User's Manual

Fire Alarm Back-up UPS1481 UNIT

Emergency Power Systems

Doc #. 6002-1646
Revision B

Installation and Operating Documentation

OnLine Power

FIRE ALARM BACK-UP UPS1481 UNIT,

Congratulations on selecting one of the fine products from On-Line Power, the Leader in Power Protection Technology. Our wide product offering includes Uninterruptible Power Systems (UPS), Power Conditioners, Automatic Voltage Regulators and Specialty Transformers (e.g. computer-grade, medical-grade). Since our beginning, On-Line Power has shipped many of these fine products around the world, to discerning customers, for use on sensitive equipment and critical applications. Our customers, both new and long-time, continue to enjoy security and peace of mind as they realize what it means to ”When the lights go out, we turn on”.

One of our goals is to make these manuals both comprehensive and easy to use. This **new-format** Technical Manual is the result of ideas and inputs from customers who have taken an active interest in our continued success. We invite constructive feedback on our products and documentation via fax, mail or telephone.

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NOTICE: THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION

SAFETY

Safety precautions are important when operating or servicing electrical equipment. The following symbols are used extensively throughout this manual. Always need these precautions since they are essential to the safe operation and servicing of this product.

THIS DANGER SYMBOL IDENTIFIES A CONDITION OR ACTION WHICH WILL RESULT IN SEVERE INJURY OR DEATH TO AN INDIVIDUAL OR SEVERE DAMAGE TO EQUIPMENT OR OTHER PROPERTY.

This Caution symbol identifies a condition or action which may result in minor injury to an individual or minor damage to the equipment or other property.

This unit was designed for specific applications. It should **not** be modified and/or used for any application other than for which it was designed. Optional equipment not described in the sales literature, or this manual should not be installed without first checking with the Service department. If you have any questions about this unit's application, call the Service department at the number shown on the previous page.

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

This technical manual contains important instructions for models WR3.0, W5.0R, WR7.5, WR010, WR012 and WR015 that should be followed during installation and maintenance of the UPS and batteries.

MODEL: WR3.0A58FPT1, WR3.0D58FPT1, WR5.0A58FPT1, WR5.0D58FPT1, WR7.5D58FPT1, ER010D58FPT1, WR012D58FPT1, WR015D58FPT1, WR3.0A01FPN1, WR3.0D04FPN1, WR5.0A01FPN1, WR5.0D04FPN1, WR7.5D04FPN1, WR010D04FPN1, WR012D04FPN1, WR015D04FPN1

Maintain 1/4 " separation between all power-limited and non-power limited conductors.

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SECTION 1 _ OPERATION

1-1 INTRODUCTION

The Fire Alarm Back-up UPS1481 provides an exceptional level of load protection and monitoring capabilities. The critical load is provided with conditioned, regulated, computer grade power at all times. There is complete electrical isolation between the input and output voltage of the UPS.

When input power to the UPS is lost, such as during a power outage, the UPS automatically draws power from its internal battery supply. The critical load receives only clean sine wave power. There are no disturbances or power interruptions on the output when the UPS transfers to battery operation. Transfers to and from battery operation are “No Break” transfers. The internal maintenance-free batteries provide ten (10) to fifteen (15) minutes (depending upon model) of backup power. The 10 and 15 kVA models have separate battery cabinets.

Upon restoration of input power, the UPS automatically resumes normal operation. Also the UPS immediately begins to recharge the batteries.

The Fire Alarm Back-up UPS1481 provides comprehensive monitoring capabilities. In addition to the LED indicators and audible alarm, the Fire Alarm Back-up UPS1481 contains a 160 alpha-numeric display and touch pad. UPS status, event history, and operating parameters (such as input, output voltage) are readily available to the operator via the touch pad and display. The UPS 1481 contains, as standard features, an AS/400 interface, RS-232 interface, and printer interface.

The Fire Alarm Back-up UPS1481 is an on—line single phase UPS available in output ratings of 3, 5, 7.5, 10, 12.5 and 15kVA. The UPS 1481 is U.L. listed under UL1481. The Fire Alarm Back-up UPS1481 is available with input voltages of 120 and 240/VAC and output voltages of 120/240/VAC. This information is provided on the nameplate located on the rear panel of the UPS. See Appendix A for a complete listing of the UPS 1481 specifications.

1-2 BENEFITS

The Fire Alarm Back-up UPS1481 is designed to fit the needs of virtually all power conditioning and UPS applications. It has been specifically designed to power all forms of modern data processing, communication, and process control equipment. The Fire Alarm Back-up UPS1481 does not require any decorating as other UPS products may when powering 100% electronic loads including switch—mode power supplies.

The Fire Alarm Back-up UPS1481 protects sensitive electrical equipment, such as computer systems, telecommunication networks, LANs and multi—user systems, and instrumentation

systems, from electrical interference. The Fire Alarm Back-up UPS1481 protects these systems from power problems associated with poor quality AC power including complete power Outages. Electrical disturbances can come from practically anywhere: from the incoming power lines and even from within a building. Outside electrical disturbances include lightning strikes, utility switching, brown—outs, and accidents. Electrical disturbances from within a building can be caused by load cycling (elevators, HVAC systems), fault conditions, welders, and other electrically noisy equipment. Whether the electrical disturbances are generated outside or from within the facility, the following power problems will occur:

1-3 PRODUCT FEATURES

The following describes the major blocks within the Fire Alarm Back-up UPS1481. Please refer to Illustration. Block Diagram for additional information.

Bypass Static Switch — The SCR solid state switch bypasses the complete UPS and provides utility input directly to the load in case of problem with UPS. This switch also supplies input power to the load during the start up. It is connected on the primary side of the optional output isolation Transformer, when used. This switch maintains it's status opposite of that of the output SCR solid state switch.

Output Static Switch — This SCR solid state switch connects the output of the inverter (UPS) to the load. It is connected on the primary side of the optional output isolation transformer, when used. This switch shuts—off in case of a problem or failure within the UPS and transfers the load directly to the utility input via bypass static switch. It maintains it's status opposite to that of bypass switch.

Power Board with IGBTs — The Power board is bolted onto the IGBT blocks that are mounted on a heat sink. The complete heat sink assembly with IGBT and power board is replaceable as one part. This assembly processes ail the power, ie. input AC power converted to DC bus, battery power boosted to DC bus and finally DC bus power converted to output AC power using PWM technology for smooth AC Sinewave. The complete heat sink assembly is easily replaceable using only a screwdriver, in case of a catastrophic failure, if required. This board also has the housekeeping power supplies and driver circuits for IGBTs. This board also provides the landing place for all internal input, output, and DC cables as well as it monitors the input-output current for control and metering.

Control Board — The microprocessor with programmable logic controllers and on board memory is located on this board. It is mounted on the door and communicates, controls, and monitors the power board via a ribbon cable. This board also senses the input AC and sends the command to close/open the input contactor, bypass static switch and output static switch. This board also sends all the data to the LCD display panel located on the door. It also has modem, AS400, RS232, and RS485 output capabilities.

LCD Display Panel — This front panel provides all the metering data for input, output and battery; alarm data and UPS status for customer use in a constantly changing and updating, the 3 sets of the screens.

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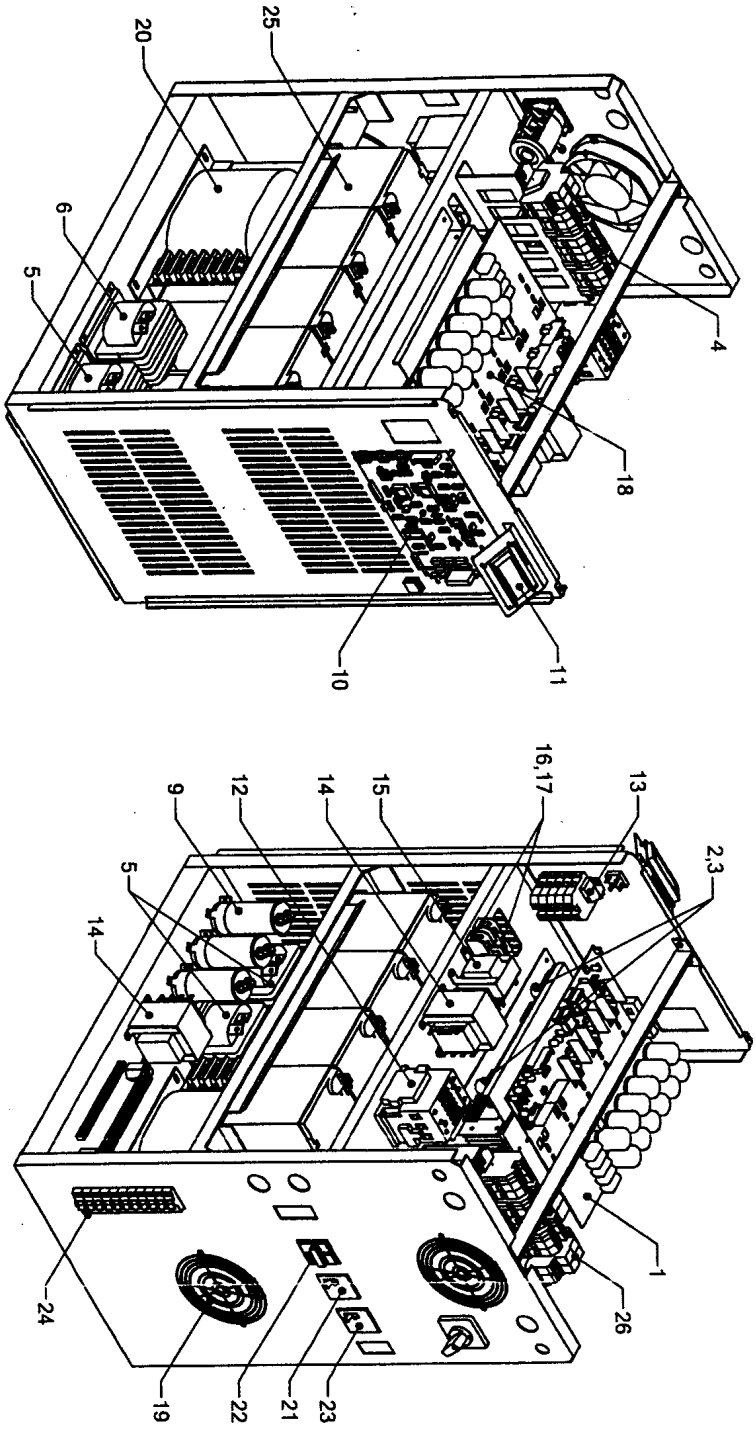
Optional Output Isolation Transformer — This transformer is provided when the input and output voltages are different, or multiple output voltages are required or an isolation at output is required. The power to the primary of this transformer is selected either from UPS via output static switch and from utility input via bypass static switch. The two static switches toggle on/off as controlled by control board.

Battery Charger — The battery charger maintains the batteries at full charge. After a battery discharge, the charger will automatically recharge the batteries upon restoration of input power.

Battery Bank — The battery bank consists of sealed, maintenance free batteries. The batteries provide emergency power during power outages. The battery bank includes a breaker for overcurrent protection and DC disconnect.

Input Contactor — The input contactor serves several functions. First, the input contactor provides connections for the input power to the UPS. Secondly, the contactor disconnects the input line when an outage occurs so that there is no back feeding of power into the power line. Thirdly, the contactor allows for automatic UPS operation upon a complete discharge of the batteries. No operator intervention is required when power to the Lips is restored after a complete battery discharge.

