Product Specifications

Models:
USC-10001, USC-10002
USC-20001, USC-20002
USC-30001, USC-30002

Guide Specification for UniStar® C Series

Rack/Universal 1, 2, 3Kva
Single-Phase, On-Line Double Conversoin
Uninterruptible Power Supply

9-1-10

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SECTION 1.0

SCOPE AND SYSTEMS RATINGS

1.1 Specification

This specification defines the electrical and mechanical characteristics and requirements for a continuous duty, single-phase, rack and universal mount design uninterruptible power system. The specification identifies 1Kva, 2Kva and 3Kva double conversion equipment, hereafter referred to as the UPS.

The UPS shall utilize "true on-line" pulse width modulated (PWM) inverter incorporating Mosfet Transistor technology. The inverter is a microprocessor controlled, solid-state device within the uninterruptible power system. The uninterruptible power system, hereafter referred to as the UPS, shall provide high quality AC power for sensitive electronic equipment loads.

The UPS shall consist of a rectifier/charger, battery, inverter, protective devices, static transfer switch, synchronizing and phase lock circuitry, and controls required to provide regulated, uninterrupted, conditioned power to the critical load.

The UPS shall include all mechanical and electrical devices that will automatically provide continuity of electrical power within the defined limits without interruption, failure or degradation of the commercial power source. Continuity of conditioned electric power shall be maintained for the defined period of time by the battery system. Upon return of the utility power source, the UPS shall automatically assume the load, while simultaneously recharging the batteries.

1.2 UPS Modes of Operation

The UPS shall be designed to operate as an on-line reverse transfer system in following modes:

1.2.1 Normal: The critical AC load is supplied continuously by the inverter. The rectifier/charger derives power from a utility AC source and supplies DC power to the inverter while simultaneously float charging a battery system. The inverter converts the DC power into clean and regulated AC power that is then supplied to the critical load through the static transfer switch.

1.2.2 Emergency: Upon failure or degradation of the utility AC power, the critical AC load supplied by the inverter will draw its power from the batteries. There shall be no interruption of power switching from utility AC power to batteries or while switching from batteries back to utility AC power upon its restoration. While the battery powers the UPS, indication for actual battery backup time shall be provided.

1.2.3 Recharge: Upon restoration of utility AC power, even if the batteries are completely discharged, the UPS will restart. The rectifier/charger shall assume the inverter and battery recharge loads. If the bypass source is within acceptable limits, the UPS will retransfer the critical load back to the inverter.

1.2.4 Bypass: When the inverter overload capacity is exceeded, the static transfer switch shall perform a transfer of the load from the inverter to the bypass source with no interruption in power to the critical load.

1.2.5 Maintenance Bypass: If for some reason the UPS has to be taken out of service for maintenance or repair, the UPS shall be provided with an optional, external maintenance bypass

switch to enable a load transfer from the inverter to the bypass source with no interruption of power to the critical load.

1.3 System Ratings

Ratings	120Vac	240Vac
Voltage Range	60Vac –144Vac Software Selectable; 120Vac – 288Vac Software Selectable	
Frequency	50/60 Hz Auto-Select, +/- 5Hz	
Phase/Wire	Line + Ground	
Power Factor	>0.99 at Rated Full Linear Load	
Transfer Time	0 ms	
AC Leakage Current	< 5mA	<3.5mA
Surge Protection	400 joules	300 joules

1.3.2 Output

Ratings	120Vac	120Vac	120Vac	240Vac	240Vac	240Vac
Capacity	1kVA/700W	2kVA/1400W	3kVA/2100W	1kVA/700 W	2kVA/1400W	3kVA/2100Watts
Voltage	100/110/115/120/127Vac Software Selectable			200/208/220/230/240Vac Software Selectable		
Voltage Regulation	+/- 1%					
Frequency (Sync Range)	3Hz or 1Hz Software Selectable					
Frequency Battery Mode	+/- 0.1% (0.05 ~0.06Hz)					
Crest Factor	3:1					
Harmonic Distortion	< 3% THD (Linear Loads), < 7% THD (Non-Linear Loads)					
Transient Response	< = 60ms/5%					
Waveform	Pure Sine Wave					
Efficiency AC Mode	85%	85%	88%	85%	85%	88%
Efficiency Bat. Mode	83%	83%	85%	83%	83%	85%
DC Start	Yes					
Cooling	Load Dependent Variable Speed Fans					
Over temperature	Normal Mode – Transfer to bypass; Battery Mode – UPS shuts down immediately					
Overload	<105% continuous, >120% for 30 seconds, >150% for 10 seconds					
Full Load Heat Rejection BTU/hr	422	843	977	422	843	977

1.3.3 Internal Battery

Internal battery shall be maintenance-free sealed type to minimize the need for servicing. Battery shall be hot-swappable design, allowing users to replace the batteries without the hazard of electrical shock or interruption to the connected load. The UPS shall continue to supply power during such servicing, as applicable.

