


<p><b>TECHNICAL SPECIFICATIONS for</b>  <b>Single Phase, UL1481, (3 to 15 kW)</b>  <b>Power Supply for Fire Protective Signaling System</b></p>	
<p>Fire Alarm Battery Backup System</p>	<p>FAB6506A 6/10/08</p>

## 1.0 GENERAL

**1.1 SUMMARY:** This specification defines a one-phase, on-line, solid-state, high frequency, double conversion system, hereafter referred to as the "Fire Alarm Backup". It is designed to provide high quality regulated and conditioned uninterruptible AC power to both linear and non-linear loads during all modes of operation. The unit shall be specifically designed to meet UL 1481, power supply for Fire Protective Signaling System. It has an industry distinctive small footprint stackable cabinet design allowing for equipment protection in limited spaces.

**1.2 STANDARDS:** The UPS shall comply with the UL1481 standards

### 1.3 SUBMITTALS

- A. Proposal Submittals:** submittals with the proposal shall include the following documents: complete electrical characteristics, connection requirements, system configuration on a single-line diagrams, description of equipment to be furnished, size and weight of shipping units, detailed installation drawings showing cable entries and the terminals locations.
- B. Delivery Submittals:** submittals on delivery shall include a complete set of submittal drawings and one user's manual with installation and maintenance guidelines. The manual shall contain diagrams, safety precautions, illustrations, step-by-step operating procedures, and routine troubleshooting information. Software packages, diagrams, cables and user's manuals shall be delivered for all optional accessories as required.

### 1.4 QUALIFICATIONS AND QUALITY ASSURANCE

- A. Manufacturer's Certification:** A minimum of twenty years experience in the design, manufacture and testing of solid-state UPS is required. The manufacturer shall specialize in manufacturing of on-line, double conversion high frequency UPS modules specified in this document. The manufacturer shall hold a current ISO 9001 certification and shall design the units in accordance with internationally accepted standards.
- B. Materials and Assemblies:** All materials and parts in the UPS shall be new, of current manufacture, unused, except for the purpose of factory testing. All active electronic components shall be solid state and designed as to not exceed the manufacturer's recommended ratings and tolerances for ensuring maximum reliability. All IGBTs and other semiconductor devices shall be sealed. All relays shall have dust covers. All incoming parts, modular assemblies and sheet metal shall undergo detailed receiving quality inspection.

**C. Factory Testing:** Every unit shipped will have completed a documented functional test of the UPS module and battery system, including a battery discharge test. A copy of the test report shall be available upon customer's request.

## 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Temperature:** operating - 0 C to 40 C (32 F to 104 F )  
storage - 20 C to +45C (- 4F to 113 F)
- B. Humidity: operating and storage:** 0 to 95% RH, non condensing
- C. Altitude:** up to 10000 ft (3,048 meters)
- D. Audible Noise:** 57 dB on "response curve A"

## 1.6 WARRANTY

- A. UPS Module:** The UPS manufacturer shall warrant the UPS against defects in materials and workmanship for a period of twenty-four (24) months. Magnetics are warranted for five (5) years after date of purchase (covers parts replacement only). The warranty shall cover all parts and labor for one (1) year period beginning from the start up, or 18 months from the ship date, whichever comes first. Optional 1 year extended warranty and maintenance contract packages shall also be available at the end of the factory maintenance period.
- B. Battery:** Battery manufacturer's standard warranty shall be transferred and assigned to the end user. It will have a minimum period of one year

## 2.0 PRODUCT DESCRIPTION

### 2.1 APPROVED MANUFACTURERS AND PRODUCT DESCRIPTION

- A. Approved Manufacturer:** The UPS shall be a Fire Protective Signaling System and shall be manufactured by:  
  
**ON-LINE POWER, INC**  
Los Angeles, CA  
Phone: (323) 721-501, Fax: (323)  
721-3929 **Service – 1 800 797 7782**
- B. Product Description:** this specification describes Fire Alarm Backup, single phase, on-line, double conversion, high frequency UPS module. It is designed to provide high quality regulated and conditioned uninterruptible AC power to both linear and non-linear loads during all modes of operation. The system shall consist of a solid state, IGBT PWM inverter, rectifier, static switch, internal maintenance bypass switch, battery, status and metering display and communication ports as described herein.
  - 1. Modular Design:** The unit shall be specifically designed as a modular system to minimize the number of replaceable assemblies. Except for the transformers, contactor, circuit breakers, chokes and terminal blocks, the actual power conversion and control system is limited to two replaceable parts: heat sink with IGBTs and

drivers, and control board with associated panel display. Both parts are easily accessible and can be hot swapped in manual bypass mode. Modular design results in a clear component layout for maximum EMI reduction and system reliability, due to distributed heat rejection pattern.

