

REF :	PE-LPE/275
REF. DATE	03/08/2017
DUE DATE	25/08/2017

To,

Open Tender

Dear Madam/Sir,

Subject: Supply, Installation, Erection & Commissioning of Automatic Power Factor Correction (APFC) Panels in BHEL-PEM, Noida.

Quotations are invited in two parts in sealed cover with Enquiry No., Enquiry Date, Quotation Due Date & Time, Name/ Address of the Organization submitting the offer legibly super- scribed on it, for the above- mentioned item so as to reach the Tender Room, BHEL, PS-PEM, Noida before 02:00 P.M. on or before the above mentioned Due Date.

SCOPE:

For Scope of work/services refer Technical Specification no. PE-TS-PEM-510-E001 REV-1 enclosed with NIT.

PAYMENT TERMS:

100 % payment shall be released after supply, erection, commissioning & successful performance test of APFC panels and submission of invoice.

DELIVERY SCHEDULE:

Supply- The delivery period for APFC Panel shall be Ten (10) weeks from the PO placement date of BHEL.

E & C, Testing- Additional time for erection, testing and commissioning shall be Four (4) weeks from the date of BHEL clearance /front available for the same.

PENALTY CLAUSE: LD: It is clearly understood among the parties to the contract that time is the essence of the contract. Therefore, the delivery of the items specified in the Order should be made within the stipulated delivery period. Where work is done after the stipulated period, the Purchaser shall be under no obligation to accept the works/items. However, if accepted, Liquidated Damages at the rate of 0.5% per week of delay or part thereof shall be levied on total contract value limited to 10% (excluding taxes) of the total contract value, without prejudice to any other relief or compensation due to the Purchaser under any other condition of the Purchase Order.

EVALUATION: shall be done on Total Price F.O.R destination (at PEM Office) inclusive of taxes, freight charges, Handling & Packing charges as given in price format Annex-I.

SECURITY DEPOSIT: The vendor shall submit a Performance Bank Guarantee (PBG) for 10% of the Purchase Order value.

VALIDITY OF RATES: After awarding the work the rates would be firm till the completion of work.

Enclosures: i) Enquiry Letter (this letter itself)

ii) Technical PQR

iii) Price Format-Annexure-I

iv) Financial PQR & Commercial Terms & Conditions- Annexure-II

iv) Technical Specification no. PE-TS-PEM-510-E001 REV-1

Thanking You,

Yours faithfully,
For and on behalf of BHEL
03/08/17
N C Sharma/ Sr. Engr.
BHEL PEM, Noida

AUTO POWER FACT CORRECTION (APFC) PANEL

BOQ-CUM-PRICE SCHEDULE

ANNEXURE-I

Sl. No. [1]	DESCRIPTION [2]	HSN CODE (TO BE FILLED BY THE BIDDER) FOR EACH ITEM [3]	UNIT [4]	QTY. [5]	UNIT EX- WORKS PRICE DULY PACKED (INR) [6]	TOTAL EX- WORKS PRICE (DULY PACKED) (INR) [7]	FREIGHT CHARGES		TOTAL PRICES (ex works + freight) (INR) [9]	APPLICABLE GST RATE IN % ON(TOTAL EX WORKS + FREIGHT) BOTH (INR)		TOTAL PRICE F.O.R. Prices with taxes (INR) (11)
							② % OF TOTAL EX WORKS (8A)	AMOUNT IN (INR) (8B) = (7X8A)		GST RATE IN % ON(TOTAL EX WORKS + FREIGHT) (10A)	TOTAL AMOUNT IN (INR) (10B) [9X10A]	
1.0	Design, Manufacture, Testing, Inspection Supply of 650 KVAR Capacitors (@415V) indoor mounted LT Detuned APFC Panels in line with specification no. PE-TS-PEM-510-E001 Rev R1 for power factor improvement including cable interconnection with LT panel(BHEL Panel of which power factor has to be corrected) with appropriate size of LT XLPE power cable. Any item not mentioned in this specification but required for the successful design, manufacturing, testing, inspection, supply of the APFC panels are to be considered by the bidder without any price implication to BHEL		Set	1					[7+8B]			[9+10B]
2.0	Erection, Connection, Commissioning and Performance testing of 650 KVAR Capacitors (@415V) indoor mounted LT Detuned APFC Panels in line with specification no. PE-TS-PEM-510-E001 Rev R1 for power factor improvement including cable interconnection with LT panel(BHEL Panel of which power factor has to be corrected) with appropriate size of LT XLPE power cable. Any item not mentioned in this specification but required for the successful erection, connection, commissioning & performance testing of the APFC panels are to be considered by the bidder without any price implication to BHEL		Set	1								

[illegible]

[Signature]

Financial PQR

Average annual financial turnover during the last 3 years - ending 31st March of previous financial year should not be less than Rs.7,50,000/- (Rupees Seven Lakh Fifty Thousand Only).

