cl.6.10.1)
4. This power supply has secondary output circuits that are considered hazardous, and which exceed 240 VA at a potential of 2V or more.
5. The output wiring terminals of this power supply has not been evaluated for field wiring and, therefore, must be properly configured by the end product manufacturer prior to use.
6. For complete circuit protection of the end product, as well as the building wiring, it is required that a primary circuit protection device be fitted to the branch circuit wiring. (EN61010-1:2001 Cl. 9.5)
7. When installed with other components and/or power supplies, hazardous voltages may be present within during normal operation. All operator adjustments are made via externally accessible switches, controls and signal lines as specified within the individual power supply operating instructions. There are no user or operator serviceable parts within this product enclosure. Refer all servicing to qualified and trained Kepco service technicians.

TABLE OF CONTENTS

SECTION		PAGE
SECTION 1 - DESCRIPTION		
1.1	General	1
1.2	Electrical	2
1.3	Mechanical	2
1.4	Accessories	2
SECTION 2 - CONFIGURING THE CA 400 RACK ADAPTER		
2.1	Input Power	6
2.1.1	General	6
2.1.2	Safety Grounding	6
2.1.3	Source Power Connections	6
2.2	Load Connections	7
2.3	Control Signal Connections	7
2.4	Slot 1 Configuration	7

LIST OF FIGURES

FIGURE	TITLE	PAGE
1	Kepeco Model CA 400 Rack Adapter	1
2	CA 400 Backplate Assembly	2
3	Controller to Power Module Interface	3
4	CA 400 Interconnections and Input/Output Pin Connections	4
5	Mechanical Outline Drawing of the CA 400 Rack Adapter	5
6	Load Connector Assembly Procedure	8

LIST OF TABLES

TABLE	TITLE	PAGE
1	Accessories	3

SECTION 1 - DESCRIPTION

1.1 GENERAL

The Kepco Model CA 400 Rack Adapter (Figure 1) is designed for the installation of Kepco MST Series Power Supplies into a non-standard width rack. Each rack adapter can accommodate a maximum of five power supplies, or four power supplies and a communication bus controller (Kepco Model MST 488-27) installed in slot 1. The CA 400 has a removable plate at the rear of slot 1 to allow for the controller connector.