2. **Minimum Maintenance Time:** The electronic modules shall be easily removable, hot swappable (in manual maintenance bypass mode) with clearly marked, keyed plug connectors. The UPS enclosure shall have vent louvers designed to prevent dust collection inside the cabinet, eliminating the need for any filters to further minimize required maintenance time

## 2.2 SYSTEM DESCRIPTION

### A. UPS Design Requirements

1. **Output Power Rating:** The continuous output power rating of the UPS shall be [ ] kW
2. **Output Power Upgrade** – unit shall be designed to have a min 20% of the rated power capacity upgradeability without having to change the unit, option specified at the time of ordering.
3. **Input Voltage:** [ ] VAC, – 20% / + 10%
4. **Output Voltage -** [ ] VAC, 1 phase, 2 wires plus-ground
5. **Battery Autonomy:** the UPS shall be capable of operating at full load for minimum 15 minutes, depending on model, at 0.8 PF output on battery power, at 25 C temp.
6. **Battery Type:** valve regulated sealed lead-acid (VRLA), low maintenance
7. **Battery Protection:** battery CB, for safe UPS, battery operation and servicing
8. **Cable Installation:** conduit entries **on the back of enclosure**

### B. AC Input Specifications

1. **Input Voltages:** 120 / 208 / 240 VAC, 2 wires plus ground
2. **Input Frequency:** Slew rate of 2Hz/sec.
3. **Input Current:** sinusoidal, 0.95 PF under all line/load conditions. Power factor correction.
4. **Input Protection:** circuit breaker, contactor
5. **Input Surge Protection:** optional Transient Voltage Surge Suppressor (TVSS)
6. **Transfer Time:** zero
7. **Input Power Connections:** hard wired terminal block, optional input cable
8. **Number of Wires:** 2 wires plus ground
9. **Cable Installation:** conduit entries **on the back of enclosure**

### C. AC Output Specifications

1. **Output Ratings:** 500 W, 750 W, 1 kW, 1.5 kW / 2 kW, 3 kW, 4 kW, 5 kW, 7.5 kW, 10 kW, 12.5 kW, and 15 kW
2. **Output Voltages:** 120 VAC
3. **Frequency:** 60 Hz +/- 0.5 Hz (when on inverter)
4. **Voltage Regulation:** +/- 3% No Load to Full Load, High Line to Low Line
5. **Output Waveform:** sinusoidal
6. **Voltage Distortion:** < 5% THD; < 3% Single Harmonic
7. **Power Factor:** 0.8 at the rated volt-amperes (kVA)
8. **Inverter Overload Capability:** 125% for 10 minutes, 150% surge for 10 seconds
9. **Bypass Overload Capability:** 150%
10. **Protection:** fault current limited

11. **Non-Linear Load Capability:** 100%
12. **Slew Rate:** 2 Hz/second, maximum
13. **Crest Factor:** 1 to 2
14. **Output Power Connections:** hard wired terminal block, optional output receptacle panel board with NEMA type receptacles and overcurrent protection (max 30 CBs)
15. **Output Distribution:** unit shall have an internal or external load center for customer use, eliminating the need for optional distribution
16. **Number of Wires:** 2 wires plus ground

#### D. Battery Specifications

1. **Standard Run Time:** 15 – 1440 min. at full load, depending on model
2. **Extended Run Time :** as required
3. **Battery Type:** sealed, maintenance-free, lead-acid, VRLA
4. **Expected Life:** 10 years
5. **Charger Ampacity:** per UL 1481
6. **Float Voltage:** 2.25 V per cell
7. **Protection:** circuit breaker in each battery cabinet
8. **Wiring:** power cables from the UPS to the battery cabinet shall be provided by the customer, per local code. With multiple battery cabinets, interconnecting cables shall be provided.
9. **Nominal DC Link Voltage:**( dependent on back-up time and number of batteries)
  - a) 500 W - 96 VDC
  - b) 750 W - 96 VDC
  - c) 1000 W - 96 VDC
  - d) 1500 W - 96 VDC
  - e) 2000 W - 96 or 120 VDC
  - f) 3000 W - 96 or 120 VDC
  - g) 4000 W - 120 or 240 VDC
  - h) 5000 W - 120 or 240 VDC
  - i) 7500 W - 120 or 240 VDC
  - j) 10000 W - 192 or 240 VDC
  - k) 12500 W - 192 or 240 VDC
  - l) 15000 W - 240 VDC
10. **Battery Cabinets:** Battery cabinet “B” and “C”, UL 1482 listed, NEMA 1, consult factory for other types.,

#### F. Physical Specifications

UPS Cabinet: 18"W x 35"H x 32"D

Battery Cabinet:

Cab “B”; 39"W x 48"H x 18"D

Cab “C”; 39"W x 68"H x 18"D

Battery Part No	Output (Watts)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-354-015	500	15	120	9.0	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	25AH	A	-
			208	5.0	120	4.2	WR3.0B58FPT1-05	640							
			240	4.5	120	4.2	WR3.0D58FPT1-05	640							
7050-354-030	500	30	120	9.0	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	25AH	A	-
			208	5.0	120	4.2	WR3.0B58FPT1-05	640							
			240	4.5	120	4.2	WR3.0D58FPT1-05	640							
7050-354-060	500	60	120	9.0	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	25AH	A	-
			208	5.0	120	4.2	WR3.0B58FPT1-05	640							
			240	4.5	120	4.2	WR3.0D58FPT1-05	640							
7050-354-120	500	120	120	9.0	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	35AH	A	-
			208	5.0	120	4.2	WR3.0B58FPT1-05	640							
			240	4.5	120	4.2	WR3.0D58FPT1-05	640							
7050-354-240	500	240	120	9.0	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	50AH	A	B
			208	5.0	120	4.2	WR3.0B58FPT1-05	640							
			240	4.5	120	4.2	WR3.0D58FPT1-05	640							
7050-354-480	500	480	120	9.0	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	65AH	A	B
			208	5.0	120	4.2	WR3.0B58FPT1-05	640							
			240	4.5	120	4.2	WR3.0D58FPT1-05	640							
7050-354-1440	500	1440	120	31	120	4.2	WR3.0A01FPN1-05	440	96	13	8	1	120AH	A	C
			208	18	120	4.2	WR3.0B58FPT1-05	640							
			240	16	120	4.2	WR3.0D58FPT1-05	640							

