SANUPS
A11H302A011US
3 kVA

Uninterruptible Power Systems

Technical Specifications

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1. The System

1.1. This specification describes a single-phase, true-online double conversion, solid state Uninterruptible Power System herein after referred to as the UPS. The UPS shall operate in conjunction with the existing building electrical system to provide power conditioning and back-up power protection. The system shall consist of a solid-state inverter, rectifier, battery charger, and a 100 % rated, automatic, continuous duty static switch.

2. UPS Requirements and Performance Characteristics

2.1. Rating

2.1.1. The UPS is available in:

	US model
Apparent power	3 kVA
Active power @ 0~40 °C (32~104 °F)	2.1 kW

2.2. Input Features

2.2.1. Voltages: 120 V, 1 phase, 2 wire + ground

AC input Range:

55 to 150 V *

96 to 150 V (100% load)

*The AC input range depends on load factor as follows.

Load Factor	Detecting low voltage	Return voltage from backup
Less than 40%	55V	96V
Less than 70%	68V	
More than 70%	80V	108V

Below 96V input voltage, UPS goes to battery operation after 1 minute. 150V detection, and 145V Return.

2.2.2. Input Frequency: depend on output frequency setting.

2.2.3. Input Frequency Range: 40Hz - 120Hz

2.2.4. Current Values

	Sn (kVA)	Normal AC source (A)	Load (A)
Double Conversion: Min i/p voltage (80 V) and 120 V o/p	3	19.3 (29.0)	25

2.2.5. Recommended AC input Breaker: 40 A

2.2.6. Inrush Current: 35 A for 1 ms

2.2.7. Input Current Total Harmonic Distortion: < 10 %

2.2.8. Power factor: > 0.7

2.3. Output Characteristics

2.3.1. Voltages: 120 V Single phase

2.3.2. Voltage Regulation: +/- 2 %

2.3.3. Frequency:

50 / 60 Hz (User selectable)

60 Hz (Default)

2.3.4. Frequency Regulation:

+/- 1, 3, 5 % (User selectable) +/-5 % (Default)

+/- 0.5 %: Battery Operation

2.3.5. Frequency converter mode: Can be used as a frequency converter
But the UPS has the range of synchronizing the inverter output frequency with input frequency at least +/- 1% from the rated output frequency.

2.3.6. Slew Rate: < 1 Hz / second

2.3.7. Frequency Stability:
When UPS is synchronized on Normal AC source, the max phase shift is 31 μs, and inverter phase leads Normal AC phase.

2.3.8. Overload detection: Current limited
Overload occurs when output VA or Watts are beyond 105 % of nominal load. The 3 kVA meets overload detection as soon as measured output VA are beyond 3.15 kVA or as soon as measured output Watts are beyond 2.21 kW.
The UPS in overload conditions:

< 200 ms 105%

If bypass inside voltage (bypass voltage < 150 V):

After the delay (200 ms), UPS switches to bypass without output break.

Customer can select a mode of action when overload disappears.

If bypass outside voltage:

After the delay (200 ms), Output is shutdown

After shutdown, if the bypass voltage becomes less than 148V, the UPS output the bypass again.

2.3.9. Short circuit: 800 % of nominal load during 2 cycles

2.3.10. Restart after short circuit:

Customer must push a bypass breaker.

2.3.11. Crest factor: 2.5:1

2.4. Battery Characteristics

2.4.1. Cold Start: The units can be started on battery.
(Frequency depends on output frequency setting.)

2.4.2. The backup time of the standard version can be increased by adding battery pack.
The battery slot can include the adding battery packs up to one.

2.4.3. Battery Replacement: Hot Swappable

2.4.4. Battery Type: 12 V / 34 W (@15minute-rate). 9Ah (@ 20 hour-rate)

2.4.5. Nominal Battery voltage: 60 V

2.4.6. Number of Batteries per Module: 5, in series

2.4.7. Battery test: manual start, every 180 days (by default).
Can be adjusted to; every 30 days, 90 days, 180 days, or no test.

2.4.8. Leakage Current:
340 µA after end of backup time and full shutdown if DC circuit is on.

2.4.9. Battery Current Protection: Battery fuse 100A

2.4.10. Battery protection against overvoltage :
Yes, if charger voltage exceeds 82.5V (2.75 V / Cell).

2.4.11. Pre-alarm level: By default, set to 1.8 V / Cell.

2.4.12. Battery to replace warning:
The UPS has inner timer. The warning alarm sounds two times when the battery has reached its services life and before half a year.