Control Electronics — The control electronics, utilizing a microprocessor, for monitoring provides all required logic signals within the UPS and interfaces with remote devices via the interface ports such as the AS/400 interface.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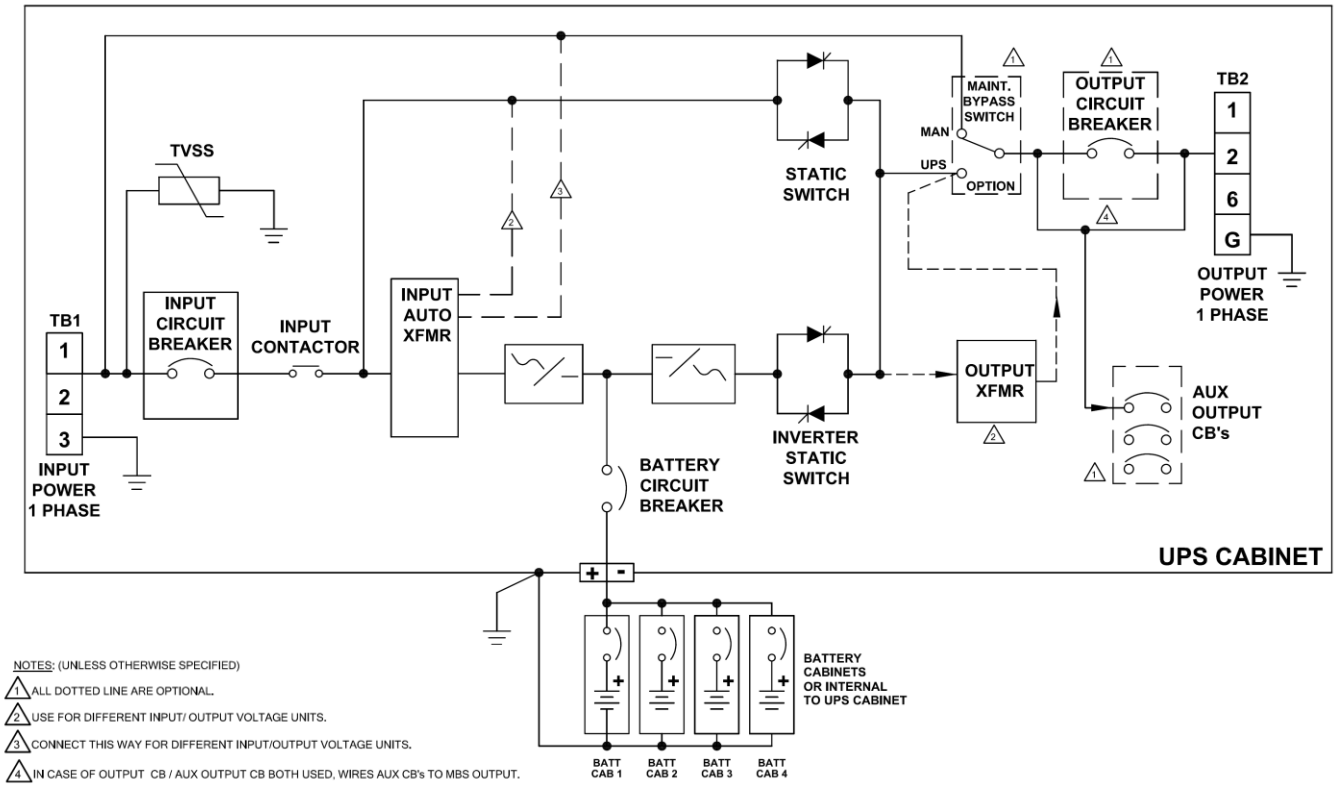
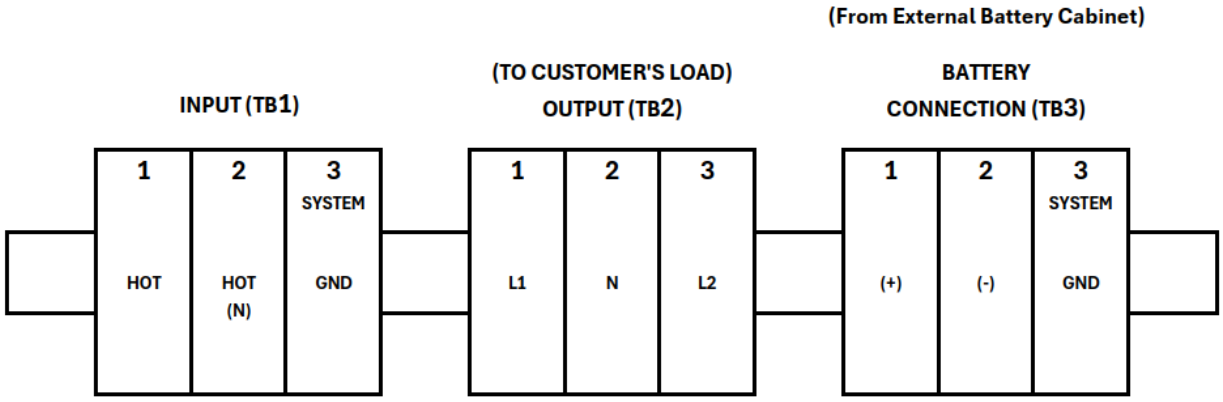
1-3 SINGLE LINE DIAGRAM



1-4 CUSTOMERS CONNECTIONS

1-4-1 Input Power Connection by Customer. See Appendix B



PROTECTOR CUSTOMER'S CONNECTION TERMINAL BLOCK
ILLUSTRATION 1-5

See Nameplate for Input Voltage Rating

Input Connection			
VOLT	TB1		Ground
	1	2	
120V	L1	N	GND (IN)
208V	L1	L2	GND (IN)
240V	L1	L2	GND (IN)
277V	L1	N	GND (IN)

Output Connection				
VOLT	TB2			Ground
	1	2	3	
120V	L1	N		GND (OUT)
240V	L1		L2	
120V	L1	N		GND (OUT)
208V	L1		L2	
120V	L1	N		GND (OUT)
277V		N	L2	
277V	L1	N		GND (OUT)

See Nameplate for Output Voltage Rating

1-5 The Fire Alarm Back-up UPS1481 SIZING

Each model of the Fire Alarm Back-up UPS1481 is designed to supply a maximum load which is given by its KVA (1000's of volt-amperes) and KW rating. It is very important that the load is within the rating of the FIRE ALARM BACK-UP ups1481 to ensure that the connected loads will be properly supported.

Volt - amperes (VA) are the number of current in amps a device draws multiplied by the nominal voltage supplied to the device. The total KVA of all the loads to be connected to the Fire Alarm Back-up UPS1481 is simply the sum of the KVA requirements of each device.

Each electrical device to be powered by the Fire Alarm Back-up UPS1481 should have a specification sheet attached to it which specifies the amount of power it requires. In addition, this information should also be listed in the manual supplied with each piece of equipment. The device's nameplate should list the electrical requirements of the device in some or all of the following units: nominal voltage, current, VA or KVA, and watts or KW. If VA or KVA is not given, then multiply the nominal input voltage by the current shown on the nameplate. Add up the KVA requirements of each device to be powered by the Fire Alarm Back-up UPS1481.

The total load to be powered by the Fire Alarm Back-up UPS1481 must not exceed its rating. If the total load is exceeded, the Fire Alarm Back-up UPS1481 monitoring will sense an overload condition and a summary alarm will occur. The overload condition must be corrected by increasing the kVA rating of the Fire Alarm Back-up UPS1481.

1-6 OUTPUT LOADS

The Fire Alarm Back-up UPS1481 is designed to power any critical, computer, florescent, or incandescent lighting. There are some types of loads which require an excessive inrush current when first turned on or at other times during its operation.

The capacity of the Fire Alarm Back-up UPS1481 may need to be greater than what would be estimated based on the nameplate requirements of loads previously discussed. Contact your On Line Power dealer or the factory directly if you have any questions about powering unusual loads from your Fire Alarm Back-up UPS1481.

1-7 OPTIONS

The following options are available with the Fire Alarm Back-up UPS1481:

AS400
RS232 — **"Connect to these circuits are to remain in the same room. DB9 connectors on the control PCBD".**

Normally On / Off circuit(s) at output.

Extended battery run times.

SECTION 2 - INSTALLATION

2-1 SITE PLANNING AND PREPARATION

The Fire Alarm Back-up UPS1481 is designed for installation indoors and meets NEMA specifications for operating temperature, humidity, and utility voltage. These cabinets are corrosion resistant and rugged. The footprint of the Fire Alarm Back-up UPS1481 is less than 6 square feet. Listed below are the environmental specifications for the Fire Alarm Back-up UPS1481.

Adequate clearance in front of the equipment should be provided for service access.

OPERATING ENVIRONMENT

- AMBIENT TEMPERATURE 0°C to 49° C
- OPERATING ALTITUDE 1,829 M (6,000 FT) DERATE 10% FOR EACH ADDITIONAL 305 M (1,000 F~) UP TO 2,744 m (9,000 FT)
- RELATIVE HUMIDITY 0% to 95% (non-condensing)

Operating the Fire Alarm Back-up UPS1481 and batteries at either extreme of the temperature range may affect the long-term reliability of the system. This is especially true of the sealed, maintenance-free batteries. Sealed, maintenance-free batteries are designed to operate at normal room temperatures (72 to 77°F).

STORAGE ENVIRONMENT.

Provide a storage environment, which meets the following conditions:

- AMBIENT TEMPERATURE -30°C to 70°C
- RELATIVE HUMIDITY 0% to 95% non-condensing

TABLE 2-1
SITE PLANNING SPECIFICATIONS FOR KVA UNIT

	MODEL NUMBER	kW / kVA	INPUT VOLTAGE	INPUT AMP	OUTPUT VOLTAGE	OUTPUT AMP		DC VOLT	DC AMP	QTY. BATT PER SET	APPROX. W/O BATT WEIGHT
√1	WR3.0A58FPT1	3.0	120	40	120/240	25.00	@120	96V	43A	8	600
2											
√3	WR3.0D58FPT1	3.0	240	19	"	12.50	@240	96V	43A	8	600
√5	WR5.0A58FPT1	5.0	120	58	"	41.70	@120	120V	57A	10	900
6											
√7	WR5.0D58FPT1	5.0	240	30	"	21.00	@240	120V	57A	10	900
9											
√10	WR7.5D58FPT1	7.5	240	41	"	31.3	@240	120V	86A	10	1150
12											
√13	WR010D58FPT1	10.0	240	58	"	41.7	@240	192V	71A	16	1600
15											
16	WR012D58FPT1	12.5	240	69	"	52.1	@240	192V	88A	16	1850
18											
19	WR015D58FPT1	15.0	240	83	"	62.5	@240	240V	84A	20	2250
21	WR3.0A01FPN1	3.0	120	40	120	25.00		96V	43A	8	530
22											
23	WR3.0D04FPN1	3.0	240	19	240	12.50		96V	43A	8	530
25	WR5.0A01FPN1	5.0	120	58	120	41.70		120V	57A	10	830
26											
27	WR5.0D04FPN1	5.0	240	30	240	20.80		120V	57A	10	830
29											
30	WR7.5D04FPN1	7.5	240	41	240	31.30		120V	86A	10	990
32											
33	WR010D04FPN1	10.0	240	58	240	41.70		192V	71A	16	1370
35											
36	WR012D04FPN1	12.5	240	69	240	52.10		192V	88A	16	1630
38											
39	WR015D04FPN1	15.0	240	83	240	62.50		240V	84A	20	1910

NOTE: FP DENOTES – FIRE PROTECTION Fire Alarm Back-up UPS1481 SERIES.

UL1481 MICRO-CHIPS & OTHER COMPONENT'S LIST									
	MODEL NUMBER	KW / KVA	INPUT VOLTAGE	MICRO-CHIP SOFTWARE	BASIC UPS KIT	LABEL KIT	INPUT CONTACTOR	BATT C.B.	FANS
1	WR3.0A58FPT1			9100-1319-018	9100-1312-11	9100-1295-02	1680-242	2025-769	1000-036
2									
3	WR3.0D58FPT1			9100-1319-025	9100-1312-11	"	"	"	"
5	WR3.0A01FPN1			9100-1319-017	9100-1312-10	"	"	"	"
6									
7	WR3.0D04FPN1			9100-1319-027	9100-1312-10	"	"	"	"
9	WR5.0A58FPT1			9100-1319-050	9100-1312-11	"	1680-093	2025-771	"
10									
11	WR5.0D58FPT1			9100-1319-057	9100-1312-11	"	"	"	"
13	WR5.0A01FPN1			9100-1319-049	9100-1312-10	"	"	"	"
14									
15	WR5.0D04FPN1			9100-1319-059	9100-1312-10	"	"	"	"
17									
18	WR7.5D58FPT1			9100-1319-081	9100-1312-11	"	"	"2025-760	"
							"	"	"
20									
21	WR7.5D04FPN1			9100-1319-083	9100-1312-10	"	"	"	"
23									
24	WR010D58FPT1			9100-1319-105	9100-1312-11	"	"	"2025-759	"
26									
27	WR010D04FPN1			9100-1319-107	9100-1312-10	"	"	"	"
29									
30	WR012D58FPT1			9100-1319-129	9100-1312-11	"	"	2025-760"	"
32									
33	WR012D04FPN1			9100-1319-131	9100-1312-10	"	"	"	"
						"	"	"	"
35									
36	WR015D58FPT1			9100-1319-153	9100-1312-11	"	"	"2025-759	"
38									
39	WR015D04FPN1			9100-1319-155	9100-1312-10	9100-1295-02	1680-187	2025-759	1000-036

2-2 Pre-Installation

The Fire Alarm Back-up UPS1481 is designed for indoor installations. All customer connections are brought through knockouts located on the top or side of the Fire Alarm Back-up UPS1481. The Fire Alarm Back-up UPS1481 consists of one (1) integrated cabinet — housing both the electronics and batteries (depending on KVA). Before unpacking the equipment, inspect the exterior, the shipping container and the equipment itself for damage that may have occurred during transit. If the shipping container or equipment itself shows evidence of damage, note the damage on the receiving document before signing for receipt of the equipment. Damage claims should be filed directly with the carrier.

2-2-1 Equipment Unpacking

Remove the equipment from the shipping carton. Since the 68” cabinet for 15KVA is designed for pad — mount installations, there are no casters. It is suggested that a fork lift be used to remove the Fire Alarm Back-up UPS1481 from its shipping pallet.
Before placing the Fire Alarm Back-up UPS1481 onto the mounting bolts or leveller (where it will be installed), the conduit knockouts need to be removed.

1. The conduit knockouts are located on the back-side of the cabinet for 3-15 KVA
2. Remove the conduit knockouts.
3. Measure the locations for the conduits on the conduit knockouts.
4. Drill or punch holes in the conduit knockouts for the conduits.

Anchor the Fire Alarm Back-up UPS1481 to the mounting pad at the four (4) mounting locations, by lowering levellers for 3-15 KVA units.
1. Anchor the conduits to the conduit knockouts
2. This concludes the mechanical installation.

2-3 Electrical Connections: “CAUTION & DE-ENERGIZE UNIT PRIOR TO SERVICING”

CAUTION

Verity that all customer-supplied wiring Is de-energized before performing any electrical work,

CAUTION

Even when the Fire Alarm Back-up UPS1481 is off, there are potentially dangerous voltages within the Fire Alarm Back-up UPS1481 due to the batteries. Extreme care must be taken when working within the Fire Alarm Back-up UPS1481 enclosure.

1. Verify that the main input circuit breaker, battery circuit breaker, and output circuit breaker(s), if provided are in the “OFF” position. See illustration 1-2 for the locations of the circuit breakers. See under Section 2-5, Storage for accessing the inside of the unit.