Battery Part No	Output (Watts)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-355-015	750	15	120	9.5	120	6.3	WR3.0A01FPN1-07	440	96	14	8	1	25AH	A	-
			208	6.0	120	6.3	WR3.0B58FPT1-07	640							
			240	5.0	120	6.3	WR3.0D58FPT1-07	640							
7050-355-030	750	30	120	9.5	120	6.3	WR3.0A01FPN1-07	440	96	14	8	1	25AH	A	-
			208	6.0	120	6.3	WR3.0B58FPT1-07	640							
			240	5.0	120	6.3	WR3.0D58FPT1-07	640							
7050-355-060	750	60	120	9.5	120	6.3	WR3.0A01FPN1-07	440	96	14	8	1	25AH	A	-
			208	6.0	120	6.3	WR3.0B58FPT1-07	640							
			240	5.0	120	6.3	WR3.0D58FPT1-07	640							
7050-355-120	750	120	120	9.5	120	6.3	WR3.0A01FPN1-07	440	96	14	8	1	50AH	A	B
			208	6.0	120	6.3	WR3.0B58FPT1-07	640							
			240	5.0	120	6.3	WR3.0D58FPT1-07	640							
7050-355-240	750	240	120	9.5	120	6.3	WR3.0A01FPN1-07	440	96	14	8	1	90AH	A	B
			208	6.0	120	6.3	WR3.0B58FPT1-07	640							
			240	5.0	120	6.3	WR3.0D58FPT1-07	640							
7050-355-480	750	480	120	17	120	6.3	WR3.0A01FPN1-07	440	96	14	8	2	90AH	A	C
			208	10	120	6.3	WR3.0B58FPT1-07	640							
			240	9	120	6.3	WR3.0D58FPT1-07	640							
7050-355-1440	750	1440	120	32	120	6.3	WR3.0A01FPN1-07	440	96	14	8	2	120AH	A	C
			208	18	120	6.3	WR3.0B58FPT1-07	640							
			240	16	120	6.3	WR3.0D58FPT1-07	640							

Battery Part No	Output (Watts)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-356-015	1000	15	120	11	120	8.3	WR3.0A01FPN1-10	440	96	17	8	1	25AH	A	-
			208	7	120	8.3	WR3.0B58FPT1-10	640							
			240	6	120	8.3	WR3.0D58FPT1-10	640							
7050-356-030	1000	30	120	11	120	8.3	WR3.0A01FPN1-10	440	96	17	8	1	25AH	A	-
			208	7	120	8.3	WR3.0B58FPT1-10	640							
			240	6	120	8.3	WR3.0D58FPT1-10	640							
7050-356-060	1000	60	120	11	120	8.3	WR3.0A01FPN1-10	440	96	17	8	1	35AH	A	-
			208	7	120	8.3	WR3.0B58FPT1-10	640							
			240	6	120	8.3	WR3.0D58FPT1-10	640							
7050-356-120	1000	120	120	11	120	8.3	WR3.0A01FPN1-10	440	96	17	8	1	50AH	A	B
			208	7	120	8.3	WR3.0B58FPT1-10	640							
			240	6	120	8.3	WR3.0D58FPT1-10	640							
7050-356-240	1000	240	120	11	120	8.3	WR3.0A01FPN1-10	440	96	17	8	1	100AH	A	B
			208	7	120	8.3	WR3.0B58FPT1-10	640							
			240	6	120	8.3	WR3.0D58FPT1-10	640							
7050-356-480	1000	480	120	17	120	8.3	WR3.0A01FPN1-10	440	96	17	8	2	90AH	A	C
			208	10	120	8.3	WR3.0B58FPT1-10	640							
			240	9	120	8.3	WR3.0D58FPT1-10	640							
7050-356-1440	1000	1440	120	18	120	8.3	WR3.0A01FPN1-10	440	96	17	8	4	100AH	A	C
			208	11	120	8.3	WR3.0B58FPT1-10	640							
			240	9	120	8.3	WR3.0D58FPT1-10	640							

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-357-015	1.5	15	120	16	120	12.5	WR3.0A01FPN1-15	440	96	24	8	1	25AH	A	-
			208	9	120	12.5	WR3.0B58FPT1-15	640							
			240	8	120	12.5	WR3.0D58FPT1-15	640							
7050-357-030	1.5	30	120	16	120	12.5	WR3.0A01FPN1-15	440	96	24	8	1	35AH	A	-
			208	9	120	12.5	WR3.0B58FPT1-15	640							
			240	8	120	12.5	WR3.0D58FPT1-15	640							
7050-357-060	1.5	60	120	16	120	12.5	WR3.0A01FPN1-15	440	96	24	8	1	50AH	A	B
			208	9	120	12.5	WR3.0B58FPT1-15	640							
			240	8	120	12.5	WR3.0D58FPT1-15	640							
7050-357-120	1.5	120	120	16	120	12.5	WR3.0A01FPN1-15	440	96	24	8	1	90AH	A	B
			208	9	120	12.5	WR3.0B58FPT1-15	640							
			240	8	120	12.5	WR3.0D58FPT1-15	640							
7050-357-240	1.5	240	120	16	120	12.5	WR3.0A01FPN1-15	440	96	24	8	1	120AH	A	B
			208	9	120	12.5	WR3.0B58FPT1-15	640							
			240	8	120	12.5	WR3.0D58FPT1-15	640							
7050-357-480	1.5	480	120	24	120	12.5	WR3.0A01FPN1-15	440	96	24	8	2	120AH	A	C
			208	14	120	12.5	WR3.0B58FPT1-15	640							
			240	12	120	12.5	WR3.0D58FPT1-15	640							
7050-357-1440	1.5	1440	120	39	120	12.5	WR3.0A01FPN1-15	440	120	19	10	4	120AH	A	C
			208	23	120	12.5	WR3.0B58FPT1-15	640							
			240	20	120	12.5	WR3.0D58FPT1-15	640							