2.4.13. Battery Supplier: CSB Battery
Part Number: = HRL1234WF2FR

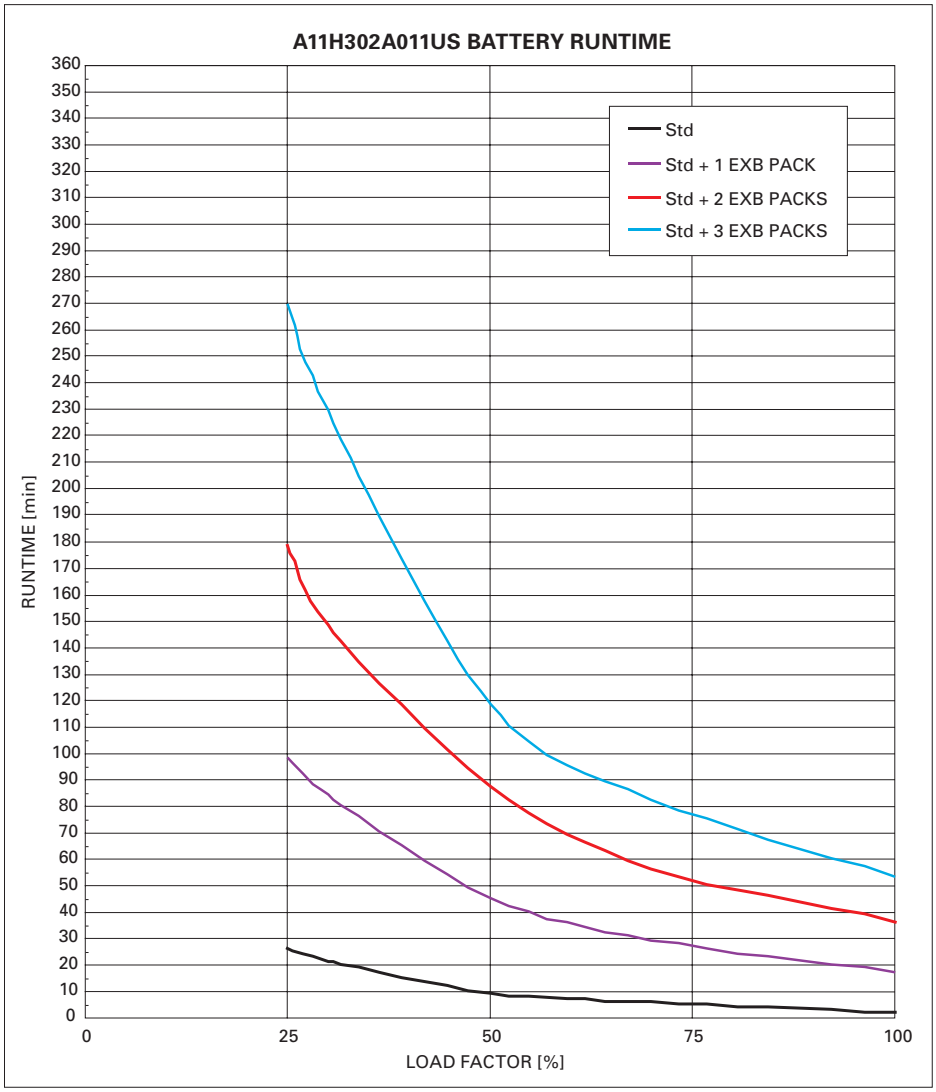
2.4.14. Backup time: 3.5 min.(at Std), 15,30,45min.(with option battery pack)

Typical backup times tables:

Backup times (in minutes) with 0.7 output power factor:
Batteries fully charged (at least 12 hours on floating conditions) @ 25 °C.
The battery aging is not taken into account in backup time prediction.
The batteries supplier is not taken into account.

3 kVA with battery units: (min)

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Std	74	39	23	16	11	9	7.5	6	4.5	3.5
Std + 1 pack	270	130	87	59	47	37	31	25	21	19
Std + 2 packs	460	240	150	110	89	70	58	50	44	38
Std + 3 packs	650	340	240	160	120	100	84	71	61	55



2.5. Charger Characteristics

2.5.1. Configuration: There is only one charger.

2.5.2. The charger is powered from the DC bus.

2.5.3. Float: The floating value is set to 68.3 Volts @ 25 °C.

2.5.4. Nominal charging current: 1.4 A

2.5.5. Floating value table vs ambient room temperature:

T (°C)	0	10	20	25	30	40
Voltage / cell	2.317	2.30	2.28	2.275	2.267	2.25
Total voltage	69.5	69.0	68.4	68.3	68.0	67.5

2.5.6. With EXB:

When an EXB battery pack is connected, the total charging current is 1.4 A.

The floating DC value is set to 68.3V.

