

**OWNER'S MANUAL**

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**PV 400FC**

**PV 750FC**

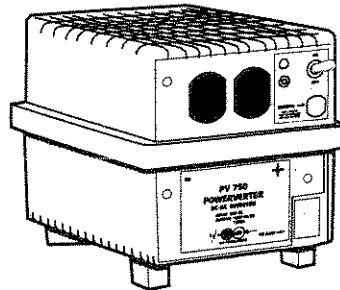
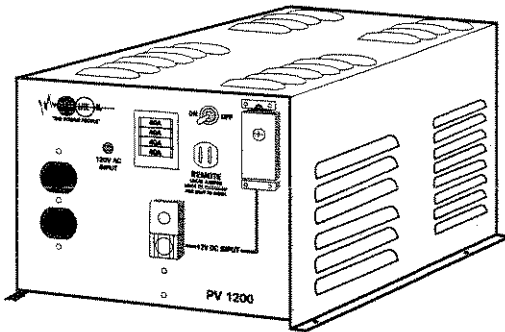
**PV 1200FC**

**PV 1800FC** (24 Volt)

**PEAK POWER, HIGH EFFICIENCY  
FREQUENCY-CONTROLLED  
DC-TO-AC POWER INVERTERS**

**INCLUDES 220-240V AC OUTPUT AND 24V DC INPUT MODELS  
SUITABLE FOR VEHICULAR AND MARINE INSTALLATION**

**\*\*These units are NOT recommended for life support applications\*\***



500 N. Orleans  
Chicago, Illinois 60610  
Tel: 312/755-5401  
FAX: 312/644-6505  
FaxBack: 312/755-5420

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**WARNING!**

Tripp Lite does not recommend the use of any of its Power Inverters in any life support application where a malfunction or failure of a Tripp Lite Power Inverter could cause failure or significantly alter the performance of the life support device. Contact Tripp Lite for further information on this subject.

**INTRODUCTION**

The PV 400FC, 750FC, 1200FC and 1800FC are peak power, high efficiency, frequency-controlled electronic power inverters. These units will operate off any 12.8V DC source of sufficient amperage capacity (24V DC units require a 24 volt input source) and convert this power into highly useable 120V AC, 60 Hz. or 220-240V AC, 50/60 Hz. frequency-controlled power (depending on model) to run electronic equipment such as computers, VCRs, CD players, stereo equipment, appliances (microwaves, refrigerators, etc.), sump pumps, air conditioners, electric motors (up to 1/8 hp for PV 400FC, up to 1/4 hp for PV 750FC; up to 1/2 hp for PV 1200FC and up to 3/4 hp for PV 1800FC), power tools, lights, etc. The advanced circuitry enables these inverters to power virtually any device that runs off standard AC power, without the limitations of previous devices.

These inverters feature sophisticated electronic circuitry which provides high peak power output to start and run heavy-draw, inductive-type devices. See p. 4 for more information concerning electric motor starting. Overload protection and regulated frequency output are also included.

All units have modified-sine wave output, polarity protection, output voltage regulation and a remote "ON/OFF" switch interface (PV 400FC does not have remote interface).

When installing these units, care must be taken to provide adequate ventilation for proper cooling. Since the units are designed for vehicular operation, they must be securely fastened to the surface they are mounted on. Refer to the "Installation" section for complete mounting and wiring guidelines.

**INVERTER CONTROLS**

Operation of the inverter is simple. There are a minimum number of controls on the front panel, as follows:

- 1. Main Power "ON/OFF" Switch:** This switch controls power to the inverter circuitry. This switch must be ON whenever using the inverter.
- 2. AC Power "ON" Indicator Light:** This indicator light illuminates RED whenever the inverter is supplying converted AC power to connected devices.
- 3. DC Input Terminals:** These two terminals are equipped with wing nuts or lug terminals depending on model. Connect 12 or 24V DC power (depending on model) of sufficient amperage to these terminals. Make sure nothing comes in contact with the terminals while they are connected to the battery. Observe polarity at all times. If the terminal polarity is accidentally reversed, the unit will not be damaged, but the fuses will blow.
- 4. AC Outlets:** Two NEMA 5-15R AC receptacles allow connection of equipment designed to run on 120V AC, 60 Hz. or 220-240V AC, 50/60 Hz. electric power, depending on model. Be sure equipment that is plugged into the inverter has a wattage draw equal to or less than the maximum continuous output of the inverter.

