TSi POWER

Operating Manual for:

Outdoor XUPS-600-1000-1500 Compact

MC00047
May, 2014

Table of Contents Page

TRADEMARK
TSi Power, TSi, the TSi Logo and XUPS-600-1000-1500 Compact are trademarks of TSi Power Corporation.

LIMITED WARRANTY
TSi Power Corporation warrants this product to be free from defects in materials and workmanship for two (2) years from the date of purchase from TSi Power or its authorized representatives. TSi will repair (or at its option, replace) any defective component(s) during this warranty period.

To make a request or claim for service under this limited warranty, the original purchaser must return the product, in the original shipping container or equivalent, to TSi Power or its authorized agent, accompanied by a written receipt showing the date of purchase and both the model name and serial number of the product.

Warranty does not cover transportation costs. Damage by misuse, accident or unauthorized tampering of the product is not covered by the warranty. NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED. TSI IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

LIMITATION OF LIABILITY
IN NO EVENT SHALL TSi POWER CORPORATION BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THIS PRODUCT, EVEN IF TSI POWER OR ITS AGENT HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSIONS MAY NOT APPLY TO YOU.

REVISIONS

ISSUE	DATE	REASON FOR REVISION
1	May, 2014	Issue 1

1. GENERAL

1.1 PRODUCT APPLICATION

This outdoor UPS is ideal for the protection of distributed antenna systems (DAS), sewage control systems / perimeter surveillance and security / gate control systems, LED traffic light / roadway display systems and industrial remote terminal units (RTUs). It is equipped with wide-temperature, pure lead, gel batteries and is housed in a weather-protected enclosure. It offers line-interactive automatic voltage regulation, surge protection with heavy duty noise filtering, communications capability and optional extended battery backup.

Figure 1: The XUPS-600-1000-1500 Compact Cabinet

1.2 SAFETY ALERTS

SAFETY SIGNAL WORD DEFINITIONS

This document contains safety alert pictorial Symbols and Words that point out areas and procedures that require special attention with regards to safety. These Symbols and Words are defined in ANSI Z535.4-1998, Product Safety Signs and Labels.

 **DANGER:**

DANGER ***indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.***

 **WARNING:**

WARNING ***indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.***

 **CAUTION:**

CAUTION ***indicates an imminently hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.***

The safety alert pictorial symbol  appears in this document to make users aware of important operating and safety concerns.

1.3 GENERAL CABINET DESCRIPTION

- Built-in automatic voltage regulation enables a wide-input voltage window to deliver power while preventing unnecessary battery drain.
- LED status indicators show voltage, load and battery levels.
- The XUPS is compatible with high-quality generators.
- The cabinet can be wall or pole mounted.
- Rain tested to UL 50E standards.
- Heavy-duty surge protection and noise filtering protects load and UPS.
- The XUPS uses wide-temperature, pure lead, gel batteries and internal cooling fan to extend battery life and protect electronic components.
- Operates in line mode with bad battery bank, which prevents unscheduled service calls.

- The XUPS is easier to repair because internal circuit board assemblies are connectorized.
- Precise output current limiting permits start of induction motors and other difficult loads.
- Includes a two-year limited warranty.

1.4 OVERALL DIMENSIONS – The XUPS-600-1000-1500 Compact cabinet is 20.5" (521 mm) H x 16.5" (419 mm) W x 9.5" (241 mm) D and weighs 100 lb / 45.4 kg (with 2 batteries for XUPS-600), 103 lb / 46.8 kg (with 2 batteries for XUPS-1000) and 110 lb / 49.8 kg (with 4 batteries for XUPS-1500, see Figure 2.

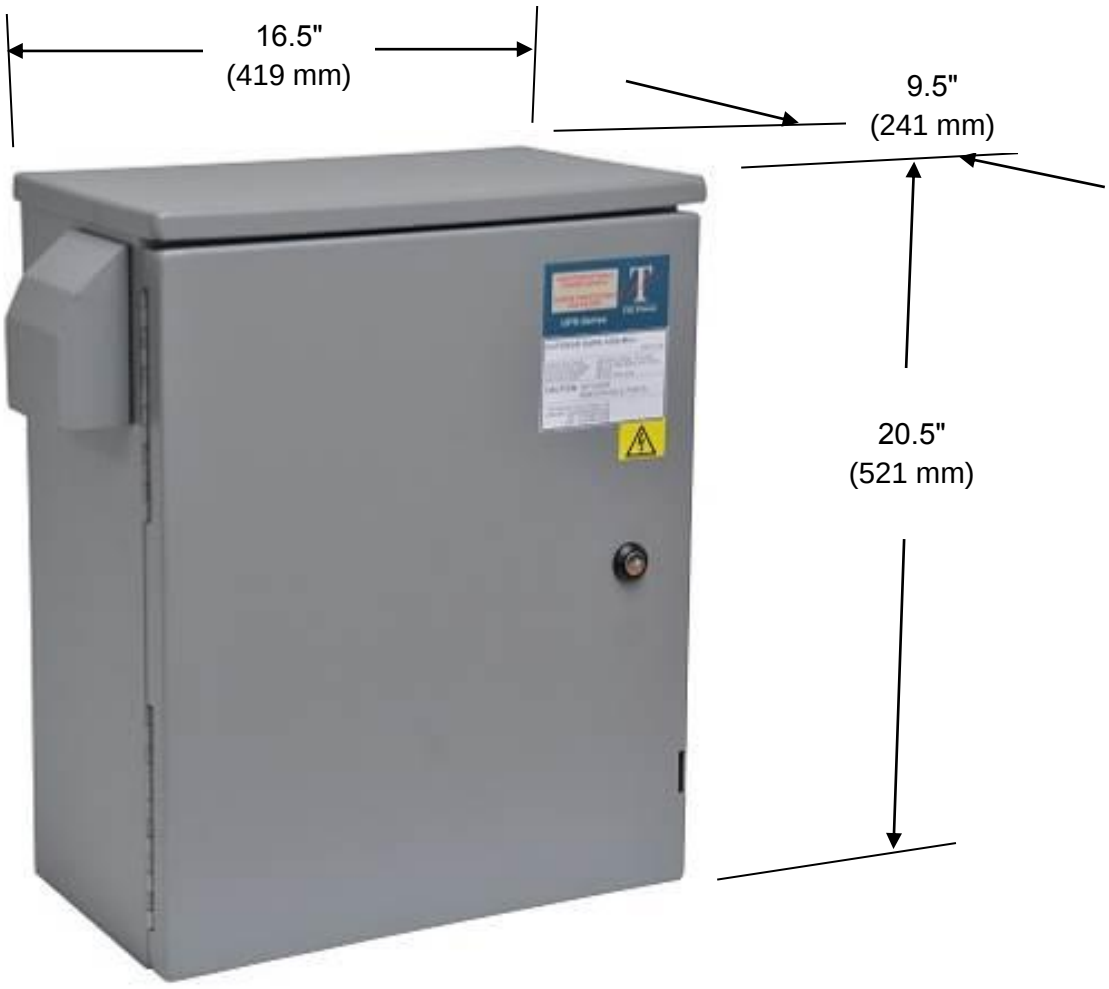

Figure 2: Outdoor XUPS-600-1000-1500 Compact Dimensions

1.5 CONSTRUCTION – The XUPS-600-1000-1500 Compact cabinet is constructed of 5052-H32 aluminum and finished with a gray polyester powder coat that is designed to protect against corrosion, water intrusion UV radiation and impact resistance.