2. Run the power wires up through the center area of the Fire Alarm Back-up UPS1481. Exercise care when working around the battery area.

3. Refer to Section 1-4 for various different installation configurations.

4. Connect the input wires to the input terminal block, TB1. Three (3) wires total: “hot”, neutral (or Hot), and ground.

5. Connect the output wires to the output terminal block, TB2. Three (3) wires total: “hot”, neutral (or Hot), and ground to the appropriate designate locations.

6. Connect the battery wires from external battery cabinet (if provided) to battery terminal block, TB3, three (3) wires total for (+), (-) and Ground.

7. This concludes the electrical connections. Do not apply power to the Fire Alarm Back-up UPS1481 at this time.

2-3-1 Remote Signaling Connections (AS400) –All wiring is to remain in the same room.

The Fire Alarm Back-up UPS1481 includes the feature of providing dry relay contacts for remote signaling capabilities. Signals available of remote annunciation are:

“UTILITY FAILURE” — This is a normally open contact which closes upon loss of input power to the Fire Alarm Back-up UPS1481. **“LOW BATTERY”** — This is a normally open contact which closes when the Fire Alarm Back-up UPS1481 is on battery operation and the batteries are approaching complete discharge.

“ON INVERTER or **ON BYPASS”** — This is a normally open contact which closes when the Fire Alarm Back-up UPS1481 goes to battery operation.
“SUMMARY ALARM” — This is a normally open contact which closed when the Fire Alarm Back-up UPS1481 has any one of the alarm conditions.

If there are no requirements for remote signaling, section 2-4-1 may be skipped.

1. The dry relay contacts for remote signaling are provided on connector (P5) of control board (A2) located on the right door inside of the Fire Alarm Back-up UPS1481. See illustration 1-2 for exact locations.

2. The dry relay contacts have the following maximum ratings:
   200V (AC or DC) maximum **Note:** For connection to power Limited sources only.
   1.25 amperes maximum
   30 watts maximum, Power Factor 1.0PF
   It is imperative that the relay contact ratings are not exceeded. Otherwise, damage to the relays within the Fire Alarm Back-up UPS1481 will occur.

3. Determine which signals will be used. Connect wires (customer-supplied) to the connector.

4. This concludes the remote signaling connection procedures.

5. This concludes the installation procedures. Please proceed to Section 3-Start-Up for these necessary to start- up the Fire Alarm Back-up UPS1481.

- **Form "C" N/O Contacts for Alarms**

Terminal Number	Signal	Description
TB30-1	LOW BATTERY	N/O contact that closes when the unit is on battery operation and the batteries approach inadmissible discharge status.
TB30-2	ON BYPASS	N/O contact that closes when the unit transfers the load to static by-pass.
TB30-3	SUMMARY ALARM	N/O contact that closes when the unit has any one of the following alarm conditions. Internal Failure, System Overheat, Battery under-voltage.
TB30-4	UPS ON	N/O when unit is on Inverter (UPS)
TB30-5	INPUT FAIL	N/O contact that closes upon loss of input power.
TB30-6	COMMON	Common Terminal

- **Dry Contact, N/O or N/C Contact with Isolated Common**

Terminal Number	Signal	Description
TB18-1 (COM)	SUMMARY ALARM	When the unit has any one of the following alarm conditions. Internal Failure, System Overheat, Battery under-voltage.
TB18-2 (N/O)		
TB18-3 (N/C)		
TB18-4 (COM)	ON BYPASS	When the unit transfers the load to static by-pass.
TB18-5 (N/O)		
TB18-6 (N/C)		
TB18-7 (COM)	LOW BATTERY	When the unit is on battery operation and the batteries approach inadmissible discharge status.
TB18-8 (N/O)		
TB18-9 (N/C)		
TB18-10 (COM)	INVERTER ON	Upon Inverter turned ON
TB18-11 (N/O)		
TB18-12 (N/C)		
TB18-13 (COM)	ON BATTERY	Upon loss of input power.
TB18-14 (N/O)		
TB18-15 (N/C)		
TB18-16 to TB18-18	Spare	

2-3-2 RS232 Connection

Control PCBD

J8 – connector / P8 IBM PC Serial Port
J2 – connector / P8 to 2 → to 2
J3 – connector / P8 to 3 → to 3
J5 – connector / P8 to 5 → to 5

Pin 1, 4, 6, 7, 9 no connection

Pin 2 : Receive
Pin 3 : Transmit
Pin 5 : GND

2-4 Storage

The Fire Alarm Back-up UPS1481 Series can be placed in storage while not in use. Provide a protected environment which meets the environmental parameters listed below.

- AMBIENT TEMPERATURE -22° to 158°F
  -30° to 70°C
- RELATIVE HUMIDITY 0% to 95% non-condensing

The Fire Alarm Back-up UPS1481 Series will be stored for several months or longer, it should be serviced by charging the batteries for 24 hours at regular, three-month intervals. While in storage, service the unit using the procedures in this section.

During long-term storage, the batteries are subject to aging and deterioration. If after visual inspection, the batteries need to be replaced contact your OnLine Power dealer or the OnLine Power factory directly to obtain new batteries.

The UPS is stored in its original packaging, unpack UPS using unpacking procedures outlined in Section 2-3-1.

If the UPS is not connected to a source of power, first connect the UPS to an appropriate source of power using the procedures in Section 2-4, Electrical Connections.

When the UPS is unpacked and first connected to an AC power source, recharge batteries as follows:

1. Unlock and remove the front panel by pushing it up and out, pull both the side panel up and out.

2. Visually inspect batteries for signs of deterioration and leakage. Replace batteries if required.

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3. Set AC power source to ON.

4. Close input CB, if provided (CB2)

5. Close battery CB, if provided (CB1)

6. The UPS automatically recharges batteries. The LCD panel will indicate the battery voltage and charging current.

7. Allow UPS to run for 24 hours to fully charge batteries.

    - When batteries have reached partial charge, the battery charging current will be under 1 Amps on LCD panel.

8. Turn OFF input power to UPS.

9. Close and replace all the panels back.

SECTION 3 - OPERATION

3-1 Start-Up Procedures

1. Verify that the main input circuit breaker, battery breaker, and output circuit breaker(s), if provided, are in the “OFF” or “down” positions.

   Refer to illustration 1-2 for the locations of the circuit breakers.

CAUTION

If during the start- up procedures anything unusual occurs, immediately turn off the Input circuit breaker, and contact OnLine Power at (800) 797-7782 for technical assistance. If there are any questions or additional information Is required, please contact On-Line Power at (800) 797-7782 for technical assistance.

2. Apply input power to the Fire Alarm Back-up UPS1481 Series

   - Verify that the voltage appearing on the input terminal block is 120/240 VAC and is same as on nameplate. Lithe voltage is not same as on nameplate approximately, do not proceed any further. Contact On-Line Power at (800) 797-7782 for technical assistance.

   - Verify that there are no voltages appearing on the output terminal block.

3. Turn on the main input circuit breaker, supplying power to the unit.

4. After turning on the System, wait one (1) minute while the Fire Alarm Back-up UPS1481 runs through its internal diagnostic routines.

   - Hear the sound of contactor closing.
   - See the fan(s) running.
   - See the LCD panel displaying correct messages. See Appendix D for LCD displays.
   - Verify that the LCD display panel indicates all correct parameters — see Appendix D for details.
   - Verify that the output voltage is 120/240 per the nameplate.

5. Close battery breaker in the UPS cabinet [and in battery cabinet(s), if provided.

6. At this point in time, the Fire Alarm Back-up UPS1481 should be providing AC line power. The Fire Alarm Back-up UPS1481 is not operating in the normal mode, turn off the input circuit breaker. Contact OnLine Power at (800) 797-7782 for technical assistance.

7. Recheck that the output voltage is 120/240 VAC.
   - If the output voltage is approximately same as nameplate, turn on the loads which will

be powered from
the Fire Alarm Back-up UPS1481.

8. The next steps verify battery operation and the inverter test switch.

   - To place the Fire Alarm Back-up UPS1481 in battery operation (to simulate loss of input power), press and hold yellow Inverter Test Switch. With switch in the hold position, the Fire Alarm Back-up UPS1481 should be running on its internal batteries.
   - Verify that the LCD panel displays such.
   - Verify that the “Battery Charger” is OFF in LCD panel.

   Note: Be sure to release the switch after the test, so it will not deplete the batteries.

9. The Fire Alarm Back-up UPS1481 is now fully functional - providing clean, sine wave power to the load with battery back—up in case of an input power failure. This concludes the start-up procedures.

3-2 Operation

3-2-1 Turning On the Fire Alarm Back-up UPS1481:

1. Apply input power.
2. With input power available, turn on the main input circuit breaker, CB2 (if provided).
3. Close battery breaker (CB1), only after the LCD display is lit & displays screens per Appendix D.
4. Wait till you hear the input contactor closing and fan running.
5. Verify that all parameters on LCD display panel are proper. See Appendix D for display details.
6. Close the output circuit breaker, CB2 (if provided).
7. Turn load breakers On.

3-2-2 Turning off the Fire Alarm Back-up UPS1481:

1. Turn off the Output Breaker(s), if provided.

2. Turn off the Battery Breaker.

3. Turn off the Input Breaker, if provided.

3-3 Theory of Operation

Illustration NO TAG is a simplified block diagram of the Fire Alarm Back-up UPS1481. This diagram provides an excellent tool in identifying the major building blocks within the Fire Alarm Back-up UPS1481.

1. **External Main input circuit breaker (CB2)** — The main input circuit power provides over current protection to the input side of the Fire Alarm Back-up UPS1481.
2. **Input Contactor (KI)** — The microprocessor based control circuitry:
   - Verifies UPS to be normal condition and not the one 'at fault".
   - Verifies correct input voltage and frequency to be within acceptable range and commands the closure of this. Contactor via control transformer T2 and fuse Fl.

3. **Input Chokes (LI, U)** — They act as a filter and an important circuitry of an up chopper, boosting input voltage to a higher internal DC bus voltage.

4. **Battery charger** — The battery charger converts AC power into regulated DC power to charge and to maintain the charge on the battery bank. The charger is fully automatic with a current limiting feature so that damage will not occur to the batteries in case of a charger malfunction. The charger is sized such that the batteries will be maintained at full charge even when the input voltage is at the low line limit for indefinite periods of time.

5. **Battery** — The battery bank, consisting of eight (8), ten (10), sixteen (16), or twenty (20), 12 volt, VRLA batteries, provides the reserve energy to power the load when suitable AC input power is not present. The batteries are sealed, and maintenance-free construction.

6. **Inverter** — When the AC input power is not available to power the load, the inverter converts the energy stored in the battery bank to AC power to supply the powers with the load. The pulse width modulated (PWM) inverter utilizes high speed, high efficiency IGBT5 for fast response, sinusoidal power.

7. **DC Choke (U)** — If helps boosting battery voltage to an internal higher DC bus voltage.

8. **Output AC Choke (L4)** — This acts as a buck circuit component connecting high DC bus voltage to an appropriate AC output voltage.

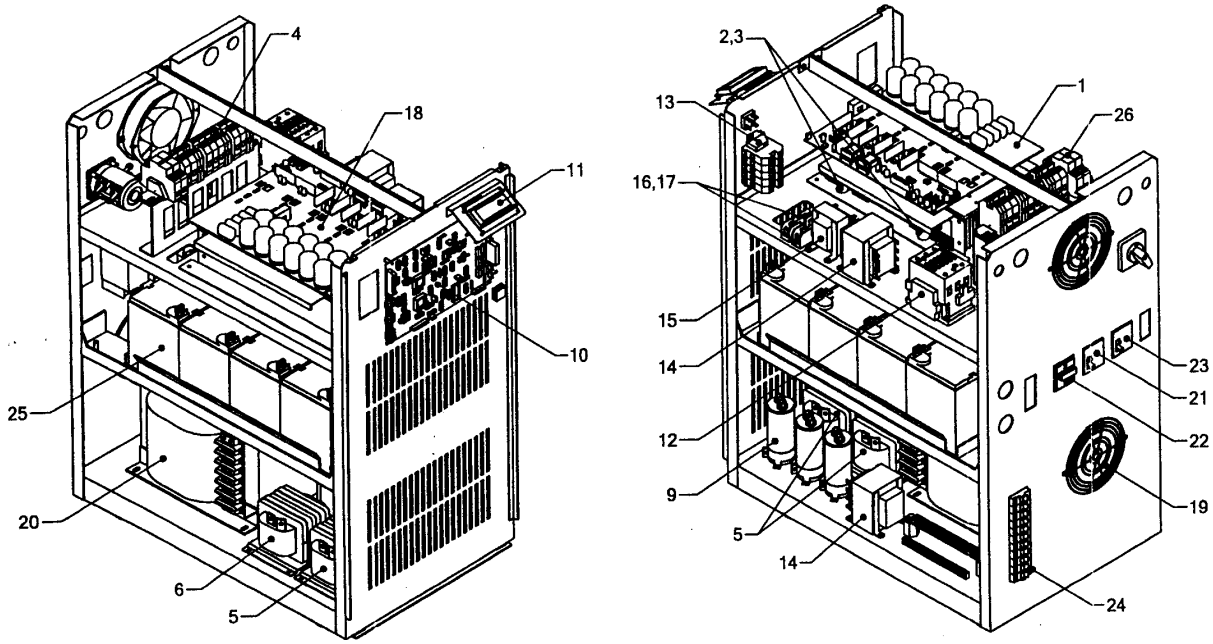
9. **Optional Output Isolation Transformer** (TI) — The transformer performs a number of critical functions. First, it provides excellent common mode and normal mode noise isolation of the load from the input or inverter power. Secondly, it provides voltage transformation and tight regulation of the output voltage while the Fire Alarm Back-up UPS1481 is operating from its internal inverter or directly from utility via bypass circuitry.

