

# Specification for UPS Spares

Material Code: SP3005100860

Specification: 10kVA 3/1 online double conversion UPS

**Component description:**

The UPS shall consist of

- Incoming MCCB in Inverter line & By-pass line
- Isolation transformers
- Harmonic filter
- Rectifier/Charging unit
- Inverter unit
- Servo-Controlled Voltage regulator in the bypass line along with isolation transformer
- Automatic switching (Static switches)
- Maintenance bypass switch
- Protective devices and other accessories
- Control and display unit for control and monitor of UPS parameters

**Specification requirement:**

S. No.	Description	Technical Requirements
1.0	Site Conditions	
1.1	Application	Automation PLC Modules, SCADA, Lighting
1.2	Design Ambient temperature	50°C
1.3	Max. RH	95%
1.4	Atmosphere	Industrial
2.0	Common technical requirements	
2.1	Type of UPS	3ph in – 1ph out, standalone online double conversion UPS
2.2	UPS rating	10kVA
2.3	Incoming Feeders	2 no's of 3 phase along with neutral
2.4	Input Voltage/Variation	3 phase 415V + Neutral, -20% to +15% at 100% load
2.5	Input Frequency/Variation	50Hz ±10%
2.6	Input Current Distortion(THDi)	i. < 3% for 100% linear load. ii. < 5% for 100% non-linear load.
2.7	Input Power factor	> 0.9 lag at 100% load
2.8	Efficiency	Above 90% at 100% load
2.9	Outgoing Feeders	1 no's of single phase
2.10	Nominal output voltage/variation	1 phase 230V ±1%
2.11	Nominal output frequency/Variation	50Hz ±1%
2.12	Voltage wave form	Pure sinusoidal
2.13	Ingress Protection	IP20
2.14	Noise Level	75dB at 1m distance
2.15	Type of cable entry	Behind
3.0	Detailed technical requirements	
3.1.0	Inverter	
3.1.1	Rating	10kVA
3.1.2	Type	Solid state, IGBT

3.1.3	Duty	Continuous
3.1.4	Output Voltage	230V AC
3.1.5	Voltage THD	Less than 3% for 100% linear load
3.1.6	Efficiency	
a)	At 100% load	> 90%
b)	At 50% load	
3.1.7	Over load capability	110% of rated for 15 min 125% of rated for 10 min 150% of rated for 60 sec
3.1.8	Output voltage regulation	
a)	Steady state (0-100% load at all input voltages and all power factors)	±1%
b)	Transient voltage on application or removal of 100% load	±8%
c)	Time to recover from transient to normal voltage	100ms
3.1.9	Synchronisation limits of frequency (for maintenance of synchronism between inverter and standby)	±1.5%
3.1.10	Field adjustment range of synchronization frequency	±1% to ±4% in steps of 0.5%
3.1.11	Steady state frequency variation (for 0-100% load at all input voltages and power factors)	±0.5%
3.1.12	Maximum allowed phase displacement between inverter and bypass	±5°
3.1.13	Maximum total harmonic content in the output (THDv)	±5%
3.1.14	Type of cooling	Natural convection or forced cooling
3.2.0	Rectifier/Charger	
3.2.1	Type	Float cum Boost
3.2.2	No of pulses	6
3.2.3	Efficiency	> 90% at full load
3.2.4	DC Voltage	240V DC
3.2.5	Blocking diode PIV	1200V(min.)
3.2.6	Protection against reverse battery connection	Required
3.2.7	Soft start feature	Required
3.3.0	Static switch	
3.3.1	Short time rating/over load capacity	125% of rated kVA for 2 min
3.3.2	Peak capacity	1000% of continuous rating for 5 cycles
3.3.3	Normal voltage	230V
3.3.4	Transfer time between inverter and bypass in synchronized mode	1/4 <sup>th</sup> of the cycle
3.3.5	Conditions of load transfer from inverter to bypass	

a)	Allowable range of stabilizer output voltage	±5% of rated UPS output voltage
b)	Allowable range of main bypass frequency	±4%
3.3.6	Output voltage regulation of stabilizer output for complete range of load	±2%
3.4.0	Maintenance bypass switch	
3.4.1	Short time rating/ over load capacity	125% of rated KVA for 15 min and 150% for 60 secs
3.4.2	Voltage	600V
3.5.0	Servo controlled voltage regulator	
3.5.1	Type	Servo controlled
3.5.2	Output voltage regulation	±1% for 0-100% load variation and full range of input supply variation over the entire power factor range.

