



**PURCHASE-BOI DEPARTMENT
BHARAT HEAVY ELECTRICALS LIMITED,
HEAVY ELECTRICAL EQUIPMENT PLANT,
RANIPUR, HARIDWAR – 249 403 (UTTARAKHAND), INDIA**

BHEL Ref. No.: B/4133/2023/1737/V1

**Tender Enquiry for the requirement of item '3 Phase UPS (Un-interrupted Power Supply)'
for 660 MW North Karanpura Unit-3 project**

Bids are invited from the bidders for providing the requirement of **3 Phase UPS (Un-interrupted Power Supply)** for **660 MW North Karanpura Unit-3 project** as per detailed specifications. All tender documents uploaded along with this tender enquiry are as mentioned below.

LIST OF TENDER DOCUMENTS

S.No.	Document Name & No.	Total Pages
1.	PQR (PRE-QUALIFICATION REQUIREMENT) (Annexure-A)	01
2.	TECHNICAL SPECIFICATIONS (TG60728 Rev. 01)	26
3.	ADDITIONAL TERMS & CONDITIONS FOR TENDER (Annexure-B) (in addition to General terms and conditions on GeM 4.0, Version 1.12 Dtd. 16.08.2023 or latest version as applicable)	04
4.	STANDARD QUALITY PLAN (Blank format)	01

For and on behalf of BHEL

Dy. Manager (PPX-BOI)
BHEL, HEEP, Haridwar

PRE-QUALIFICATION REQUIREMENTS (TECHNICAL) FOR
3 PHASE UNINTERRUPTED POWER SUPPLY (UPS)

1. Experience:

The Bidder should be a manufacturer of 3 Phase Uninterrupted Power Supply (UPS) equipment or Authorized Dealer/Channel Partner for the UPS and should have successfully executed contracts for supply of 3 Phase UPS during the last 5 years. Vendor to furnish copies of Purchase Orders executed for the same.

2. Authorization from OEM:

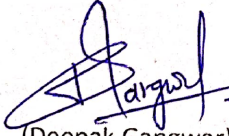
In case bidder is quoting as Authorized Dealer / Channel Partner on behalf of the OEM the bidder should be authorized by the OEM. Bidder should submit the back to back service level agreements with the OEM which includes integration support, Technical Assistance support, spares support etc. The bidder should submit an up to date valid authorization letter & confirmation from OEM that all the support shall be provided during installation, commissioning, warranty period and after sales support.

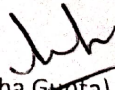
3. Technical Requirements:

- 3.1 Only the site-proven & type tested (within the last 5 years), electronic modules (in case of UPS System) & cell plates (in case of UPS Battery) will be acceptable, unless otherwise decided by the purchaser under special circumstances.
- 3.2 For UPS, the type test shall be as per IEC-62040-3, Degree of Protection test as per IS-2147. For Battery, the type test shall be as per IS:10918 and IEC-60623. The type test certificates (not older than 5 years) shall be acceptable if conducted on the similar type/rating or similar type/ higher rating. Vendor to necessarily submit the type test certificates as part of the PQR.
- 3.3 Vendor to confirm that offered product shall meet the requirements of BHEL specification. Any vendor if not able to comply with the specification should bring it out clearly as a deviation.

Note:

BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.


(Deepak Gangwar)
Dy. Mgr. (EME)


(Asha Gupta)
Sr. DGM (EME)

दिनांक एवं हस्ताक्षर
SIGN & DATE



उत्पाद मानक

PRODUCT STANDARD

TG 60728

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SUPERSEDES
INVENTORY
NO.

समग्री सूची संख्या को
अधिकारित करना

BASED ON OWN EXPERIENCE

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PURCHASE SPECIFICATION

FOR

3 PHASE

UNINTERRUPTED POWER SUPPLY (UPS)

स्वत्वधिकार एवं गोपनीय

इस प्रत्येक में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्येक एवं उपप्रत्येक रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक हो न किया जाए

दिनांक एवं हस्ताक्षर
SIGN & DATE

समग्री सूची संख्या
INVENTORY NO.

नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE
PSC Member	Rakesh Kumar <i>[Signature]</i> 21/7/15
अनुवादक TRANSLATED BY	
TSX	LALIT KUMAR <i>[Signature]</i> 21/7/15
निर्माणकर्ता WORKED BY	MANJU AZAD <i>[Signature]</i> 20/7/15
QAX	S. K. Chauhan <i>[Signature]</i> 20.07.15
जांचकर्ता CHECKED BY	ANUP GOYAL <i>[Signature]</i> 20/7/15
सहमत विभाग AGREED DEPT	नाम NAME
पर्यवेक्षणकर्ता SUPERVISED BY	S.D.NAGAR <i>[Signature]</i> 20/7/15
स्वीकृति : APPROVED : AGM (EME)	<i>[Signature]</i> 20/7/15
निर्माण : PREPARED : EME	जारी : ISSUED : TSX
REV.NO. 01	Reaffirmed Year
Dt.	2022
Ch. Action No.	TGE-22-1B 01:02:22

GR NO
8.10

दिनांक
DATE : 20 / 07 / 15

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उत्पाद मानक (हीप - हरिद्वर)

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PRODUCT STANDARD (HEEP - HARDWAR)

SUPERSEDES
INVENTORY NO.

सामग्री सूची संख्या को
अधिकारित करना

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स्वत्वधिकार एवं गोपनीय
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हानिकारक हो न किया जाए

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DATE

सामग्री सूची संख्या
INVENTORY NO.

REV 01

निर्माणकर्ता
WORKED BY

MANJU AZAD



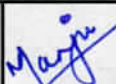
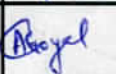
जांचकर्ता
CHECKED BY