Note: 1) In case the adopted accounting year is other than financial year than previous years to be considered accordingly.

2) The bidder shall provide the complete set of accounts for last 3 years duly signed and stamped by auditors and directors/owner i.e. Balance Sheet, Profit & Loss Account, Schedule/Notes to Accounts, Auditor Report and/or Income Tax Traces report for evaluation.

COMMERCIAL TERMS AND CONDITIONS
1. BID SUBMISSION

Bids shall be submitted latest by **02:00 P.M.** on or before the due date in two parts as follows:

PART-1: TECHNO-COMMERCIAL BID

This part shall contain the following:

- a) Technical Specification & other scope of work
- b) Commercial terms and conditions & General terms and conditions
- c) Unpriced copy of the price bid format (Annexure-I) with all amounts/figures/ percentages wherever quoted in the price bid being replaced with the word 'Quoted' or 'Q'.
- d) Supporting document/ information to be submitted against each point of 'PQR' and Documents to be enclosed with bid as per checklist Annex-VII.

This part shall be submitted in duplicate in two separate Sealed Covers with bidder's distinctive Seal super scribed with correct Enquiry No., Item of supply, due date of opening and '**part-1 : techno-commercial bid**'.

Complete tender in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.

PART -2: PRICE BID (strictly as per price bid format-Annexure I)

This part shall contain Prices only and should not contain any technical details and/or Commercial Terms & Conditions. Any technical details and/or Commercial Terms & Conditions, if found in this part shall be ignored as the same are supposed to be contained in PART-I only as indicated above.

This part shall be submitted in a separate Sealed Cover with bidder's distinctive Seal super scribed with correct Enquiry No., Item of supply, due date of opening and '**part -2: price bid**'.



(Signature & Seal of Bidder)

Tenders and all correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the following address:

Kind Attn: Sh N C Sharma / Sr. Engineer (MM) & Sh I P Singh / Sr. Mgr. (CMM)
Tender Room,
M/s Bharat Heavy Electricals Ltd.
Project Engineering Management,
Power Project Engineering Institute,
HRD & ESI Complex,
Plot No 25, Sector-16 A, Noida-201301 (U.P.)
Phone no. 0120-4213591, 4368749
E-mail: ncsharma@bhel.in; INDRA.PAL.SINGH@bhelpem.co.in

2. BID OPENING

PART- I (Techno-Commercial Bids) will be opened at 03:00 P.M. on the due date in the presence of bidders who may like to be present. Date and time of opening of Part - II (Price Bids) shall be communicated separately.

3. The bid shall remain valid for a period of 180 days from the date of opening of offers. No revision of prices shall be entertained after bids have been opened. Bidder shall not be entitled during this period to revoke or vary the content of bid or any terms thereof. In case of any unsolicited variation subsequent to bid opening, the bid shall be treated as "Rejected".
4. Prices shall remain firm without any variation till completion of contract. Once the contract is awarded, the quoted rate shall remain firm for the entire contract period & will not vary on any account whatsoever be the reason.
5. **EVALUATION:** shall be done on Total Amount F.O.R destination (at PEM Office) inclusive of all taxes & duties, freight charges, Handling & Packing charges as given in price format Annex-I
6. **PACKING AND MARKING:** Vendor shall arrange for sound packing and marking the goods to avoid any loss or damage during transit.
7. **PAYMENT TERMS:** 100 % payment shall be released after supply, erection, commissioning & successful of performance test of APFC panels and submission of invoice.
8. **SUBMISSION OF INVOICE:** All Invoices shall be submitted in duplicate, to HR-GAX Dep't. Of BHEL/PEM, BHEL, PPEI, NOIDA-201301.
9. **DELIVERY: Supply-** The delivery period for AFPC Panel shall be Ten (10) weeks from the PO placement date of BHEL.
E & C, Testing- Additional time for erection, testing and commissioning shall be Four (4) weeks from the date of BHEL clearance /front available for the same.
10. **Guarantee Certificate:** - Materials to be supplied in good quality and free from defects. More over all the Item/materials shall carry a Guarantee for a period of 1 year from the date satisfactory commissioning. Defects if any found in this period shall be indicted to the supplier and the same to be replaced by supplier free of cost (including to and fro transportation) within 1 month.