**CAUTION!**

220-240V AC/50-60 Hz. models also feature NEMA 8-15R receptacles, due to AC plug adapters for this style of receptacle being more readily available in different parts of the world.

**5. DC Fuses:** There are two fuses on the PV 400FC and PV 750FC and four fuses on the PV 1200FC and PV 1800FC. These fuses protect the inverter against overload and your vehicle electrical system from short circuit. If too much wattage is drawn from the AC outlets or in the event of a major electronic failure, these fuses will blow to protect the inverter circuitry and your vehicle from damage.

**6. Remote "ON/OFF" Socket (except PV 400FC):** This socket allows connection of a standard SPST (single pole-single throw) switch for remote control operation of the inverter. Required switch rating is 1 amp at 24V DC. Switches are available from your local electronics dealer. With the switch installed, the inverter can be turned ON from a remote location, ideal if the inverter is not easily accessible where it is installed. If remote switch is not connected, the remote bypass jumper wire must be installed.

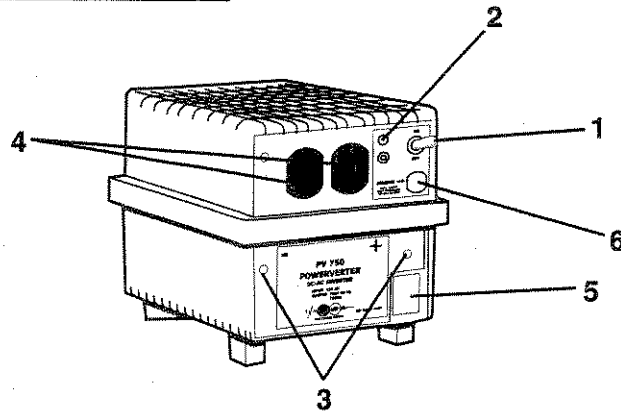
**CAUTION!**

Using EITHER switch will turn the inverter OFF. Both the panel-mounted "ON/OFF" switch and the Remote "ON/OFF" switch must be ON to turn the inverter ON. If remote switch is not connected, the remote bypass jumper must be installed!

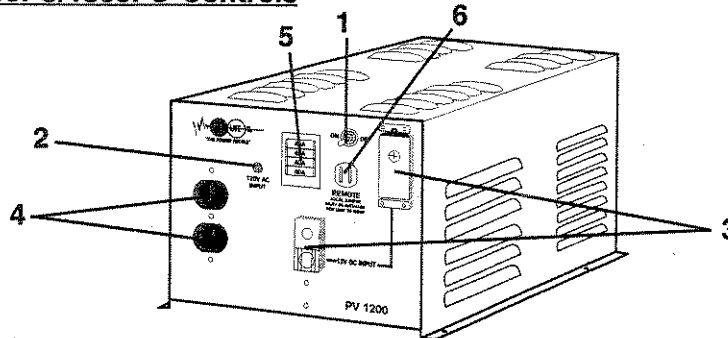
**UNPACKING**

Carefully unpack the inverter from its carton. Be sure to save all the original packing material in case the unit must be sent in for service. Improper packing may void your warranty.

### PV 400FC/750FC Controls



### PV1200FC/1800FC Controls



### INSTALLATION

The inverters in this manual are intended for vehicular and marine use in a dry, protected environment. These units **must** be secured in place if used in a mobile or marine environment to prevent the unit from moving around. Due to their size and weight, the inverters should be mounted **directly** to a rigid horizontal surface or to a strong mounting bracket or plate, as follows. All power must be disconnected and the units turned OFF before mounting. Remove the top cover on the PV 400/750FC to facilitate mounting. Refer to the illustrations on p. 6 for mounting dimensions for all inverter models.

**PV 1200FC/1800FC:** There is a metal mounting flange as part of the top cover. There are two mounting holes on each side of the flange. Use large screws or bolts to secure the inverter to a rigid surface using the holes provided.