1.6 DOORS & LOCKS – The electronic/battery compartment is accessed by a front door which is retained by stainless steel hinges and secured by a quarter–turn lock. This lock provides for proper compression gasket sealing and prevents unauthorized entry.

1.7 FRONT ACCESS (Electronic/Battery Compartment) See Figure 3

With the front door open, both the electronics and batteries are readily accessible for ease of testing, servicing or component replacement.

2. MAJOR COMPONENT/CIRCUIT DESCRIPTIONS

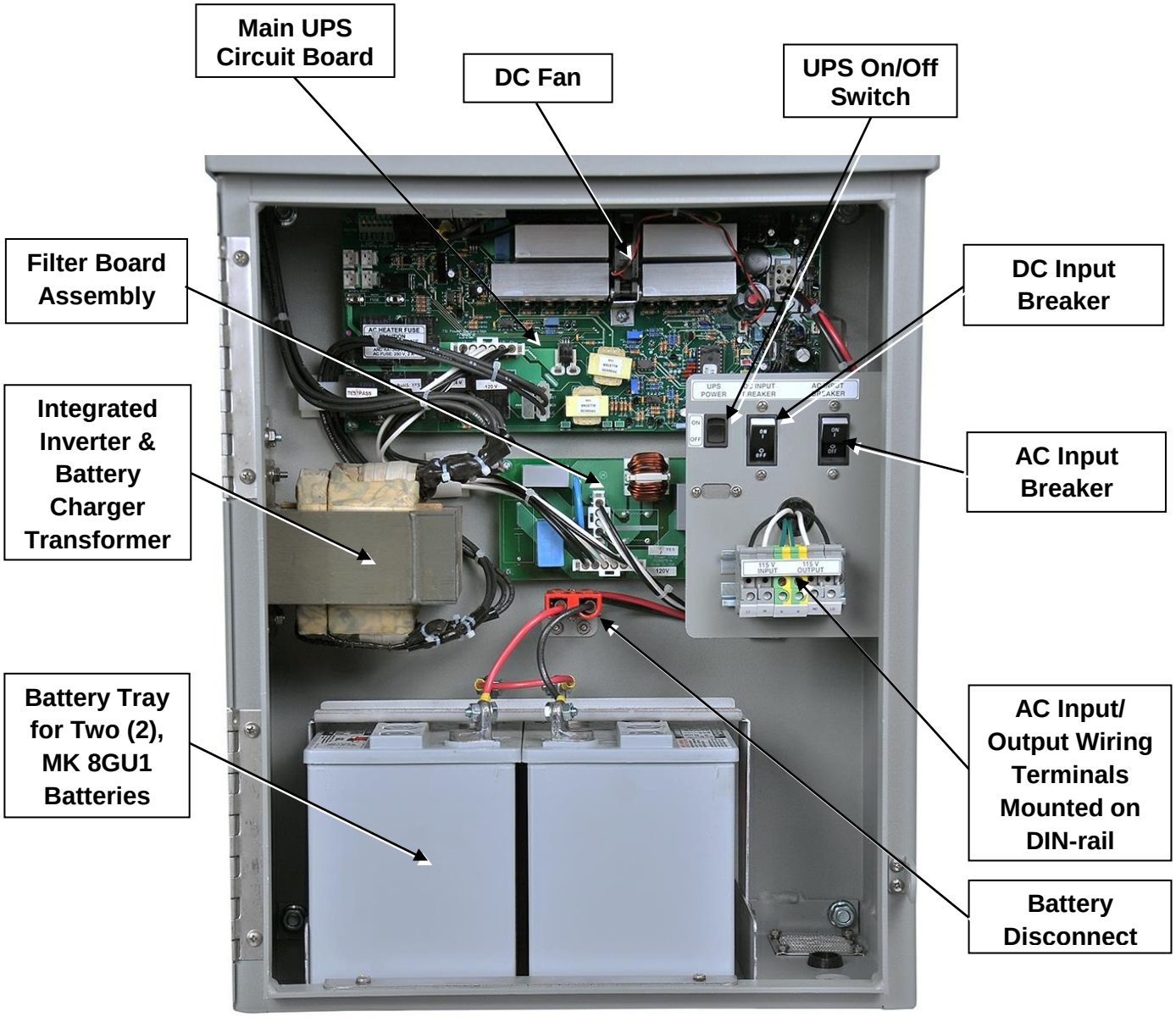

Figure 3: Electronic/Battery Compartment w/Door Open

(XUPS-600 or 1000 Compact shown).