(Signature & Seal of Bidder)

- 11. Contract Performance Bank Guarantee:** The vendor shall submit a Performance Bank Guarantee (PBG) only from any one of the 'Consortium Banks' of BHEL as per list and directives on <https://www.bhelpem.com/Documents/Misc/List%20of%20Consortium%20Bank.pdf> for 10% of the Purchase Order value in the format enclosed Annex-VIII covering the agreed Guarantee period (with additional 2 months as claim period).

All bank charges incurred on account of issuance of PBG will have to be borne by the vendor.

Purchaser reserve the right to encash the bank guarantee and forfeit the amount in the event of any default, failure or neglect on part of the Seller/ Contractor in fulfillment of performance of the Order/ Contract.

- 12.** BHEL shall be under no obligation to accept the lowest or any other bid and shall have the right to accept or reject any bid in part or in full without assigning any reason whatsoever. BHEL also reserves the right to reject any or all quotations without assigning any reason whatsoever. Quotation of the parties which have been black-listed / debarred / banned by PSUs / kept on hold by any office of Delhi-based Divisions of BHEL during the last three years will be rejected.

- 13.** Late tenders will be rejected.

- 14. RISK PURCHASE:** Purchaser will have the option to terminate the contract and purchase from elsewhere (the best and the nearest available substitute thereof) at the risk and cost of the Vendor, either the whole or part of the goods/services which the contractor has failed to deliver services or as not able to give quality services as stipulated in the contract. The contractor would be liable to compensate the Purchaser for any loss which the Purchaser may sustain by reason of such risk purchase, in addition to Liquidated Damages (Penalty Clause) at the rate as mentioned in technical specification.

15. PRICE DISCREPENCY:

- a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price the quantity), the unit price shall prevail and the total price will be corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price., in which case the total price as quoted shall govern and the unit price will be corrected accordingly.
- b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in the words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.
- d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date up to which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.
- e) Taxes and duties if not specified clearly as extra shall be considered as include in the basis price and, therefore, shall not be reimbursed separately.

16. TAX DEDUCTION AT SOURCE:

Tax shall be deducted at source from the running bills as per applicable Income Tax Rules and other statutory requirements.

- 17. DEVIATION:** The Contractor must comply with the tender specification and all terms and conditions of contract. No deviation shall normally be entertained. Deviation if any, should be given as per the format attached at Annexure-III by mentioning the related/affected clause number etc.



(Signature & Seal of Bidder)

GENERAL TERMS AND CONDITIONS

18. ARBITRATION

In the event of any dispute or difference arising out of the execution of the Order/Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision between BHEL & Service Provider in any manner touching upon the Order/Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred to the arbitration of the person appointed by the competent authority of BHEL.

Subject to as aforesaid, the provisions of Arbitration and Conciliation Act, 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The venue of arbitration shall be at Noida.

19. LAWS GOVERNING THE CONTRACT

The Order/Contract shall be executed and governed by the laws of India and the courts of India alone shall have jurisdiction in respect of any matter arising under or in connection with the Order/Contract. Extant regulations of Govt. of India will be applicable. Law of land will supersede any condition given in tender enquiry, in case of any contradiction.

20. RESOLUTION OF DISPUTES

- The purchaser and the supplier shall make every effort to resolve any disagreement or dispute, arising between them under or in connection with the contract, amicably by direct negotiation.
- Dispute if any, arising out of or in respect of the contract(s) to which these conditions are applicable, is subject to the jurisdiction of the Delhi courts only.

21. STATUTORY VARIATION:

- i) Statutory variation for CGST/SGST/UGST/IGST is available provided the actual completion of supply does not occur beyond the period stipulated in the order/contract or any extension (without levy of penalty).
- ii) For variation after the agreed completion periods, the seller/contractor alone shall bear the impact for the upwards revisions and adjust the price in their basic price in such a manner that total price with tax matches with the ex-works with taxes of Purchase Order/Contract. For downward revisions, purchaser shall be given the benefit of reduction in CGST/SGST/UGST/IGST. This will be without prejudice to the levy of penalty for delay in delivery/completion schedule.
- iii) No other variations such as on Custom Duty, exchange rate, minimum wages, prices of controlled commodities, any other input etc. shall be payable by the purchaser.

22. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendor/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL web site <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud as soon as it comes to their notice.