**PV 400FC/750FC:** There are 4 mounting bosses and holes molded into the bottom of the PV 400FC/750FC case, immediately adjacent to the transformer. These holes will accept #10 (3/16" or 4 mm) fasteners. A spacer 3/4" or 19 mm in height **MUST** be used between the outside bottom of the inverter case and the mounting surface to prevent the case from flexing or cracking from the torque of the mounting fasteners as they are tightened.

#### **NOTE!**

**DO NOT** mount either inverter to a vertical surface using the above methods. The weight of the transformer makes vertical mounting impractical. Vertical mounting also reduces air flow essential for cooling the unit.

If installing your inverter in a **marine** environment, keep in mind the following points:

- The inverter is deliberately designed with an open, well-ventilated cabinet to keep the unit cool during operation. A shield should be installed over the inverter (leaving at least 2" clearance for air circulation) to keep water out of the unit.

- Due to movement of the ship, extra effort should be taken to make sure the inverter is securely fastened down. See the instructions listed above for secure mounting.

4 Even though these units are high-efficiency converters of electricity, their output capacity (400 watts, 750 watts, 1200 watts and 1800 watts continuous, respectively) is limited by three primary factors:

- The amp-hour size of the battery supplying power to the inverter;
- The amp-capacity of the alternator charging the battery;
- The length and gauge of the wires running from the battery to the inverter

If any of these items are not sufficient to supply the recommended current, output power of the inverter will be less than its rated maximum.

**WARNING!**

If using AC shore power at anytime with the inverter, the user must make sure that AC shore power cannot enter the output of the inverter while the inverter is operating. Contact Tripp Lite Customer Service at (312) 755-5401 for more information on this subject.

**CAUTION!**

Never operate the inverter from an alternator with battery disconnected. Abnormal high voltage may damage the inverter.

The high efficiency of the inverter converts most of the battery power into useable AC power. Using the inverter on an unsupported battery (a battery that is not being recharged) will cause the battery to discharge faster depending on the size of the load connected to the inverter. It is recommended that the engine be running at a high idle (about 1500 RPM) while using the inverter, in order to replenish the battery charge.

The inverter must be installed in a location that allows sufficient cooling, away from any sources of heat. Make sure the vents are not blocked. Use the shortest leads with the largest diameter possible when connecting the inverter to the battery. Short, large diameter leads limit DC voltage drop and allow for maximum transfer of current. Connect the inverter input terminals directly to the battery with the heaviest wire available. Smaller gauge numbers indicate heavier wire. **Observe battery polarity at all times.** Always connect Positive//Red//+ to Positive//Red//+ and Negative//Black//- to Negative//Black//-.

Remember that the inverters are capable of delivering much higher wattage outputs for brief periods of time. Therefore the wiring should be configured to handle this brief high-current potential draw. Use large ring terminals on the ends of the wires that are connected to the DC input terminals on the PV 400FC and 750FC. The terminals on the PV 1200FC and 1800FC directly accept wire from 2/0 to 4 gauge.

The PV 400FC, 750FC, 1200FC and 1800FC can deliver 20% more wattage than their continuous rated output for time periods up to 5 minutes. This peak power delivery is limited by changes in ambient temperature.

**WARNING!**

Never short or bridge the two DC input terminals together. **DO NOT** allow anything to come into contact with these terminals during inverter operation or whenever the inverter is connected to a battery. Serious injury to person and/or property could result. You may cover or insulate these terminals once the battery is connected, to help protect against accidental short circuits. Sparks may result during final battery connection, so the battery location must be kept fully ventilated. Explosive hydrogen gas can accumulate near the battery if it is not kept well ventilated.

	PV 400FC	PV 750FC	PV 1200FC	PV1800FC
Watts Out- (Max., continuous):	400	750	1200	1800
Current Draw (cont.) For Max. Power:	42 amps	78 amps	130 amps	95 amps
Recommended Wire Gauge:	10 gauge or 2 x 14 gauge	6 gauge or 2 x 10 gauge	0 gauge or 2 x 4 gauge	0 gauge or 2 x 4 gauge

**INVERTER OPERATION**

Before using the inverter, double check all electrical connections for tightness and correct polarity. Turn OFF equipment before plugging it into the inverter. Turn ON the inverter then turn ON the connected equipment. Do not start the vehicle while the inverter is running. Turn OFF the inverter first, then start the vehicle. AC extension cords may be used to connect devices to the inverter. The use of grounded, 14 ga., 3-wire extension cords 100' in length or less, if necessary, are recommended.