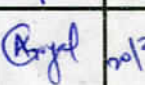
A.K.GOYAL

Manju 20-07-15
Agoyal 20/7/15

P-6448

21/7/15

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक (हीप - हरिद्वर) PRODUCT STANDARD (HEEP - HARDWAR)	TG 60728 पृष्ठ का Page 3 OF 26	
समग्री सूची संख्या को अधिकारित करना	SUPERSEDES INVENTORY NO.	<p>1) SCOPE OF SUPPLY</p> <p>1.1 This specification covers the design, manufacture, inspection, testing and supply of 3 Phase Uninterrupted Power Supply (UPS) of suitable rating along with Battery as mentioned in different sections of this specification.</p> <p>1.2 It is not the intent to specify herein all the details of design to manufacture. However, the UPS shall conform in all respect to high standards of design, engineering and workmanship and shall be capable of performing in continuous operation up to guarantee as specified with the purchase enquiry instructions.</p> <p>1.3 Deviations, if any, should be brought out very clearly along with the offer, otherwise it will be presumed that the offer is in line with what has been stated/asked for in this specification.</p> <p>1.4 The offer should be complete with technical data, catalogue, brochures and drawings as applicable.</p> <p>1.5 Bidder shall refer only the latest revision of the cross-referred national/international standard covered under various clauses of this specification.</p> <p>1.6 Specific requirements of UPS to be considered are mentioned in "Data Sheet" Annexure-2.</p>		
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	<p>2) APPLICATION</p> <p>UPS shall be used for supplying 415VAC, 50 Hz Uninterrupted Power supply to continuously run a 3 Phase, 0.75KW rating Squirrel Cage Induction Motor.</p> <p>3) DESIGN CRITERIA</p> <p>a) UPS shall be capable for supplying 415VAC, 50 Hz Uninterrupted Power supply to continuously run a 3 Phase, 0.75KW (0.8 pf) rating Squirrel Cage Induction Motor for at least one hour duration.</p> <p>b) UPS should be capable of catering to the starting current of the motor which is approximately 600% for the duration of 10 seconds in addition to the requirement mentioned at (a).</p>			
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक हो न किया जाए	<p>2) APPLICATION</p> <p>UPS shall be used for supplying 415VAC, 50 Hz Uninterrupted Power supply to continuously run a 3 Phase, 0.75KW rating Squirrel Cage Induction Motor.</p> <p>3) DESIGN CRITERIA</p> <p>a) UPS shall be capable for supplying 415VAC, 50 Hz Uninterrupted Power supply to continuously run a 3 Phase, 0.75KW (0.8 pf) rating Squirrel Cage Induction Motor for at least one hour duration.</p> <p>b) UPS should be capable of catering to the starting current of the motor which is approximately 600% for the duration of 10 seconds in addition to the requirement mentioned at (a).</p>			
दिनांक एवं हस्ताक्षर SIGN				
समग्री सूची संख्या INVENTORY NO. P-6448	REV 01	निर्माणकर्ता WORKED BY MANJU AZAD		20.7.15
		जांचकर्ता CHECKED BY A.K.GOYAL		20/7/15

<div style="display: flex; flex-direction: column; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">दिनांक एवं हस्ताक्षर SIGN & DATE</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">SUPERSEDES INVENTORY NO</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">समस्त सूची संख्या को अपडेट करवा</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">स्वत्वधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक हो न किया जाए</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">दिनांक एवं हस्ताक्षर SIGN & DATE</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">समस्त सूची संख्या INVENTORY NO</div> </div>		उत्पाद मानक (हीप - हरिद्वर) PRODUCT STANDARD (HEEP - HARDWAR)	TG 60728 पृष्ठ का Page 4 OF 26
<p>The detail data sheet of the motor is attached at Annexure-5 of this specification. UPS is expected to meet all the requirements in totality for satisfactory start-up & continuous running of the motor in Emergency condition for the stipulated duration of 1 hour.</p> <p>c) The detailed design calculation for selection of UPS rating (min 5 KVA) & capacity of the batteries to meet above mentioned design requirements shall be furnished by the vendors along with the offer. Without these calculations the offer shall not be considered for bid evaluation.</p>			
<p>4) REFERENCE STANDARDS</p> <p>The equipment covered under this specification shall, unless otherwise stated, be designed, constructed and tested in accordance with the applicable sections of the latest relevant Indian Standard (IS), International Standards, which should be indicated in the offer.</p>			
<p>5) SYSTEM DESCRIPTION</p> <p>The UPS system shall consist of a single UPS module which shall be located within a fully enclosed, free standing cabinet. The cabinet shall include all components specified below power & control cables, input/output power terminals etc.</p>			
<p>5.1 COMPONENTS</p> <p>The UPS shall be comprised of the major components listed below:-</p>			
<ol style="list-style-type: none"> a. Insulated gate Bipolar Transistor (IGBT) Converter Section. b. Insulated gate Bipolar Transistor (IGBT) Inverter Section. c. Digital Signal processor (DSP) using Pulse Width Modulation (PWM) control for Direct Digital Control (DDC) of all UPS control and monitoring functions. d. Static bypass switch e. Manual bypass switch f. Isolation transformer at the input side g. Sealed Maintenance free Ni-Cd batteries along with Battery Rack h. Interconnection power cable between UPS and battery i. Foundation bolts for UPS Panel and Battery Rack 			
P-6448	REV 01	निर्माणकर्ता WORKED BY MANJU AZAD	 20.7.15
		जांचकर्ता CHECKED BY A.K.GOYAL	 20/7/15

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अधिकतम करना

The UPS system with all components shall have surge withstand capability (SWC) to meet the requirements of ANSI (37.90A) /IEEE standard 587/IEC 62040-2.

6) EXCLUSIONS

6.1 The following shall be excluded from the scope of supply/works of supplier unless otherwise specified else where in this specification.

- a) Civil works like foundations and trenches, flooring.
- b) Connection of panels to the station earthing grid.
- c) External power and control cable from distribution feeder

7) OPERATION OF UNINTERRUPTIBLE POWER SUPPLY SYSTEM

7.1 Normal: During normal operation, the critical 3 phase A.C load is continuously supplied directly by the UPS Inverter. The UPS converter derives power from the LT distribution board and supplies D.C power to the inverter.

7.2 Battery: Upon failure of the input A.C power supply the critical A.C load is supplied by the inverter, which obtains power from the battery. There shall be no interruption in power to the load upon failure or restoration of the main source.

7.3 Recharge: Upon restoration of A.C power from the LT distribution board, the UPS converter shall automatically restart and resume supplying power to the inverter and battery charger shall recommence recharging the battery. The UPS converter shall provide a soft start on the return of the A.C power.

7.4 Automatic Restart: Upon restoration of A.C power after an A.C power outage, the UPS shall automatically restart and resume supplying power to the connected load via the inverter.

7.5 Static Bypass: The static bypass shall provide an alternate path for power to the connected A.C load and shall be capable of operating in the following modes:

- a. Automatic: In the event of a UPS failure or should the inverter overload capacity be exceeded, the UPS unit shall perform an automatic transfer of the connected A.C. load from the inverter to the bypass source.

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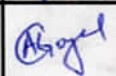
स्वायत्तधिकार एवं गोपनीय
इस प्रलेख में दी गई सूचना भारत हीी इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्येक एवं अप्रत्येक रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हितिकारक हो न किया जाए

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समकी सूची संख्या
INVENTORY NO.
P-6448

REV 01

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जांचकर्ता CHECKED BY	A. K.GOYAL	<i>[Signature]</i>	20/7/15