Material Code: SP2004001260

Specification: 12V 65Ah VRLA battery bank with rack

**Specification requirement:**

S. No.	Description	Technical Requirements
1.0	Battery bank	
1.1	Type	VRLA-SMF
1.2	Nominal Battery Voltage	12V
1.3	Nominal Battery Bank voltage	240V DC
1.4	Battery Ah	65
1.5	No of Batteries in each bank	20 no
1.6	Design Margin	10%
1.7	State of charge factor	1
1.8	Ageing factor	1.25
1.9	Type of mounting	On stackable modular mild steel rack
1.10	End Cell voltage	1.75 at 27°C
1.11	Single Cell Nominal Voltage	2V
1.12	Make	EXIDE/QUANTA/AMAR RAJA/HBL
2.0	Battery Stand	
2.1	Type	In stackable module form
2.2	Material	Mild steel painted with corrosion resistance paint
2.3	Accessibility	Each cell shall be easily accessible for inspection
2.4	Dimensional requirement	To accommodate 20 nos of 12V 65Ah VRLA battery
3.0	Connectors	
3.1	Material	Connectors for inter battery, inter stack connections – Flexible insulated copper cable with lugs (suitable size) at both ends.
3.2	Bolts, nuts & washers	Bolts, nuts and washers for connecting the cells.

**Note to Supplier:**

1. The Bidder is requested to submit the details in the format mentioned in Annexure-1 and Annexure-2 for technical evaluation.
2. Warranty shall be 1 year from the date of supply.
3. Data sheet for the UPS and battery shall be attached while placing bid.
4. UPS operating manual along with maintenance instructions to be supplied along with UPS.
5. Battery bank maintenance manual shall be shared along with battery supply.

Annexure-1: Bidders details for 10KVA 3/1 Online UPS

S. No.	Description	Data
1.0	UPS System	
1.1	Make	
1.2	Type designation	
1.3	Rating(KVA at rated pf)	
1.4	Input pf	
1.5	Output pf	
1.6	Mode of operation	
1.7	Dynamic response under the following conditions	
a)	For 50% step load	
b)	For 100% step load and unload	
c)	Power supply interruption and restoration	
d)	Load transferred to bypass line	
1.8	Type of cooling	
1.9	Degree of Ingress protection	
1.10	Noise level	
1.11	Colour shade	
1.12	Efficiency of bypass stabilizer including input transformer	
a)	At 100% load	
b)	At 75% load	
c)	At 50% load	
d)	At no load	
1.13	Overall efficiency of the UPS system (ratio of output load to input power drawn from mains when all charger, inverter are on with bypass operating at no load)	
a)	At 100% load	
b)	At 75% load	
c)	At 50% load	
d)	At no load	
1.14	Cable entry	
1.15	Dimensions of the UPS(LXBXH)	
1.16	Heat loss of the total system (kW)	
2.0	Inverter	
2.1	Rating(at specified ambient)	
2.2	DC input voltage	
2.3	DC input current	
a)	At no load	
b)	At full load	
2.4	Steady state output frequency(Nominal/Variation)	
2.5	Steady state output voltage(Nominal/Variation)	