**NOTE!**

These units are capable of starting an electric motor of the rated horsepower listed on p. 2. Certain electric motors take a large amount of power to start, but much less power to continue running. After the inverter has started an electric motor, it will have reserve power while the motor is running to power other devices. At this point, the load on the inverter may be increased at your discretion.

If the inverter is powering a motor that cycles on and off in relation to demand (refrigerators, sump pumps, etc.), the peak power requirements used to start the motor will recur at an undetermined rate. Under these parameters, a full load of devices plus the peak power demands of the motor hooked to the inverter may cause overloading of the unit. This possibility should be considered when determining the size of the inverter and the loads connected to it.

## INVERTER FEATURES

### •OVERLOAD PROTECTION

The inverter has built-in protection against overload. If the overload is too great or lasts for more than the few seconds normally required to bring a motor up to speed, an electronic turn off will occur. Turn the Power Switch OFF and wait one minute before turning back on. This will release the overload shutdown circuit and again power the load (providing the excess load has been removed). If the unit is repeatedly overloaded or a major electronic failure occurs, the fuses on the front panel will blow, protecting the inverter and your vehicle wiring from damage. The fuses are standard automotive "blade" style fuses and should only be replaced with this exact style and type. Using non-rated fuses could cause equipment damage or failure and could void your warranty.

### •HIGH EFFICIENCY

The inverter operates at high efficiency and generates minimal heat during use. This efficiency rating is maintained throughout the inverter's load range, diminishing moderately at maximum output. Typical efficiency of the inverter is 90% or better with 50% load @ 12.5V DC (or 25V DC depending on model); typical efficiency is 85% or better from 20% to 80% load. If long term support is desired, the engine of the vehicle must be run at a high idle (approximately 1500 RPM) or larger capacity batteries, connected in parallel (two or more batteries with positive to positive and negative to negative terminals connected) to increase their amp-hour capacity, should be used to power the inverter.

### •FREQUENCY CONTROLLED OUTPUT (all models)

This feature allows devices dependent on AC line frequency (50 or 60 Hz.) to operate properly without variation in pitch or speed. Devices that are dependent on line frequency include computers, VCRs, CD players, tape recorders, clocks and turntables. The inverter's modified sine wave output and voltage regulation provide additional stability for operation of frequency-dependent devices.

#### NOTE!

DO NOT plug a surge suppressor, line conditioner or UPS into the AC output receptacles of these units.

#### NOTE!

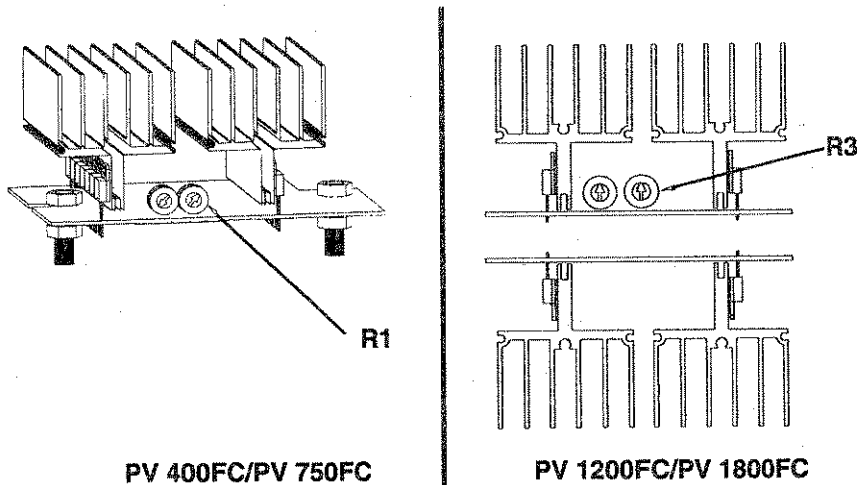
On 220-240 Volt units ONLY, the output frequency is adjustable from factory set 50 Hz. to optional 60 Hz. by a qualified technician. The output frequency is NOT adjustable on 60 Hz. units. **THIS ADJUSTMENT IS FOR EXPORT ONLY.**

## FIELD ADJUSTABLE PARAMETERS

### WARNING!

Intended for export use only. Only qualified electronics technicians should attempt to set or adjust these setpoints. The user accepts responsibility for any resetting or readjustment of these setpoints. Equipment damage or personal injury could result from improperly adjusted setpoints. Domestic user adjustment voids warranty!