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सामग्री सूची संख्या को अपडेटिंग करना SUPERSEDES INVENTORY NO.	<p>b. Manual Operation: Should the UPS module need to be taken out of service for limited maintenance or repair, manual activation of the bypass through a manual bypass switch shall cause an immediate transfer of the connected A.C. load from the inverter to the bypass source. Full electrical isolation of the UPS system shall therefore be obtained, without disruption to the critical load, by operation of an integral wrap-around manual bypass switch.</p>		
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	<p>8) BATTERIES</p> <p>8.1 The battery system shall be suitable to support a connected motor load of 0.75KW (0.8 p.f.) for a minimum of 60 minutes continuous duty at an ambient temperature from 5 deg C to 50 deg C.</p> <p>8.2 In addition to clause 8.1 the battery shall be suitable to support the starting current for the starting time of the motor load as specified in the Motor data at Annexure-5.</p> <p>8.3 The batteries shall be Sealed Maintenance free type Ni-Cd batteries.</p> <p>8.4 The battery string of multiple cells shall have its own dedicated means of electrical protection.</p> <p>8.5 Battery Rack shall be supplied along with accessories and devices required for maintenance and testing of batteries(e.g. Hydro meter, Set of Hydrometer syringes suitable for vent holes in different cells, Spanners, Cell testing voltmeter, rubber aprons, Rubber gloves, Temperature indicator and cell lifting facility)</p> <p>8.6 A fully discharged battery system shall be capable of being recharged to 80% of the UPS output capacity within a maximum period of 10 times the normal total discharge time period, and further to 90% of the UPS output capacity within a maximum period of 4 hours.</p>		
स्वतंत्रताधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेतु इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हितकारक हो न किया जाए			
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सामग्री सूची संख्या INVENTORY NO. P-6448	REV 01	निर्माणकर्ता WORKED BY	MANJU AZAD  20.7.15
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PRODUCT STANDARD (HEEP - HARDWAR)

दिनांक एवं
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INVENTORY

संशुद्धि सूची संख्या
अथ अपडेटिंग संख्या

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संस्थानों के हित में हानिकारक हो न किया जाए

दिनांक एवं
SIGN & DATE

संशुद्धि सूची संख्या
INVENTORY

9) STATIC INVERTERS AND AUXILIARY EQUIPMENTS

9.1 The static inverter shall be solid state type using proven pulse width Modulation (PWM)/Quasi square wave/step wave technique. The inverter equipment shall include all necessary circuitry and devices to conform requirements like voltage regulation, current limiting wave shaping, transient recovery, automatic synchronisation, synchronisation limits etc. as specified herein. **Vendor may note that Ferro resonant type inverters shall not be acceptable, charges/inverters shall be of IGBT based semiconductor technology, and regulation part of UPS shall be based on microprocessor.**

9.2 INVERTER CAPACITY:

Each static inverter shall have the following minimum capabilities without causing any damage to the components and with current limits not operating.

- a. Continuous full load rating: As per approved design calculations but 5 KVA (Minimum)
- b. Overload capacity:
 - i. 125% for 10 minutes minimum at all specified input voltage.
 - ii. 150% for 60 seconds minimum at all specified input voltage.
 - iii. 600% of motor rated current for 10 seconds minimum at all specified input voltage.

The inverter shall have sufficient I²t capability to clear a slow acting HRC fuse/semiconductor fuse having a continuous current rating equal to at least 20% of the continuous full load current rating of the inverter, while feeding 100% rated loads of the inverter. **Bidder should clearly bring out in his offer with detailed scheme and calculation as how this requirement is met.**

9.3 STEP LOAD PICK UP:

Upon transfer of full load, the inverter output voltage shall not drop below 80% of normal voltage during the first half cycle after transfer and 90% of normal voltage in the next half cycle. The recovery to within ± 2% of voltage shall be in less than 50 milliseconds. The Bidder shall furnish test data to BHEL that the equipment offered meets the above requirements.

REV 01

निर्माणकर्ता
WORKED BY

MANJU AZAD

Manju 20-7-15

जांचकर्ता
CHECKED BY

A.K.GOYAL

A.K.Goyal 22/7/15

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PRODUCT STANDARD (HEEP - HARDWAR)

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SUPERSEDES
INVENTORY

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का अधिकतम संख्या

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स्वत्वधिकार एवं गोपनीय
इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति
है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो
कि कंपनी के हित में हितकारक हो न किया जाए

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9.4 SUPPLY VOLTAGE, VARIATION AND LOSS

Each inverter shall include equipment necessary to protect itself from damage resulting from excursion, loss or restoration of DC input voltage and synchronising voltage.

9.5 OVERLOADS, SHORT CIRCUITS AND LOSS

- a. The inverters shall be provided with suitable fuse- free circuit breakers or fuses at the input and output which will permit proper co-ordination with other protective devices and at the same time protect the inverter against damage due to internal faults. All necessary equipment shall be provided to protect the inverter against over loads, short circuits and 100% loss of load. The inverter shall be self-protecting against damage if energised with full load connected.
- b. The inverter shall be provided with current limiting circuitry which will limits the output current to a value which will not damage the inverter or blow its fuses (or fuse free circuit breakers).

9.6 NON-LINEAR-LOADING

Each inverter shall be capable of operation with nonlinear loads. Vendor should consider a load of non-linear wave form providing a current crest factor of 3.0 occurring coincident with voltage peak. The nonlinearity shall be assumed to consisting of third, fifth and seventh order harmonics. The output waveform of the inverter (S) shall remain within specified limits when operating with nonlinear loads at 100% rated load.

9.7 SOURCE PROTECTION

The inverter shall be self-protecting against all AC and DC transients, voltage surges and steady state abnormal voltages and current likely to be encountered in utility power station.

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WORKED BY

MANJU AZAD

Manju
20-7-15

जांचकर्ता
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A.K.GOYAL

A.K.Goyal
20/7/15

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9.8 AUTOMATIC SYNCHRONISATION

- a. Inverter equipment shall include stable solid state circuitry & devices including stable oscillators etc. to enable inverter to operate satisfactorily under various modes specified under clause no. 7 above.
- b. The D.C. input current shall never exceed the full load current except for a short circuit within the inverter. This limitation applies to transient as well as steady state currents and includes inrush currents upon initial energisation of the UPS, loads energisation short circuits external to the inverter etc. for any value of the load and load power factor drawn by the equipment served. The inverter shall not impose on D.C. source any voltage oscillations in excess of 5 volts (RMS total of all frequencies) or any current oscillations in excess of 3% (RMS total of all frequencies) of the D.C. current at full load.

10) STATIC & MANUAL BYPASS SWITCH

10.1 The static switch shall be a high speed transfer device comprised of naturally commutated SCR's. It shall be rated for 100% output. It shall be capable of supplying the UPS rated load current and also provide fault clearing. It should work in the following limitations:

- Inverter output under voltage or over voltage
- Overloads beyond the capability of the inverter
- DC circuit under-voltage or overvoltage
- Final voltage of system battery is reached (bypass source present & available)
- System failure





10.2 A Manual bypass switch shall be provided for bypass entire UPS system and connecting the loads to normal AC source / the backup source. Necessary interlocks to prevent mal-operation of UPS system by operation of manual bypass switch should be provided.

10.3 The manual bypass switch shall have make before break contacts to ensure continuous supply to inverter loads during the operation of this switch.