Note: All versions except the XUP-1500 use 2, 8GU1 batteries and a 24 VDC bus

2.1 XUPS WIRING DIAGRAM –

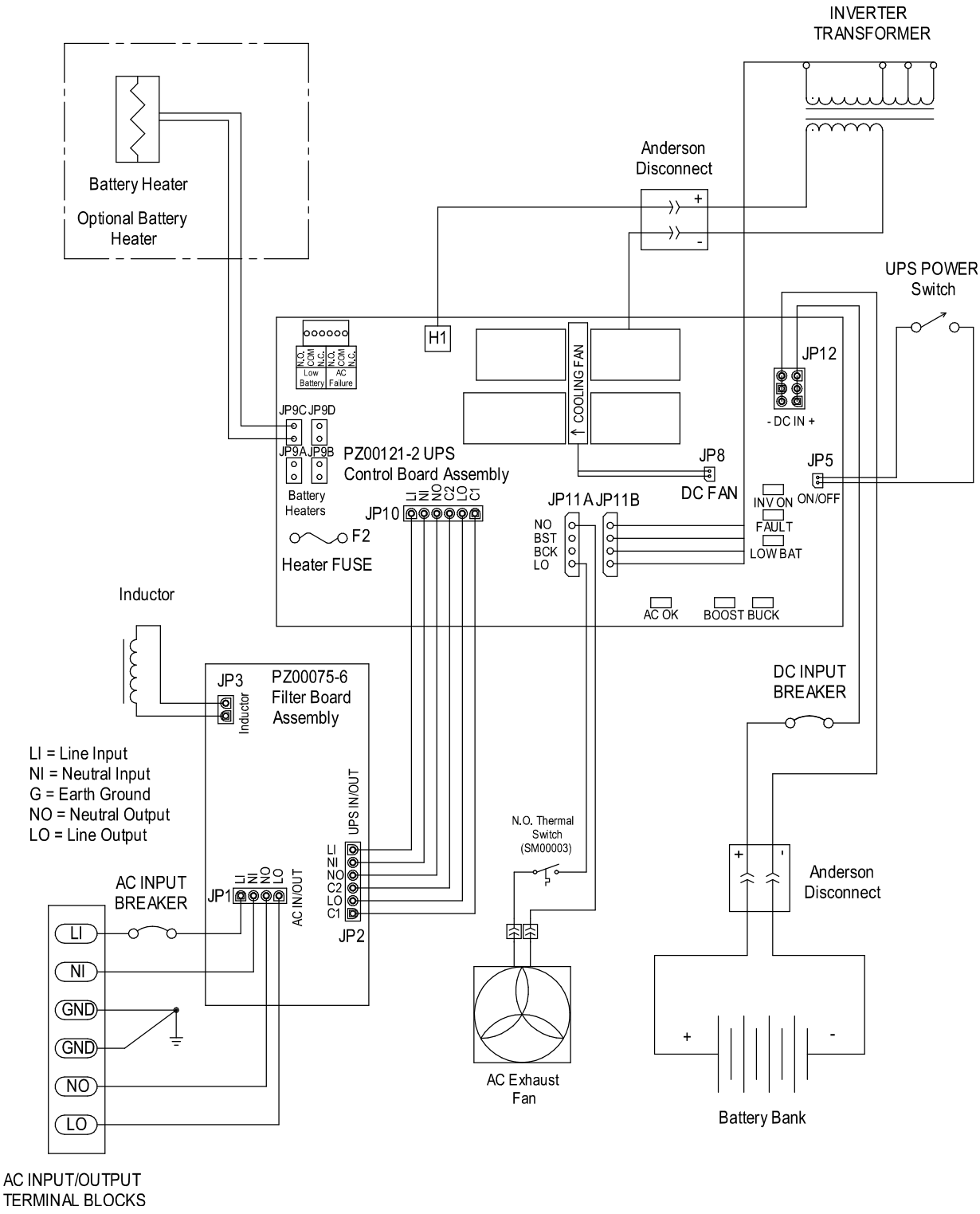

Figure 4: XUPS-600-1000-1500 Compact Wiring Diagram

2.2 INVERTER, CHARGER & VOLTAGE REGULATION TRANSFORMER

The main transformer of the XUPS is connected to the main circuit board and performs three functions: (see Figure 5):

1. Inverter transformer
2. It acts as an auto transformer adjusting the mains voltage as required
3. It charges the Battery Bank as required

Figure 5: Inverter & Voltage Regulation Transformer

2.3 INVERTER, CHARGING & VOLTAGE REGULATION MAIN CIRCUIT BOARD

The control board of the XUPS uses a rugged design with a microprocessor-controlled 20 kHz sine wave inverter (see Figure 6). The circuit boards are conformally coated for use in severe outdoor environments. The control board includes integral LED indicators for AC OK, BOOST and BUCK as well as INV ON, FAULT and LOW BAT to provide a real-time status of the XUPS' operation.

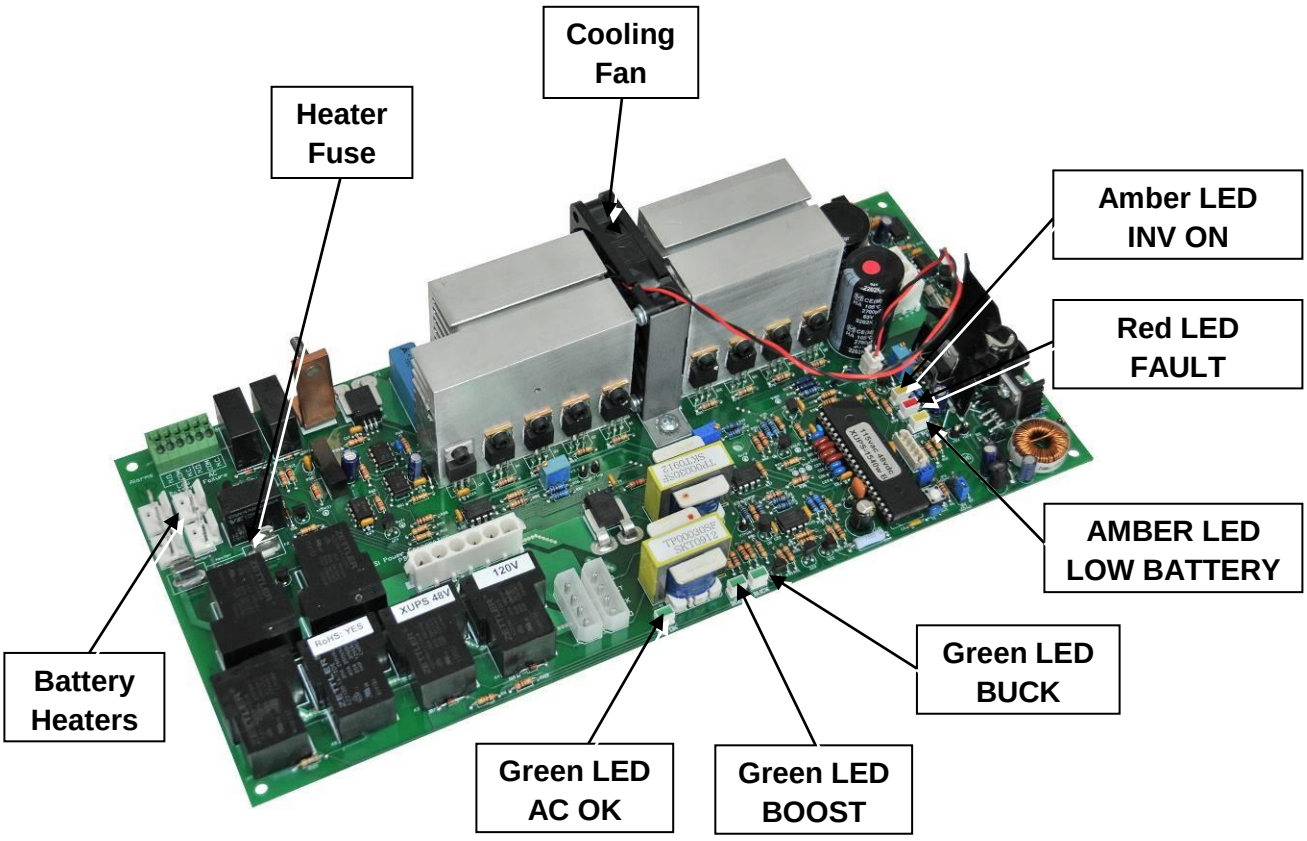

Figure 6: Main Inverter, Charging & Voltage Regulation Circuit Board

2.4 FILTER BOARD ASSEMBLY

The XUPS-600/1000/1500 Compact is protected against surge voltages by a proprietary circuit board. This board uses a 40mm MOV to provide protection and assure the continued function of the XUPS (see Figure 7).