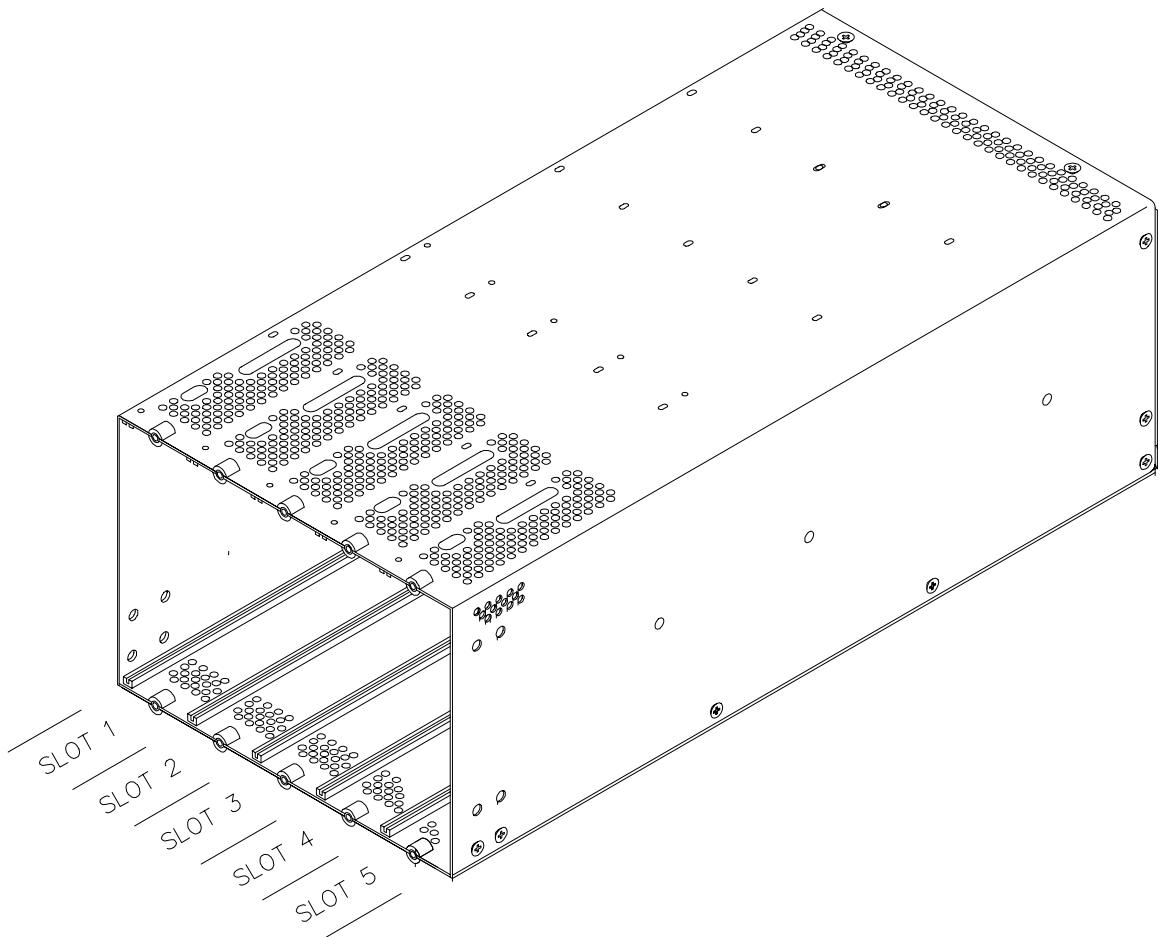


FIGURE 1. KEPKO MODEL CA 400 RACK ADAPTER

1.2 ELECTRICAL

The rack adapter contains a PCB backplane whose connectors mate with the MST Power Module plug-in connectors to facilitate rapid installation of the power modules. The a-c input terminal blocks (J6) on the backplate assembly (Figure 2) distributes input power to five PCB-mounted a-c input/control bus power connectors (P1 - P5) as shown in Figure 4. Two-wire IEEE 1118 control bus data is supplied to the five a-c input/control bus power supply connectors via two 9-pin connectors (six pins are not used), J7 and J8 on the backplate assembly. The utilized pins of the two IEEE 1118 control bus connectors are paralleled, facilitating "daisy chain" control bus configurations. A shield connection is routed to connector P1 for grounding within the controller when a controller is installed; otherwise this connection is not used.

The d-c output connectors of the MST power supplies installed in the rack adapter are accessed via connector extenders (J1 - J5) mounted on the backplate assembly.