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SUPERSEDES INVENTORY NO. समीची सूची संख्या को अधिकारित करना	<p>10.4 Manual bypass switch shall have continuous load carrying capacity equal to 1.25 times of full load inverter current and necessary short term load carrying and interrupting capacity to meet the requirements of the inverter system.</p> <p>10.5 Other items like selector switches, pushbuttons etc. which are required for operation of the UPS system shall be as per supplier's standards.</p> <p>10.6 The following shall also be provided:</p> <ol style="list-style-type: none"> Provision of "group fault" for remote indication for UPS system. Provision of "group alarm" contacts for each feeder. <p>Note: For all major components Vendor list (from where the items are procured) shall be submitted for BHEL's Approval</p>			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	<p>11) BATTERY CAPACITY & SIZING CRITERIA</p> <p>11.1 The battery shall have sufficient plate per cell and ample ampere-hour capacity to allow the sequence of discharge currents to be supplied from a fully charged battery under maximum as well as minimum ambient temperature conditions encountered at site and specified elsewhere in this specification, 600% of full load current during starting of the motor for 10 sec. duration, 100% Full load current of UPS system for 60 minutes.</p> <p>The Battery capacity calculation shall correspond to the finally selected UPS system rating irrespective of the actual load on UPS.</p> <p>11.2 The battery shall be high discharge performance type to withstand discharge/charge throughout life like without loss of capacity.</p> <p>Bidder shall submit battery sizing calculations, with the offer for BHEL approval.</p> <p>The battery shall be furnished as per sizing calculation approved by BHEL during offer evaluation stage without any Price repercussion whatsoever.</p>			
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समीची सूची संख्या INVENTORY NO. P-6448	REV 01	निर्माणकर्ता WORKED BY	MANJU AZAD	 20/7/15
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Bidder shall take in to account various correction factors, such as capacity factor, temperature correction factor, aging factor, design margin etc. as per data given below while calculating the size of the battery.

Capacity factor one hour rating to ten hour rating : As per recommendation of Original Equipment Manufacturer of battery

Temperature correction factor (for min ambient temp) : As per recommendation of Original Equipment Manufacturer of battery

Aging factor : 25%

Design margin : 10%

11.3 Each cell shall be assigned an identification number. Identification number shall be clearly a permanently marked on the front of the battery mounting structure so that individual cells are easily identifiable. In addition, the polarity markers shall be furnished for the end cells.

12) CONTROL AND INDICATIONS

12.1 UPS shall have the necessary control switches, push buttons and indicating lamps on the front panel door for its independent start up and shut down. It should be possible to isolate the inverter on the input as well as the output side by means of DC & AC MCBs.

12.2 Indicating lights with proper actuating devices, circuitry and legend shall be furnished on front of the inverter panels. Even if the abnormal conditions are momentary in nature, these indicating lamps shall continue to glow until cleared by a reset push button provided on the front of the panel.

12.3 Indicating lamps shall be of cluster LED type. Following indications shall be provided minimum on UPS panels:

Fault Indication on LCD Digital Display

- i. Input Single Phasing/Phase reversal
- ii. Mains Fail
- iii. Rectifier Over Voltage
- iv. DC Under Voltage

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- v. Battery Low Pre-alarm
- vi. Battery Low
- vii. Booster Over Voltage
- viii. Converter Over Temperature
- ix. Output Under Voltage
- x. Output Over Voltage
- xi. Output Short Circuit
- xii. Output Overload
- xiii. Inverter Over Temperature
- xiv. Bypass Abnormal

Indications on LED Display

- i) Input isolator ON
- ii) Rectifier ON
- iii) Battery on Float
- iv) Battery on Boost
- v) Battery Isolator ON
- vi) Load on Battery
- vii) Inverter ON
- viii) Load on Inverter
- ix) Load on Manual Bypass

Note: The above listed indications are only for indicative purpose, other indications which are required for quick trouble shooting of the UPS system or for the purpose as desired by the supplier shall be provided as per vendor's standards.

12.4 Following mentioned panel meters shall be provided on front panel of UPS.

- i) Output voltmeter AC indicating 0-300V scale, (1.5% Accuracy)
- ii) Output Ammeter AC indicating scale of 0-150% of rated continuous full load of inverter output current of 1.5% Accuracy.
- iii) * Digital display of 4-1/2 digit for indicating output KW
- iv) * Digital display of 4-1/2 digit for indicating output Frequency.
- v) * Digital display of 4-1/2 digit for indicating Power factor.

Note:

1. The meters should be selected with appropriate calibration so as to display accurate readings even at low values of current or voltage.
2. Asterisk (*) marked meters can be part of LCD digital display.
3. All panel meters shall be 90 ° FSD and size of 96mm x 96mm.

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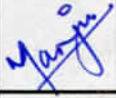

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समाप्ती सूची संख्या को अधिष्ठापित करके	SUPERSEDES INVENTORY NO	<p>12.5 In addition to the above indicating lamps, at least one potential free changeover contact shall be made available (wired up to the terminal block) for each of the conditions to be connected to other system in purchaser's scope.</p> <p>12.6 The meters as mentioned in technical data shall be provided as minimum, mounted on the front panel of UPS.</p> <p>12.7 LCD display should be back lit.</p> <p>13) CUBICLE PROTECTION CLASS & MECHANICAL CONSTRUCTION OF THE PANELS</p> <p>13.1 Protection class shall be minimum IP32.</p> <p>13.2 The equipment shall be housed in free standing, floor mounted panels designed for indoor service. The panels shall be of CRCS (Cold Rolled Carbon Steel) construction. Sheet steel thickness shall be of minimum 2 mm for front equipment bearing surface, top, bottom, sides and back portions.</p> <p>13.3 Enclosures shall be furnished with concealed hinges. Front and rear doors shall be designed to permit easy access to all components for maintenance or replacement. The enclosures shall be reinforced with formed steel members as required to form a rigid self-supporting structure. Doors shall have three point latches.</p> <p>13.4 Adequate ventilation louvers shall be included. All vent openings shall be covered with corrosion resistant fine screen coverings.</p> <p>13.5 Suitable foundation bolts required for fixing of UPS panel bottom frame shall be supplied with the UPS panel. Bidder shall show necessary grouting details for foundation bolts in OGA drgs of UPS panel.</p> <p>13.6 Anti-vibration pad (Dunlop make) of thickness not less than 15 mm shall be provided.</p> <p>13.7 The panels shall be provided with illumination lamps and anti-condensation heaters.</p> <p>14) PAINTING</p> <p>14.1 The panels shall be chemically cleaned, rinsed, air dried and painted by painting process stoving / powder coating (preferably powder coating)only. The final finished thickness of paint shall be 100Microns.</p>		
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14.2 The colour shade of UPS panel exterior (Front/Rear) / interior shall be as per RAL 9002 (grey white). For rest it shall be as per RAL 5012 (light blue).

15) CABLE TERMINATION

All cable connections in the UPS shall be provided with ring type lugs and designation/cross reference type ferrules for firm connections and easy maintenance. The panels shall be designed to facilitate cable entry from bottom of the panel. Removable un-drilled Hylum sheet 6mm of thickness or aluminum sheet of 5 mm thickness shall be provided for this purpose, and to be drilled at site for fitting the cable glands. Sufficient space shall be provided for avoiding sharp bending and easy connection of cables. A minimum space of 200 mm from the gland plate to the nearest terminal shall be provided.

16) EARTHING

The panel shall be equipped with an earth bus securely fixed along the inside base of the panel. It shall be connected preferably at two points to the outgoing earth studs.

17) LABEL

All components mounted in the panel shall be provided with individual labels with designation engraved on them.