2.5.7. Recharge time table vs number of extensions:

(after 100 % RCD load discharge then recharge to recover 90 % of nominal backup time)

Version	Std	Std + 1 pack	Std + 2 packs	Std + 3 packs
Recharge time	12 hours	36 hours	48 hours	60 hours

3. Front Panel Information

3.1. MIMIC panel

13 LEDs on the top

- ALARM (red)
- ON / OFF (green)
- BATT. LOW (red)
- LOAD LEVEL / 25%, 50%, 75%, 100% (green) / O.L. (red)
- BATT. TEST (green)
- BACK UP (orange)
- OUTPUT (green)
- BYPASS (red)
- INVERTER (green)

3 buttons (ON/OFF / BATT.TEST / CLEAR)

3.2. ON / OFF button

3.2.1. ON switch

Push time > 1 second: start the inverter.

Push time > 5 seconds: UPS cold start (if batteries connected and without Normal AC source)

3.2.2. OFF switch

Push time > 1 second (Default)*: stop the inverter**.

*Customer can select “ 1 second ” or “ 3 seconds ” or “ unique ” .
The “ unique ” setting needs two steps operation to off the UPS.
**Customer can select “ off ” (default) or “ change to bypass ” .

3.3. Battery Test button

The UPS starts a battery test when this button has been pushed.
If the button is pushed again during battery test, the UPS stops a battery test.

3.4. Clear button

Clear the result of battery test.
And if the button is pushed during alarm beeping, the UPS stops alarm beeping.

4. Communication links specification

4.1. RS232 communication (on DB9 connector)

4.2. REMOTE switch connector *2

These are connectors for remote ON / OFF signal input and for linked operation.

4.3. External control terminal block

4.3.1. Connect outlet box

Connecting an outlet box to the UPS provides three output lines: OUTPUT 0, 1, and 2.

4.3.2. EPO terminal

Connect these to the terminals of a switch or other device to enable Emergency Power Off of UPS output.

4.4. Optional Card slots:

1 slot is available. Below is a list of optional cards.

4.4.1. LAN interface Card (PRE11A01-US) features a web interface, Simple Network Management Protocol (SNMP), Simple Mail Transfer Protocol (SMTP) email notification and keeps log files about UPS operation.

4.4.2. Contact Signal Interface Card (PRE11A02-US) provides status in the form of 5 Alarm relays (125V 0.5A rated relays). Connection provided is D-Sub 15pin connector.

5. LEDs and buzzer

5.1. BUZZER DEFINITION

Definition:

- Beep two times in 2 seconds: ** ** ** ** ...
  As soon as the UPS is on battery it must beep slow.
- One beep: *
  An inverter is on or off. Key clicked at a setup menu.
- Continuous beeps: **********...
  On battery, when the UPS reaches the pre-alarm threshold it must beep quick.
- Continuous tone: *----------
  The buzzer must beep continuously when:
  The UPS has a mechanical failure.
  The battery is exhausted.
- Beep four times in 3 seconds: **** **** **** ...
  The load devices connected to the output exceed the rated capacity.
- Beep one time in 2 seconds: * * * * ...
  The UPS supplies the BYPASS output to the load.
- Beep seven times in 2 seconds: ******* ******* ...
  The battery check result was an error.
- Beep five times in 2 seconds: ***** ***** ***** ...
  The battery has reached before half year of its service life.
  The battery has reached its service life (The red BATT.LOW indicator blinks).

Customer can change the buzzer parameters:

a. All beep
b. Only beep when the UPS has mechanical failure
c. Key clicks at a setup menu only.
d. Both b and c.

Note that:
In any case, it is possible to stop the buzzer at any time, until the next buzzer, by pressing CLEAR button.

6. Standards

6.1. Safety:

The UPS meet UL1778 stds. It is UL listed.

6.2. EMC:

UPS are class A according to FCC Part 15 Subpart B.

6.3. Susceptibility:

IEC 61000-4-2 (ESD): level 3.
IEC 61000-4-5 (Surge): level 3.

6.4. Transportation:

JIS Z 0200 (drop and vibration tests): Yes.

6.5. Environment temperature and humidity

6.5.1. Ambient operating temperature: 0 to 40 °C (32 to 104 °F)
6.5.2. Ambient storage temperature: -15 to 50 °C (5 to 122 °F)
6.5.3. Humidity: 20 to 90 %.
6.5.4. Altitude: up to 3000 meters (9843 ft.) without derating.
(Load reduction is necessary for 3281ft or more. 6562ft 90% 9843ft 80%)

6.6. Audible noise

6.6.1. Max 50 dBA (buzzer not included)

6.7. MTBF

139,000 hours (est.)

Power Systems Division

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