10. **Inverter Test Switch (SW2)** — This switch is a manually operated switch which tests the Fire Alarm Back-up UPS1481 and the batteries for proper operation. When the Fire Alarm Back-up UPS1481 is running and Switch SW2 is pushed and held in, the Fire Alarm Back-up UPS1481 will automatically transfer to battery operation. The Fire Alarm Back-up UPS1481 will continue to run on batteries until the switch is released back to the “normal” position (Switch is a momentary switch). When the switch is released, the Fire Alarm Back-up UPS1481 returns to normal operation (provided input power is present).

11. **Control Transformer (T2)** — This transformer with fuse (FI), provides (internal housekeeping) power supply as well as 120 VAC for the coil of the input contactor. The primary of this transformer has various taps that needs to be matched with the various input voltages.

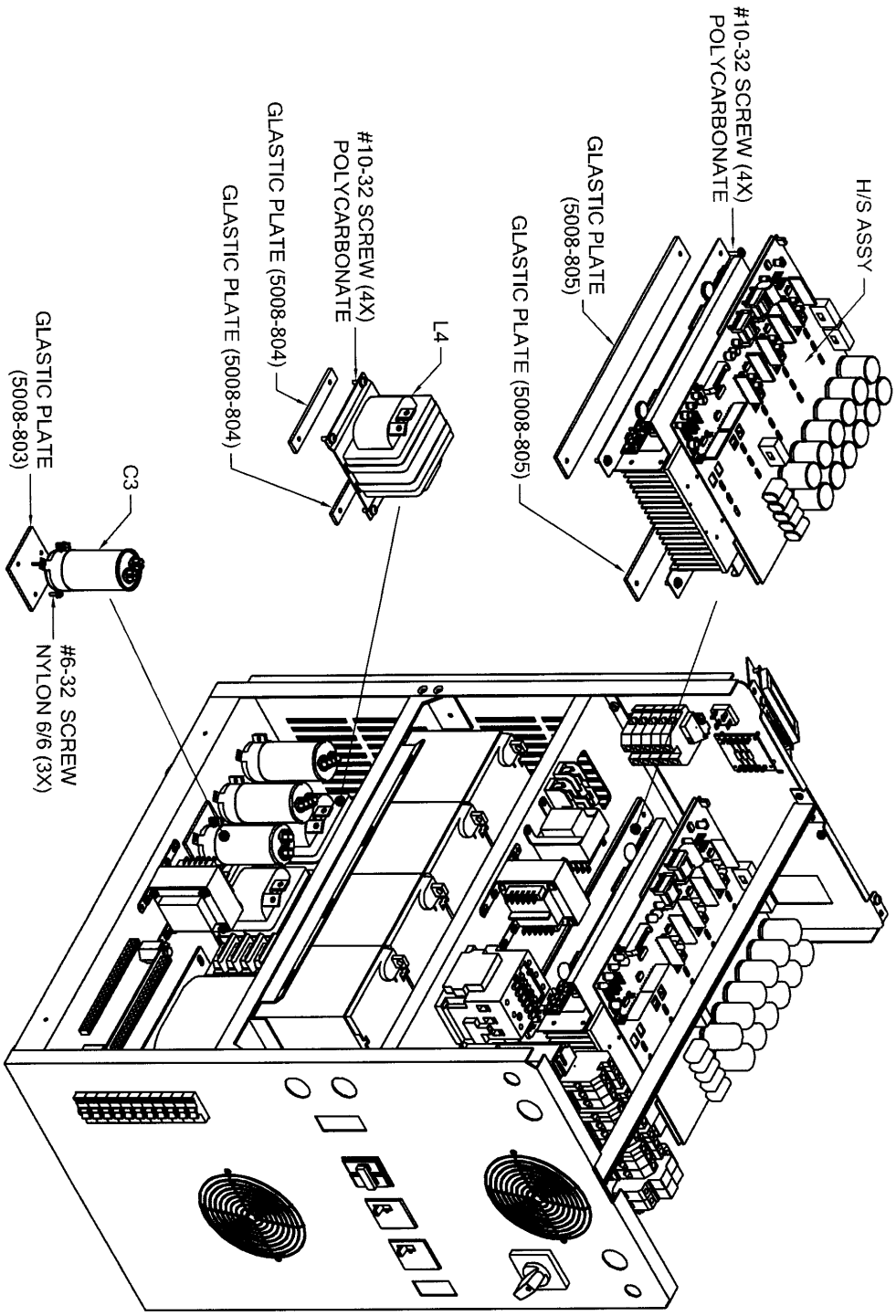
12. **Fan Transformer (T3)** — This transformer with fuse (F2) provides 120 VAC to the fan(s) for various output voltages that are matched at its primary taps.

3-4 COMPONENT'S LOCATION & LIST

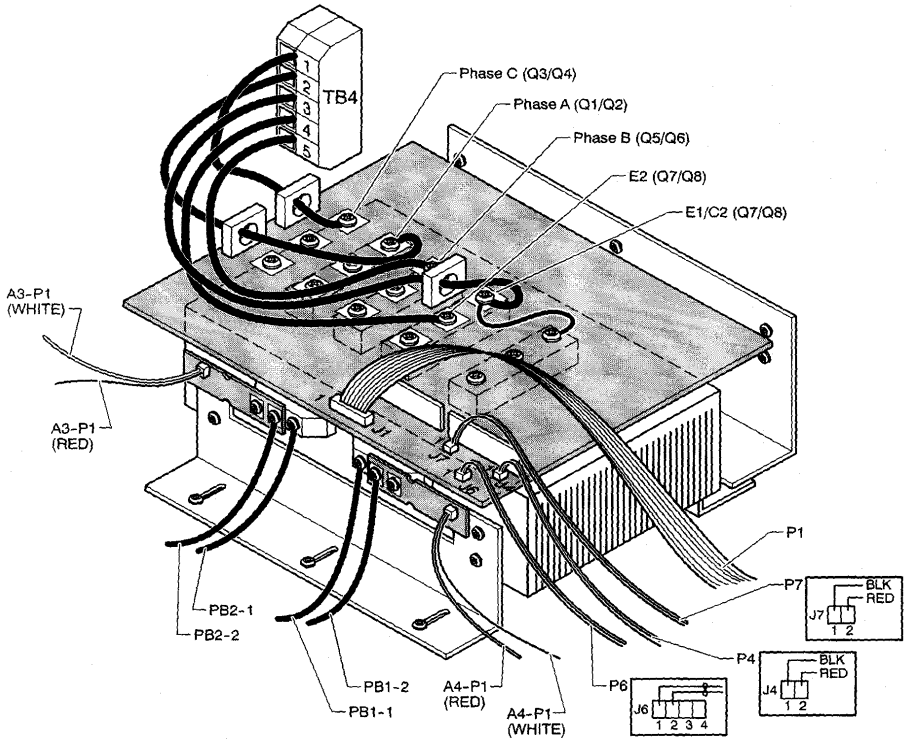


COMPONENT'S TABLE

ITEM	QTY	DESCRIPTION	DESIG.	OLP PART NUMBER
1	1	Power Board	A1	1625-287-01
2	1	Bypass Static Switch	PB1	1690-002
3	1	Output Static Switch	PB2	1690-002
4	1	Input/Output/Battery Terminal Block for customer's use	TB1, TB2, TB3	4025-210
5	1	Input Choke / output choke	L1, L2, L3	1450-1470-03
6	1	DC choke	L4	1450-1472-03
9	1	The Frequency Noise Filter Capacitors for Input Power	C1, C2, C3	1525-206
10	1	Control Board	A2	1625-288-01
11	1	LCD Display Board	A5	1690-164
12	1	Input Contactor	K1	1680-242/ -093/ -139/ -187
13	1	Terminal Block to remove heat sink assembly	TB4	4025-211
14	1	Fan Transformer	T3	1400-110
15	1	Control Power Transformer	T2	1400-105
16	1	Control Transformer Fuse	F1	2075-024
17	1	Fan Fuse	F2	2075-065
18	1	Heat Sink Assembly	HS1	9100-1338-01 THRU -04
19	1	Fan(s)	B1, B2	1000-036
20	1	Optional Output Isolation Transformer	T1	1450-1473-06
21	1	Input Breaker	CB2	OPTIONAL, SEE NAMEPLATE
22	1	Battery Breaker	CB1	2025-XXX, CONSULT FACTORY
23	1	Output Breaker	CB3	OPTIONAL, SEE NAMEPLATE
24	1 +	Output Distribution Breakers	CB4 and UP	OPTIONAL, SEE NAMEPLATE
25	8, 10, 16, 20	Maintenance Free Lead Acid Battery(s)	B1 and UP	SEE THE NAME-PLATE
26	1	TVSS	TVSS	


H/S ASSY
#10-32 SCREW (4X)
POLYCARBONATE
GLASTIC PLATE
(5008-805)
GLASTIC PLATE (5008-805)
L4
#10-32 SCREW (4X)
POLYCARBONATE
GLASTIC PLATE (5008-804)
GLASTIC PLATE (5008-804)
C3
GLASTIC PLATE
(5008-803)
#6-32 SCREW
NYLON 6/6 (3X)

3-4 ITEM 18 (CONTINUED)



HEAT SINK ASSEMBLY
ILLUSTRATION 3-2

APPENDIX A: EXTENDED BATTERY RUN CHART

Battery Qty. x Ahr, (Qty. & Type of Cabinets w/t UPS), -xxx indicates minutes as well as it is a suffix of the part number in top row.						
Part No.	**7050-272**	**7050-273**	**7050-274**	**7050-275**	**7050-276**	**7050-277**
Battery Brkr.	**70A, 125VDC**	**90A, 150VDC**	**125A, 150VDC**	**100A, 250VDC**	**125A, 250VDC**	**125A, 300VDC**
105 degree C int.	**6 AWG**	**6 AWG**	**4 AWG**	**4 AWG**	**4 AWG**	**4 AWG**
1.0 P.F. KW	**3kVA 1.0 P.F.**	**5kVA 1.0 P.F.**	**7.5kVA 1.0 P.F.**	**10kVA 1.0 P.F.**	**12.5kVA 1.0 P.F.**	**15kVA 1.0 P.F.**
FIRE PROT. (MIN)	**8x35AH A-015**	**10x35AH B-015**	**10x50AH B-015**	**16x50AH B-015**	**16x50AH B-015**	**20x50AH C-015**
	8 x 50 Ahr B -048	**10 x 50 Ahr B -030**	**10 x 65 Ahr B -021**	**16 x 65 Ahr C -029**	**16 x 65 Ahr C -020**	**20 x 65 Ahr C -021**
	8 x 65 Ahr B -060	**10 x 65 Ahr B -040**	**10 x 90 Ahr B -033**	**16 x 90 Ahr C -043**	**16 x 90 Ahr C -032**	**20 x 90 Ahr C -033**
	8 x 90 Ahr B -83	**10 x 90 Ahr B -057**	**10 x 100 Ahr B -043**	**16 x 100 Ahr C -54**	**16 x 100 Ahr C -40**	**20 x 100 Ahr C -043**
	8 x 100 Ahr B -107	**10 x 100 Ahr B -73**	**10 x 120 Ahr B -52**	**16 x 120 Ahr C -066**	**16 x 120 Ahr C -050**	***20 x 120 Ahr C -052**
	8 x 120 Ahr B -132	**10 x 120 Ahr B -90**	**10 x 150 Ahr B -68**	**16 x 150 Ahr C -86**	**16 x 150 Ahr C -64**	***20 x 150 Ahr C -68**
	8 x 150 Ahr B -170	**10 x 150 Ahr B -118**	**20 x 90 Ahr C -83**	**32 x 90 Ahr (B+C) -108**	**32 x 90 Ahr (B+C) -079**	****40 x 90 Ahr (2C) -083**
	16 x 90 Ahr C -208	**20 x 90 Ahr C -144**	**20 x 100 Ahr C -108**	****32 x 100 Ahr (B+C) -137**	****32 x 100 Ahr (B+C) -101**	****40 x 100 Ahr (2C) -107**
	16 x 100 Ahr C -260	**20 x 100 Ahr C -182**	***(20 x 120 Ahr C -132**	****32 x 120 Ahr (B+C) -166**	****32 x 120 Ahr (B+C) -125**	**40 x 120 Ahr (2C) -132**
	16 x 120 Ahr C -315	**20 x 120 Ahr C -220**	***(20 x 150 Ahr C -170**	**32 x 150 Ahr (B+C) -213**	**32 x 150 Ahr (B+C) -161**	***40 x 150 Ahr (2C) -169**
		***(20 x 150 Ahr C -282**				
Cabinet Types:						
A = internal batteries located on the bottom shelf of small Cabinet						
B = 48" Tall, one Cabinet						
C = 68" Tall, one Cabinet						
nB = 48" Tall, n number of Cabinets						
nC = 68" Tall, n number of Cabinets.						