NOTE:

It is presumed that the bidder has accepted all the instructions, Terms and conditions and Technical Specifications covered in this Tender Enquiry, unless the deviations are specifically indicated in the bid on a separate sheet.

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(Signature & Seal of Bidder)

No Deviation Certificate

(To be submitted along with Part-1 Bid)

Notwithstanding anything mentioned in our bid, we hereby accept all the terms and conditions of the above tender. We confirm that the offer submitted by is confirming to all the terms and conditions mentioned in the tender document. We hereby undertake and confirm that we have understood the scope of services properly and shall carry out the job as mentioned in this tender.

Or

We hereby accept all terms and conditions of the above tender except the following:

1.

2.

3.

4.



(Signature & Seal of Bidder)

DECLARATION CERTIFICATE

I / We do hereby declare that there is no case with the Police/Court/Regulatory authorities against the proprietor/firm/partner. Also I/We have not been suspended / delisted / blacklisted by any other Govt. Ministry / Department/Public Sector Undertaking/ Autonomous Body/Financial institution/Court. We also certify that neither our firm nor any of our partners are involved in any scam or disciplinary proceedings settled or pending adjudication.



(Signature & Seal of Bidder)

DETAILS OF BIDDER

S. No.	Description	Details
1	Name of the Party	
2	Address of the party	
3	Contact Person's Name	
4	Cell No. of Contact Person	
5	Land Line No.	
6	FAX No.	
7	E-mail ID of the Party	
8	PAN No.	
9	GST No.	

FINANCIAL DETAILS

TURN OVER (F.Y.) (In Rs. Lakhs)	2016-2017	2015-16	2014-15

INCOME TAX RETURN (F.Y.)	2016-2017	2015-16	2014-15

EXPERIENCE	No. of Work	Value	Customer's Name

WORK EXPERIENCE

SIMILAR WORKS	Nature of Works	No. of Works	Value	Customer's Name



(Signature & Seal of Bidder)

Check List**SUMMARY OF COMPLAINE TO REQUIREMENT OF TENDER**

S. No.	Required Document	If Submitted, then Tick (√)
1	Copies of the Audited Balance sheet and Profit & Loss account statements of last three financial years i.e. FY: 2014-15, 2015-16, & 2016-17 (AY: 2015- 16, 2016-17 & 2017-18) duly certified by CA.	
2	Acknowledgement of IT return of last three financial years i.e. FY: 2014-15, 2015-16, & 2016-17 (AY: 2015- 16, 2016-17 & 2017-18).	
3	Details of work experience, satisfactory work performance certificates	
4	Duly signed and stamped complete set of tender documents for technical bid	
5	Bidder's details	
6	Financial details / Work Experience	
7	Work orders / Completion certificates	
8	Signed and Stamped Un- priced bid format (The bidder has to write "Quoted" in places where he has quoted in Price Bid)	
9	Copy of PAN No. registration certificate	
10	Copy of GST registration certificate	
11	NO DEVIATION CERTIFICATE as per Annexure -III duly signed and stamped	
12	Declaration Certificate as per Annexure -IV	
13	Duly filled and signed Annexure - V regarding information of the tenderers	
14	Quoted PRICE BID (Annex-I) duly signed and stamped along with tender enquiry.	
15	Financial Details as per Annex-VI	
16	Contract Performance Bank Guarantee as per Annex-VIII	



(Signature & Seal of Bidder)

CONTRACT PERFORMANCE BANK GUARANTEE

1) In consideration of **Bharat Heavy Electricals Limited, Project Engineering Management Division** (hereinafter called the "**Company**") having agreed from M/s _____ (hereinafter called the said **Contractor** which term includes supplier for the purpose of the bond) to accept the demand under the terms and conditions of the Agreement No. _____ dated _____ and made between _____ and _____ (hereinafter called the said **agreement**) of Security Deposit for the due fulfilment by the said contractor of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. _____ (Rupees _____ only) we, _____ (indicate the name of the Bank) _____ (hereinafter referred to as the **Bank**) at the request of _____ [Contractor(s)] do hereby undertake to pay to the Company an amount not exceeding Rs. _____ against any loss or damage caused to or suffered by or would be caused to or suffered by the Company by reasons of any breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement.

2) We, _____ (indicate the name of the Bank) _____ do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the company by reasons of breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement or by reasons of the Contractor(s) failure to perform the said Agreement. Any such demand made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

3) We undertake to pay to the Company any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.
The payment to so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4) We, _____ (indicate the name of the Bank) _____ further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claim satisfied or discharged or till _____ office/ Department/ Division of Bharat Heavy Electricals Limited certifies that the

terms and conditions of the said Agreement have been fully and properly carried out by the said contractor(s) and also including the satisfactory performance of the equipment

(Signature & Seal of Bidder)

X

during guarantee period and accordingly discharge this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the _____*, we shall be discharged from all the liability under this guarantee thereafter.