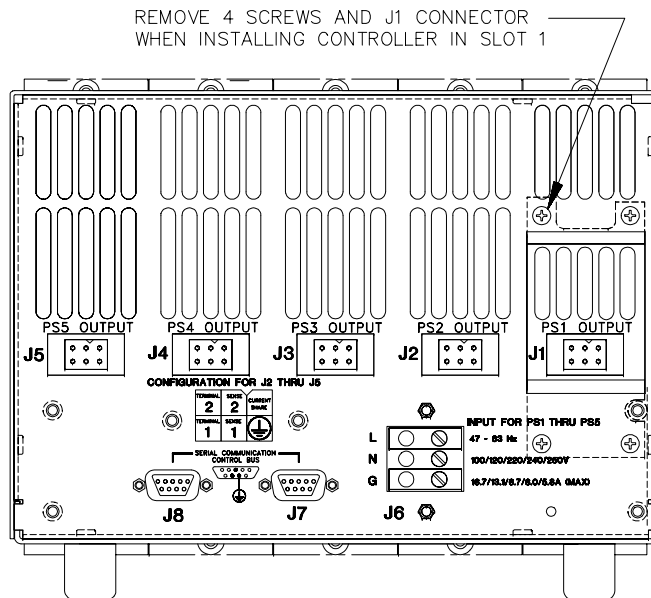


FIGURE 2. CA 400 BACKPLATE ASSEMBLY

1.3 MECHANICAL

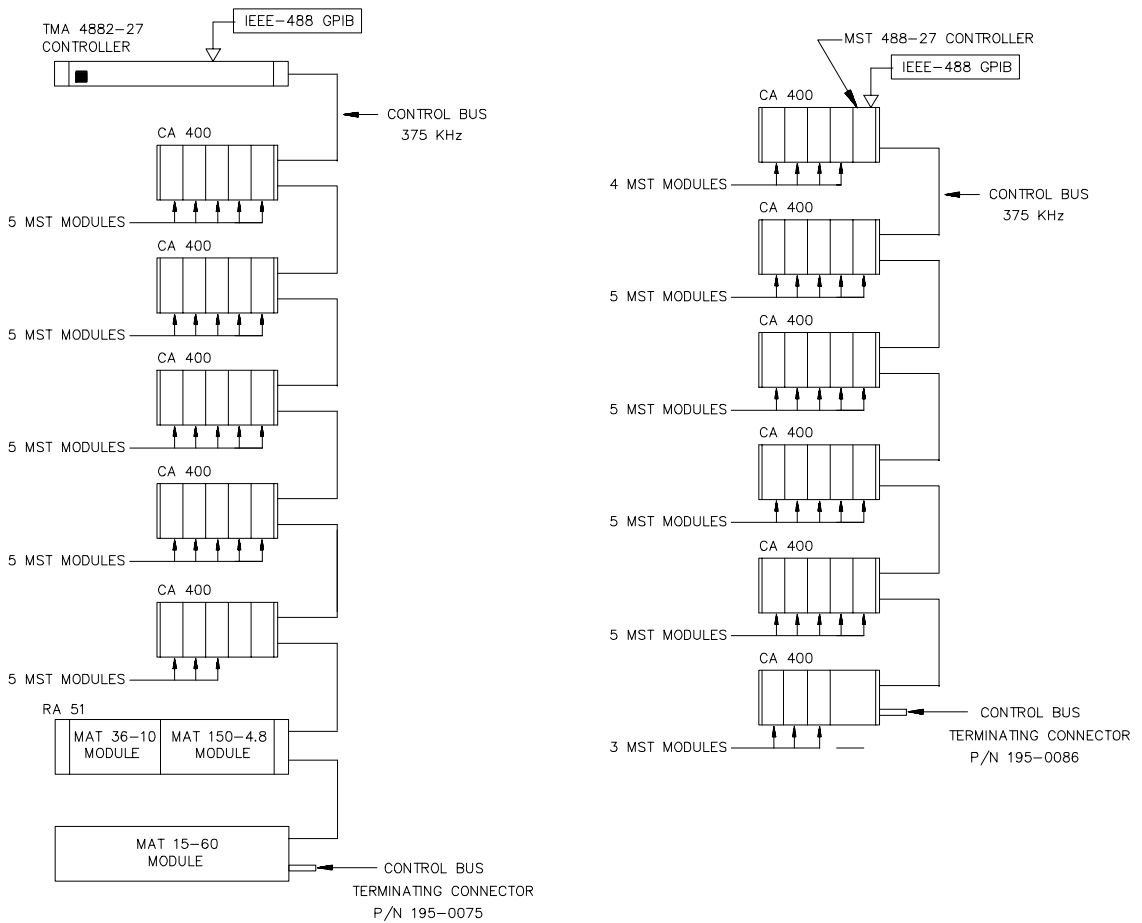
The rack adapter is pre-drilled to accept chassis slides. It is equipped with four metal foot attachments; mounting ears and rack adapter handles are available as accessories (see Table 1). The rack adapter can use 18-inch (457.2 mm) Jonathon Model 110-QD-18-2 chassis slides. The rack adapter can be equipped with optional 1/5 rack blank filler panels (Kepco Model RFP 55-1) if the full complement of five power supplies is not utilized.

