**Section IV L - Price Bid for local supplies**

**CENTRAL POWER RESEARCH INSTITUTE, BHOPAL Web: www.cpri.in, www.tenderwizard.com/CPRI**

**Tender Enquiry No : STDS/12-01/2022-23/PUR/RTL-NK-32/**

**Description of the Equipment/Goods/Services : Supply Installation, Commissioning and Testing of Three Numbers Single Phase Current Limiting Reactor Banks.**

| | |
|---|---|
| **Name and address of the Bidder** * | |
| **Quotation Number and Date*** | |
| ***HSN code (Harmonized system nomenclature)*** * | |
| ***GSTIN No*** * | |
| ***SAC code (Services Accounting Code)*** * | |
| **Income Tax permanent account number(PAN)*** | |
| **Details of EMD submitted*** | |

| Sl.No | Particulars | Qty | Unit Rate in Rupees | Total Amount in Rupees |
|---|---|---|---|---|
| **1** | **Basic Price (Including mandatory spares, packing and forwarding charges) (The list of mandatory spares shall be provided in the technical bid without mentioning the price) Insurance is under Supplier's Scope** | **3** | | **0.00** |
| *1(a)* | *GST rate as applicable in percentage only* | | | |
| | *IGST* | | | **0.00** |
| | *CGST* | | | **0.00** |
| | *SGST* | | | **0.00** |
| | *UTGST* | | | **0.00** |
| | *CESS if any* | | | **0.00** |
| **2** | **Transportation Charges (To be Quoted in Lumpsum ,if applicable)** | | | **0.00** |
| *2(a)* | *GST rate as applicable in percentage only* | | | |
| | *CGST* | | | **0.00** |
| | *IGST* | | | **0.00** |
| | *SGST* | | | **0.00** |
| | *UTGST* | | | **0.00** |
| | *CESS if any* | | | **0.00** |
| **3** | **Installation and Commissioning Charges (To be Quoted in Lumpsum ,if applicable)** | | | **0.00** |
| *3(a)* | *GST rate as applicable in percentage only* | | | |
| | *CGST* | | | **0.00** |
| | *IGST* | | | **0.00** |
| | *SGST* | | | **0.00** |
| | *UTGST* | | | **0.00** |
| | *CESS if any* | | | **0.00** |
| | **TOTAL LANDED COST** | | | **0.00** |
| | **Total Landed Cost in Words** | | | |

**Section IV L - Price Bid for local supplies**

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| | | | | |
|---|---|---|---|---|
| **4** | **OPTION-1 :**<br>**Post warrenty comprehensive AMC including, Labour, Travel, Spare Parts etc. in INR (lumpsum)**<br>(This cost is optional hence will not to be considered for cost comparission evaluations.) | | | |
| **5** | **OPTION-2 :**<br>**Optional accessories in INR (lumpsum)**<br>**List of items with breakup price to be furnished in case CPRI demands for the same.** | | | |
| **6** | **Guarantee/Warrantee period** | | | |
| **7** | **After sales and service facility (location of the facility and address to be furnished)** | | | |
| **8** | **Delivery period** | | | |
| **9** | **Validity of the offer** | | | |
| **10** | **Payment terms**<br>**(as per CPRI payment terms)** | | | |
| **11** | **Details of enlistment if any under Department of expenditutre , Minsitry Of Finance , GOI.** | | | |
| **12** | **Name and address of the customer, if any to whome a similar equipment/items has been supplied with their purchase order number and date (as per the APPENDIX I).** | | | |
| **13** | **Whether a similar equipment could be demonstrated to our representative in case required.** | | | |
| **15** | **Acceptance for submission of security deposit in the event of placement of order.** | | | |

PN:
1) The price bid shall be submitted in this format only.
2) All blue fields are madatorily to be filled in.
3) As a policy of CPRI High Sea Sales bids are not acceptable and shall be rejeced.
4) CPRI reserves the right to conduct "predispatch inspection" prior to dispatch at the works of the supplier and the expenditure towards PDI shall be borne by CPRI. However information regarding the rediness of the equipment/machinary for the PDI shall be communicated in writing at lease 70 days in advance.
5)UNDER TAKING: THE OFFER MADE IS IN STRICT COMPLAINCE WITH THE QUALITY AND OTHER TECHNICAL REQUIREMENT MENTIONED IN SECTION - IV T.