5) We, _____(indicate the name of the Bank)_____ further agree with the Company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the company against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act or omission on the part of the company or any indulgence by the company to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

6) This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

7) We, _____(indicate the name of the Bank)_____ lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Company in writing.

_____ Day of _____ Date
for _____
(indicate name of the Bank)_____

(Signature of Authorised signatory)

* This date to be indicated should not be earlier than 60 days after the date contemplated under the contract.



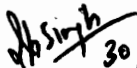
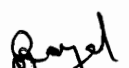
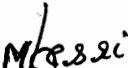
	PRE-QUALIFICATION REQUIREMENTS (PQR) FOR AUTOMATIC POWER FACTOR CORRECTION (APFC) PANEL	PE-PQ-PEM-510-E002
		REVISION NO. 00 DATE 30/05/2017
		SHEET NO. 1 OF 1

ITEMS : AUTO POWER FACTOR CORRECTION (APFC) PANEL

SCOPE: Supply : YES; Erection & Commissioning : YES;

1	Only those bidders, who have supplied 415V APFC panel of capacity 650 kVAR or Higher and which is working satisfactorily for at least one year after commissioning should quote. The bidder should submit the following relevant documents along with offer for establishing the same & for qualifying: 1. Performance certificate (on the customer's letter head) of the quoted make of 415V APFC panel of 650kVAR or higher rating from minimum one customer for the satisfactory performance of this APFC panel for at least one year after commissioning. The date of commissioning should not be earlier than 5 years from the date of bid opening.
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Note: In case bidder is not the OEM of the quoted make of APFC panel, the bidder should furnish MOU/Aggrement with the OEM for Design, Manufacturing, Testing, and Supply of APFC panel.

PREPARED BY  30/5/17 NAME: AMTAL SINGH DESIGNATION: MANAGER	CHECKED BY  30/05/17 NAME: Sandeep DESIGNATION: DGM	REVIEWED BY  30/5/17 NAME: Rajat DESIGNATION:	APPROVED BY  30.15.17 NAME: M. S. S. S. DESIGNATION:
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BHARAT HEAVY ELECTRICALS LIMITED

POWER SECTOR

PROJECT ENGINEERING MANAGEMENT

NOIDA, UTTAR PRADESH, INDIA – 201301

TECHNICAL SPECIFICATION

FOR

**APFC PANEL FOR 650 kVAR @415V and 450
kVAR@415V CAPACITORS**

SPECIFICATION NO : PE-TS-PEM-510-E001
REV-1

**TECHNICAL SPECIFICATION FOR APFC PANELS FOR 650 kVAR & 450 kVAR
CAPACITORS**

Scope: Design, Manufacture, Supply, testing , inspection , erection, connection, commissioning and performance testing of the following indoor mounted LT Detuned APFC Panels for power factor improvement including cable interconnection with LT panel(BHEL Panel of which power factor has to be corrected) with appropriate size of LT XLPE power cable which shall be in bidder's scope of supply .

1. APFC PANELS FOR 650 kVAR Capacitors (@415V)- 1 No.
2. APFC PANELS FOR 450 kVAR Capacitors (@415V) - 1 No.

The system power factor after connecting the above APFC panels with LT Panel (BHEL panel of which power factor has to be corrected) shall come to be more than 0.97. Bidder shall ensure that the stated performance parameter shall be met during actual running condition. APFC panels shall be of type tested design.

The automatic/manual Power Factor Correction Panels shall be fabricated out of 2mm CRCA Sheets Modular, compartmentalized, Free Standing, Floor Mounting, Front hinged doors for indoor use, removable bottom gland plates for incoming cables, dust and vermin proof (IP: 32 protection) with TP Aluminium Busbars, complete with busbar connection, internal wiring, name plates, painting etc. as per details furnished below:

S.NO.	ITEM	PARTICULARS
1	Output Rating of APFC Panel at 415V	650 kVAR at 415V – 1No. 450kVAR at 415V – 1 No.
2	Quantity	650 kVAR at 415V – 1No. 450kVAR at 415V – 1 No.
3	Rated Voltage of the Panel	415V $\pm$ 10%
4	Rated Frequency	50 Hz $\pm$ 5%
5	No.of Phases	3 phase
6	Ambient Temperature	50 degree C.
7	Enclosure details:	Free Standing, Floor mounted
	Material	CRCA
	Thickness of Sheet Steel Used:	Frame:2.0mm Doors:2.0mm Partitions-1.6mm Suitable Base frame
	Dimensions	2500 (L) x 2200 (H) x 800 (D) (approx) for 650 kVAR 1500 (L) x 2200 (H) x 800 (D) (approx) for 450 kVAR
	Protection	IP-32
	Application	Indoor
	Cable Entry	Bottom
	Painting	Shade Siemens grey /RAL 7032
8	Busbar Detail	
	Material	Aluminium Insulated with R.Y.B sleeves
	Cross Section	To be decided by bidder.
	Busbar support	SMC/DMC

9	Capacitors	
	Type	Heavy duty MPP type, 480 V, 3 ph, 50 Hz (Cylindrical) along with discharge resistance and conforming to IEC/Indian Standards.
	No.of Steps	To be decided by bidder
	Configuration	For 650kVAR In suitable steps of 25 KVAR , 50 KVAR and 100 KVAR For 450 kVAR In suitable steps of 25 KVAR , 50 KVAR and 100 KVAR The capacitors are rated for 500 480 V due to the effect of detuned reactor. Accordingly 650kVAR & 450kVAR are ratings @415V.
10	Protection	Suitable over-heating, over-current, earth fault, over voltage, short circuit, thermal over load & over pressure protection to be provided in line with requirements of IEC/IS
11	Detuned Reactors	Detuned harmonic suppression filters rated for 7% of capacitive reactance for individual capacitor controls to be provided
11a	Calculation for selection of Capacitor Voltage	Applied voltage = $\frac{\text{System Voltage}}{1-0.07}$ $= \frac{415}{1-0.07}$ $= 446.23\text{V}$ Selected Capacitor Voltage = 480 V
11b	Bidder to take care of increase in capacitances due to the effect of Detuned reactor(7%) in line with the formulae provided on the right:	Formula for Selected Capacitor KVAR ratings at 480 V $= \left(\frac{\text{Capacitance}}{1-0.07} \right) * \left(\frac{480}{446.23} \right)^2$
12	Switchgear Details	
	Incomer	ACB
	Steps Outgoing	MCCB, contactors (Refer Bill of Material for further details)
13	APFC Relays	Intelligent Microprocessor based
14	Bill of Materials	As per Annexure "Scope, Bill of material & Datasheet"

15A	Power Cable	Power cable of suitable size for interconnection to BHEL Panels of which power factor has to be corrected for both the 650KVAR panel as well as 450 kVAR panel is in the scope of bidder
15B	Control cable wiring	Flexible copper wiring of minimum 1.5 sq.mm. Suitable for APFC panel application as per the requirements of Indian standards. Control wiring for CT circuits shall be with 2.5 sq. mm. Wiring size and wiring type for capacitors shall be suitably decided by bidder. Mounting of Three Numbers CTs (in Y phase only) in existing panels and Cable connections between CTs (mounted in existing panels) and new APFC panels is also in scope of bidder.
16	Conduits with clamps	As per requirement.
17	Glands, Lugs & foundation bolts	As per requirement.
18	Location of placement	The two APFC panels are to be placed separately in two different Local substation inside BHEL complex 650kVAR panel shall be connected to BHEL's LT panel (BHEL Panel of which power factor has to be corrected. This panel is being fed by 1600kVA dry type transformer.) 450 kVAR panel shall be connected BHEL's LT panel (BHEL Panel of which power factor has to be corrected. This panel is being fed by 630kVA oil type transformer.) Separate support stool for placement & mounting of 450 kVAR APFC panel shall also be supplied by bidder. Height of this support stool shall be suitable for cable entry from bottom. This stool is required for 450kVAR APFC panel only and vendor shall fix the same to floor. 650kVAR panel shall be floor mounted on trench.
19	Applicable standards	IS 16636 , IS 8623-1,-3, IS 13947, IS 13585, IS 12672, IS 5553, IS 13340, IS 13341, 12672, IEC 60921.

		IEC60831, IEC 60439-3, IEC 60076-6, IEC 60044-1, IEC 60664-1/IEC 61326.
20	Routine tests for APFC panels	All Routine tests to be conducted as per relevant IS/ IEC standards
21	Type Test certificates for APFC panels of rating 650kVAR and 450 KVAR	Bidder to offer type tested design for both 450 KVAR and 650 KVAR APFC panels. Type test reports as per relevant IS / IEC standards has to be submitted by the bidder for both 450 KVAR and 650 KVAR APFC panels.