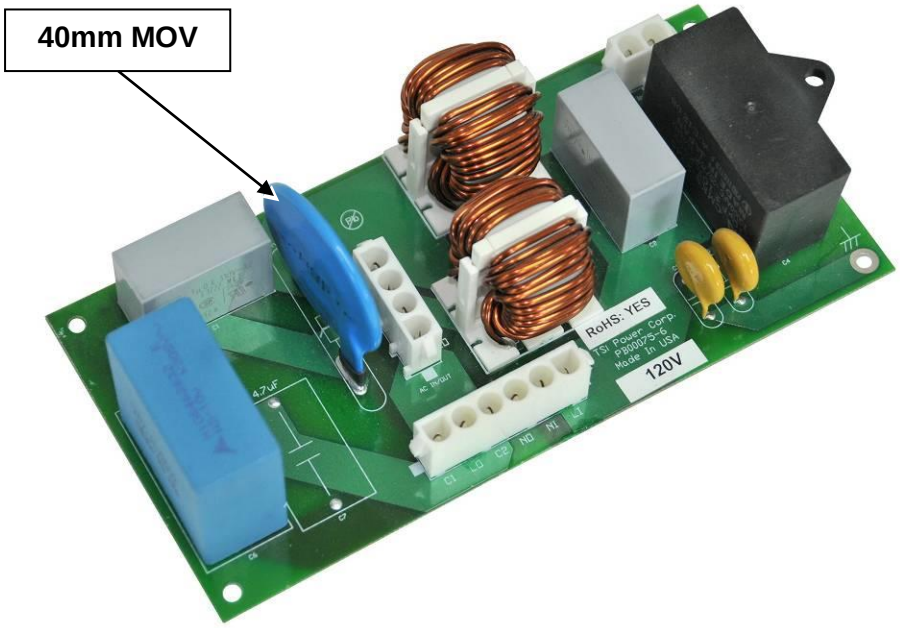

Figure 7: Filter Board Asssembly

2.5 INPUT FILTER INDUCTOR

This 1mh, iron core filter inductor is off board and is placed after the surge protection circuit. It filters out normal mode noise between the line and neutral branches of the incoming AC (see Figure 8).

Figure 8: AC Input Filter Inductor

2.6 ALARM CONNECTIONS

Alarm connection terminations have been integrated into the main control board and are located in the upper left corner of the board. To connect the alarm wires, insert the stripped wire into the desired Wire Inlet and press the corresponding Compression Tab on the connector (see Figure 9).

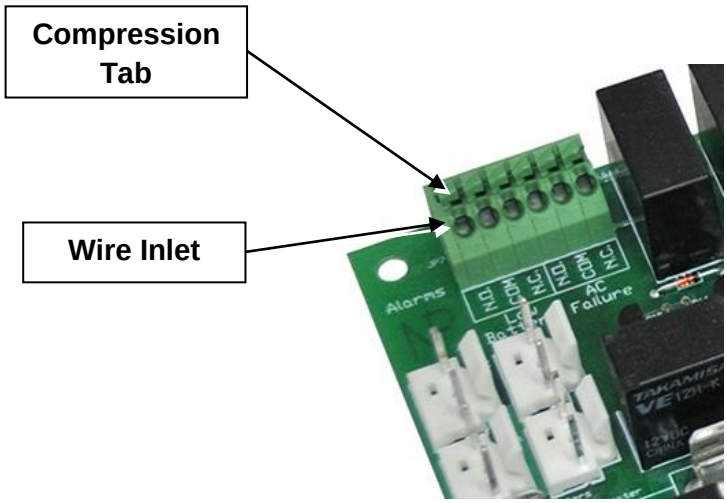

Figure 9: Alarm Connections

2.61 Low Battery Alarms

N.O. – COM: Open = Battery OK

N.C. – COM: Closed = Battery OK

2.62 AC Failure Alarms

N.O. – COM: Open = AC OK

N.C. – COM: Closed = AC OK

3. INSTALLATION

IMPORTANT: ONLY QUALIFIED PERSONNEL SHOULD PERFORM THE INSTALLATION OF THIS PRODUCT.

CAUTION: Make sure that appropriate lifting equipment is used and that company safety practices are followed.

3.1 TYPE INSTALLATION– The Outdoor-XUPS-600-1000-1500 Compact can be installed in either of two (2) ways:

3.11 Wall - Mount

- In this configuration, the unit can be mounted vertically to a solid wall by means of four (4) mounting feet that are provided and attached as standard items when the XUPS is ordered (see Figure 10).
- Before this unit is mounted, it is important to determine the load bearing capabilities of the mounting surface and to make sure that company practices regarding safety are followed.

Figure 10: Wall Mounting of XUPS

3.12 Pole - Mount

- When ordering the XUPS for this application, an optional pole-mount bracket must be included. This bracket will come installed on the rear of the unit (see Figure 11).

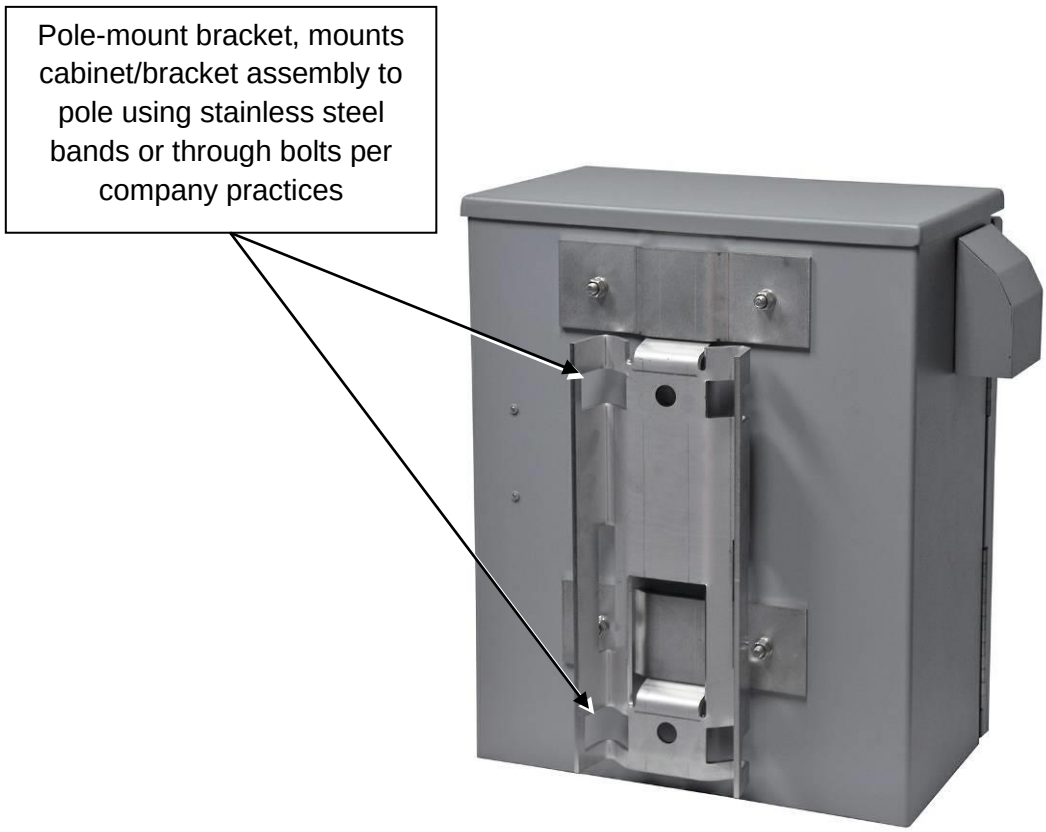

Figure 11: Mounting of XUPS to a Pole

- This product is intended for installation in RESTRICTED ACCESS LOCATIONS ONLY.
- It is recommended that this unit be installed as a Walk-Up unit making sure that the center of the door is at an eye-level height for optimum accessibility and ease of installation.
- The cabinet should be mounted on the power pole in such a manner so that the door doesn't open onto a road or a driveway.
- Position the cabinet on the pole so that the cabinet rests where the cable can easily enter the cabinet from the right side. If bringing in cable through a conduit up the

pole, make sure that the trade size of the conduit is no larger than ½". Larger conduit will not fit through the cable fitting.