The PV series features field adjustable set-points that set output line frequency. The potentiometer location for each model is shown below.



## **MAINTENANCE**

The inverter requires no maintenance but should be kept dry at all times. Periodically check all cable connections both at the inverter and at the battery. Clean and tighten as necessary.

## **IF YOU SHOULD NEED SERVICE**

Should you require service which goes beyond what is explained in the "Troubleshooting Guide" section of this manual, do the following:

Call Tripp Lite Technical Support at (312) 755-5401. Explain fully the perceived problem to the technical support person. They will either remedy the problem over the phone or give you instructions about return, repair or exchange.

If sending your existing unit back to Tripp Lite, use the ORIGINAL PACKING MATERIAL that came with the unit.

1. Carefully pack the inverter using the ORIGINAL PACKING MATERIAL that came with the unit. Adequate packing is essential to ensure the inverter is not damaged in transit. Be sure to save the original carton and styrofoam inserts. Your warranty may be voided if the inverter is sent back to Tripp Lite in improper packaging.
2. Enclose a letter describing the symptoms of the problem. This will help speed turn-around time.
3. If the inverter is within the 1 year warranty period, enclose a copy of your sales receipt. SEND THE INVERTER TO:

**TRIPP LITE  
418 W. ILLINOIS  
CHICAGO, IL 60610  
ATTN: REPAIR DEPARTMENT**

## **1-YEAR LIMITED WARRANTY**

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship for a period of one year from the date of initial purchase. If the product should prove defective in material or workmanship within that period, Seller will repair or replace the product, in its sole discretion. Service under this Warranty can be obtained by your delivering or shipping the product (with all shipping or delivery charges prepaid) to: Tripp Lite, 418 W. Illinois, Chicago, IL 60610. Seller will pay return shipping charges. Call Tripp Lite at (312) 755-5401 before sending any equipment back for repair.

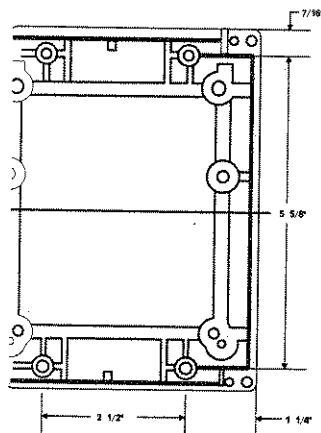
THIS WARRANTY DOES NOT APPLY TO NORMAL WEAR OR TO DAMAGE RESULTING FROM ACCIDENT, MISUSE, ABUSE OR NEGLIGENCE. SELLER MAKES NO EXPRESS WARRANTIES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY OR FITNESS, ARE LIMITED IN DURATION TO THE WARRANTY PERIOD SET FORTH ABOVE; AND THIS WARRANTY EXPRESSLY EXCLUDES ALL INCIDENTAL AND CONSEQUENTIAL DAMAGES. (Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may have other rights which vary from jurisdiction to jurisdiction).

**Tripp Lite  
500 N. Orleans  
Chicago, IL 60610**

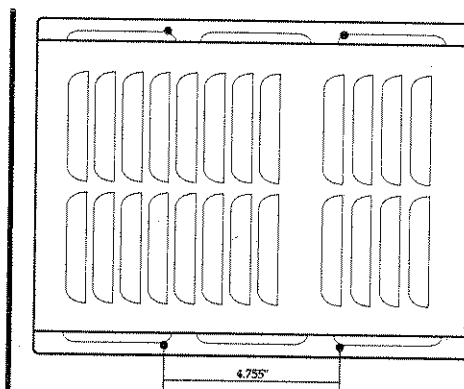
WARNING: The individual user should take care to determine prior to use whether this device is suitable, adequate or safe for the use intended. Since individual applications are subject to great variation, the manufacturer makes no representation or warranty as to the suitability or fitness of these devices for any specific application.