Work shall also include dismantling & removal of 1 No. "Existing 650kVAR capacitor panel" to a suitable location within BHEL complex. The existing panel shall be replaced with new 650kVAR panel shall be placed at same location.

Bidder shall visit site to acquaint themselves with the actual site installation conditions before making the offer.

The bidder's scope shall also include any mounting accessories including Current Transformers, E&C consumables, minor civil works, etc. required for completion of the work.

Vendor to fill up this format and submit signed and stamped Specification, Bill of material & Datasheet (Sheet 1 to 9) along with Technical offer for 415Volts Capacitor Bank for each 650kVAR & 450kVAR panels

ANNEXURE
SCOPE, BILL OF MATERIALS & DATASHEET

(For each 650 kVAR & 450kVAR, 3Ph, 50 Hz, DETUNED APFC Panel)

S.NO.	DESCRIPTION	QUANTITY (Quantity indicated below is to be considered separately for each 650kVAR & 450kVAR panels)
	INCOMER	
1	ACB Type, MDO type, 50kA for 1 sec, 3 pole with all suitable accessories as per Indian standard requirements with suitable over current, short circuit current, earth fault protection and shunt closing coil. (1 No. 1250A for 650kVAR panel, 1 No. 800A for 450kVAR panel.)	1 No.
2	Digital multi-functional meter with current, voltage, power factor, %THD measurement to be mounted in incomer.	1 No.
3	Phase Indicating Lamps	3 Nos.
4	Auto/Off/Manual Switch (Auto/Manual selectable operation to be provided)	1 No.
5	Current Transformer (1250/5A for 650kVAR and 800/5A for 450kVAR.) Scope shall also include mounting of Current transformers in the existing BHEL LT panels(Both BHEL Panels of which power factor has to be corrected). All required hardware, wires, lugs, support material, etc shall be included in the scope.	3 Nos (In Y Phase)
6	APFC Relay (11-Stage & 9 stage Microprocessor based power factor controller.) Make: Electronican/L&T/ABB/ICD/Schneider/Ducati/other makes acceptable to BHEL. Bidder to furnish the list of makes which shall be subject to approval at contract stage without any commercial implication to BHEL.	1 No.
7	Switching time	Variable & selectable.
8	Timer	1 lot
9	Cooling Fans	1 Lot
10	Control Transformer	1 No.
11	OUTGOING	
1	Indicating Lamps (ON/OFF)	As per requirement.
2	Push Buttons (ON/OFF)	As per requirement.

12	FOR 25 kVAr @415V	Number of steps to be decided by bidder as per requirement
1	SDF/MCCB	As per requirement.
2	Capacitor duty Contactor	As per requirement.
3	7% reactor for 25 kVAr filter	As per requirement.
13	FOR 50 kVAr @415V	Number of steps to be decided by bidder as per requirement
1	SDF/MCCB	As per requirement
2	Capacitor duty Contactor	As per requirement
3	7% reactor for 50 kVAr filter	As per requirement
14	FOR 100 kVAr @415V	Number of steps to be decided by bidder as per requirement
1	SDF/MCCB	As per requirement
2	Capacitor duty Contactor	As per requirement
3	7% reactor for 100 kVAr filter	As per requirement
15	One minute power frequency withstand voltage	3kV rms
16	Rated Short circuit withstand current	50kA/1 sec
17	Temperature rise limits (above 50 deg C) 1.Busbar 2.Capacitor case 3.Reactor Coil 4.Terminals 5.Enclosure	Bidder to indicate the values.
18	Configuration	Delta
19	Ventilation fans of required size to dissipate the heat of panel (generated by capacitors, reactors, etc.) with Automatic on/off controls shall be provided. Min. 2 sets of cooling fans (One working & other standby, each suitable for ventilation requirement of the complete panel) shall be provided. Ventillation inside the panel should be such that the operating temperature should remain lower than maximum permissible temperature of components. One set of fans shall work at one time and in case of failure of any fan the other set shall switch on automatically. Provision of manual switching of standby set shall also be provided.	As per requirement. Bidder to mension minimum capacity in cfm
20	Space heaters of suitable rating	As per requirement.
21	75x10 GI Earthing flat of suitable length for inter connecting of APFC panel with nearby earth risers	As per requirement.