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-358-015	2	15	120	20	120	16.7	WR3.0A01FPN1-20	440	96	32	8	1	25AH	A	-
			208	12	120	16.7	WR3.0B58FPT1-20	640							
			240	10	120	16.7	WR3.0D58FPT1-20	640							
7050-358-030	2	30	120	20	120	16.7	WR3.0A01FPN1-20	440	96	32	8	1	35AH	A	-
			208	12	120	16.7	WR3.0B58FPT1-20	640							
			240	10	120	16.7	WR3.0D58FPT1-20	640							
7050-358-060	2	60	120	20	120	16.7	WR3.0A01FPN1-20	440	96	32	8	1	50AH	A	B
			208	12	120	16.7	WR3.0B58FPT1-20	640							
			240	10	120	16.7	WR3.0D58FPT1-20	640							
7050-358-120	2	120	120	20	120	16.7	WR3.0A01FPN1-20	440	96	32	8	1	100AH	A	B
			208	12	120	16.7	WR3.0B58FPT1-20	640							
			240	10	120	16.7	WR3.0D58FPT1-20	640							
7050-358-240	2	240	120	20	120	16.7	WR3.0A01FPN1-20	440	96	32	8	2	90AH	A	C
			208	12	120	16.7	WR3.0B58FPT1-20	640							
			240	10	120	16.7	WR3.0D58FPT1-20	640							
7050-358-480	2	480	120	29	120	16.7	WR3.0A01FPN1-20	440	96	32	8	3	120AH	A	C
			208	17	120	16.7	WR3.0B58FPT1-20	640							
			240	15	120	16.7	WR3.0D58FPT1-20	640							
7050-358-1440	2	1440	120	48	120	16.7	WR3.0A01FPN1-20	440	120	26	10	5	120AH	A	2C
			208	28	120	16.7	WR3.0B58FPT1-20	640							
			240	24	120	16.7	WR3.0D58FPT1-20	640							

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-359-015	3	15	120	30	120	25	WR3.0A01FPN1-30	440	96	44	8	1	35AH	A	-
			208	18	120	25	WR3.0B58FPT1-30	640							
			240	15	120	25	WR3.0D58FPT1-30	640							
7050-359-030	3	30	120	30	120	25	WR3.0A01FPN1-30	440	96	44	8	1	50AH	A	B
			208	18	120	25	WR3.0B58FPT1-30	640							
			240	15	120	25	WR3.0D58FPT1-30	640							
7050-359-060	3	60	120	30	120	25	WR3.0A01FPN1-30	440	96	44	8	1	90AH	A	B
			208	18	120	25	WR3.0B58FPT1-30	640							
			240	15	120	25	WR3.0D58FPT1-30	640							
7050-359-120	3	120	120	30	120	25	WR3.0A01FPN1-30	440	96	44	8	2	90AH	A	C
			208	18	120	25	WR3.0B58FPT1-30	640							
			240	15	120	25	WR3.0D58FPT1-30	640							
7050-359-240	3	240	120	36	120	25	WR3.0A01FPN1-30	440	120	36	10	2	120AH	A	C
			208	21	120	25	WR3.0B58FPT1-30	640							
			240	18	120	25	WR3.0D58FPT1-30	640							
7050-359-480	3	480	120	43	120	25	WR3.0A01FPN1-30	440	120	36	10	4	120AH	A	2C
			208	25	120	25	WR3.0B58FPT1-30	640							
			240	22	120	25	WR3.0D58FPT1-30	640							
7050-359-1440	3	1440	120	71	120	25	WR3.0A01FPN1-30	440	192	32	10	5	120AH	A	3C+B
			208	41	120	25	WR3.0B58FPT1-30	640							
			240	36	120	25	WR3.0D58FPT1-30	640							