- Make sure that the door clearances around the unit provide for unobstructed access.
- Provide a 20 A, 120 V service with a disconnect switch in the near vicinity of the XUPS.
- Fasten the pole-mount bracket to the pole by means of through bolts or stainless steel banding of size and type to be determined by local practices.
- Slide the unit onto the pole-mount bracket as shown in figure 11.

3.2 REQUIRED TOOLS

- Southco key to open the cabinet door (a key is provided with each new unit)
- A standard telco socket wrench set and standard mechanic telco tools
- Appropriate lifting equipment to lift and secure the unit to the approriate mounting location. The weight with four batteries is 114 lbs (49.8 kg).

3.3 UNPACKING & INSPECTION

3.31 The units are shipped one per box or in wooden crates, each containing up to twelve units. The units are placed on a pallet with protective material between them.

3.32 Carefully open the crates, making sure not to damage the units, and remove the protective wrap and packing material.

3.33 Before the units are removed from the crates, inspect them for physical damage.

3.34 If no damage is found, remove the units from the crates, open the door and again inspect for damage. If damage is found in either steps 3.32 or 3.33, do not accept the shipment and file a claim with the carrier. Contact TSi Power for assistance if necessary.

CAUTION: The units may contain charged batteries capable of causing fire and injury if shorted across terminals. Be very careful not to short terminals accidentally when unpacking.

4. POWERING UP THE XUPS

Before powering up the unit, make sure that the air inlet and exhaust ports are free of obstruction to prevent overheating.

4.1 AC INPUT CONNECTIONS

4.11 Make sure that an AC, 20 A, 120 V service with a disconnect switch is provided near the XUPS and confirm that it is switched **OFF.**

4.12 If bringing in cable through a conduit up the pole, make sure that the trade size of the conduit is ½" and not larger. Larger conduit will not fit through the 1/2" conduit holes for cable entry which are on the bottom of the unit, see Figure 11. Cool air intake vent is also located on the bottom.

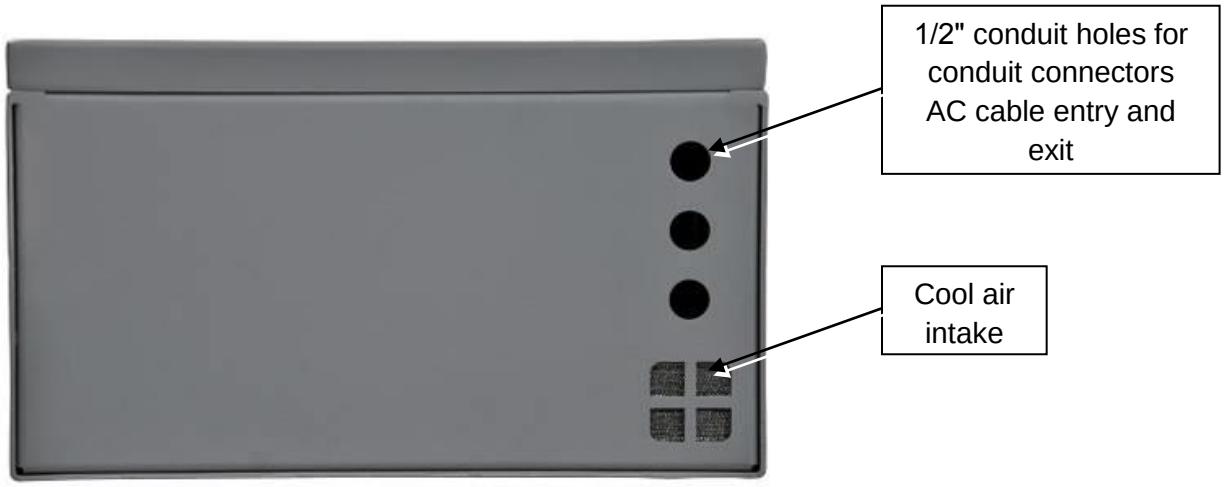

Figure 11: Cable Entry and Exit Ports in Bottom of Cabinet

4.13 Use 12 AWG wire with a 105° C insulation system for all conductors.

4.14 Allow for sufficient wire length to reach the wiring terminals and leave enough slack to reduce the stress in the wires.

4.15 Strip approximately 3/8" (9.52 mm) insulation from the end of each of the six (6) incoming / outgoing AC wires and terminate them in the wiring terminals located on the right side of the cabinet (see Figure 12).

4.16 Terminate the incoming wires on the terminals marked as shown in Figure 12 and as follows:

- **LI** is for phase conductor (black)
- **NI** is for neutral conductor (white)
- **G** is for safety ground

4.17 Terminate the outgoing wires on the terminals marked as shown in Figure 12 and as follows:

- **LO** is for phase conductor (black)
- **NO** is for neutral conductor (white)
- **G** is for safety ground

4.18 In terminating the wires as outlined in 5.16 & 5.17 above, use a slotted screwdriver to tighten the terminal screws until the wires are secure. Do not apply excessive torque to make sure that the terminal screws are not damaged. Once the screws have been tightened, gently tug on the wires to make sure that they are properly connected.