Mechanical dimensions, material, and finish of the Kepco Model CA 400 Rack Adapter are provided in Figure 5.

1.4 ACCESSORIES

Table 1 lists the accessories provided with the CA 400 Rack Adapter. A controller and up to 27 MST, MAT or MBT Power Modules can be connected in a daisy chain configuration as shown in Figure 3. The last power module control bus outlet (in the daisy chain) must be terminated with an IEEE1118 Control Bus Terminator supplied with the Rack Adapter; even if only one Rack

Adapter is used (for one rack, use either connector J7 or J8). Note that IEEE 1118 requires a daisy chain configuration only; other configurations (e.g., star) are not supported by Kepco.



- NOTES: 1. MAXIMUM OF 27 UNITS CAN BE CONTROLLED (ANY COMBINATION)
 2. TERMINATOR MUST BE CONNECTED EVEN IF ONLY ONE RACK ADAPTER USED.
 3. CONFIGURATIONS OTHER THAN DAISY CHAIN NOT SUPPORTED.

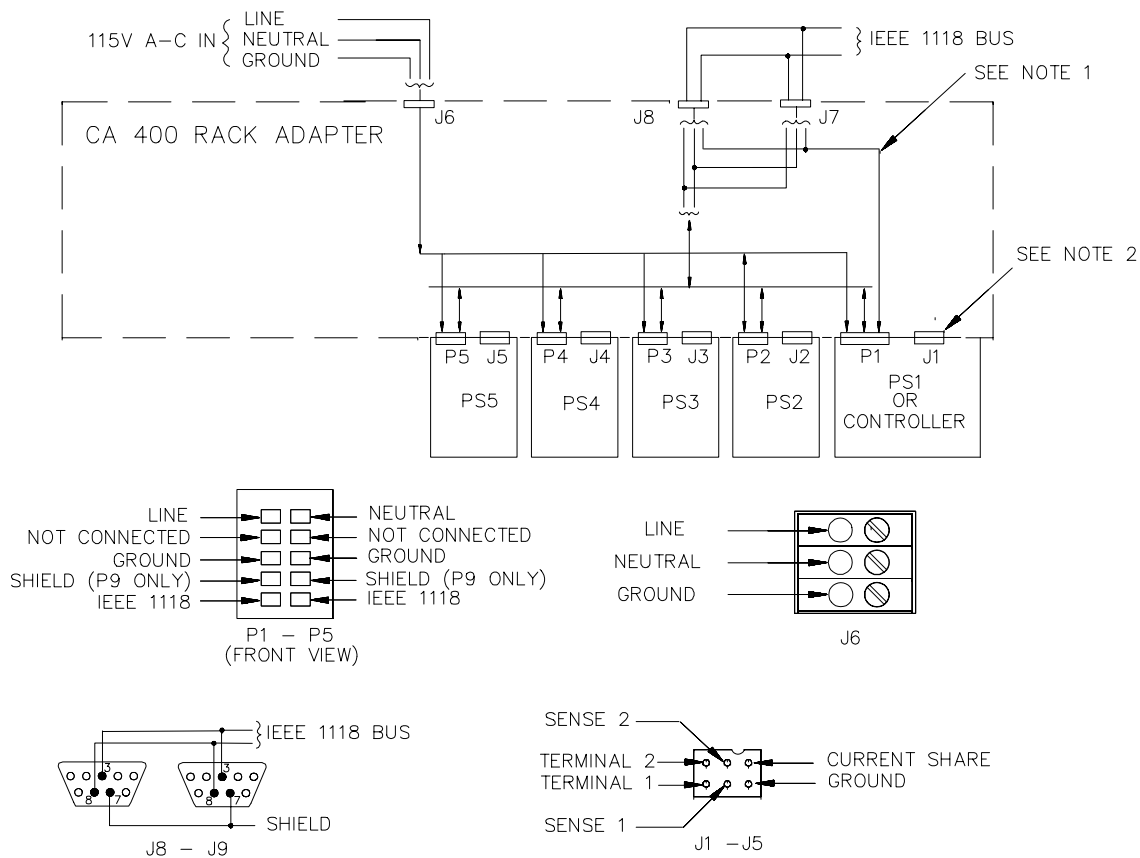
FIGURE 3. CONTROLLER TO POWER MODULE INTERFACE

TABLE 1. ACCESSORIES

ITEM	PART NO.	QUANTITY SUPPLIED