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-360-015	4	15	120	38	120	33.3	WR3.0A01FPN1-40	440	120	46	10	1	35AH	A	-
			208	22	120	33.3	WR3.0B58FPT1-40	640							
			240	19	120	33.3	WR3.0D58FPT1-40	640							
7050-360-030	4	30	120	38	120	33.3	WR3.0A01FPN1-40	440	120	46	10	1	50AH	A	B
			208	22	120	33.3	WR3.0B58FPT1-40	640							
			240	19	120	33.3	WR3.0D58FPT1-40	640							
7050-360-060	4	60	120	38	120	33.3	WR3.0A01FPN1-40	440	120	46	10	1	90AH	A	B
			208	22	120	33.3	WR3.0B58FPT1-40	640							
			240	19	120	33.3	WR3.0D58FPT1-40	640							
7050-360-120	4	120	120	38	120	33.3	WR3.0A01FPN1-40	440	120	46	10	2	90AH	A	C
			208	22	120	33.3	WR3.0B58FPT1-40	640							
			240	19	120	33.3	WR3.0D58FPT1-40	640							
7050-360-240	4	240	120	38	120	33.3	WR3.0A01FPN1-40	440	120	46	10	2	120AH	A	C
			208	22	120	33.3	WR3.0B58FPT1-40	640							
			240	19	120	33.3	WR3.0D58FPT1-40	640							
7050-360-480	4	480	120	54	120	33.3	WR3.0A01FPN1-40	440	120	46	10	4	120AH	A	2C
			208	31	120	33.3	WR3.0B58FPT1-40	640							
			240	27	120	33.3	WR3.0D58FPT1-40	640							
7050-360-1440	4	1440	120	87	120	33.3	WR3.0A01FPN1-40	440	240	24	20	5	120AH	A	4C
			208	51	120	33.3	WR3.0B58FPT1-40	640							
			240	44	120	33.3	WR3.0D58FPT1-40	640							

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-361-015	5	15	120	48	120	41.7	WR5.0A01FPN1	440	120	57	10	1	35AH	A	-
			208	28	120	41.7	WR5.0B58FPT1	640							
			240	24	120	41.7	WR5.0D58FPT1	640							
7050-361-030	5	30	120	48	120	41.7	WR5.0A01FPN1	440	120	57	10	1	65AH	A	B
			208	28	120	41.7	WR5.0B58FPT1	640							
			240	24	120	41.7	WR5.0D58FPT1	640							
7050-361-060	5	60	120	48	120	41.7	WR5.0A01FPN1	440	120	57	10	1	120AH	A	B
			208	28	120	41.7	WR5.0B58FPT1	640							
			240	24	120	41.7	WR5.0D58FPT1	640							
7050-361-120	5	120	120	48	120	41.7	WR5.0A01FPN1	440	120	57	10	2	90AH	A	C
			208	28	120	41.7	WR5.0B58FPT1	640							
			240	24	120	41.7	WR5.0D58FPT1	640							
7050-361-240	5	240	120	57	120	41.7	WR7.5A01FPN1-50	440	120	57	10	3	120AH	A	C+B
			208	34	120	41.7	WR7.5B58FPT1-50	640							
			240	30	120	41.7	WR7.5D58FPT1-50	640							
7050-361-480	5	480	120	69	120	41.7	WR7.5A01FPN1-50	440	120	57	10	5	120AH	A	2C
			208	40	120	41.7	WR7.5B58FPT1-50	640							
			240	35	120	41.7	WR7.5D58FPT1-50	640							
7050-361-1440	5	1440	120	110	120	41.7	WR015A01FPN1-50	440	240	29	20	5	150AH	A	4C
			208	64	120	41.7	WR015B58FPT1-50	640							
			240	55	120	41.7	WR015D58FPT1-50	640							



Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-362-015	7.5	15	120	71	120	62.5	WR7.5A01FPN1	440	120	85	10	1	65AH	A	B
			208	41	120	62.5	WR7.5B58FPT1	640							
			240	36	120	62.5	WR7.5D58FPT1	640							
7050-362-030	7.5	30	120	71	120	62.5	WR7.5A01FPN1	440	120	85	10	1	120AH	A	B
			208	41	120	62.5	WR7.5B58FPT1	640							
			240	36	120	62.5	WR7.5D58FPT1	640							
7050-362-060	7.5	60	120	71	120	62.5	WR7.5A01FPN1	440	120	85	10	2	90AH	A	C
			208	41	120	62.5	WR7.5B58FPT1	640							
			240	36	120	62.5	WR7.5D58FPT1	640							
7050-362-120	7.5	120	120	79	120	62.5	WR012A01FPN1-75	440	120	85	10	3	90AH	A	C+B
			208	46	120	62.5	WR012B58FPT1-75	640							
			240	40	120	62.5	WR012D58FPT1-75	640							
7050-362-240	7.5	240	120	87	120	62.5	WR012A01FPN1-75	440	120	85	10	3	120AH	A	C+B
			208	50	120	62.5	WR012B58FPT1-75	640							
			240	44	120	62.5	WR012D58FPT1-75	640							
7050-362-480	7.5	480	120	102	120	62.5	WR015A01FPN1-75	440	240	43	20	5	90AH	A	4C
			208	59	120	62.5	WR015B58FPT1-75	640							
			240	51	120	62.5	WR015D58FPT1-75	640							
7050-362-1440	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-363-015	10	15	120	94	120	83.3	WR010A01FPN1	440	192	72	16	1	50AH	A	B
			208	54	120	83.3	WR010B58FPT1	640							
			240	47	120	83.3	WR010D58FPT1	640							
7050-363-030	10	30	120	94	120	83.3	WR010A01FPN1	440	192	72	16	1	90AH	A	C
			208	54	120	83.3	WR010B58FPT1	640							
			240	47	120	83.3	WR010D58FPT1	640							
7050-363-060	10	60	120	94	120	83.3	WR010A01FPN1	440	192	72	16	2	65AH	A	C+B
			208	54	120	83.3	WR010B58FPT1	640							
			240	47	120	83.3	WR010D58FPT1	640							
7050-363-120	10	120	120	94	120	83.3	WR015A01FPN1-11	440	240	58	20	2	120AH	A	2C
			208	54	120	83.3	WR015B58FPT1-11	640							
			240	47	120	83.3	WR015D58FPT1-11	640							
7050-363-240	10	240	120	116	120	83.3	WR015A01FPN1-11	440	240	58	20	3	120AH	A	2C+B
			208	67	120	83.3	WR015B58FPT1-11	640							
			240	58	120	83.3	WR015D58FPT1-11	640							
7050-363-480	10	480	120	134	120	83.3	WR015A01FPN1-11	440	240	58	20	5	120AH	A	4C
			208	77	120	83.3	WR015B58FPT1-11	640							
			240	67	120	83.3	WR015D58FPT1-11	640							
7050-363-1440	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-364-015	12.5	15	120	120	120	104.2	WR012A01FPN1	440	192	88	16	1	65AH	A	B
			208	69	120	104.2	WR012B58FPT1	640							
			240	60	120	104.2	WR012D58FPT1	640							
7050-364-030	12.5	30	120	120	120	104.2	WR012A01FPN1	440	192	88	16	1	120AH	A	B
			208	69	120	104.2	WR012B58FPT1	640							
			240	60	120	104.2	WR012D58FPT1	640							
7050-364-060	12.5	60	120	120	120	104.2	WR012A01FPN1	440	192	88	16	2	90AH	A	C+B
			208	69	120	104.2	WR012B58FPT1	640							
			240	60	120	104.2	WR012D58FPT1	640							
7050-364-120	12.5	120	120	133	120	104.2	WR015A01FPN1-12	440	240	71	20	3	90AH	A	2C+B
			208	77	120	104.2	WR015B58FPT1-12	640							
			240	67	120	104.2	WR015D58FPT1-12	640							
7050-364-240	12.5	240	120	146	120	104.2	WR015A01FPN1-12	440	240	71	20	4	120AH	A	3C+B
			208	84	120	104.2	WR015B58FPT1-12	640							
			240	73	120	104.2	WR015D58FPT1-12	640							
7050-364-480	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								
7050-3634-1440	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								