Model	**1kva/2kva 120V**		**3kva/120V**	**1kva/2kva 240V**		**3kva 240V**
Battery Run Time @Full Load	7		5	7		5
	1kva	2kva	3kva	1kva	2kva	3kva
Type	3 ea.12V/7AH	6 ea.12V/7AH	6 ea.12V/9AH	3 ea.12V/7AH	6 ea.12V/7AH	6 ea.12V/9AH
Charging Current	1.1 Amps	2.17 Amps	2.7 Amps	1.1 Amps	2.17 Amps	2.7 Amps
Charging Voltage	41.0Vdc +/-0.5V	82.0Vdc +/-0.5V	82.0Vdc +/-0.5V	41.0Vdc +/-0.5V	82.0Vdc +/-0.5V	82.0Vdc +/-0.5V
Hot – Swappable	Yes					
Recharge Time	4 hours to 90%					
Extended Battery	Yes – Hot Swappable					
DC Linkage Current	<30uA (+/-10uA) with no AC applied and unit Off					
Battery Mgmt.	Automatic Battery Management (ABM) saves battery life					

SECTION 2.0
ENVIRONMENTAL

2.1 Environmental

Operating Temp: 0°C – 40°C

Altitude: 0 - 2,000 m up to 40° C. 3,000 m up to 35° C

Noise Level: <50dBA @ 1 Meter

Relative Humidity: 0 to 90% non-condensing

SECTION 3.0
GENERAL REQUIREMENTS

3.1 System Description

3.1.1 Rectifier/Charger

The rectifier section of the power converter module capable of receiving utility input and rectifying it to produce Direct Current (DC) power at levels sufficient enough to supply the load via the inverter, and recharge the battery.

3.1.2 Inverter

The inverter section of the power converter module shall utilize power switching Mosfet Transistors. This solid-state device that incorporates pulse width modulation (PWM) technology is capable of accepting the output of the rectifier/charger or the battery system voltage and delivering AC power within specified limits to the critical load bus. The inverter shall be microprocessor controlled and include all necessary timing logic and control circuits.

3.1.3 Static Transfer Switch

An internally mounted static transfer switch and bypass circuit shall be provided as an integral part of the UPS. The static switch shall be high speed power electronic devices rated to conduct full load current continuously while on inverter or bypass power. The static switch shall include all necessary logic circuitry for fully automatic frequency synchronization and phase locking of the UPS inverter output to the bypass/reserve power source.

SECTION 4.0

WIRING AND CONNECTION

Wiring practices, materials and coding shall be in accordance with the requirements of the National Electric Code, NFPA 70 and other applicable codes and standards

Section 4.1 Description

Input/Output Connections

KVA	Vac	Input Cord	Output Connection
1	120	5-15P	(6) 5-15R
2	120	5-20P	(2) 5-15R (2) 5-20R
3	120	L5-30P	(4) 5-15R (1) L5-30R
1	230	(10A) IEC320-C14	(6) 10A IEC320-C13
2	230	(10A) IEC320-C14	(6) 10A IEC320-C13
3	230	(16A) IEC320-C14	(4) 10A IEC320-C13 (1) – C19

Output Control: (2) ON/OFF Software controlled receptacle banks for load shedding

SECTION 5.0

MECHANICAL STANDARDS

5.1 Cabinet Description

The UPS unit, comprised of the rectifier/charger, inverter, static transfer switch shall be housed in an enclosure offering indoor protection.

Dimensions	Rack Configuration	1kva	3.5 x 17.4 x 16	2/3kva	3.5 x 17.4 x 25.6
H" x W" x D"	Tower Configuration	1kva	17.4 x 3.5 x 16	2/3kva	17.4 x 3.5 x 25.6

	1kva, 120V	2kva, 120V	3kva, 240V	1kva, 240V	2kva, 240V	3kva, 240V
Weight (lbs.)	35	64	65	35	64	65

SECTION 6.0

MONITORING, CONTROLS, ALARMS AND COMMUNICATION

6.1 General

6.1.1 Control Panel

The UPS unit shall incorporate the necessary controls, instruments and indicators to allow the operator to monitor the system status and performance, as well as take any appropriate action.