## Section IV NL - Price Bid format for Non - Local supplies (Import) Offer

**CENTRAL POWER RESEARCH INSTITUTE, BHOPAL Web: www.cpri.in, www.tenderwizard.com/CPRI**

**Tender Enquiry No : STDS/12-01/2022-23/PUR/RTL-NK-32**

**Description of the Equipment/Goods/Services : Supply Installation, Commissioning and Testing of Three Numbers Single Phase Current Limiting Reactor Banks.**

| | |
|---|---|
| **Name and address of the Bidder** | |
| **Quotation Number and Date** | |
| ***HSN code (Harmonized system nomenclature)*** | |
| ***GSTIN No (if applicable)*** | |
| ***SAC code (Services Accounting Code)*** | |
| ***Income Tax permanent account number(PAN)*** | |
| ***Details of EMD submitted*** | |

| Sl.no | Partuculars | Qty | Unit Rate in Figures | Currency Type | Amount |
|---|---|---|---|---|---|
| 1 | **FOB value of the complete system (Including mandatory spares, packing and forwarding charges) (The list of mandatory spares shall be provided in the technical bid without mentioning the price)** | 3 | | | 0.00 |
| 2 | **Insurance charges upto CPRI(ware house to ware house basis in Lumpsum)** | | | | 0.00 |
| 3 | **Freight Charges,As applicable(Lumpsum)** | | | | |
| | **3a) Air Freight Charges.(Lumpsum)** | | | | 0.00 |
| | **3b) Sea Freight Charges.(Lumpsum)** | | | | 0.00 |
| 4 | **Total CIP/CIF cost** | | | | 0.00 |
| | **Total CIP/CIF cost in words** | | | | |
| 5 | **Installation and commission charges in INR (Lumpsum)** | | | | 0.00 |
| 5(a) | *GST as applicable (GST rate in percentage only)* | | | | |
| | *IGST* | | | | 0.00 |
| | *CGST* | | | | 0.00 |
| | *SGST* | | | | 0.00 |
| | *UTGST* | | | | 0.00 |
| | *CESS if any* | | | | 0.00 |
| | **TOTAL COST** | | | | 0.00 |
| | **Total Cost in Words** | | | | |


**PROCUREMENT PROCEDURE OF CPRI (NON WORKS)**





## Section IV NL - Price Bid format for Non - Local supplies (Import) Offer

**CENTRAL POWER RESEARCH INSTITUTE, BENGALURU/BHOPAL Web: www.cpri.in, www.tenderwizard.com/CPRI**


| Sl.no | Partuculars | Qty | Unit Rate in Figures | Currency Type | Amount |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 6 | **OPTION-1 :**<br>**Post warrenty comprehensive AMC including, Labour, Travel, Spare Parts etc. in INR (lumpsum)**<br>(This cost is optional hence will not to be considered for cost comparission evaluations.) | | | | |
| 7 | **OPTION-2 :**<br>**Optional accessories in INR (lumpsum)**<br>**List of items with breakup price to be furnished in case CPRI demands for the same.**<br>(This cost is optional hence will not to be considered for cost comparission evaluations.) | | | | |
| 2 | **Guarantee/Warrantee period** | | | | |
| 3 | **After sales and service facility (location of the facility and address to be furnished)** | | | | |
| 4 | **Delivery period** | | | | |
| 5 | **Validity of the offer** | | | | |
| 6 | **Payment terms**<br>**(as per CPRI payment terms)** | | | | |
| 9 | **Name and address of the customer, if any to whome a similar equipment/items has been supplied with their purchase order number and date (as per the APPENDIX I).** | | | | |
| 10 | **Whether a similar equipment be demonstrated to our representative in case required.** | | | | |
| 12 | **Acceptance for submission of security deposit in the event of placement of order.** | | | | |
| NOTE : CPRI IS EXEMPTED FROM PAYMENT OF CUSTOMS DUTY UNDER NOTIFICATION NO.51/96 DATED 23-071996 AND AMENDED NOTIFICATION NO.24/2007-CUSTOMS DATED 1-3-2007(HOWEVER CONCESSIONAL CUSTOMS DUTY AND ADDITIONAL CUSTOMS DUTY AS APPLICABLE WIIL BE CONSIDERED. | | | | | |
| UNDER TAKING: THE OFFER MADE IS IN STRICT COMPLAINCE WITH THE QUALITY AND OTHER TECHNICAL REQUIREMENT MENTIONED IN SECTION IV T | | | | | |