TABLE 4-10
KW, BATTERY CONFIGURATION (Fire Alarm Back-up UPS1481)

*UL LISTING WAS PERFORMED ONLY FOR 15 MINUTES RUN TIME. Max DC Ripple 48 V

APPENDIX B – Optional Main Input & Main Output Breakers

for various models (*All Values are typical as reference only)

TABLE B-1: External Output Breaker (Standard KAIC)				
KVA	Output Voltages			
	120 Vac		240 /120 VAC	
3	40 Amps, 120 VAC, 1 Pole, 14 KAIC OLP P/N: 2025-783		20 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-788	
5	70 Amps, 120 VAC, 1 Pole, 14 KAIC OLP P/N: 2025-997		40 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-791	
7.5	100 Amps, 120 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-999		50 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-792	
10	125 Amps, 120 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-759		70 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-794	
12.5	1750 Amps, 120 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-468		80 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-795	
15	200 Amps, 120 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-541		100 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-797	

TABLE B-2: Output Breaker (High KAIC)				
KVA	Output Voltages			
	120 Vac		240 Vac	
3	40 Amps, 120 VAC, 1 Pole, 42 KAIC OLP P/N: 2025-799		20 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-762	
5	70 Amps, 120 VAC, 1 Pole, 42 KAIC OLP P/N: 2025-998		40 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-766	
7.5	100 Amps, 120 VAC, 2 Pole, 42 KAIC OLP P/N: 2025-803		50 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-767	
10	125 Amps, 120 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-759		70 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-769	
12.5	1750 Amps, 120 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-468		80 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-770	
15	200 Amps, 120 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-541		100 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-894	

INPUT CIRCUIT BREAKER

TABLE B-3: Input Breaker Ampacity (Standard KAIC)				
KVA	**Input Voltages**			
	120 Vac		**240 V/ or 208V**	
3	50 Amps, 120 VAC, 1 Pole, 14 KAIC OLP P/N: 2025-784		30 Amps, 240 VAC, 2 Pole, 14 KAIC OLP P/N: 2025-790	
5	70 Amps, 120 VAC, 1 Pole, 14 KAIC OLP P/N: 2025-997		40 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-791	
7.5	N/A		60 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-793	
10	N/A		70 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-794	
12.5	N/A		90 Amps, 240 VAC, 2 Pole, 10 KAIC OLP P/N: 2025-796	
15	N/A		125 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-759	

TABLE B-4: Input Breaker Ampacity (hIGH KAIC)				
KVA	**Input Voltages**			
	120 Vac		**240 Vac or 208VAC**	
3	50 Amps, 120 VAC, 1 Pole, 42 KAIC OLP P/N: 2025-800		30 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-764	
5	70 Amps, 120 VAC, 1 Pole, 42 KAIC OLP P/N: 2025-998		40 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-766	
7.5	N/A		60 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-768	
10	N/A		70 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-769	
12.5	N/A		90 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-771	
15	N/A		125 Amps, 240 VAC, 2 Pole, 65 KAIC OLP P/N: 2025-759	

APPENDIX C: LCD DISPLAY MENU & TROUBLSHOOTING GUIDE

Two screens (A, B) are updated continuously for units without optional output transformer.

Three screens (A, B, C) are updated continuously for units with optional output transformer.

Start-up Screen

When input power is applied for the unit, LCD panel lights up and displays

OnLine Power **UPS Project**

If LCD display panel is not lit, unit has a problem. Contact factory service at 1–800–PWR-SRVC at OnLine Power.

SCREEN A: The screen appears as below.

Line 1	**UPS NORMAL**	**@**	**7**	**KW**
Line 2	**INPUT OK**	**@**	**CHRG**	**ON**
Line 3	**BATTERY OK**	**@**	**DC**	**OK**
Line 4	**ON INVERTER**	**@**	**OUT**	**OK**

It may show

1. **UPS** **NORMAL** **@** **7KW**

- **7KW** indicates the KW rating of the unit
- **STANDBY** is shown for testing or startup
- **NORMAL** indicating normal UPS operation
- **PROBLEM** UPS having problem
  Try to reset the unit by shutting off and restarting, or else contact factory
- **FAILURE** indicates UPS failed or had alarm condition
  Reset unit as above. Shut it off till LCD is shut-off. Restart unit, or else contact the factory

SCREEN B: The screen appears as below.

Line 1	**OUTPUT: _____V**	**@**	**_____**	**W**
Line 2	**INPUT : _____V**	**@**	**_____**	**A**
Line 3	**DC BUSS: _____V**	**@**	**NA**	**A**
Line 4	**BATT: _____V**	**@**	**+_____A**	

4. Indicates output voltage and power in watts, when output transformer is not used. It indicates primary voltage of the output transformer (T1) (120 VAC, typically) when T1 is used.

5. Indicates input volts and Amps.

6. Indicates internal DC buss condition for factory use.

7. Indicates battery voltage. The (+) current in Amps indicates charging Amps, while (-) indicates discharging Amps.

SCREEN C: When optional output transformer is used, various output voltages are indicated as such.

Line 1	**OUTPUT VOLTAGE**	**120 V**
Line 2	**OUTPUT VOLTAGE**	**N/A**
Line 3	**OUTPUT VOLTAGE**	**240 V**
Line 4	**OUTPUT VOLTAGE**	**N/A**

2. **INPUT OK @ CHG ON**

- **ON:** Charger is ON
- **OFF:** Charger is OFF
- **OK:** Input is within acceptable range
- **BAD:** Input is off or out of range.

3. **BATTERY OK @ DC OK**

- **OK** – DC bus is OK
- **UV** – DC bus is lower
- **OV** – DC bus is high
- **OK** – Battery voltage is OK
- **OV** – Battery voltage is high, possible charger failure
- **LOW** – Battery voltage is low, recharge of battery is required

4. **ON INVERTER @ OUT OK**

- **OK** – Load is OK
- **OVERLOAD** – Output is overloaded, reduce the load.
- **BAD** – Load is bad, or high, or grounded. Disconnect and rectify the problem with load.
- **ON INVERTER** – UPS is on inverter
- **ON BYPASS** – UPS is running not on inverter, but on bypass.

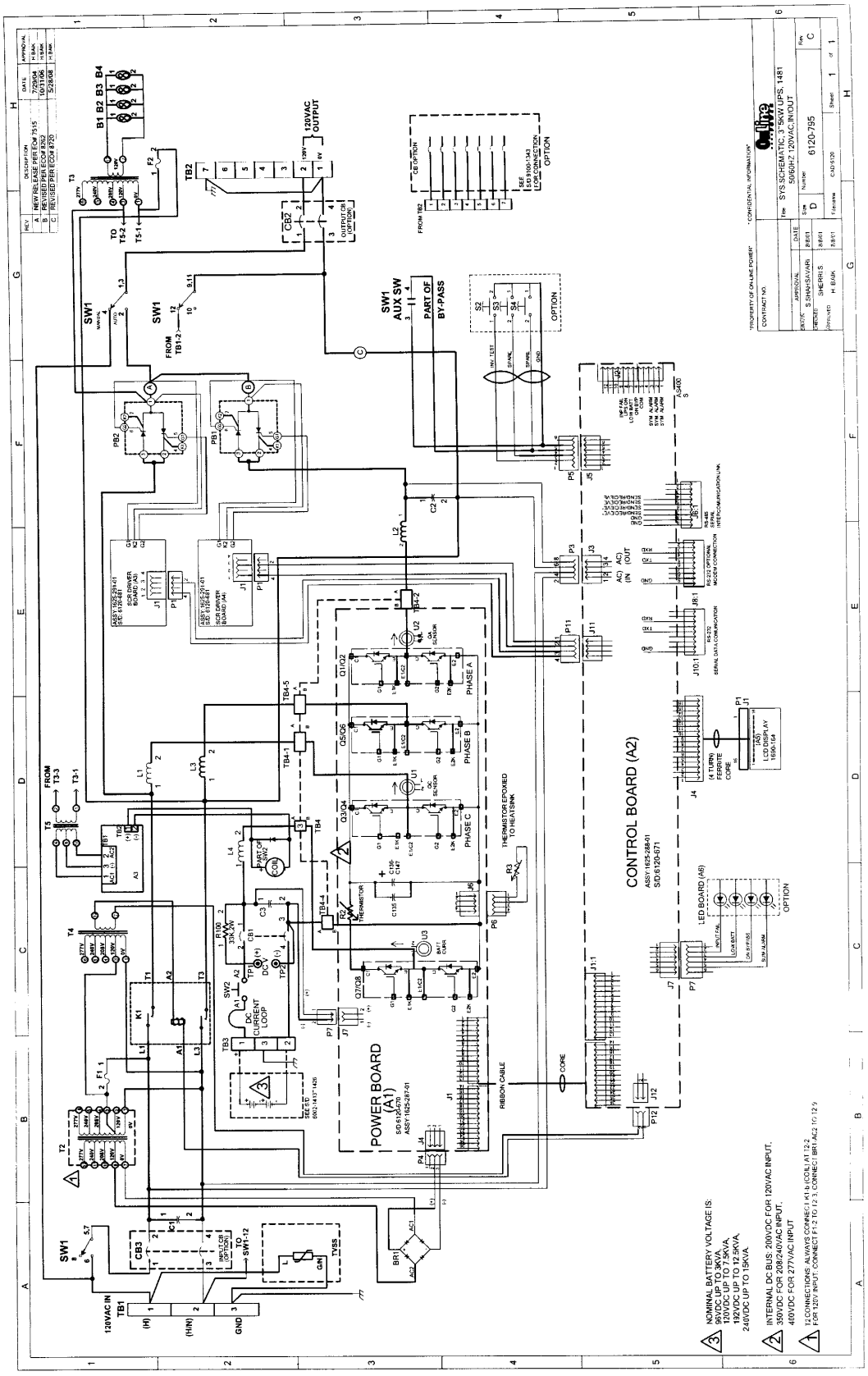
APPENDIX D: SPECIFICATION

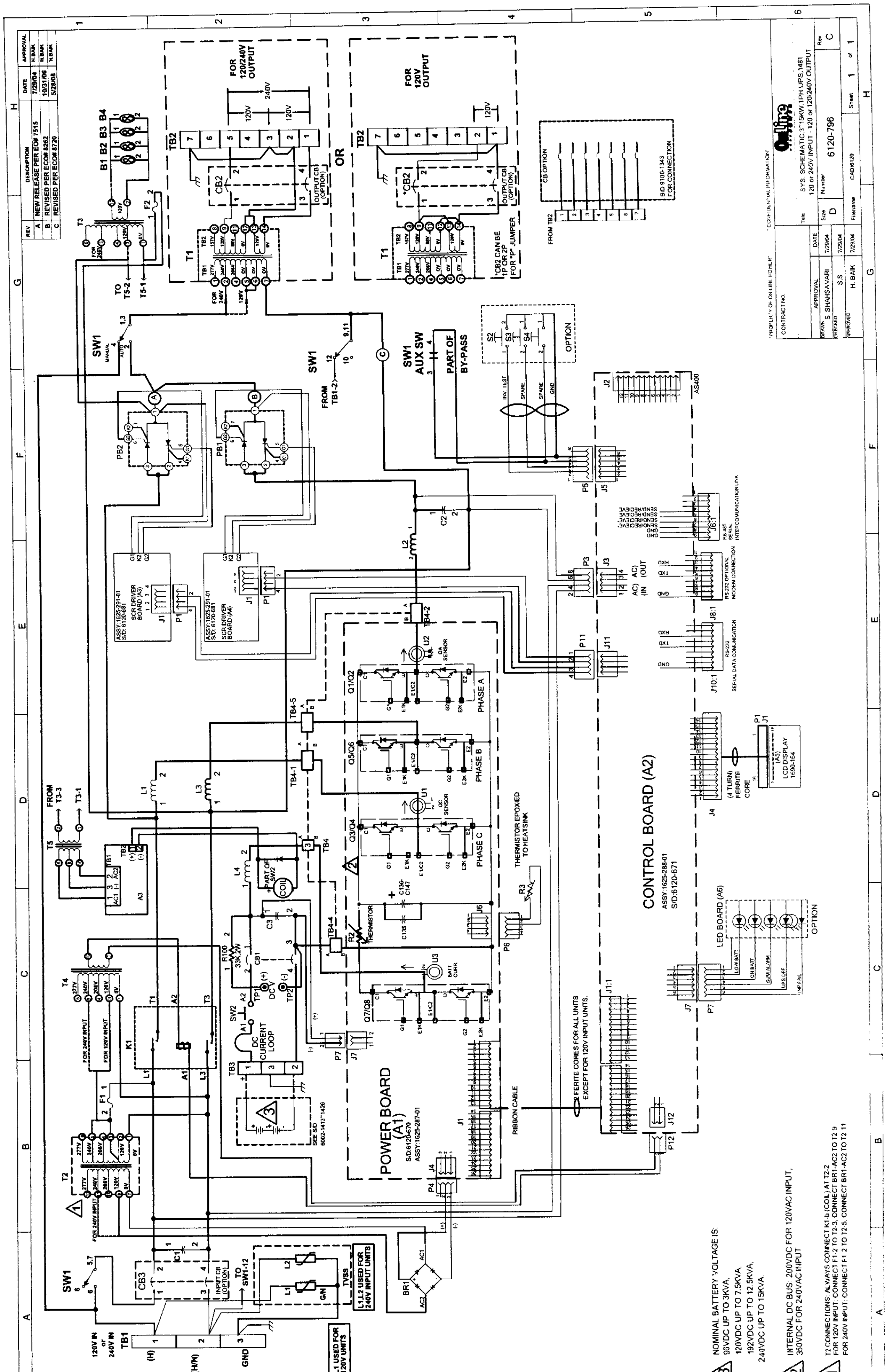
POWER RATING (KW)	3.0	5.0	7.5	10	12.5	15
VOLTAGE (VAC) INPUT	Single Phase, 120/208/240		Single Phase, 240/208VAC			
MAXIMUM CURRENT	40/19/16	58/30/28	41/36	58/50	69/60	83/72
TOLERANCE	+10% to -15%					
FREQUENCY (Hz)	60 +/- 3%					
POWER FACTOR	1.0 (Typical)					
OVERCURRENT PROTECTION	Electronic / Circuit Breaker					
NUMBER OF WIRES	2 Wires plus Ground					
POWER CONNECTION	Hard Wired (Terminal Block)					
OUTPUT						
RATING (KVA/KW)	3.0	5.0	7.5	10	12.5	15
VOLTAGE (VAC)	120/120/240	120/120/240	120/240	120/240	120/240	120/240
VOLTAGE REGULATION	+/-3% No Load to Full Load; +/-3% High Line to Low Line					
FREQUENCY (Hz)	60 Hz +/-0.25 Hz (When on Inverter)					
WAVESHAPE	Sine Wave					
HARMONIC DISTORTION	<5% THD; <3% Single Harmonic					
CREST FACTOR	Up to 3 to 1					
POWER FACTOR	1.0PF					
STEADY-STATE CURRENT	25/12.5	42/20.8	62.5/31.3	83.3/41.7	104/52	125/62.5
OVERLOAD	125 % for One (1) minutes, surge 150 %					
PROTECTION	Electronic / Circuit Breaker					
NOISE REJECTION	-120 kB Common Mode; -60 kB Normal Mode					
NUMBER OF WIRES	2 Wires plus Ground					
POWER CONNECTION	Hard Wired (Terminal Block)					