18) THERMAL DESIGN OF UPS PANELS

- 18.1 The Inverter panels shall be designed for not more than 10 degree centigrade temp. rise above ambient during all operating conditions.
- 18.2 When the inverter is in operation the temperature rise in the panel shall not be more than 10 degrees centigrade above ambient for all operating conditions.
- 18.3 All components like SCRs, IGBTs, ICs, capacitors resistors etc., shall be properly chosen and de-rated such that failure rate is reduced to absolute minimum.

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19) TESTING AND INSPECTION

The complete UPS, including all instruments etc., shall be subjected to standard factory tests as per IEC 62040 – Part III & II. Battery shall be tested as per IS: 10918 and IEC 60623/ IEC 62259.

Type Test Certificates (not older than 5 years from the date of bid opening) of the **type tests** as mentioned in this clause conducted earlier on same rating & type of UPS and same type & make of battery shall be furnished with the offer and same shall be made available during customer inspection to the inspector. **In-case of non-availability of any of the type test certificates, vendor shall carry out the type tests along with routine test as part of main offer without any price implication to BHEL.**

Further all the routine test and type test as mentioned in this clause (as a minimum requirement) shall be carried out as per the BHEL approved Quality Plan. Other tests as per standards those are necessary to be performed for thorough testing of equipment shall also be carried out. All tests shall be witnessed by **BHEL** and customer's representative.

19.1 UPS

A. TYPE TESTS

- 1) Over load capability test
- 2) Short circuit current capability
- 3) Short circuit (fuse clearing) test
- 4) Radio frequency interference test
- 5) Audible noise test
- 6) Frequency regulation test
- 7) Dynamic test
- 8) Efficiency test for converter & inverter at 50% and 100% loads.
- 9) SWC test on complete UPS system.
- 10) Induced over voltage test on transformers and chokes (IEC 60076-11).

B. ROUTINE TESTS & ACCEPTANCE TEST

- 1) Checking of inter connection of cables
- 2) Checking of auxiliary devices(it includes operational check for UPS output, annunciation and inter lock checks)
- 3) Insulation resistance test(IR test)

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- 4) High voltage (HV) test (2000V AC RMs for 1 minute)
- 5) Checking of correct firmware and parameters of software
- 6) Adjustment of measuring circuits
- 7) Output voltage adjustment range
- 8) Output frequency adjustment range
- 9) Light load test
- 10) AC input failure and return test
- 11) Restart test with battery
- 12) Total harmonic distortion (content) measurement
- 13) Transfer test
- 14) Full load test
- 15) Asynchronous transfer test Short circuit test
- 16) Input voltage variation test
- 17) Inverter output voltage regulation test
- 18) Frequency regulation test
- 19) Current limiting test
- 20) Transient response test
- 21) Meter Accuracy Test
- 22) Synchronisation test
- 23) Efficiency test
- 24) Continuous energised condition for 48 hours (it includes temperature rise test of transformers, chokes , Thyristor and IGBTs.
- 25) Burn in and rapid temperature cycling tests on PCBs.(vendor shall made available during inspection , the internal test certificates of burn-in test conducted on the modules for the project during stage testing)

19.2 BATTERY

a. TYPE TESTS

- 1) Verification of constructional requirements
- 2) Verification of markings
- 3) Verification of dimensions
- 4) Test for Capacity test – Test for voltage during discharge
- 5) Ampere-hour and watt-hour efficiency tests
- 6) Test for loss of capacity on storage
- 7) Endurance Test
- 8) Retention of charge test
- 9) Short circuit current and internal resistance test

b. ROUTINE TESTS & ACCEPTANCE TEST

- 1) Visual Inspection
- 2) Verification of markings
- 3) Verification of dimensions
- 4) Test for voltages during discharge
- 5) Open circuit Voltage and polarity

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A.K. Goyal 20/11/15

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20) TEST REPORTS AND CERTIFICATES

Four (4) copies of test reports/certificates of all the type/routine tests shall be sent to the BHEL for approval and furnished to Inspectors at supplier's works, prior to dispatch of equipment's from the works.

The routine and type test reports of miscellaneous and bought out components shall also be furnished. On approval, the manufacturer shall furnish six (6) sets of bound test certificates as approved by the BHEL.

21) GUARANTEE

The equipment should be guaranteed for 18 months after dispatch from supplier's works or 12 months from date of commissioning of the equipment, whichever is earlier.

22) DRAWING & DOCUMENTATION

22.1 The drawing and documentation required are listed in Annexure-4.

22.2 The following drawing/documents shall be approved by the purchaser during various stages.

- Block diagram, Schematic diagram.
- Outline General diagram & Door mounted components layout diagram.
- Quality assurance program.
- Details of tests conducted.
- Calibration, Accuracy of various components.
- Deviations.
- Test reports.
- Draft O&M manual for approval along with dimensional drgs of UPS.

22.3 The supplier shall furnish the drgs/documents as per following tentative distribution.

Sl.No.	Category of Drawing	No. of Prints/ Copies
i)	For approval	4
ii)	For final distribution(after approval)	6
iii)	As built drawings	6
iv)	*O & M manual for final distribution. (Hard copies)	10
v)	O&M Manuals in soft-form(on CDROMS)	2

* Note: 1) Draft of O&M Manual (UPS & Battery) shall be submitted to BHEL for approval. O&M Manual for final distribution should be only submitted after approval by BHEL.

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23) LIST OF ANNEXURES ATTACHED TO THIS SPECIFICATION

Annexure No.	Description	No. of Pages
1.	Scope of Supply	1
2.	Data Sheet	2
3.	Site Conditions	1
4.	Documentation	2
5.	Motor Data	1
6.	Schedule of Prices – UPS & BATTERIES	
7.	Schedule of prices - Supervision of erection & commissioning	
8.	Schedule of Prices– Mandatory Spares	

24) ERECTION & COMMISSIONING

- 24.1 Supplier shall separately quote for supervision of complete erection and commissioning of the UPS system and battery.
- 24.2 The necessary commissioning spares shall be in supplier's scope as part of main offer.

25) PACKING AND MARKING

All the items should be conserved suitably against damages/corrosion during transportation & storage. Packing box should be reusable type i.e. its top and planks should be held together by fasteners. Equipment should be packed in proper water proof and sound package to avoid damage during transit. Package should be legibly marked with following details:

- Purchase order number & date
- Description of equipment
- Name of supplier
- Net/Gross weight

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WORKED BY

MANJU AZAD

20-7-15
जांचकर्ता
CHECKED BY

A.K.GOYAL

20/7/15

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ANNEXURE-1

SCOPE OF SUPPLY

SL NO.	DESCRIPTION	QUANTITY
01	Stand- alone 3 Phase UPS system with sealed maintenance free Ni-Cd batteries, along with foundation bolts, Anti Vibration pads, fully assembled and wired. (Rating of the UPS shall be as per approved design calculations subject to min. rating of 5KVA)	1 Set (Bidder to furnish price offer as per Annexure- 6)
02	Commissioning Spares quantity sufficient for commissioning of UPS system (part of the main offer)	1 Set (Bidder to furnish list a/w price offer as per Annexure-6)
03	Supervision of Erection & Commissioning Charges	1 set (bidder to furnish price offer as per Annexure-7)
04	Mandatory Spares	1 Set As per List given in "Schedule of prices - Mandatory Spares for UPS & Battery" (bidder to furnish price offer as per Annexure-8)