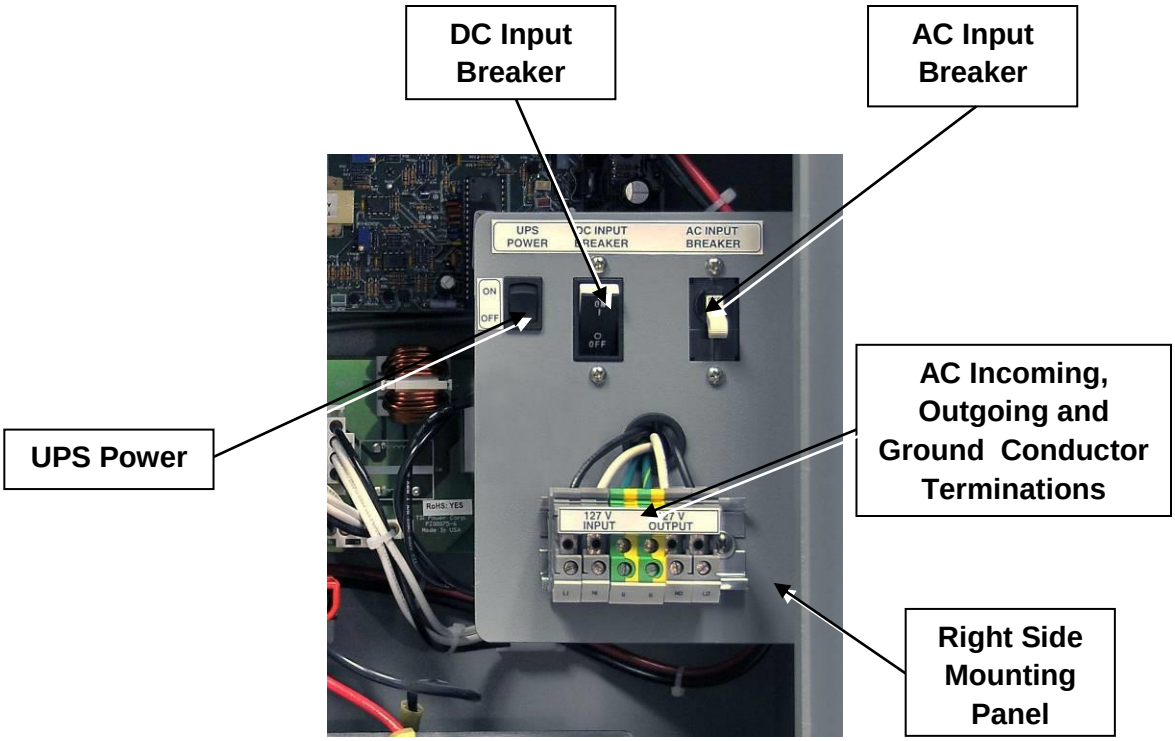

Figure 12: Incoming & Outgoing Wire Terminations

WARNING: TO PREVENT DAMAGE MAKE SURE TO CHECK THAT THE INPUT & OUTPUT WIRES ARE NOT REVERSED

4.2 ENERGIZING THE XUPS

The following steps outline the procedures for putting the XUPS into operation:

4.21 A DMM (Digital Multimeter) is required.

4.22 Make sure that all AC and DC circuit breakers are in the **OFF** position. Ensure that the UPS On/Off switch is in the **OFF** position.

4.23 Check for damage to ensure no components or wires have been damaged in transit.

4.24 Using the DMM, measure the voltage across the terminals of each battery. Battery voltage must be 11.5 V or higher for all batteries in the XUPS unit (2 batteries are used in the XUPS-600 Compact and XUPS-1000 Compact; and 4 batteries are used in the XUPS-1500 Compact).

Note: All battery voltages must be within 0.3 V of each other.

4.25 Make sure that the AC input and output are wired correctly**.** The Input voltage should be 100 to 130 V, 60 Hz and the load equipment should be turned **OFF**.

4.26 Turn **on** the **DC INPUT BREAKER.**

4.27 Turn **on** the **UPS POWER SWITCH and wait 5 sec. for INVERTER to turn ON.**

4.28 Measure UPS output voltage between **LO** and **NO** output terminals. Acceptable voltage range is 115 V +-5%. The UPS is now in battery/inverter mode.

4.29 Turn **on** the **AC INPUT BREAKER.**

4.30 Verify that the following LEDs are illuminated:

1. **AC OK** green LED illuminated in approximately 5 seconds.

2. If AC input is too low: Green - Boost LED will illuminate. If AC input is too high: Green - Buck LED will illuminate.

3. If LED **INV ON** remains on or fluctuates between **AC OK** and **INV ON**, check with the power company for out of mains voltage tolerance.

4. Verify that green LED marked as **AC OK** stabilizes and remains ON:

THE SYSTEM IS NOW READY FOR OPERATION.

4.31 Measure the output voltage between LO and NO output terminals: Acceptable voltage range is 106 – 126 V, which confirms normal output voltage when AC input is present.

4.32 Simulate a power outage by switching the AC circuit breaker to the OFF position. The UPS is now in battery/inverter mode. Measure the output voltage between the LO and NO output terminals. Acceptable voltage range is 115 V ± 5%.

4.33 Repeat steps in 4.29 through 4.31 to verify restoration of normal AC operation. The UPS is now operating correctly without load.

4.34 **Now switch OFF the AC input breaker, UPS switch and DC input breaker. The UPS is now turned OFF.** Connect the load to output terminals marked **LO** and NO.

4.35 Switch **ON** any downstream circuit breaker between the UPS and the load.

4.36 Switch **ON** DC breaker and UPS switch. Wait for 5 seconds until yellow INV LED is **ON**.

4.37 Switch **ON** AC breaker. Relays on control board will make a clicking noise. AC OK green LED should illuminate in approximately 5 seconds.

4.38 Verify that the load equipment is operating properly

4.39 Simulate transfer to battery/inverter and return to normal AC operation by following steps in paragraphs 4.31 to 4.33. Verify that the load equipment continues to operate normally and without interruption.

5. MAINTAINING THE XUPS

To make sure that the unit is functioning properly and safely, check the following periodically or at least once a year:

5.1 XUPS OPERATION

5.11 Switch-off **AC INPUT BREAKER** (see Figure 12).

5.12 Verify that the XUPS operates in **Inverter Mode** with **INV ON, Amber LED ON** (see Figure 6).

5.2 CABINET INTEGRITY

5.21 Check the air intake and exhaust for dust and debris. Remove as required.

5.22 Check for moisture and water accumulation and remove as necessary.

5.23 Check to make sure locks are functioning properly and have not been vandalized. Replace if necessary.

5.24 Check the gaskets to make sure that door seals are still tight and effective. Replace if necessary.

5.3 ANNUAL BATTERY MAINTENANCE

See Section 7 for battery replacement.

5.31 Check the batteries for electrolyte leakage. Clean up and replace if necessary.

5.32 Measure the battery terminal voltage of all batteries. Each battery should have a terminal voltage of 13.5 VDC ±0.3 V. Replace **All** batteries if the difference is larger than ±0.3 V.

6. TROUBLESHOOTING & COMPONENT REPLACEMENT

6.1 TROUBLESHOOTING

The Outdoor XUPS-600-1000-1500 Compact is designed to facilitate quick replacement of circuit boards in the field. Therefore, troubleshooting procedures described in this manual are limited to visual inspection and board and battery replacement only. More detailed troubleshooting, repair and calibration can only be done at the TSi Power factory.

6.2 REPLACING BATTERIES

DANGER: The servicing or replacement of batteries should be restricted to qualified and experienced personnel.

- **Use extreme care when handling the batteries.**
- **When lifting the batteries wear heavy gloves and safety glasses at all times.**
- **Do not wear rings, metal wrist bands, or bracelets.**
- **Do not allow metal objects to come in contact with the terminal side of the batteries.**
- **Use tools with insulated handles.**
- **Disconnect charging source prior to connecting or disconnecting battery terminals.**

- **Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance.**

CAUTION: Do not dispose of batteries in a fire. The batteries may explode.

CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

CAUTION: **A battery can present a risk of electric shock and high short-circuit current.**

AVERTISSEMENT: Ne jetez pas les batteries dans un feu. Elles pourraient exploser.