Connector Shell	Kepco - 142-0372 (Positronic Industries - MS112N)	5
Contact, 12 Gauge	Kepco - 107-0327 (Positronic Industries - PLB06M0050)	36
Cable (BIT bus, 2 meters long, with two 9-pin DSUB connectors)	Kepco - 118-0844	1
Terminator, IEEE1118 Control Bus	Kepco - 195-0086	1

TABLE 1. ACCESSORIES (CONTINUED)

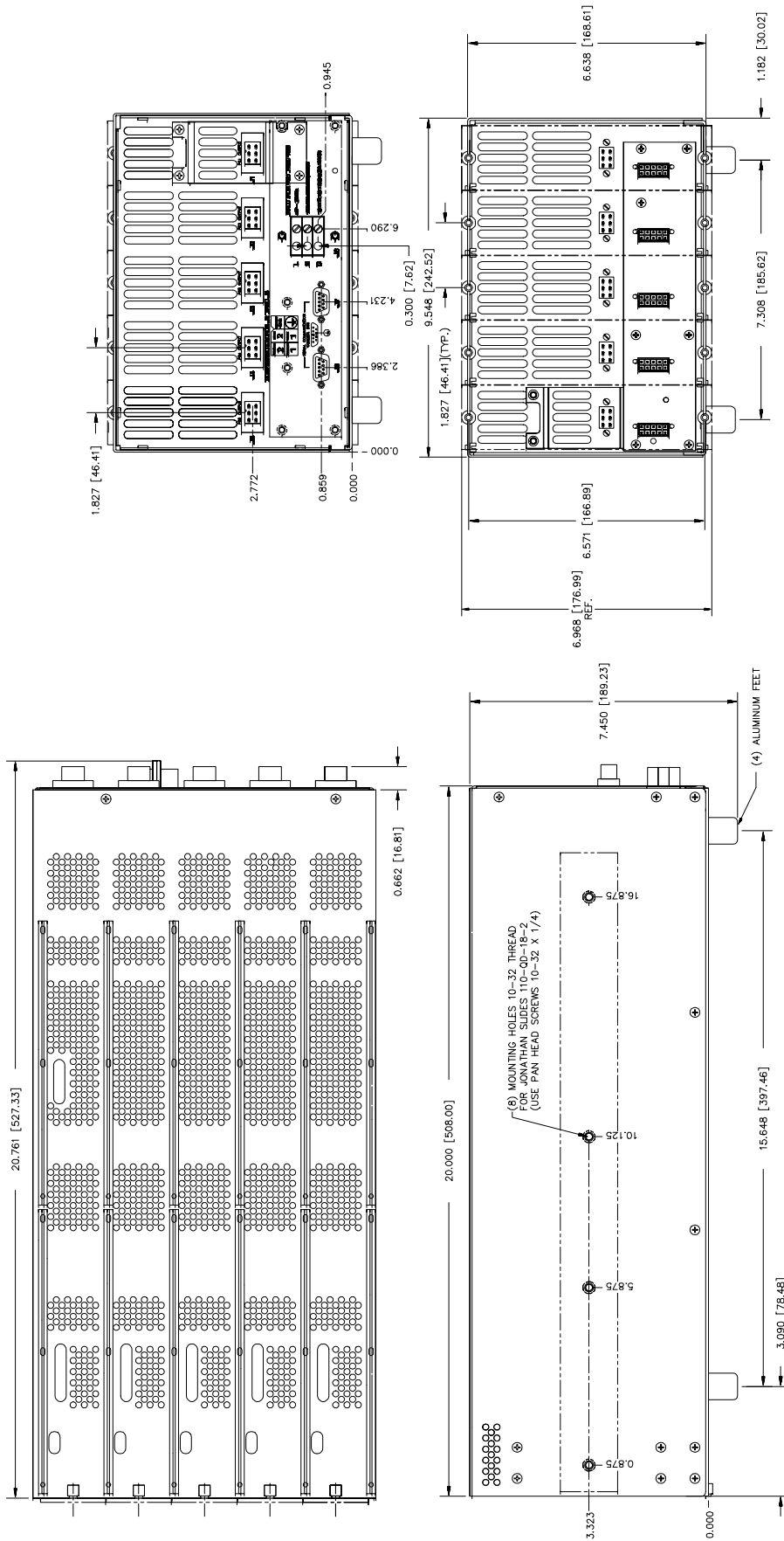
ITEM	PART NO.	QUANTITY SUPPLIED
Chassis Slide	Kepeco 108-0249 (Jonathan 110-QD-18-2)	(Not supplied)
Mounting Ear Bracket	128-1791	(Not supplied, 2 required per rack adapter)
Screw (mounting ear bracket to chassis)	101-0407 (6-32 x 3/16 St., FLPO)	(Not supplied, 2 required per ear bracket)
Handle	139-0229	(Not supplied, 1 required per ear bracket)
Ferrule	170-0001	(Not supplied, 2 required per handle)
Screw (Handle to mounting ear bracket)	101-0396 (10-32 x 1/2 St., FLPO)	(Not supplied, 2 required per handle)
Screw (Secure MST modules to chassis for transportation purposes)	101-0406 (8-32 x 5/8 St. RHPH, Thread cutting Type 23)	(Not supplied, 2 required per MST module)