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ANNEXURE-2

DATA SHEET FOR UPS AND BATTERY

SL. NO.	TECHNICAL SPECIFICATION	DATA
01	INPUT	
(a)	Nominal Voltage	415VAC Three phase, 3 Wire
(b)	Voltage Range	Min.+10%, -15% with battery charging Min.+10%, -25% without battery charging
(c)	Frequency	50Hz +/- 6%
(d)	Input Power Factor	>0.9 (at input full load & input nominal voltage)
02	RECTIFIER	
(a)	Type	IGBT based full wave rectifier
03	DC BUS CHARGER	
(a)	Type	SMPS based
(b)	Voltage	305 to 425 Vdc
(c)	Nominal Voltage Regulation	+/- 1 %
(d)	Max. DC bus ripple without Battery	2% RMS
(e)	Charging Method	Constant Voltage Constant Current (CVCC) Auto & Manual
04	BATTERY	
(a)	Battery Voltage	240 V dc
(b)	Type	Maintenance free Ni-Cd
(c)	Rating (AH)	As per approved design calculations
(d)	No. of batteries	As per approved design calculations
(e)	Battery Charging capacity	To be specified by the bidder
(f)	Model	To be specified by the bidder along with catalog in the offer
(g)	No. of Cells	To be specified by the bidder
(h)	Whether in built or separately mounted in the stand	To be specified by the bidder
(i)	Back up Time	1 hour during continuous running of the motor
05	OUTPUT/INVERTER	
(a)	Power capacity	Min. 5KVA or greater (as per approved design calculations)
(b)	Load Power Factor	0.7 lag to Unity within KVA & KW rating
(c)	Nominal Voltage	415 VAC, 3Phase, 3 Wire
(d)	Voltage Regulation (Steady State) at all input voltage and power factors	+/- 1 %
(e)	Voltage Regulation (Dynamic State)	+/- 5 %
(f)	Recovery time to 98%	<50 msec
(g)	Load Crest Factor	3 : 1



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(h)	Frequency for all conditions of input supply loads & temperature occurring simultaneously or in any combination. (Automatically controlled)	50Hz (+/- 0.25Hz in Free running mode)
		50Hz (+/- 3Hz) in Synchronous mode
(i)	Slew rate	1 Hz/Sec
(j)	Waveform	True Sine Wave
(k)	Total Harmonic Distortion	< 3% for 100% Linear Load < 5 % for non Linear Load
(l)	Overload Capacity	a) 125% for 10 minutes minimum at all specified input voltage. b) 150% for 60 seconds minimum at all specified input voltage c) 600% for 10 seconds minimum for starting of the motor at all specified voltage
(m)	Inverter	IGBT based PWM with INSTANTANEOUS SINEWAVE CONTROL
(n)	Dynamic Response	For 0-100% step load change the output shall remain within +/- 5% & recover to 98% within 2-3 cycles
(o)	Duty	Continuous
06 ENCLOSURE		
(a)	Construction	2mm thick CRCA steel sheet
(b)	Protection Class	Minimum IP 32
(c)	Application	Indoor
(d)	Finish	Panel exterior / interior(front & rear) shall be as per RAL 9002 (grey white). For rest it shall be as per RAL 5012 (light blue).
(e)	Ventilation	Forced Air (Internal Fans)
(f)	Cable Entry	Bottom
(g)	Panel Dimensions	To be specified in the offer
(h)	System Configuration	Stand alone
07 STATIC BYPASS SWITCH		
(a)	Frequency Sync. Band	+/- 3 Hz
(b)	Slew rate	0.1Hz./Sec
(c)	Transfer (Inverter to Bypass)	0 msec. In Sync Mode <10 msec. In Async. Mode
(d)	Retransfer (Bypass to Inverter)	0 msec. In Sync.Mode In Async.Mode-N/A
08 MANUAL BYPASS SWITCH		
(a)	Manual Bypass	Make before Break
(b)	Voltage rating	440V AC
(c)	Current Capacity	Not less than 1.25 times of UPS output and rated current

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A.K.Goyal 20/9/15

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SUPERSEDES INVENTORY NO.
समशी सूची संख्या को अधिकतम करण

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ANNEXURE-3

SITE CONDITIONS

1. CLIMATIC CONDITIONS

The climatic conditions at site are given below.
All equipment supplied shall be designed and suitable for satisfactory working under these conditions:

Sl. No.	Description	Value
1.	Max. temperature of the air	50 deg. C
2.	Min. temperature of the air	5 deg. C
3.	Average relative humidity	maximum 95%
4.	Altitude	Less than 1000 M above MSL

ANNEXURE-4

DOCUMENTATION

A. Documents required along with quotation (2 sets)

- i. Block diagram and Schematic diagram.
- ii. Functional write up and detailed specification of UPS system.
- iii. Outline general diagram showing cutout for cable entry, painting details, fixing arrangement, foundation details, and overall dimensions.
- iv. Quality Assurance Program. (Typical)
- v. Details of tests conducted both type tests and Routine tests. Certified copies of Type test certificates for the type test conducted earlier on similar type, size and rating (or higher rating) shall be enclosed along with the offer.(It is a mandatory requirement)
- vi. Diagram showing components mounted on the door along with labeling information.
- vii. Catalogs of major components used clearly stating ratings, calibration, accuracy's chosen.
- viii. Vendor list for bought out components.
- ix. Reference list.
- x. UPS Rating and BATTERY sizing calculation

B. Documents required within 2 weeks after placement of Order (4sets for approval and 6 sets after approval)

- i) OGA Drawing & list of tests conducted on sub-assemblies and equipment.
- ii) Detailed schematic diagram of sub-assemblies and circuit diagrams.

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- iii) Functional write ups of equipment, Electronic modules sub-assemblies, giving full description of design and operation.
- iv) Detailed Bill of Material.
- v) Catalogs of all the components used.
- vi) General arrangement drawing showing the mounting details of components inside the panel.
- vii) Quality Assurance Program (project specific)
- viii) Test Schedule (Brief testing procedure shall be given in Test Schedule)
- ix) Certified copies of Type test certificates for the type test conducted earlier on similar type, size and rating of UPS and Battery.
- x) UPS Rating and BATTERY sizing calculation

C. After the dispatch of equipment - 10 sets

Vendor shall prepare the draft O&M Manual, organized in to various sections covering the following aspects clearly and submit draft O& M manuals 2 sets for approval of BHEL.

- i) Operation, maintenance, troubleshooting instructions. (List of operation and maintenance spares shall also be included)
- ii) Data Sheets of Electronic cards used in the Equipment (without giving any proprietary information like Component tag No. and make etc.)
- iii) Installation and commissioning instruction.
- iv) Tests reports of tests conducted on sub-assemblies and equipment's.
- v) Storage for prolonged duration.
- vi) Unpacking.
- vii) OGA and constructional features with schematic diagrams.
- viii) Copies of product Catalogue of all components/spare parts liable to be replaced during the life of panel.