22	Appropriate size of LT XLPE power cables for interconnection to BHEL Panels of which power factor has to be corrected for both the 650KVAR panel as well as 450 kVAR panel.	Bidder to select the suitable size.
23	Scope shall include Design, Manufacture, Supply, erection, connection, commissioning and testing of the both 650KVAR as well as 450 kVAR detuned APFC Panels for power factor improvement including cable interconnection with LT panel (BHEL Panels of which power factor has to be corrected). Any item not mentioned in this specification but required for the successful manufacturing, erection, commissioning & testing of both the APFC panels are to be considered by the bidder without any price implication to BHEL.	To be confirmed by Bidder.
24	Contactors for capacitor switching shall be "Capacitor Duty Contactors" in order to prevent inrush current	Bidder to confirm
25	3 sets of Operation, Maintenance and Programming manual in English for Micro Processor, with circuit/ wiring diagram to be supplied along with the panel. A copy of makes, rating details, technical data sheet & details and catalogue of all the bought out items used in the panel.	Bidder to indicate Yes/No
26	Technical catalogue furnishing the features of the controller and panel shall be enclosed with the offer Required.	Bidder to indicate Yes/No
27	List of makes of items	List of approved makes is attached. However, vendor can suggest and request for acceptance of additional makes at contract stage. Acceptance or Non-acceptance of these additional makes shall not have any commercial implication to BHEL.
28	Note : 1)GA drawings, control & scheme drawings and bill of materials to be submitted for approval before manufacturing of the panels. 2)Final inspection to be offered before despatch. 3)During commissioning the APFC panel in the BHEL substation, programming of the controller to suit the reactive compensation to be provided by the vendor and necessary training to our staffs should be given. 4)3 sets of Operation, Maintenance manual in English. Circuit/ wiring diagram to be supplied along with the panel. Two copies of make, rating details, technical details and catalogue of all the bought out items used in the panel. 5) Point by point confirmation is required from the supplier otherwise the offer will not be considered. 6) List of makes which shall be subject to approval at contract stage without any commercial implication to BHEL.	Bidder to indicate Yes/No
29	Documents to be submitted after placement of order	GA Single Line Diagram

		Sizing Calculations for Capacitor and other components Make of components Master BOM Schemes
30	<u>Performance testing:</u> 1. After successful commissioning of APFC panel along with its connection with LT Panel (BHEL panel of which power factor has to be corrected), Bidder shall operate both the APFC panel for 12 hours from 8AM to 8PM and shall demonstrate the improvement of power factor to 0.97 during these 12 hours under actual electrical loading conditions at installation site (BHEL complex).	

Name of the Bidder:
Address of the Bidder:
Contact number:
Email:

Signature with Seal:

LIST OF APPROVED MAKES FOR COMPONENTS OF AUTO POWER FACTOR CORRECTION (APFC) PANEL		
S.No.	Components	Approved makes
1	Capacitor MPP-heavy duty With Discharge Resistance (Aluminium Round Enclosure)	Electronicon/TDK Epcos/Schneider/L& T /Neptune/Siemens/ABB
2	ACB, MCCB, Spreader Link, Auxiliary Contactor, MCB, Capacitor duty contactor	L&T/Schneider/ABB/ GE/Siemens/C&S
3	Current Transformers	AE/Kappa/Eltech/C&S/Pragati /Precise/Silkaans/Prayog/Indcoil
4	CT's(Current Transformers) Shorting Link	Wago/Elmax/Phonix
5	Digital Multi-functional meter with current, voltage, power factor, %THD measurement, etc.	Secure/HPL/Neptune/Conzerve
6	Cooling Fans	Encoz/ Rexnord
7	Digital 11 stage & 9 stage Microprocessor based APFC relay	L&T/Epcos/HPL/ Electronicon/ABB/ICD/ Schneider/Ducati/Siemens
8	Start/Stop Push Button, ON, OFF indicator lamp LED type, Phase Indication Lamps, etc.	L&T/C&S/FTC/BCH/Essen Deinki/Vaishno/Siemens/Schneider/BCH/EAPL
9	ON Delay timer	L&T/Omron/Essen Deinki/BCH/EAPL/ Siemens/ABB / Schneider
10	PVC Wire Ferrules & Other Wiring Accessories.	Bonton/Ecko
11	Materials for Wiring, Buttons, Tie Sticker, Terminal Blocks.	ConnectWell/Elemex/Wago/Phoenix
12	Control Terminals	Phoenix/Wago
13	Epoxy Moulded DMC/SMC Bus Bar Supports	Powermat/Master
14	Neutral Link	RAMANUJ/FTC