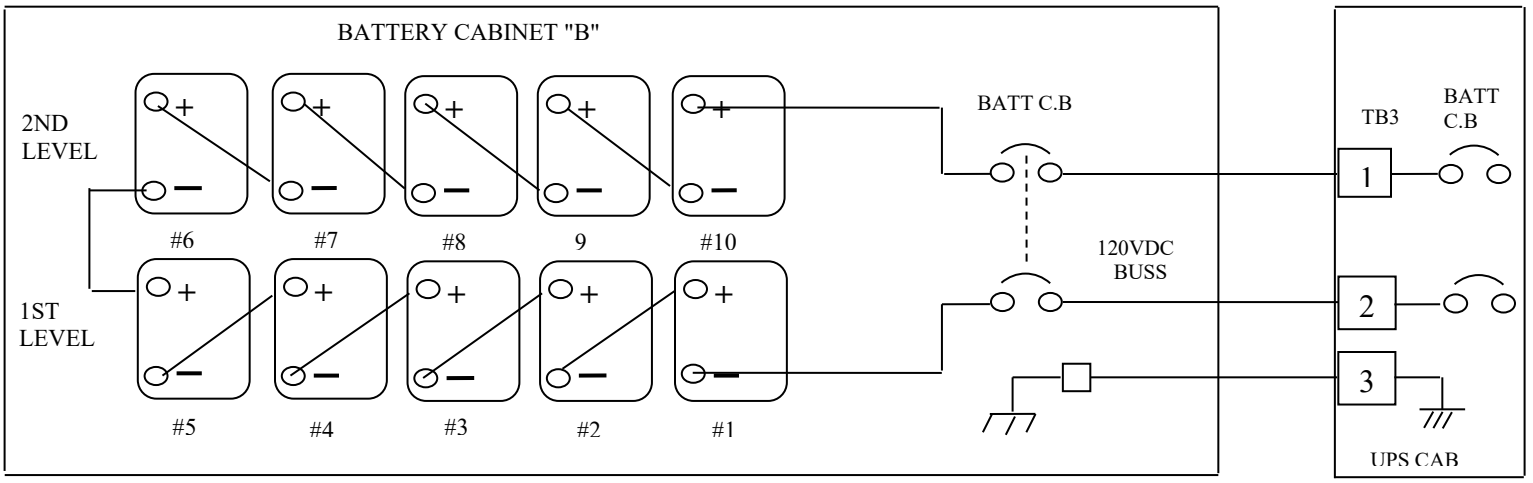
Output Receptacle Connect Ratings:

Voltage	Current	Frequency H2	Phase	Power Factor
120 vac	20	60	1	1
240 vac	20	60	1	1

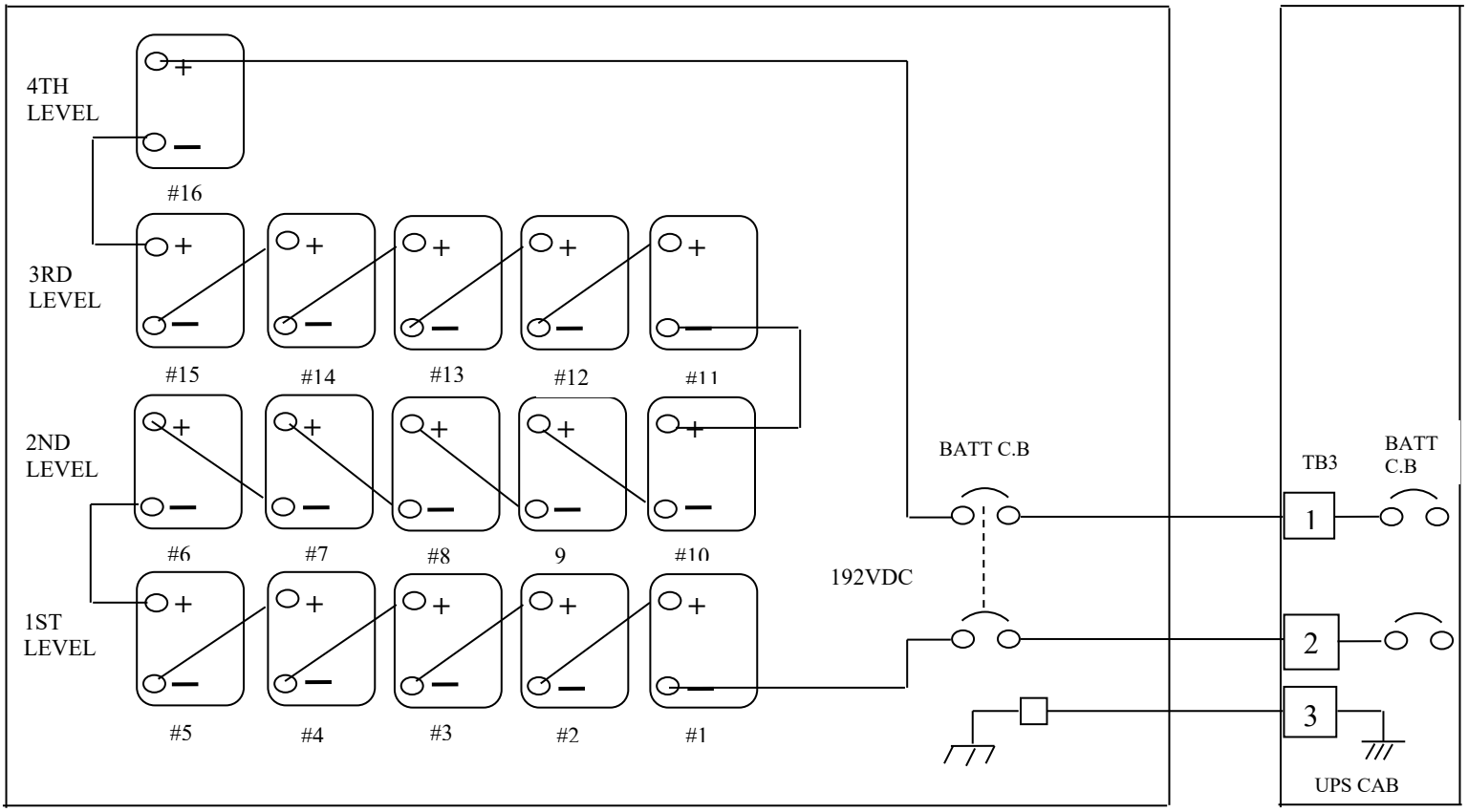
POWER RATING (KVA/KW)	3.0	5.0	7.5	10	12.5	15
BATTERY						
BATTERY RUN TIME	See Appendix C for various Run time					
BATTERY TYPE	Sealed, Maintenance-Free, AGM, VRLA type					
NOMINAL DC VOLTAGE	96 VDC	120 VDC	120 VDC	192 VDC	192 VDC	240 VDC
OVERCURRENT PROTECTION	Circuit Breaker					
PACKAGING	Batteries Housed in Same Enclosure and/or additional battery cabinet (See Table 2-1)					
MONITORING AND COMMUNICATIONS						
LCD SCREEN	Input Voltage, Batt. Charger, UPS Output; On Batt.; Low Batt.; Summary Alarm					
INDICATORS	LCD Display Panel					
RELAY INTERFACE	Dry Contacts for: UPS On (N.C.); On Inverter (N.O.); Loss of Input Power (N.O.); Low Battery (N.O.)					
CONTACT RATING	125 Volts (AC or DC) Maximum; 1.25 Amperes Maximum; 30 Watts / 50 VA Maximum					
INTERFACE CONNECTION	Hard Wired (Terminal Block)					
ENVIRONMENTAL						
USRGE WITHSTANDABILITY	ANSI C62.41-1980 Categories A & B					
OPERATING TEMPERATURE	Meets NEMA Requirements					
OPERATING RELATIVE HUMIDITY	0 to 95% Non-Condensing					
ALTITUDE	Up to 6,000 Feet (1,829 Meters) with No De-Rating					
COOLING	Air Cooled-Forced Fan					
PHYSICAL						
SIZE WxHxD in. (cm)	18 x 35 x 32 (45.7 x 88.9 x 84.3 cm)					
WEIGHT ibs (kg) with batteries	600(273)	900(409)	1150(523)	1600(727)	1850(841)	2250(1023)
CONSTRUCTION	Painted Steel Enclosure with 3 Point Double Locking Front Door; and Full-Length Door Hinge.					
ENCLOSURE	Designed for Inside Installations					
COLOR	Natural finish					
ACCESSIBILITY	Front - All Servicing is Through the Front; No Side or Rear Access is Required.					
CABLE ENTRY	Bottom or sides					
MOUNTING	Four (4) Holes Provided to Anchor Enclosure to Pedestal (Supplied by Others)					


SYS.SCHEMATIC, 3.5KW UPS, 1481
50/60HZ 120VAC IN/OUT
6120-795
POWER BOARD (A1)
CONTROL BOARD (A2)
LED BOARD (A5)
120VAC OUTPUT
120VAC IN
SW1
SW1 AUX SW
PART OF BY-PASS
OPTION
NOMINAL BATTERY VOLTAGE IS:
96VDC UP TO 7.5KVA
120VDC UP TO 7.5KVA
192VDC UP TO 12.5KVA
240VDC UP TO 15KVA
INTERNAL DC BUS: 200VDC FOR 120VAC INPUT,
350VDC FOR 208/240VAC INPUT,
400VDC FOR 277VAC INPUT
1) CONNECTIONS ALWAYS CONNECT H1 to ICOIL AT 12.2.
FOR 120V INPUT, CONNECT P1-2 TO 12.3; CONNECT BR1-AC2 TO 12.9