Display, Alarms, Diagnostics, Communications & Emergency Functions

Status On LCD	Line Mode, Backup Mode, ECO Mode, Bypass Supply, Battery Low, Battery Bad/Disconnected, Overload, Transferring with interruption & UPS Fault
Readings On LCD	Input Voltage, Input Frequency, Output Voltage, Output Frequency, Load Percentage, Battery Voltage & Units Inner Temperature
Power Up	ON/OFF Button, Test Alarm & Reset Button
Self-Diagnostics	Upon Power –On, Front Panel Setting & Software Control, 24 Hour self check
Audible Alarms and Visual Communications	Line Failure, Battery Low, Transfer to Bypass, System Fault Conditions RS232 Serial Port and USB, optional SNMP/WEB, USB or Dry Contact Cards
Emergency Power Off (EPO) Connection	Emergency Power Off shuts down UPS when activated by customer supplied EPO Circuit

6.1.2 Communications

The communication port on the rear panel of the UPS shall be RS232 serial type, allowing for computer connection to monitor the status of the UPS, and allow for the control and operation of the UPS. Communication software will bundled with the UPS for use with MS Windows

Section 7.0
Standards

7.1 Applicable Documents

The UPS shall be designed in accordance with the applicable sections of the current revision of the following documents.

Safety/Performance	UL1778, c-UL, CE, IEC/EN 62040-1-1, IEC 60950-1, IEC/EN 62040-2 Class A, FCC Part 15 Subpart B Class A (Note 230vac not UL, c-UL listed)
EMC Standards	IEC/EN62040-2 Class A, FCC Part 15 Subpart B Class A, IEC/EN55011, CISPR11, IEC61000-4-2/-3/-4/-5, IEC61000-2-2, IEC61000-3-2/-3

SECTION 8.0

OPTIONS

8.1 Battery

A storage battery shall be used to provide the system with extended operational run times. Battery shall be hot-swappable design, allowing users to replace the batteries without the hazard of electrical shock or interruption to the connected load . The UPS shall continue to supply power during such servicing, as applicable. Battery run times shall be as follows:

UPS Size	Quantity Cabinets	25% Load	50% Load	75% Load	100% Load
I kVA	0	50	20	10	7
	1	380	160	95	66
	2	740	320	195	130
	3	1150	505	310	215
	4	1575	695	430	300
2kVA	0	45	18	10	7
	1	195	80	45	33
	2	320	155	95	66
	3	550	240	145	100
	4	745	325	195	135
3kVA	0	40	15	8	5
	1	163	65	40	25
	2	305	130	75	53
	3	460	195	120	80
	4	650	280	170	120

Notes: Battery rated at 12V; 1kva 7A/hour, 2/3kva 9A/hour, 1kva 36v, 2/3kva, 72v

8.2 Maintenance Bypass Module

The manually operated, external Maintenance Bypass Module shall be make-bfore-break and provide for continuous power to the critical load, when maintenance procedures are necessary, for either scheduled or unscheduled events. The Ratings shall be as follows:

KVA/Rating/Voltage	Input Connection	Output Receptacles
1kVA / 120V	Attached 6' Cord with 5-15P	(8) 5-15R
2kVA / 120V	Attached 6' Cord with 5-20P	(6) 5-15R & (2) 5-20R
3kVA / 120V	Attached 6' Cord with L5-30P	(4) 5-15R & (1) 5-30R
1kVA & 2kVA/230V	Attached 6' Cord with IEC C14	(8) IEC C13
3kVA / 230V	Attached 6' Cord with IEC C20	(6) IEC C13 & (1) IEC C18

Dimensions: 3.5"H x (2U) x 17.3"W x 3.0"D

8.2 Communications

The UPS shall have a card slot to receive an optional:

SNMP/WEB kit to include **SNMP/Web brouser adapter card**, MIB software, interface cable and operators manual. Support HP Open View, Sun SunNet Manager, IBM NetView, Novell NMS, Accton AccView and other SNMP Compliant NMS's, or **USB Interface Card** or **Opto- coupler type Dry Contact Card, DB9 (AS/400)** or **Relay Contact Board Card**, True Relay 10 Pin.

SECTION 9.0

FACTORY TESTING

9.1 Factory Testing

Before shipment, the manufacturer shall completely test the system to factory standards to assure compliance with the specification.

SECTION 10.0

INSTALLATION AND OPERATION DATA

10.1 Operating and Maintenance Manuals

The specified UPS system shall be supplied with one copy of the User's Manual. Additional copies may be downloaded from manufacturers web site or ordered at an additional charge from the manufacturer.

SECTION 11.0

LIMITED WARRANTY

11.1 UPS and Battery Limited Warranty

The UPS parts with depot repair warranty shall be in effect for 36 months. The battery shall provide for a one year warranty, prorated for a period of four years.

SECTION 12.0

QUALIFYING EXPERIENCE

12.1 Qualifying Experience

The manufacturer shall have a minimum of ten years experience in the design, manufacture, and testing UPS systems. This specification outlines the minimum requirements for a UPS. Every supplier shall provide a specification compliance statement with its proposal referencing each section of this specification.

12.2 Approved Manufacturer

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