AVERTISSEMENT: N'ouvrez pas et n'altérez pas physiquement les batteries. La solution électrolyte qui serat libérée est dangereuse pour la peau et des yeux. Elle pourrait même être toxique.

ATTENTION: Une batterie peut présenter un risque de décharge électrique et un fort courant de court-circuit.

6.21 The battery compartment accommodates two (2) 31.6 Ah, 8GU1, MK batteries for the XUPS-600 and 1000; and four (4) 17.2 Ah, NP 18-12, Enersys Batteries for the XUPS-1500. See Figure 13.

6.22 Only wide-temperature rated, valve-regulated sealed gel batteries such as MK Battery's, 8GU1 or Enersys Battery's NP 18-12 should be used (TSi Power's part number for the 8GU1 battery is VB00010 and for the NP-18-12 battery it is VB00004).

6.23 The following battery replacement procedure should be followed:

- Turn off **UPS Power** switch (see Figure 12),
- Turn off **AC Input Breaker**,
- Turn off **DC Circuit Breaker**,
- Disconnect **Battery Disconnect** (see Figure 14) from **UPS Battery Disconnect** (see Figure 3)
- Remove **Battery Tray with batteries** from XUPS (see Figure 13),
- Loosen terminal bolts,
- Remove ring terminal connections one by one and save hardware,
- Set battery jumpers aside,
- Pull out old batteries carefully, set them aside,
- Install new batteries (see Figure 14), *Note: Battery Positive (+) terminals toward front edge of Battery Tray,*

- Connect battery jumpers and cables using the hardware that came with the new batteries. Tighten bolts and nuts lightly.
- Torque bolts in accordance with battery manufacturer's specifications.
- Using a Voltmeter, verify that the voltage across the **Wire Kit Battery Disconnect** (battery Bank) is approximately +48 VDC (see Figure 14),
- Install Battery Tray with Batteries into the XUPS enclosure (see figure 13),
- Connect **Wire Kit Battery Disconnect** (see Figure 14) to **UPS battery**
- **Disconnect** (see Figure 3) as shown in figure 13.
- Check all connections,
- Re-energize system,
- Dispose of old batteries in accordance with battery manufacturer's instructions.

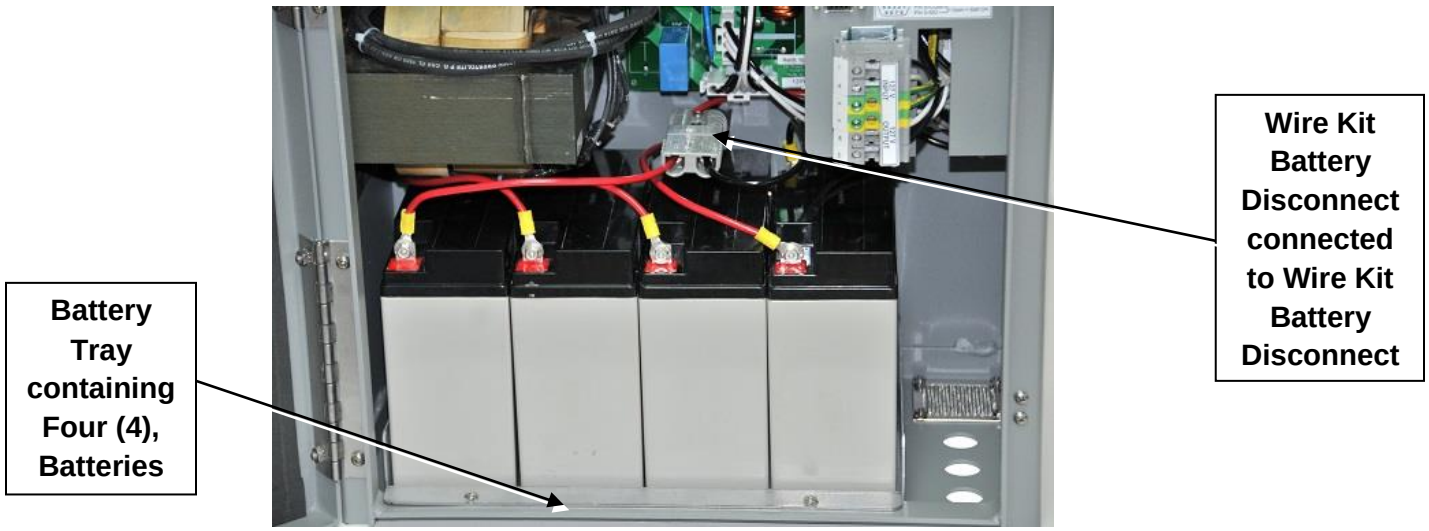

Figure 13: Four (4), NP 18-12 Battery Configuration Shown in XUPS-1500 Compact

Note: Batteries shown are for instructional purposes only and are not actual Enersys NP 18-12 batteries.

Figure 14: Four (4), NP 18-12 Battery Configuration Shown on removed Battery Tray

Note: Batteries shown are for instructional purposes only and are not actual Enersys NP 18-12 batteries.

7. OPTIONAL EQUIPMENT

7.1 OPTIONAL BATTERY HEATER CIRCUIT BOARD – The optional battery heating pads are constructed from printed circuit boards with resistor networks that are encapsulated in epoxy. The AC current flows through the resistors to generate heat. By being pressed against both internal walls of the batteries, the batteries are heated. The standard Outdoor XUPS-600 and 1000 would each require one battery heating circuit board, while the XUPS-1500 would need two boards. See Figure 15.

Installation of the heater pads is as follows:

- Turn the AC circuit breaker off,
- Turn the DC circuit breaker off,
- Remove connections between batteries (save hardware),
- Remove battery brackets,
- Remove batteries by pulling them out of compartment,
- Remove ”bumpons” from either side of compartment,

- Push both batteries gently into compartment, form a wedge,
- Insert heating pad between batteries,
- Push batteries back in,
- The heating pad should now be secure between the batteries,
- Replace battery brackets,
- Run the wires back to the heater control PCB and mate connector with header.
- Restart the XUPs.