Battery Part No	Output (kW)	B/U Time (min)	AC Input		AC Output		UPS Model No	Weight (lbs)	Battery		Battery		Bat Type	UPS Cab	Bat Cab
			Volt	Amp	Volt	Amp			Volt	Amp	Qty	Strg			
7050-365-015	15	15	120	142	120	125	WR015A01FPN1	440	240	85	20	1	50AH	A	C
			208	82	120	125	WR015B58FPT1	640							
			240	71	120	125	WR015D58FPT1	640							
7050-365-030	15	30	120	142	120	125	WR015A01FPN1	440	240	85	20	1	120AH	A	C
			208	82	120	125	WR015B58FPT1	640							
			240	71	120	125	WR015D58FPT1	640							
7050-365-060	15	60	120	142	120	125	WR015A01FPN1	440	240	85	20	2	90AH	A	2C
			208	82	120	125	WR015B58FPT1	640							
			240	71	120	125	WR015D58FPT1	640							
7050-365-120	15	120	120	157	120	125	WR015A01FPN1	440	240	85	20	3	90AH	A	2C+B
			208	91	120	125	WR015B58FPT1	640							
			240	79	120	125	WR015D58FPT1	640							
7050-365-240	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								
7050-365-480	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								
7050-3635-1440	N/A	1440	120		120		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A
			208		120		N/A								
			240		120		N/A								

**2.3 MODES OF OPERATION:** The UPS module shall be designed to operate as an on-line, high frequency (min 10 kHz), high precision PWM conversion, fully automatic system with “no break” transfer time in the following modes:

**A. Normal:** During normal operation, utility (or generator) power is converted to DC, drawing sinusoidal input AC current at unity power factor under all load conditions. The converter supplies DC power to the Inverter and Battery Charger sections. The Inverter shall supply the load through the Static Bypass Switch (SBS) without using the energy stored in the battery at a min.10 kHz power conversion.

**B. Emergency:** Upon loss of input power or when power exceeds the specified input limits, the control logic shall allow the inverter to draw energy from the battery without interruption to the load and disconnect the input line. The transfer to battery shall be uninterrupted - "no break" power transfer. The inverter shall supply power from the batteries to the critical load through the Static Bypass Switch. The output voltage shall be sinusoidal and within specified limits. If power is not restored before the batteries have been exhausted, the UPS shall completely shutdown - protecting the batteries from possible damage.

**C. Recharge:** When utility power is restored and before the batteries are completely exhausted, the UPS shall automatically return to normal operation. This retransfer to normal operation shall be uninterrupted. The battery charger shall automatically recharge the batteries to full capacity. Recharge characteristics must strictly comply with UL1481 requirements.

**D. Bypass:** In the event of a component malfunction in either the Rectifier/Charger or the Inverter sections, the unit’s Static Bypass Switch shall transfer the load to the utility power with no interruption. Bypass mode shall cause alarm indication and initiate output relay dry contacts closure for customer use.

**E. Off-Battery:** When the battery is removed for maintenance or the battery breaker is off, the unit will continue to function, meeting all the specified performance parameters with the exception of the power back up time capability.

## 2.4 COMPONENT DESCRIPTION

**A. Input Terminal Block:** an input terminal block shall be hard wired, and located in the UPS close to knockouts for incoming power cable for easy installation. The conduit entries shall be located on the top and both sides of the cabinet.

**B. Optional Input Circuit Breaker:** a circuit breaker shall be provided and hard wired at the UPS input for protection from the utility line and associated wiring disturbances. An optional, higher KAIC breaker shall be available, and should be specified when required.