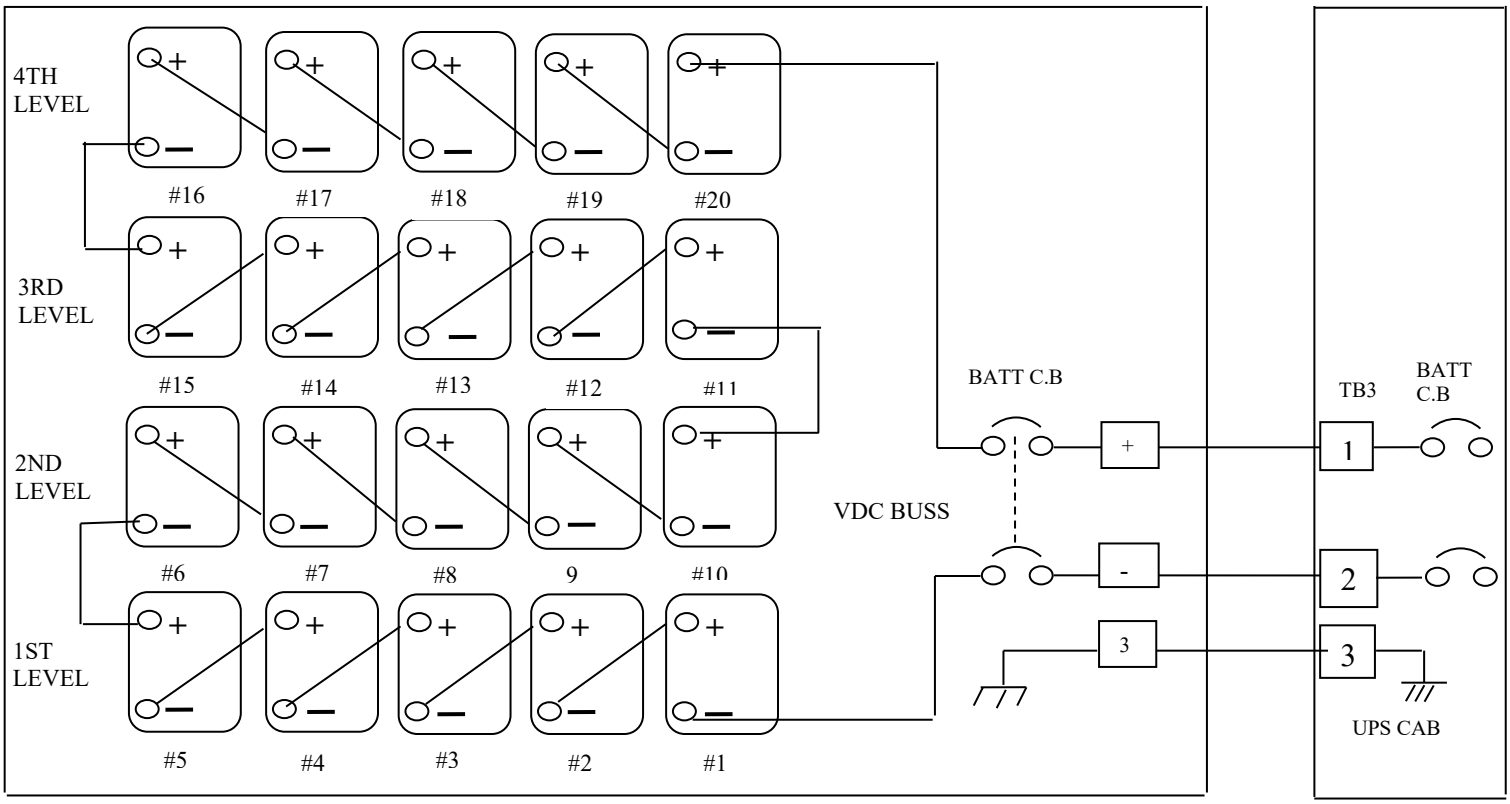

CONTROL BOARD (A2)
POWER BOARD (A1)
RIBBON CABLE
PHASE A
PHASE B
PHASE C
OPTION
LCD DISPLAY



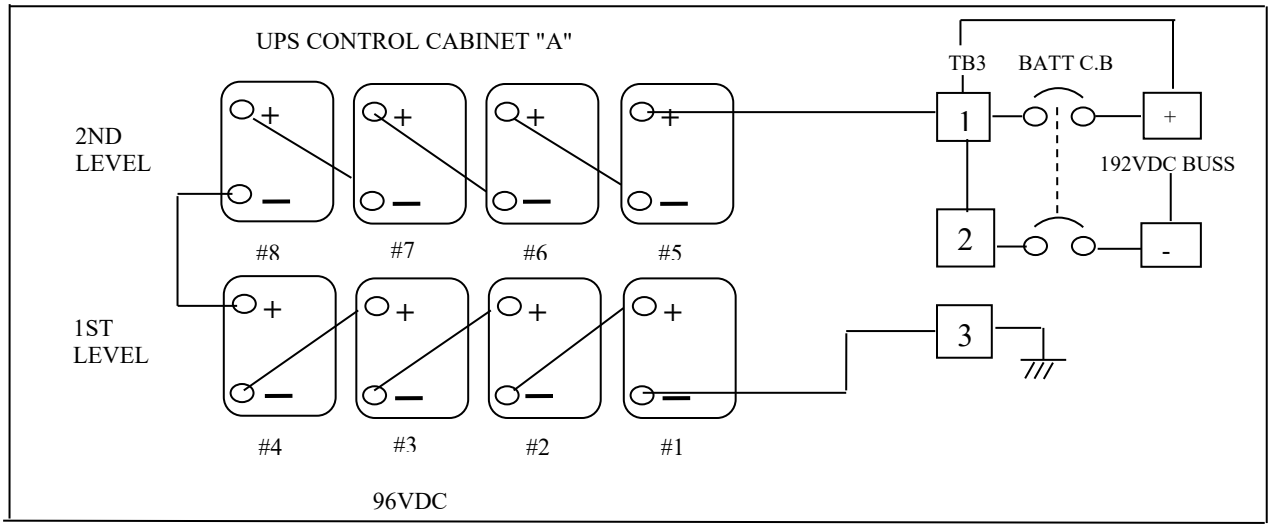
B" CABINET BATTERY)QTY:10) SYSTEM



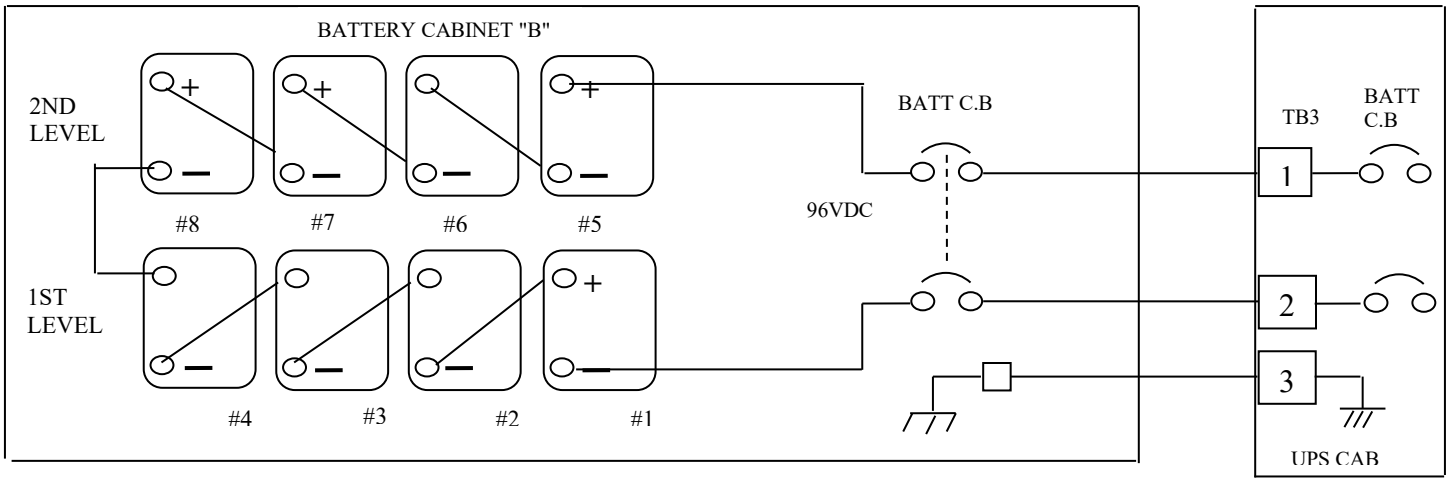
- **"B" OR "C" BATTE**277V
- **TY 16)**208V