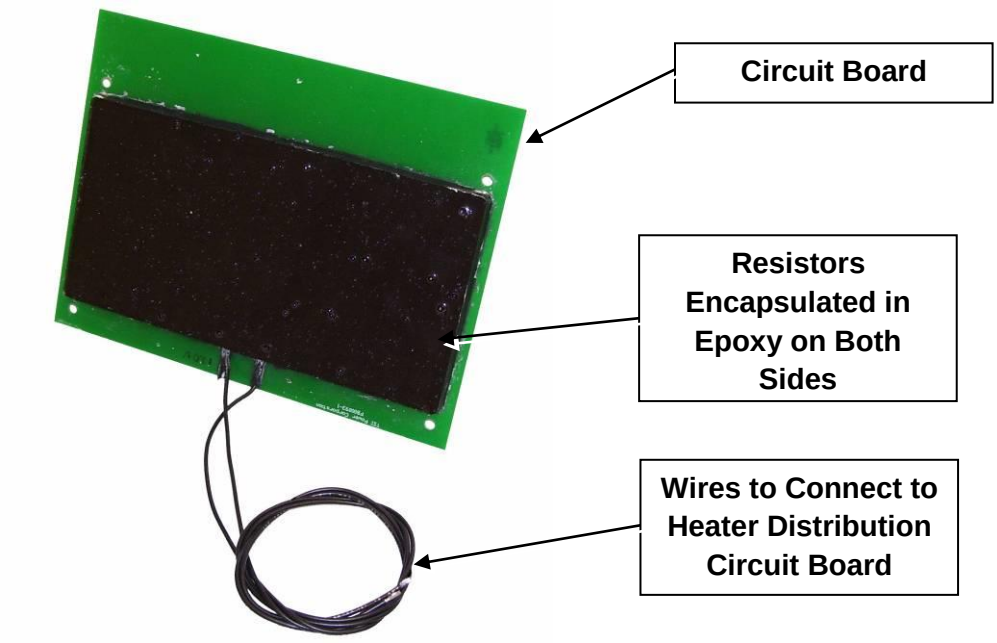

Figure 15: Optional Battery Heater Circuit Board

8. REPAIRS, SERVICE & SPARE PARTS

8.1 REPAIRS - The Outdoor XUPS-600-1000-1500 Compact should only be repaired by persons with knowledge of power electronics and electrical safety procedures. Others should contact TSi Power Corporation for a Return Material Authorization (RMA). The TSI service representative will determine if factory repair is necessary and issue an RMA.

A replacement unit will be shipped to certain customers with service agreements. TSI retains the repaired unit.

8.2 SPARE PARTS - The table below contains information on replaceable parts that can be ordered from TSI if necessary.

Description	TSi Part Number	Manufacturer	Mfg. Part No.
Main XUPS PCB	PZ00121-2	TSi Power	N/A
Filter /Surge Protection PCB	PZ00075-6	TSi Power	N/A
34 W Battery Heater	BH5	TSi Power	N/A
Input Inductor for XUPS-600/1000/1500	IT00016	TSi Power	J13939
Inverter Transformer for XUPS-600	TP00194B	Johnson Electric Coil	J14956 (RoHS Compliant)
Inverter Transformer for XUPS-1000	TP00228B	Johnson Electric Coil	J15137 (RoHS Compliant)
Inverter Transformer for XUPS-1500	TP00236B	Johnson Electric Coil	J15208 (RoHS Compliant)
DC Battery Breaker for XUPS-600 - 30 A	FC00081	Airpax Corp.	IELBX1-1-72-30.0-M3-V
DC Battery Breaker for XUPS-1000/1500 – 40 A	FC00082	Airpax Corp.	IELBX1-1-72-40.0-M3-V
AC Input Breaker for XUPS-600 – 10 A	FC00016	Carling Technologies	A11-B0-34-610-111-C
AC Input Breaker for XUPS-1000/1500 – 15 A	FC00021	Airpax Corp	IELBX1-1-62-15.0-M3-V
31.6 Ah Battery for XUPS-600/1000	VB00010	MK Battery	8GU1
17.2 Ah Battery for XUPS-1500	VB00004	Enersys	NP 18-12
AC Fan (Hot Air Exhaust, 80 mm)	VF00015	NMB Technologies	3115FS-12W-B30-A00

9. REFERENCE

9.1 SPECIFICATIONS

SPECIFICATION	XUPS-600	XUPS-1000	XUPS-1500
INPUT			
Nominal voltage & frequency	115 V, 60 Hz		
Operating voltage	96 - 136 V		
Current @96 V & max charging 600 / 1000 / 1500	7.8 A	11.4 A	14.2 A
Circuit breaker 600 / 1000 / 1500	10 A	15 A	15 A
Surge voltage withstand	ANSI/IEEE: 6 kV, 1.2 x 50 µs / 3k A, 8 x 20 µs; L-N: 450 V L-G: 300 V N-G: 300 V		
OUTPUT			
Output power: 600 / 1000 /15000	500 W	840 W	1050 W
Voltage	115 V ± 8%		
Crest factor	3 : 1		
Waveform and THD	Sine wave, < 3% THD with linear load		
Power efficiency	Line: 97%, Inverter: 92% under full load conditions		
Power on / off switch	On / off rocker style power switch		
Transfer time	0 to 8 milliseconds		
BATTERY			
Type	8GU1		NP 18-12
Dimensions: L x W x H Inch / mm & weight US / Metric	7.71 x 5.18 x 7.22 / 196 x 132 x 183 23 lbs / 10.5 kg		7.1 x 3 x 6.57 / 180 x 76 x 167 13.7 lbs / 6.2 kg
Ah @20hr rate and bus voltage	31.6 Ah, 24 VDC		17.2 Ah, 48 VDC
Number of batteries	2		4
Battery circuit breaker	30 A	40 A	40 A
Temp. range fully charged	-15° to +50° C / 5° to +122° F / -40° to +50° C / -40° to +122° F with optional battery heater		
Battery heater pad BH 5	34 W, one required		34 W, two required
Battery backup time under full load - Actual time may vary due to battery condition and ambient temperature	32 min	17 min	27 min
Recharge time	Temperature compensated charger, charge to 90% capacity after full discharge		
	7 hrs		
INDICATORS AND ALARMS			
LED Status indicators on control board	**Amber**-Inverter On; **Amber**-Low battery, after inverter shut down following low batt. after long outage; **Red**-Fault for overload / red blinks for high temp; **Green**-AC ok when AC in buck, bypass or boost mode		
N/O & N/C contacts for AC failure & low battery alarm	Low Battery Alarm is activated when battery voltage is lower than 22.5 V for 600-Compact & 1000-Compact, or lower than 45 V for 1500-Compact		
PHYSICAL			
Dimensions: W x H x D Inch / mm	16.5 x 20.5 x 9.5 / 419 x 521 x 241		
Aluminum cabinet	Outdoor type, powder coated		
Input / output connections	3 position terminal block provided for 3 x 12 AWG, 7/8" holes for 1/2" conduit connectors		
Weights with batteries lbs / kg 600 / 1000 / 1500	100 /45.4	103 / 46.8	110 / 49.8
Mounting option	Wall mounting is standard, optional pole mounting bracket is available		
ENVIRONMENTAL			
Operating temperature w/o battery heater	-10° to +50° C / 14° to +122° F		
With battery heater option: BH5	-40° to +50° C / -40° to +122° F		
Cooling method	Thermostat controlled exhaust fan		
Moisture protection	Conformal coating of electronic boards for moisture resistance		
SAFETY			
Standards	UL 1778 Ed: 4, CSA C22.2 #107.3, UL 60950-1, UL 60950-22, CSA C22.2#60950-22		
WARRANTY			
Warranty	Two-year limited warranty on parts and labor. Manufacturer warranty on batteries.		

9.2 TSi POWER CONTACT INFORMATION

TSi Power Corporation
1103 West Pierce Avenue
Antigo, WI 54409, USA
Toll-Free Tel: 800-874-3160 (for USA & Canada only)
Tel: +1-715-623-0636
Fax:+1-715-623-2426
URL: www.tsipower.com E-mail: sales@tsipower.com