NOTES:

1. IF MST 488-27 CONTROLLER INSTALLED, SHIELD CONNECTED TO GROUND WITHIN CONTROLLER. IF PS1 INSTALLED, THIS LINE NOT USED.
2. J1 REMOVED IF CONTROLLER INSTALLED.

FIGURE 4. CA 400 INTERCONNECTIONS AND INPUT/OUTPUT PIN CONNECTIONS



- NOTES:
- MATERIAL:
 - CHASSIS STEEL CRS #11 GAGE
 - COVER, BACKPLATE STEEL CRS #16 GAGE
 - FINISH:
 - CHASSIS & BACK COVER: YELLOW IRIDIITE.
 - FRONT PANEL & ANGLE BKT: KEPCO GRAY.
 - COVER: YELLOW IRIDIITE
 - RACK OR CABINET MOUNTING: REMOVE (4) ALUMINUM FEET
 - DIMENSIONS IN PARENTHESSES ARE IN MILLIMETERS.
 - TOLERANCES:
 - BETWEEN MOUNTING HOLES: $\pm 1/64$ (± 0.4)
 - ALL OTHER DIMENSIONS: $\pm 1/32$ (± 0.8), EXCEPT AS NOTED.

FIGURE 5. MECHANICAL OUTLINE DRAWING OF THE CA 400 RACK ADAPTER

SECTION 2 - CONFIGURING THE CA 400 RACK ADAPTER

CAUTION

THE RACK ADAPTER SHOULD BE MOUNTED AND FASTENED SECURELY TO RACK BEFORE INSTALLING POWER SUPPLIES TO AVOID DISTORTION OF THE RACK ADAPTER. (INSTALL POPULATED RACK ADAPTER ONLY IF BOTTOM OF RACK ADAPTER IS FULLY SUPPORTED.) FAILURE TO OBSERVE THIS CAUTION MAY RESULT IN MISALIGNMENT OF THE POWER SUPPLIES WITH THE RACK ADAPTER.

NOTES:1.Prior to installation of MST Power Modules, remove the plate installed in slot 3 (see Figure 1) for support during shipping.