Vendor shall submit the O&M manual in 10 copies after obtaining the approval of draft O&M manual from BHEL. The O & M copies shall be legible, clear and properly bound in folder.

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Annexure-5

MOTOR DATA

MOTOR : 3 Phase Squirrel Cage Induction Motor to IS: 325 (TEFC TYPE)

Sl.No.	Technical Parameter	Data
i.	KW rating	0.75 KW (0.8 pf)
ii.	Rated voltage	415 volts ,3 phase, 50 Hz
iii.	Rated Current	1.7 Amp
iv.	Permissible voltage variation	± 10%
v.	Permissible Frequency variation	± 5%
vi.	Combined voltage & Frequency variation	± 10%
vii.	Type of duty	Continuous.
viii.	Min. voltage required under starting : Condition to bring driven equipment to rated speed.	85%
ix.	Starting current	not to exceed 600% of rating current ± 20% Tolerance as per IS: 325
x.	Starting	DOL
xi.	Acceleration time with full load connected	3.5 ± 0.5 sec
xii.	Starting Duty	3 starts spread over an hour and 2 consecutive starts from hot condition without injurious heating to the winding.
xiii.	Overload Capacity	Motor shall be capable of running at full load with 80% of rated voltage for 10 min and 70% of rated voltage for 1 sec.
xiv.	Fault level	45 KA for 0.12 sec.

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SCHEDULE OF PRICES – UPS & BATTERIESANNEXURE- 6

S. No.	DESCRIPTION	TOTAL (Nos)	UNIT PRICE Rs.
1	Stand- alone 3 Phase UPS system with sealed maintenance free Ni-Cd batteries, along with foundation bolts, Anti Vibration pads, fully assembled and wired. (Rating of the UPS shall be as per approved design calculations subject to min. rating of 5KVA)	01 set	
2	Commissioning Spares quantity sufficient for commissioning of UPS system (part of the main offer)	01 set	

ANNEXURE-7SCHEDULE OF PRICES – SUPERVISION OF ERECTION & COMMISSIONING

Sl. No.	DESCRIPTION	UNIT PRICE Rs.
1.	SUPERVISION OF ERECTION & COMMISSIONING CHARGES AT SITE	

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ANNEXURE-8

**SCHEDULE OF UNIT PRICES –
MANDATORY SPARES FOR UPS & BATTERIES**

Sl. No.	DESCRIPTION	QUANTITY	UNIT PRICE Rs.	TOTAL PRICE Rs.
	UPS			
1.	HRC fuses / MCB's of each type and rating	2 sets		
2.	Semi-conductor fuses of each rating	4 sets		
3.	Electronic cards/modules of each type & function	2 nos.		
4.	Thyristors and Power Transistors of each type	1 no.		
5.	Power diodes of each rating	2 sets		
6.	Auxiliary relays of each type & rating	2 nos.		
7.	Filter Capacitors	1 set		
8.	Filter chokes	1 set		
9.	Cooling fans	1 no.		
10.	AC & DC Switches of each type & rating	2 nos.		
11.	D.C. Ammeter	1 no.		
12.	A.C. Ammeter	1 no.		
13.	D.C. Voltmeter	1 no.		
14.	A.C. Voltmeter	1 no.		
15.	Push Buttons	5 nos.		
16.	Special Cables of each type	1 no.		
	BATTERY FOR UPS			
17.	Cell Insulators	10 nos.		
18.	Connectors with nuts and bolts	50 nos.		
19.	Battery Cell	5 nos.		

Note: Any item in the above list if not applicable for the offered UPS system may be clarified along with suitable reason.

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ADDITIONAL TERMS & CONDITIONS OF TENDER
FOR THE REQUIREMENT OF 3 PHASE UPS FOR NORTH KARANPURA U-3 PROJECT
BHEL ref. no. B/4133/2023/1737/V1

(Annexure-B)

Sl. No.	Terms	Description	Bidder confirmation										
1.	Technical Requirement	<p>a) Please quote your valuable offer as per BHEL specification i.e. Technical Specification no. TG60728 (Rev. 01) enclosed with this tender enquiry.</p> <p>b) Please note that your offer should be complete with Sizing calculations, Commissioning spares, Mandatory spares and Price of Supervision of Erection & Commissioning as per various schedules (Annexure-6, Annexure-7 & Annexure-8) given in technical specification TG60728 (Rev. 01).</p>											
2.	Basis of quotation	Kindly confirm that Prices for material portion have been quoted on Ex-Works Freight prepaid upto North Karanpura project site basis inclusive of GST (i.e. including all taxes, duties, duties, local levies, transportation/freight, packing, forwarding charges etc.).											
3.	Transit insurance	Transit insurance would be arranged by BHEL. Please send your offer keeping this in view.											
4.	Evaluation Criteria	<p>Evaluation of tender will be done on Total Landed Cost to BHEL upto Project site for complete requirement covered in the enquiry (i.e. Material cost (supply portion) and Supervision cost (erection portion) taken together). Total Landed Cost to BHEL includes Material cost including commissioning and mandatory spares, Supervision cost of Erection & Commissioning at site, Packing and Freight charges, GST etc.</p> <p>'Price Bid to RA' shall be processed on GeM portal as per GeM terms & conditions (GeM 4.0) of only those bidders who meet the PQR, techno-commercial requirement of tender and approved from End Customer.</p>											
5.	Scope of Enquiry	<p>Kindly note the scope/requirement covered in this tender enquiry as detailed below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Sl. No.</th> <th style="text-align: center;">Material Code and Item Description</th> <th style="text-align: center;">Qty.</th> <th style="text-align: center;">Project</th> <th style="text-align: center;">Delivery Requirement</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.</td> <td>Material Code: W97415000099 3 Phase Uninterrupted Power Supply (UPS) with maintenance free Ni-Cd Batteries alongwith Commissioning Spares Details as per Specification No. TG60728 Rev. 01</td> <td style="text-align: center;">01 Set</td> <td style="text-align: center;">660 MW North Karanpura Unit-3</td> <td style="text-align: center;">Dec-2023</td> </tr> </tbody> </table>	Sl. No.	Material Code and Item Description	Qty.	Project	Delivery Requirement	1.	Material Code: W97415000099 3 Phase Uninterrupted Power Supply (UPS) with maintenance free Ni-Cd Batteries alongwith Commissioning Spares Details as per Specification No. TG60728 Rev. 01	01 Set	660 MW North Karanpura Unit-3	Dec-2023	
Sl. No.	Material Code and Item Description	Qty.	Project	Delivery Requirement									
1.	Material Code: W97415000099 3 Phase Uninterrupted Power Supply (UPS) with maintenance free Ni-Cd Batteries alongwith Commissioning Spares Details as per Specification No. TG60728 Rev. 01	01 Set	660 MW North Karanpura Unit-3	Dec-2023									
6.	Delivery Schedule/ Period	<p>Material Supply: The delivery schedule/ site requirement of the above item has been mentioned above in the clause 5 of Scope of Enquiry. Bidder to quote their best minimum possible delivery in no. of weeks from the date of drawings & documents approval or manufacturing clearance from BHEL, whichever is later.</p> <p>Supervision of Erection & Commissioning: Supplier's representative to carry out the supervision of Erection and commissioning shall reach project site within 15 days of intimation of BHEL. <i>Please confirm.</i></p>											
7.	Supervision of Erection & Commissioning	<p>Supervision of Erection & Commissioning of above item is required by supplier's representative at North Karanpura project site as per schedule (Annexure-7) given in the technical specification TG60728 (Rev. 01).</p> <p>Bidder to quote the lump sum charges for supervision work during E&C (irrespective of man days and inclusive of all factors i.e. food, boarding, lodging, travel etc.) including applicable GST as per defined separate GeM catalogue for Supervision (Erection) portion. <i>Kindly confirm.</i></p>											