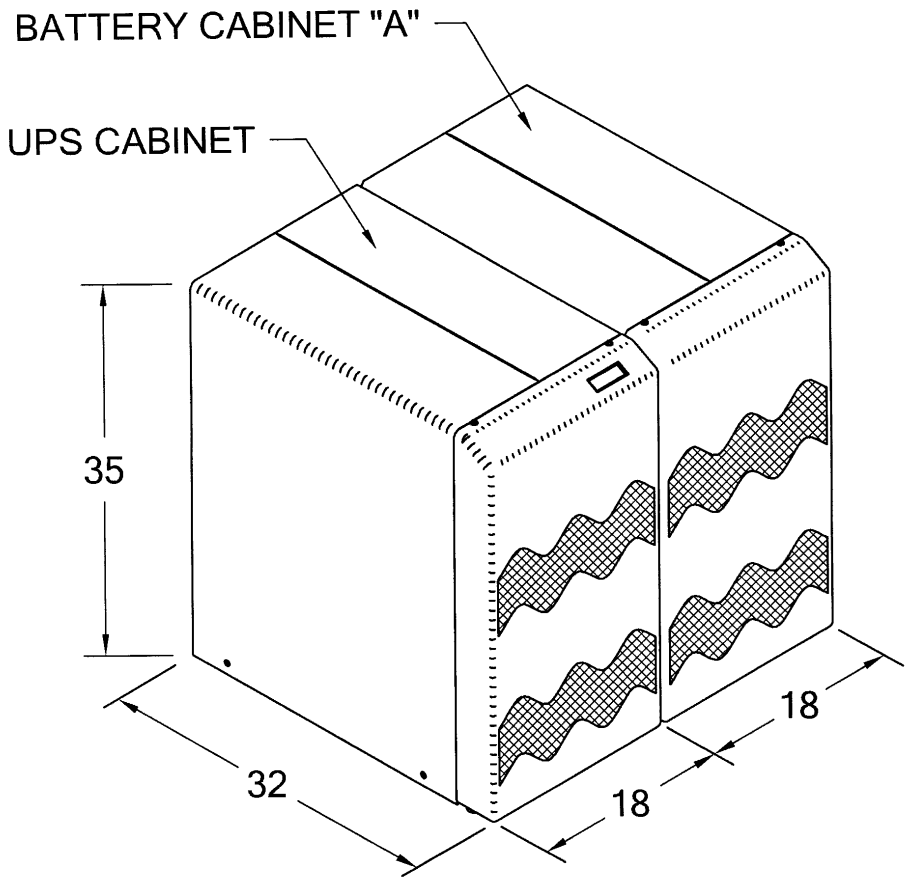
"C" CABINET BATTERY (QTY:20) SYSTEM



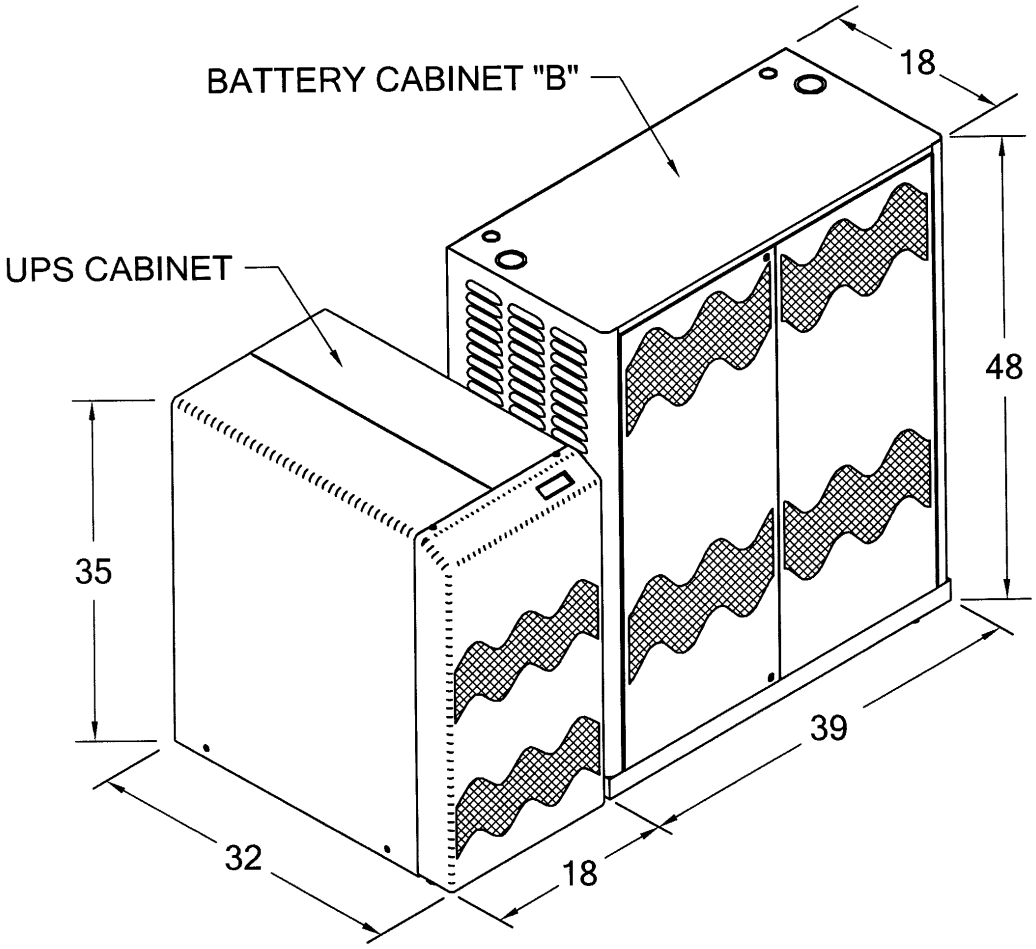
3KW/5KW (8X35AH) BATERRY SYSTEM ONLY



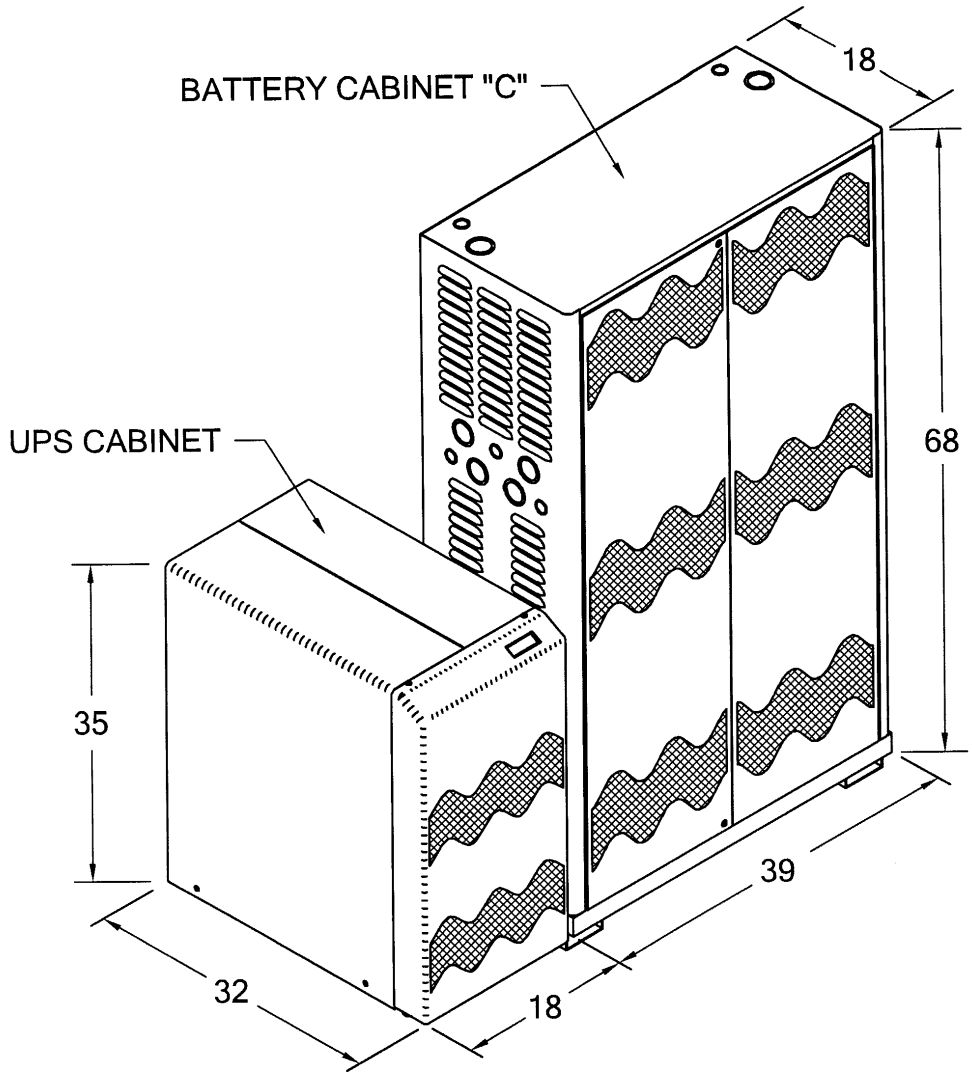
B CABINET BATTERY (QTY: 8) SYSTEM



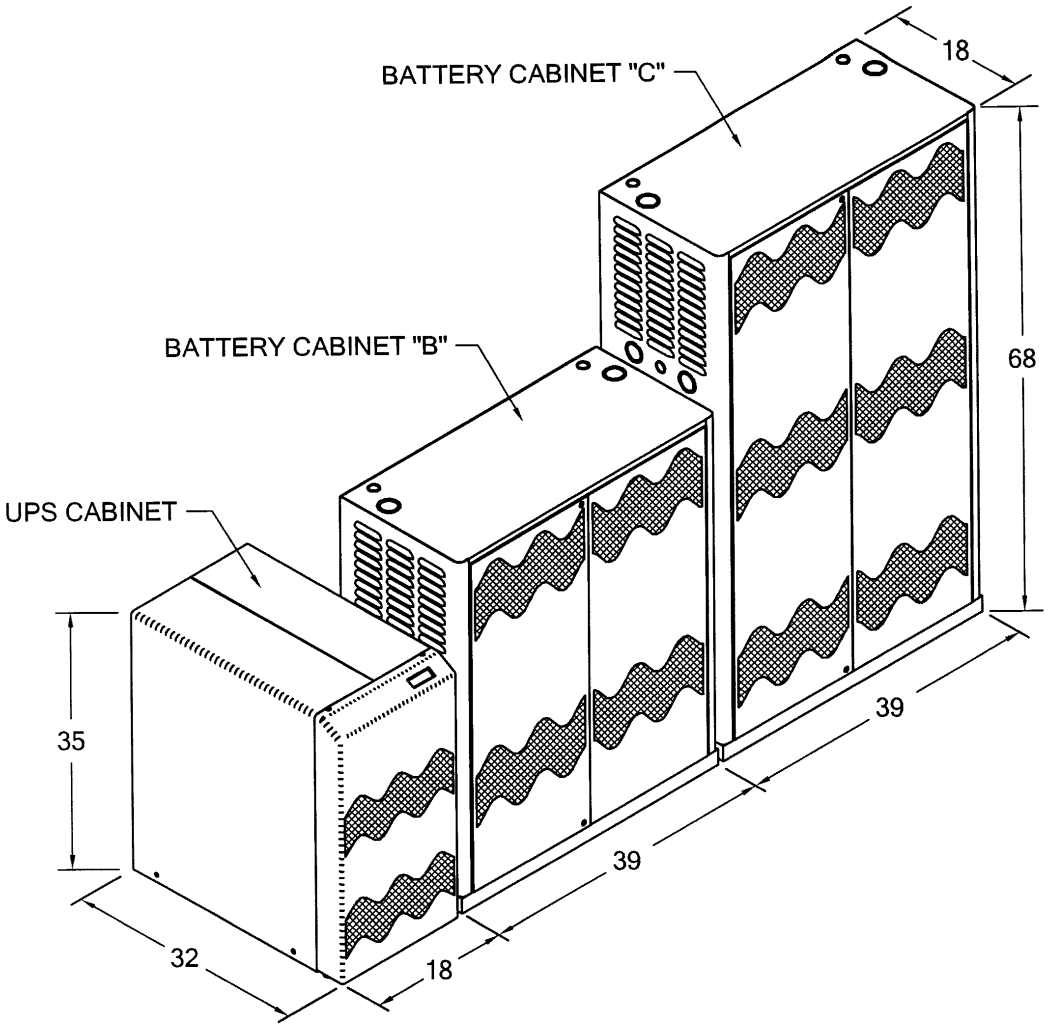
CABINETS BASIC ARRANGEMENT



CABINETS BASIC ARRANGEMENT

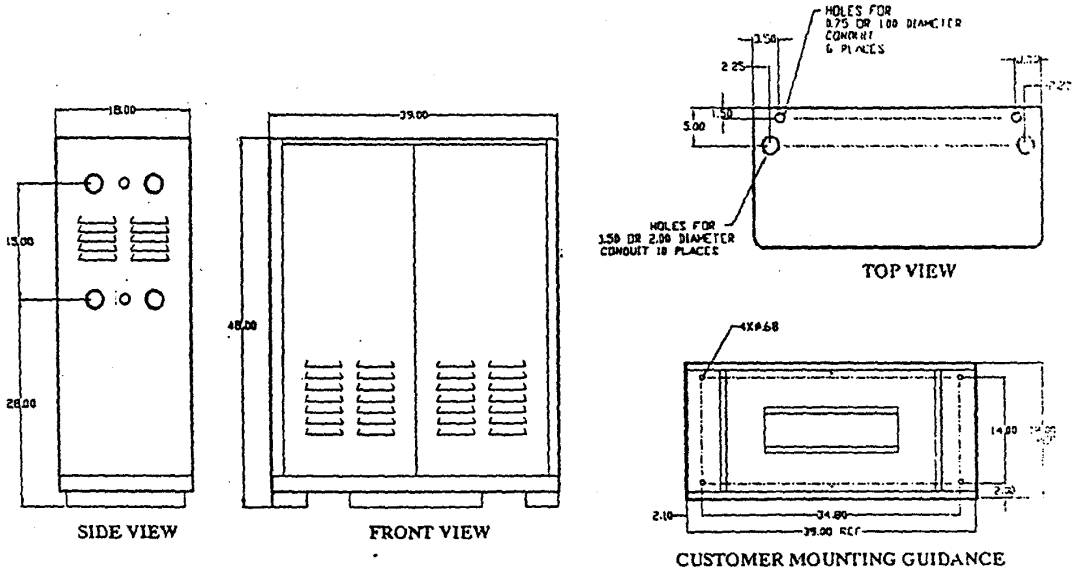


CABINETS BASIC ARRANGEMENT

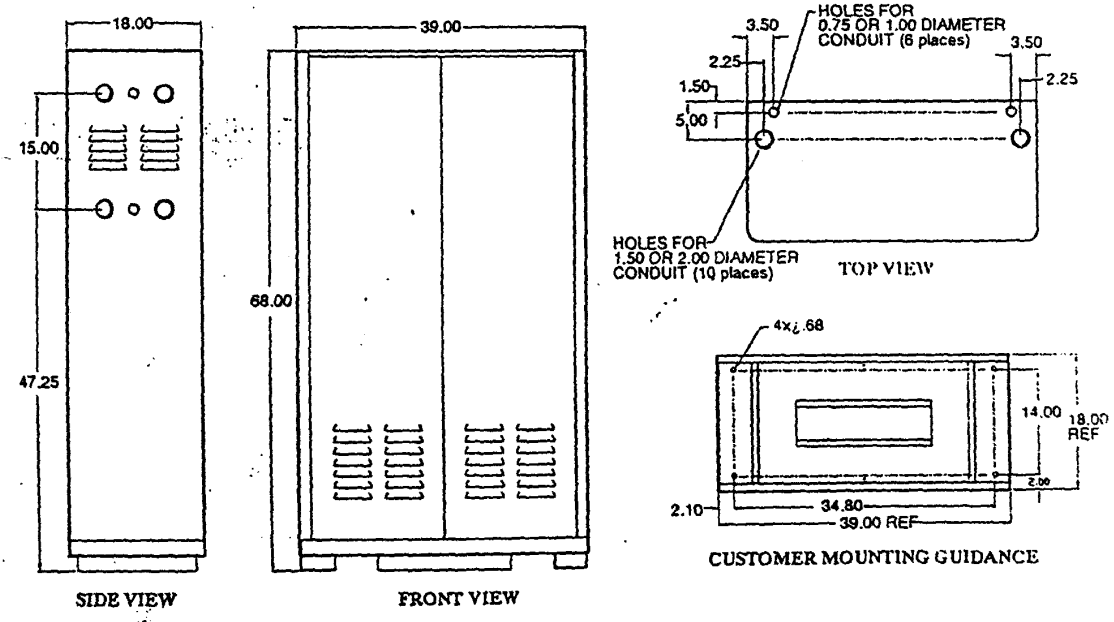


CABINETS BASIC ARRANGEMENT

BATTERY CABINET



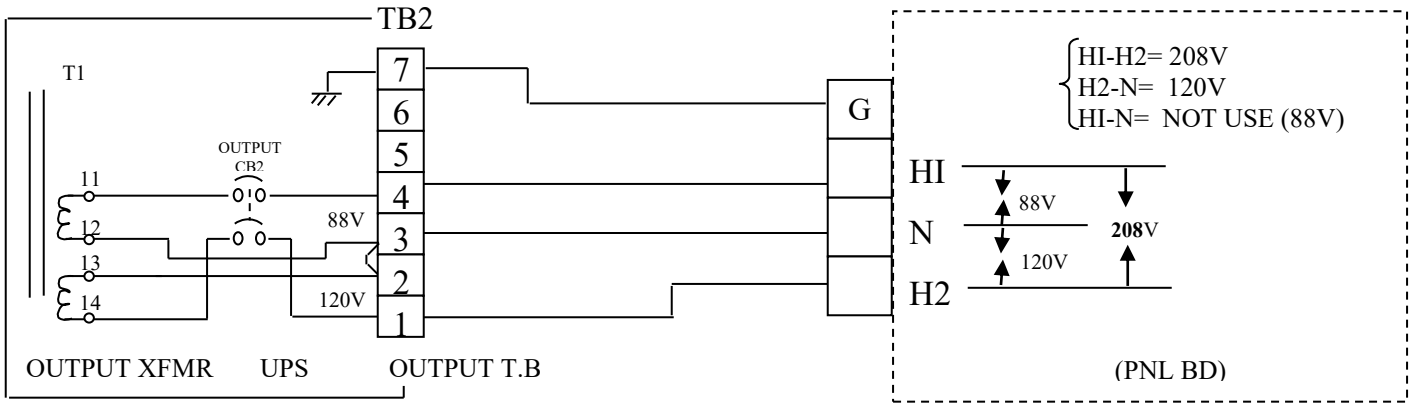
48" CABINET CABLE ACCESS



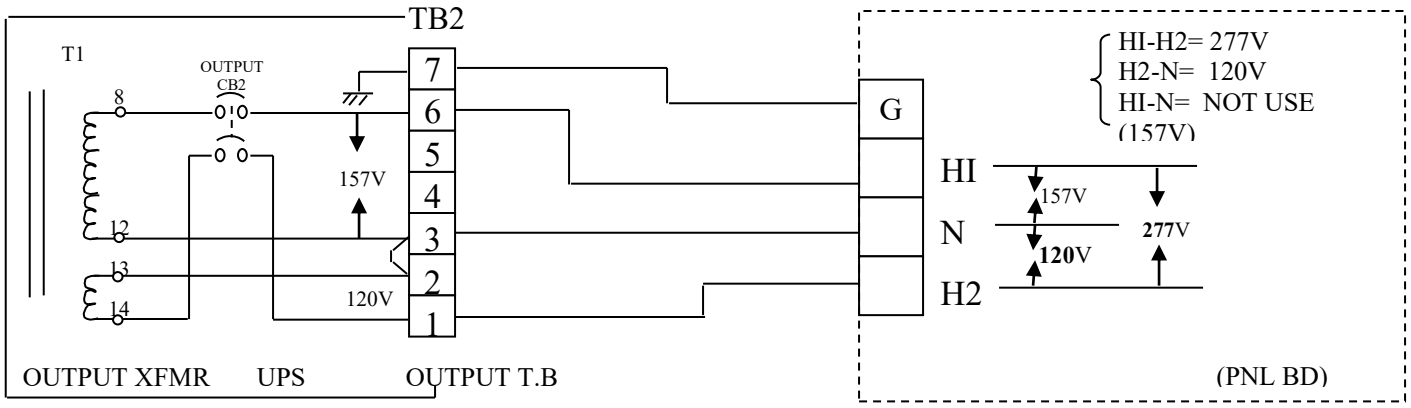
68" CABINET CABLE ACCESS

Connection Diagram using existing 3 pole panel board for dual output voltages.

A)



B)



C)