**C Input Contactor:** The UPS shall have a line contactor to isolate the rectifier in case of a line problem and allow for a smooth transfer/retransfer to and from bypass.

**D. Rectifier:** a solid state circuit design, converting incoming AC power to regulated DC bus voltage for the input to the inverter and battery charger.

**E. Inverter:** The inverter shall feature pulse-width modulation (PWM) design utilizing high frequency (15 kHz) switched IGBT’s. It shall use a true double conversion system, generating rated AC output from the utility power, or the batteries when in back up mode. The unit shall have a single heat sink and power IGBT’s assembly tray for reduced

switching noise and maximum reliability. The assembly shall come as a FRU and its design and mounting location shall be conceived for an easy maintenance. It shall be located on the electronics shelf with direct access, with opened door and can be replaced in app.15 min, using only a screwdriver.

**F. Charger:** A separate battery charger circuit shall be provided. It uses the same IGBT's as in the inverter, with constant voltage and current limiting control. The battery float voltage is microprocessor programmable for the applicable kVA and DC bus ratings. Charging current limit is temperature compensated for battery protection. Full recharge of the batteries shall be in full accordance with UL 924. The rectifier, inverter and charger shall be a part of the heat sink, IGBTs and drivers subassembly as part of FRU modular design aimed at increased ease and safety of service.

**G. Static Bypass : 100% rated, Continuous Duty**

The bypass serves as an alternative source of power for the critical load when an input line failure or abnormal condition prevents operation in inverter mode. It consists of a fully rated, continuous duty static switch for high-speed transfers and features two back to back SCRs to allow make before break transfer. The design shall include a Manual Bypass Switch, protected within the locked cabinet. It shall be accessible only to authorized personnel, allowing the unit to stay in bypass at all times for safe work on the unit. Manual transfer to bypass shall not cause unit trip, nor transfer into battery back up mode. The static switch shall be able to be powered up by an optional separate power source (generator or other power supply) for dual input capabilities.

1. **Transfer to Bypass** - will initiate automatically under the following conditions:
  - a) Critical bus voltage out of limits
  - b) Total battery discharge – ( for specified back up time w/o damaging batteries)
  - c) Over temperature period expired
  - d) UPS problem
  
2. **Automatic Re-transfer** - takes place whenever the inverter is capable of assuming the critical load. It shall be inhibited for the following conditions:
  - a) When transfer to bypass is activated manually or remotely
  - b) UPS problem
  
3. **All Transfers to Bypass shall be inhibited** for the following conditions
  - a) Bypass voltage out of limits (+/- 10 % of nominal)
  - b) Bypass frequency out of limits (+/- 3 Hz)

**H. Control Logic:** The entire UPS operation shall be performed by the microprocessor controlled logic. All operations, parameters, diagnostics, test and protection routines are firmware controlled, compensating component drift and changes in operating environment to ensure stable and consistent performance. A self-test and diagnostics subroutine shall assist in troubleshooting the unit. Control PCB shall be located on the front door, removed from power wiring and switching devices. This arrangement shall minimize EMI and allow hot boards swap, in manual bypass mode.

**I. Manual Maintenance Bypass Switch:** An auto/man MBS switch shall be provided in the UPS cabinet for connecting power to the critical load through the external maintenance bypass line. It shall be used when the unit needs to be de-energized for maintenance, without disrupting power to the load. Operating the switch shall be strictly restricted to authorized personnel with cabinet access key. The MBS shall be operated in conjunction with a S-1 synchronization switch, ensuring full synchronization and no inrush current during transfer.

- K. Output Transformer:** An isolation output transformer shall be utilized to provide specified output voltage and separate the UPS rectifier/Inverter section from the load disturbances and conducted noise.
- L. Manual Inverter Test Switch:** Unit shall have a momentary test switch to allow the user a manual system test without the need to operate any breakers or shutting down the system. The test switch shall be in compliance with UL1481 rules, well marked, accessible only after opening a locked front cabinet door and further protected from accidental activation. The Fire Alarm Back-up shall resume a normal operation after the test switch release.
- M. Battery Subsystem:** Sealed, maintenance-free VRLA batteries shall be provided. The batteries shall have an expected life of 10 years or a minimum 250 complete discharge cycles. The batteries shall be contained in a separate battery cabinet with a dedicated circuit breaker (no fuses) for battery protection, convenient power cut-off, and servicing. Battery run time (based on 100% full load) shall be no less than the specified time. Runtime shall comply with UL1481 providing a specified back up time at full load.
- N. Transient Voltage Surge Suppressor (TVSS):** TVSS is a DIN rail mounted device, connected to the UPS input. Its plug-in phase modules are easily replaceable. The device contains energy absorbing components and has a two-stage protection. When a protection component is damaged by absorbed transient, the module will display a flag indicating a need for replacement. At this time the device is still operational, due to redundant circuits. After the second spike, the device shows alarm condition indicating need for replacement. Remote indication contacts "TS" allows remote control of the protection status.