**Section IV T -Technical Specification**

**CENTRAL POWER RESEARCH INSTITUTE, BHOPAL Web: www.cpri.in, www.tenderwizard.com/CPRI**

**Tender Enquiry No : STDS/12-01/2022-23/PUR/RTL-NK-32**

**Description of the Equipment/Goods/Services : Supply Installation, Commissioning and Testing of Three Numbers Single Phase Current Limiting Reactor Banks.**

**Note : 1) The technical bid submitted in other than this format is liable to be rejected.**

**2) All blue fields are mandatorily to be filled in.**

| | |
|---|---|
| **Name of the Vendor** | |
| **Quotation Number and Date** | |

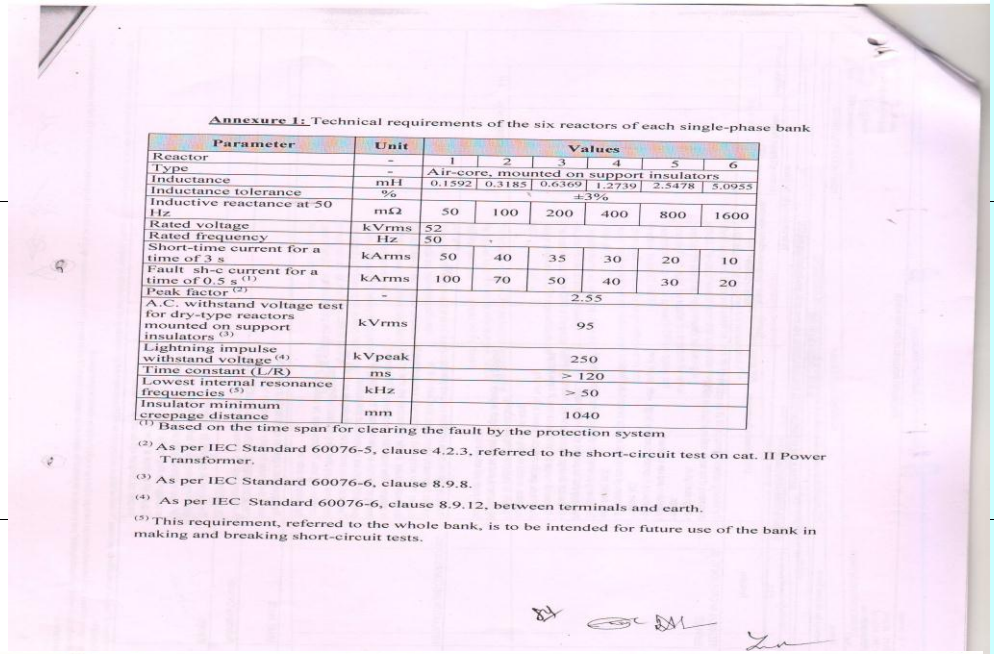
| Sl.No. | Parameters | CPRI Specification / Requirements | Qty | To be completed by the Bidder | | |
|---|---|---|---|---|---|---|
| | | | | Detials of guaranteed technical parameters offered by the bidder | Guaranteed Technical Particulars (GTP) | Specify deviations/ Remarks if any |
| 1 | Place where equipment/service to be supplied/ provided | Regional Test Laboratory (RTL), CPRI, Nasik | | | | |
| 2 | Scope | The scope covers Design, supply, Installation, commissioning and Testing of three Single Phase Current Limiting Reactor Banks X(52) at CPRI, Nasik. For the Current Control Reactor banks shall comply the specification covered in this documents. The value of reactance are as per the Annexure 1 & 2. | 3 Nos. | | | |
| 3 | Application | Current Limiting Reactor Banks shall be used for current control during short circuit testing of Distribution and Power Transformers, Instrument Transformers, Switchgears and other equipments as per relevant product standards. | | | | |
| 4 | Prequalification requirement | Similar type of Current Limiting Reactor Banks of the same OEM offered in this bid shall have been supplied and shall be in successful operation at minimum two short-circuit test laboratories. Performance certificate of the same shall be submitted with the bid. | | | | |
| 5 | Prebid meeting requirement | The bidder may write to Purchase Section, CPRI, Bhopal for clarification if required. | | | | |
| 6 | Ambient temperature | 5 °C up to 50 °C | | | | |
| 7 | Altitude | 986 m above MSL | | | | |
| 8 | Relative humidity | 10 to 95 % (non-condensing) | | | | |
| 9 | Seismic zone | suitable for Zone 3 | | | | |
| 10 | Installation | Indoor | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 11 | Reference Standards | 1) IEC Standard 60076-6: Power transformers – Part 6: reactors,<br>2) IEC Standard 62231: Composite station post insulators for substations with a.c. voltages greater than 1000 V up to 245 kV - Definitions, test methods and acceptance criteria,<br>3) IEC Standard 60273: Characteristics of indoor and outdoor post insulators for system with nominal voltages greater than 1000 V,<br>4) IEEE Standard 605: Guide for design of substations rigid bus structures,<br>5) IEC Standard 60076-5: Power transformers – Part 5: Ability to withstand short circuit | | | | |