2. If Rack Adapter is received with MST Power Modules already installed, each Power Module is secured to the Rack Adapter with two shipping screws. These screws are accessible from the bottom of the Rack Adapter, and must be removed before installing the Rack Adapter, otherwise the MST Power modules cannot be removed from the Rack Adapter.

2.1 INPUT POWER

2.1.1 GENERAL

Interconnections between an a-c power source and a stabilized power supply, and between the power supply and its load, are as critical as the interface between other types of electronic equipment. If optimum performance is expected, certain rules for the interconnection of input power source, power supply and load must be observed by the user. These rules are described in detail in the following paragraphs. All interconnections are accomplished at the backplate assembly (Figure 2). Refer to Figure 3 for CA 400 interconnections and input/output connector pin assignments.

2.1.2 SAFETY GROUNDING

National and international safety rules dictate the grounding of the metal cover and case of any instrument connected to the a-c power source. The instructions below suggest wiring methods which comply with these safety requirements; however, in the event that the specific installation for the power system involves differences with the recommended wiring, it is the customers responsibility to ensure that all local electrical codes for safety grounding are met.

2.1.3 SOURCE POWER CONNECTIONS

CAUTION

THE CA 400 DOES NOT INCORPORATE ANY SAFETY INTERRUPT DEVICES. PROTECTION OF INPUT WIRING REQUIRES USER-CONFIGURED SAFETY INTERRUPTS.

The backplate assembly of the CA 400 includes a 3-terminal terminal block (J6) to allow for the connection of single-phase source power. The connector positions are labeled L, N, and G. Their functions are as follows:

- **Terminal G (Ground)** is the safety ground connection for the CA 400, is connected to the CA 400 chassis and to the safety ground terminal of the input power connector for each of the five mounting positions via the PCB backplane. Terminal G must be con-

nected to safety ground in order to ensure proper grounding of the MST power supplies and MST 488-27 Controller (when installed).

- **Terminals L (Line Phase) and N (Neutral)** are connected to the input power entry connectors. J6 provides a-c power to connectors P1 through P5.

The following standard wiring configuration is recommended by Kepco as being compliant with applicable national and international safety standards. Please consult local electrical codes for wire current ratings and other specific requirements:

- Connect Terminal G of the CA 400 input power terminal block (J6) to safety ground
- Connect a wire pair from input power to the L/N terminal pair of the input power terminal block (J6).
- Wire size is determined by the maximum rated source current for each MST power supply and the number of MST modules installed. Operation below 100V rms can result in source current in excess of 15A at terminal block J6. For this reason Kepco recommends use of #14 AWG wire (minimum) in fully populated systems. For lower system power configurations, smaller wire can be used; contact Kepco Applications Engineering for assistance.

2.2 LOAD CONNECTIONS

Load connections to the CA 400 are achieved via the five individual connectors (J1 - J5) located on the backplate assembly directly behind each mounting position (see Figures 2 and 4). Mating connectors (assembly required) are supplied (see Figure 6).

NOTE

REGARDLESS OF OUTPUT CONFIGURATION, OUTPUT SENSE LINES OF MST POWER SUPPLIES MUST BE PROPERLY CONNECTED FOR OPERATION (REFER TO MST INSTRUCTION MANUAL).

2.3 CONTROL SIGNAL CONNECTIONS

Access to the IEEE 1118 communication control bus for each power supply is provided via two 9-pin D-subminiature type connectors (J7 and J8) on the backplate assembly (see Figures 2 and 4). Two pins of each connector are used for the 2-wire control bus; the third pin is utilized when a controller is installed in slot 1, allowing the shield to be grounded within the controller.

2.4 SLOT 1 CONFIGURATION

The unit is shipped with slot 1 configured to accept an MST power supply. To install a controller in slot 1, remove J1 connector plate by removing four screws at the backplate assembly (see Figure 2).

NOTE: Before installing MST Power Module in CA 400 Rack Adapter, pull out the two captive thumb screws at the front of the Power Module and turn counterclockwise until the threads engage.