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8.	Engineering Document approval	<p>Drawings/ Data Sheet/ Documents as called for in BHEL specifications shall be submitted for approval to BHEL for BHEL/customer approval within 15 days of Purchase Order. BHEL will arrange the approval of the drawings/data sheets/ documents within 15 days of their receipt provided those are complete in all respect.</p> <p>The delay due to late submission shall be to supplier's account whereas delay in approval of documents shall be BHEL's account. In case of delay on account of BHEL, delivery shall be re-scheduled accordingly.</p>									
9.	Liquidated Damages (LD)	<p>Liquidated Damages shall be applicable on <u>material supply</u> as per clause no. 15 (iii) of General terms and conditions on GeM 4.0 (Version 1.12 Dtd. 16.08.2023 or latest version as applicable).</p> <p>Date of GR/LR shall be treated as date of delivery for LD purpose. Kindly confirm.</p>									
10.	Quality Requirement & Inspection	<p>a) Kindly submit the duly filled endorsed copy (sign & stamp) of detailed Quality Plan in with ordering documents (in attached QP format) along with your offer for BHEL review and approval.</p> <p>b) Inspection shall be done by BHEL nominated third party inspection agency M/s Intertek as per approved Quality plan. Kindly confirm.</p> <p>The charges of TPI will be borne by BHEL. However, co-ordination with Third Party Inspection agency would be the sole responsibility of the supplier. At least 07 days prior notice should be given to BHEL nominated TPI agency to arrange inspection.</p>									
11.	Payment terms	<p>Material portion: 100% payment of material (supply) portion shall be released as per below after receipt of material at site (i.e. On issue of Delivery CRAC i.e. consignee receipt-cum-acceptance certificate) alongwith submission of PBG @ 5% of the Order value. <i>Kindly confirm.</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Type of Bidder</th> <th style="text-align: center;">Payment Terms (Number of Days)</th> </tr> </thead> <tbody> <tr> <td>Micro & Small Enterprises (MSEs)</td> <td style="text-align: center;">45 days</td> </tr> <tr> <td>Medium Enterprises</td> <td style="text-align: center;">60 days</td> </tr> <tr> <td>Non MSME</td> <td style="text-align: center;">90 days</td> </tr> </tbody> </table> <p>Negotiable documents for Supply payment are as under:</p> <ul style="list-style-type: none"> • Material receipt certificate/ CRAC issued by BHEL. • Original Guarantee certificate. • Original Invoice • Original Packing list • Copy of Consignee GR • Copy of MDCC issued by BHEL. • Original Bank Guarantee (PBG) as per below clause no. 14. <p><i>Please ensure to send the Original GR (Consignor copy) alongwith above original negotiation documents to BHEL Haridwar for End customer billing purpose.</i></p> <p>Supervision (Erection) portion: 100% payment of Supervision charges of erection and commissioning at project site shall be released after receipt of work completion certificate (Commissioning CRAC) issued by Consignee/BHEL site. <i>Kindly confirm.</i></p>	Type of Bidder	Payment Terms (Number of Days)	Micro & Small Enterprises (MSEs)	45 days	Medium Enterprises	60 days	Non MSME	90 days	
Type of Bidder	Payment Terms (Number of Days)										
Micro & Small Enterprises (MSEs)	45 days										
Medium Enterprises	60 days										
Non MSME	90 days										
12.	PBG clause	<p>Performance Bank Guarantee (PBG) for 5% of Order/Contract value shall be submitted by bidder to BHEL. PBG should be valid for entire Guarantee/Warranty period. PBG should be in BHEL format and from one of the BHEL consortium banks, which are available at https://hwr.bhel.com.</p> <p>PBG would be submitted before processing of payment of material portion.</p> <p><i>The requirement of PBG for entire Guarantee/Warranty period is mandatory and non-acceptance of the PBG may lead to rejection of your offer.</i></p>									

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13.	Guarantee/ Warranty Clause:	<p>Supplier shall guarantee the trouble free operation of the item for a period of 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier.</p> <p>In case of any failure or trouble reported from site, the supplier should depute their representative immediately to attend the problem and replace the defective component/part if required, without any additional cost to BHEL.</p>	
14.	O&M Manuals	O&M manual of the item(s) as mentioned in BHEL Specification shall be provided with dispatch of material. Kindly confirm.	
15.	MDCC clause	<p>Material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) by BHEL/Customer.</p> <p>All Test certificates (TCs) & Inspection Reports should be submitted by supplier to BHEL at least 07 days in advance for review and issuance of MDCC.</p> <p>Material should be dispatched within 07 days of issue of MDCC by BHEL.</p>	
16.	Risk Purchase Clause	<p>In case of abnormal delays (beyond the maximum late delivery period as per LD clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost.</p> <p>If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract or under General Law.</p>	
17.	Conflict of interest	<p>A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:</p> <ul style="list-style-type: none"> a) they have controlling partner(s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, <u>that puts them in a position to have access to information about or influence on the bid of another Bidder, or</u> e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. <u>However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; or</u> f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following: <ul style="list-style-type: none"> 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal, or g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid, or 	

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		h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/similar line of business.	
18.	Regarding ITC based evaluation bid	Kindly note that this bid/tender has been availed with 100% ITC (Input tax credit) based evaluation. Bidders shall have to enter their Prices inclusive of all taxes including GST during participation in bid on GeM portal and also bidders to add/input the applicable GST amount in percentage separately as per provision made by GeM in the system. Kindly confirm your compliance to the above and submit your offer on GeM portal accordingly.	
19.	Confirmation to General terms & conditions of GeM	This ADDITIONAL TERMS & CONDITIONS OF TENDER should be read and complied in conjunction with GENERAL TERMS AND CONDITIONS of GeM (GeM 4.0 Version 1.12 Dt: 16.08.2023) governed for this bid. Please provide the acceptance to General terms & conditions (GeM 4.0, Version 1.12 Dt: 16.08.2023) applicable for this tender.	

Kindly ensure to submit the below documents/enclosures alongwith Part-1 bid:

- a. Signed & Stamped copy (each page) of GeM tender bid.
- b. Signed & Stamped copy (each page) of duly filled Additional terms & conditions of tender (Annexure-B).
- c. Copy/Replica of Price schedule (without prices) mentioning "Quoted' in place of price alongwith your techno-commercial (Part-1) offer.