2.6	Output voltage adjustment range at rated load	
2.7	AC Output current	
a)	At no load	
b)	At full load	
2.8	Max. inrush current when inverter is energized	
2.9	Harmonic distortion at inverter output at rated load	
a)	For linear load	
b)	For non-linear load	
2.10	Over loading capacity and duration	
2.11	Short circuit capacity and duration	
2.12	Type of control circuit	
2.13	Load crest factor (for which UPS is designed)	
2.14	Max. allowed rating of outgoing feeders for fault clearance of feeder fault by UPS with and without mains supply backup (as percentage of UPS rating)	
a)	With fast acting semiconductor fuses	
b)	With normal HRC fuses	
2.15	Efficiency of inverter module including input and output transformer	
a)	At 100% load	
b)	At 75% load	
c)	At 50% load	
d)	At no load	
2.15	SCR element provided with	
a)	Surge protection	
b)	Fast acting HRC fuse	
3.0	Static Switches	
3.1	No of static switches in UPS	
3.2	Current rating at specified ambient (Continuous/Short time)	
3.3	Slew rate	
3.4	Type of static switch	
3.5	Transfer time	
a)	Synchronized mode	
b)	Unsynchronized mode	
4.0	Rectifier/Charger	
4.1	Current rating	
4.2	Type of charger	
4.3	Input current at the following loads in addition to the battery charging current supply	
a)	50% rated load	

b)	100% rated load	
c)	110% rated load	
4.4	Charger maximum inrush current	
4.5	Output voltage under	
a)	Float charging	
b)	Rapid charging	
4.6	Output voltage accuracy under specified input	
4.7	Maximum ripple content on DC side with	
a)	Battery connected	
b)	Battery disconnected	
4.8	Maximum harmonic content in input current	
4.9	Input transformer rating	
4.10	Efficiency of charger module including input and output transformer	
a)	At 100% load	
b)	At 75% load	
c)	At 50% load	
d)	At no load	
4.11	SCR element provided with	
a)	Surge protection	
b)	Fast acting HRC fuses	
5.0	Maintenance bypass switch	
5.1	Make/Type designation	
5.2	Rated voltage	
5.3	Rated current	
5.4	Short time current rating	
5.6	No of positions and details of positions	
6.0	Step down bypass transformer with solid state voltage stabilizer	
6.1	Make/Type designation	
6.2	Rating and voltage ratio	
6.3	Accuracy of stabilizer	
6.4	Type of control	
6.5	Type of cooling	
6.6	Type of stabilizer	
6.7	Class of insulation	
6.8	Guaranteed loss at 100% rated voltage and frequency	
6.9	No load loss	
6.10	Copper loss at full load	
6.11	Efficiency at 0.8 pf	
a)	At 100% load	
b)	At 50% load	
7.0	Isolation transformers	
7.1	Make/Type designation	

7.2	Rating and voltage ratio of the input transformer	
7.3	Rating and voltage ratio of the output transformer	
7.4	Type of cooling	
7.5	Insulation class	

Annexure-2: Bidders details for 12V 65Ah VRLA Battery bank with rack

S. No.	Description	Data	
1.0	Battery		
1.1	Make		
1.2	Type designation		
1.3	Type		
1.4	AH rating of each battery		
1.5	End cell voltage		
1.6	Nominal Voltage of each battery		
1.7	Battery charging requirement	Volt/Cell	Current
a)	Nominal		
b)	Float		
c)	Rapid charging		
d)	Equalizing charge		
1.8	Rapid charging time		
1.9	Expected life of battery		
1.10	Battery internal resistance		
1.11	Overall Dimension		
1.12	Overall Weight		
1.13	Shelf life of battery		
1.14	Operating ambient temperature		
2.0	Battery Rack		
2.1	Type of Rack i.e., no of racks and tiers with clearances		
2.2	Overall dimensions		
2.3	Material of Rack		
2.4	Weight		
3.0	Connectors		
3.1	Cable Material		
3.2	Cable Insulation Voltage		
3.3	Cable size		
3.4	No of different cable lengths		
3.5	Cable lengths		
3.6	Lug Material		
3.7	Lug Type		
3.8	Lug Size		
3.9	Bolt Material		
3.10	Bolt Size		
3.11	Nut Material		
3.12	Nut Size		
3.13	Washer Material		
3.14	Washer Size		