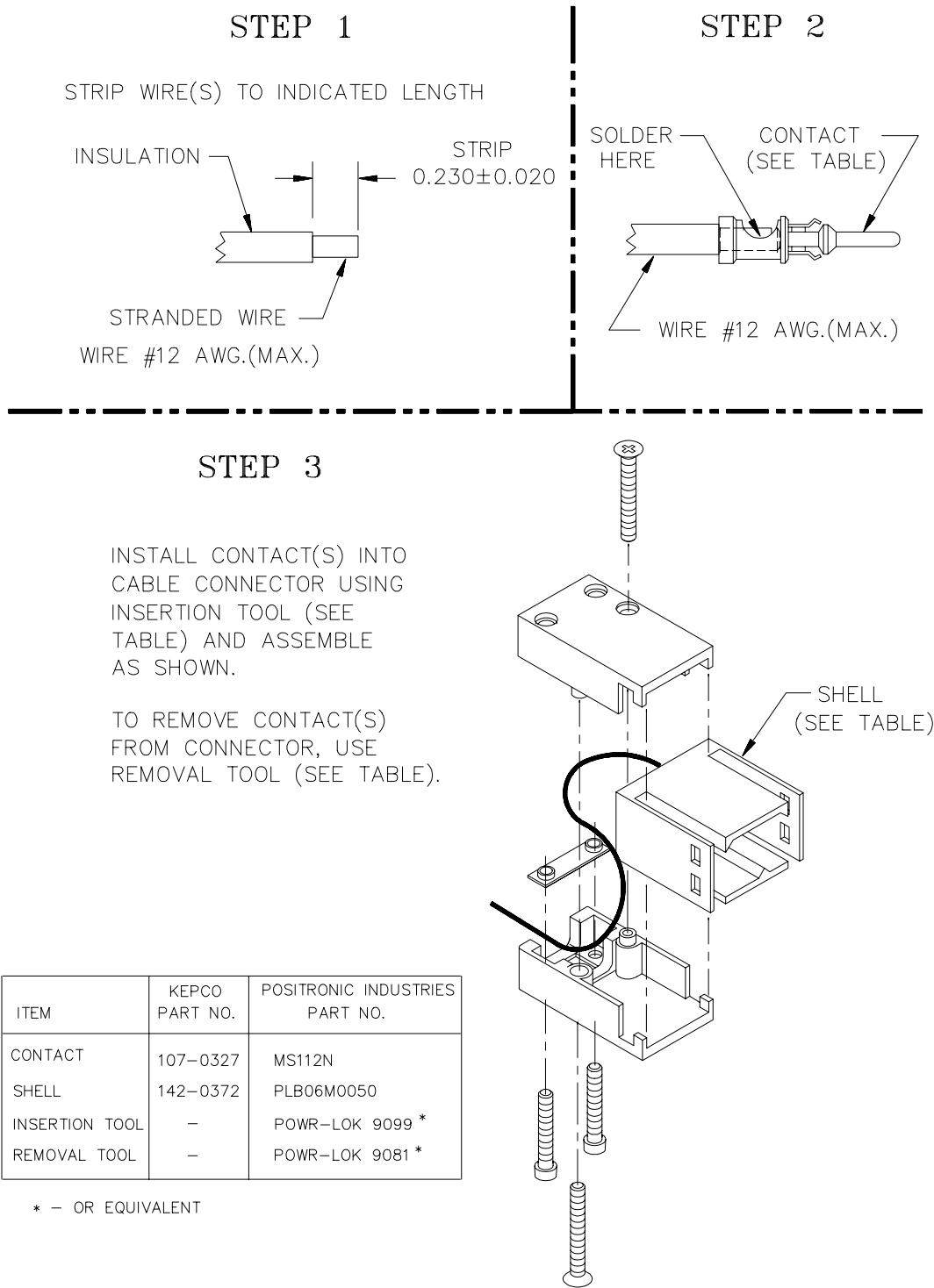


FIGURE 6. LOAD CONNECTOR ASSEMBLY PROCEDURE