### 3.0 SYSTEM INDICATORS AND MONITORING

- 3.1 Front Panel LCD Display:** Standard, 4 lines x 20 characters back lit, blue LCD display on the UPS for instant indication of UPS status, metering, alarms and battery condition. The display provides easy read-out on 2 standard and 2 optional screens, providing continuous information with scrolling update:

- A. Status Screen**

- 1) Start Up : first screen to appear after energizing the unit
- 2) Stand By: unit continues internal check and self test
- 3) Normal : normal operating status, on inverter
- 4) UPS : kVA - indicates unit's nominal capacity in kVA
- 5) Input : OK input power available;
- 6) Input BAD - no input power or out of limits
- 7) Charger: On - charger operational;
- 8) Charger: Off no input power
- 9) Battery: OK battery charged;
- 10) Battery: Bad - battery not charged
- 11) DC: OK – DC bus voltage normal;
- 12) UV: bus undervoltage;
- 13) OV: bus overvoltage
- 14) On Inverter: load supplied from inverter,
- 15) Out OK: output OK,
- 16) Out Bad: no output
- 10) On Battery: unit supplies load from battery power
- 11) On Bypass: unit supplies load via bypass
- 12) PM REQ: elapsed maintenance interval reminder

## **B. Metering Screen**

- 1) Output: UPS output voltage
- 2) Output Power: total actual power - W
- 3) Input Voltage: UPS input voltage
- 4) Input Current: total input current
- 5) DC Bus: actual DC bus voltage, VDC
- 6) DC Bus: current in A (factory use)
- 7) Batt: -actual battery voltage, VDC
- 8) Batt: Charging (+), discharging(-) current

## **4.0 MECHANICAL DESIGN AND CONSTRUCTION**

- 4.1 Construction:** Only quality, unused material shall be used to build the unit, under strict observance of standards and quality workmanship. The cabinets shall be cleaned, primed and painted. The unit shall be constructed with rigorously tested, burned-in, replaceable subassemblies. Only two electronic subassemblies: heat sink assembly with IGBTs and drivers and control PCBA shall be used for maximum reliability and simple servicing. All printed circuit assemblies shall have plug connections. Like assemblies and like components shall be interchangeable.
- 4.3 Earthquake Protection:** The cabinet shall be evaluated for earthquake zone 4 installation, with the addition of optional earthquake brackets.
- 4.4 Wiring Installation:** UPS cabinet conduit entry arrangement shall allow for flexibility of user wiring installation. The wiring shall be routed thru the back of the cabinet.
- 4.5 Wiring Termination:** The UPS input and output power connections shall be hard wired within the cabinet. Optional input line cable and output receptacle panels shall be available (limited range of units only, please consult factory for details). Input and output terminal blocks shall be provided for easy field wiring of UPS and battery cabinets

## **5.0 ACCESSORIES (OPTIONAL COMPONENTS)**

- 5.1 External Manual Bypass Switch:** If specified by the customer, The bypass switch, enclosed in a box, could be field mounted in the UPS cabinet or an adjacent wall. This box includes a rotary switch with make before break contacts to provide a single control for transferring to and from maintenance bypass with no load support interruption.
- 5.3 Normally On/ Normally Off Output Aux. Circuit Breakers:** These CB's are 1 pole, 20 A devices for protection of customer's load circuits. Combine 5.7 & 5.8 to eliminate the need of internal output breakers
- 5.4 Higher KAIC Norm On/Off Output CB:** 1 Pole, 20 A Circuit Breaker with Higher KAIC, DIN rail mounted or molded case design.
- 5.5 Seismic Mounting Brackets:** Left / Right seismic floor mounting brackets

## 6.0 SERVICE

- 6.1 Service Personnel:** The UPS manufacturer shall employ a nationwide service organization, with factory-trained Customer Service Engineers dedicated to the start-up, maintenance, and repair of UPS and power equipment. The manufacturer shall provide a fully automated national dispatch center to coordinate field service personnel schedules. One toll-free number shall reach a qualified support person 24hrs/day, 7days/week and 365 days/year. For emergency service calls, response time from a local Customer Engineer shall be approximately 15 minutes.
- 6.2 Replacement Parts:** Parts shall be available through an extensive network to ensure around- the-clock parts availability throughout the country. Customer Support Parts Coordinators shall be on-call 24hrs/day, 7days/week, 365 days a year for immediate parts dispatch. Parts shall be delivered to the site within 24 hours.
- 6.3 Maintenance Training:** In addition to the basic operator training conducted as a part of the system start-up, class-room courses for customer employees shall be made available by the manufacturer. The course shall cover UPS theory, location of subassemblies, safety, battery considerations and UPS operational procedures. It shall include AC/DC and DC/AC conversion techniques as well as control and metering, Troubleshooting and fault isolation using alarm information and internal self-diagnostics interpretation shall be stressed.
- 6.4 Maintenance Contracts:** A comprehensive offering of preventive and full service maintenance contracts shall be available. An extended warranty and preventive maintenance package shall be available. All services shall be performed by factory trained Service Engineers.
- 6.5 Site Testing:** The manufacturer's field service personnel shall provide site testing if requested. The testing shall consist of a complete test of the UPS system and the associated accessories supplied by the manufacturer. A partial battery discharge test shall be provided as part of the standard start-up procedure. The test results shall be documented, signed, and dated for future reference.

**NOTE:** This Guide Specification follows the Construction Specification Institute guidelines per CSI MP-2-1,MP-2-2. It is subject to change due to product improvement and/or enhancement.

Please use this document as a guide specification, and do not hesitate to contact our application engineering department, should you have any further questions or special requirements.

You can contact us at: **800 -227-8899**, or via e-mail: [sales@onlinepower.com](mailto:sales@onlinepower.com),  
[tech@onlinepower.com](mailto:tech@onlinepower.com)