Policy of Tripp Lite is one of continuous improvement. Specifications are subject to change without notice.

## **MOUNTING ILLUSTRATIONS**



**PV 400/750 Hole Centers**



**PV 1200/1800 Mounting Flange  
Hole Locations**

## TROUBLESHOOTING GUIDE

Before sending the unit in for service, call Tripp Lite first at (312) 755-5401. Please check the following:

<u>SYMPTOM</u>	<u>PROBLEM</u>	<u>CORRECTIVE ACTION</u>
Inverter does not turn ON when Main Power "ON/OFF" switch is turned ON.	Batteries discharged.  Remote switch OFF or remote bypass jumper not installed.  One or more fuses are blown.	Recharge batteries before attempting to use inverter.  Turn Remote switch ON or insert remote bypass jumper.  Replace blown fuses. Check for possible overload of the inverter.
Inverter is not able to power devices plugged into it.	Batteries becoming low.  Battery wire gauge size too small.  Power draw of equipment is too high for inverter output.	Recharge battery or run engine. Low battery voltage reduces inverter power output.  Correct wiring. Measure actual DC voltage at inverter input terminals under load.  Check rated power draw of equipment. Make sure it does not exceed the maximum continuous output rating of the inverter.
Inverter output seems intermittent.	Loose wiring connection(s).	Check/tighten all battery and cabling connections.
PV 750/1200/1800FC will not turn ON when used with remote "ON/OFF" switch.	Main Power "ON/OFF" switch must be ON to turn inverter ON when using remote "ON/OFF" switch.	Turn Main Power "ON/OFF" switch ON. (When using remote "ON/OFF" switch, leave Main Power switch ON and control inverter only from remote "ON/OFF" switch).

**SPECIFICATIONS**

Model:	PV 400FC PV int 400FC*	PV 750FC PV int 750FC*	PV 1200FC PV int 1200FC*	PV 1800FC PV int 1800FC*
Output Power, intermittent:	800 watts	1500 watts	2400 watts	3600 watts
Output Power, 5 minutes max.:	480 watts	900 watts	1440 watts	2000 watts
Output Power, continuous:	400 watts	750 watts	1200 watts	1800 watts
Input Voltage (DC, nominal):	12.8V DC	12.8V DC	12.8V DC	24V DC
Input Voltage (range):	11-14V DC	11-14V DC	11-14V DC	22-28V DC
Input No Load DC Current Draw:	.8 amp	1.2 amps	2 amps	1.5 amps
Input Full Load DC Current Draw:	42 amps	78 amps	130 amps	95 amps
Output Voltage (AC; RMS regulated):	120V AC (*220-240V AC)	120V AC (*220-240V AC)	120V AC (*220-240V AC)	120V AC (*220-240V AC)
Output Frequency (regulated +/- 1/2 Hz.):	60 Hz. (*50/60 Hz.)	60 Hz. (*50/60 Hz.)	60 Hz. (*50/60 Hz.)	60 Hz. (*50/60 Hz.)
Output Waveform:	modified sine	modified sine	modified sine	modified sine
AC Outlets:	2 NEMA 5-15R	2 NEMA 5-15R	2 NEMA 5-15R	2 NEMA 5-15R
Circuit Protection (DC overload):	2-30 amp fuses	2-40 amp fuses	4-40 amp fuses	4-40 amp fuses
Dimensions (HxWxD):	7 x 7 x 10"	7 x 7 x 10"	6-1/2 x 8-1/2 x 12"	6-1/2 x 8-1/2 x 12"
Weight:	14 lbs. (*16 lbs.)	17 lbs. (*20 lbs.)	38 lbs. (*45 lbs.)	41 lbs. (*48 lbs.)

**Additional Features:**

- All models feature "ON/OFF" Power Switch, Red AC Power "ON" Indicator Light, DC input terminals with wing nuts or lug terminals and heavy-duty vented cabinets.

- All models feature modified sine wave output, high peak power capability, high efficiency, regulated frequency output, remote "ON/OFF" interface (except PV 400FC), input polarity protection and output voltage regulation.

- On 220-240 volt models of the PV, electrical plug and/or receptacle adapters may be necessary to connect equipment to the unit