| 12 | Functional Characteristics | The 3 single-phase reactor banks X(52) are used to control the test current in performing the following tests in the MV Test Cell:<br>□ ability to withstand short-circuit test,<br>□ short-time withstand current test, Internal Arc Test<br>The reactors shall be mounted on stationary frames. The reactors can be interconnected in series and/or in parallel, by means of bus bar manually. | | | | |
| 13 | Make | To be furnished by bidder | | | | |
| 14 | Type | Air-core, mounted on support insulators | | | | |
| 15 | Design requirements of current limiting reactors banks | The MV Current Limiting reactors banks have to be designed, manufactured and tested in accordance with the best international engineering practices under stringent quality control to meet the requirement stipulated in the technical specifications. Adequate safety margin with respect to thermal, mechanical, dielectric and electrical stress etc. are to be considered during design, selection of raw material, manufacturing process. The manufacturer shall take all necessary measures to ensure the safety of the test operator during the execution of the tests. Each single-phase bank consists of 6 dry type reactors having the reactance values given below. Inductive reactance in the range from 25.4 mΩ up to 3.15 Ω with all possible series and parallel combinations. The selection of various series parallel combination with current rating shall be furnished.<br>The reactors shall be intended only for intermittent duty and they will be assigned no rated continuous current. The expected frequency of short-circuit application is at least 1000 tests per year.Technical requirements of the six reactors of each single-phase bank are given in Annexure -1 attached. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | The features and the construction details of the components of the Reactor banks | | | | | |
| 16.1 | Reactors Duty cycle: | The Reactors should be designed so as to withstand the following basic duty cycle during its operation in the laboratory and repeated indefinitely.<br>□ 1 number, totally asymmetrical short-time withstand current test with the short-time current listed in Annexure 1 , with duration 3 s, repeatable every 30 minutes.<br>The above item defines the maximum allowed $I^2t$ for each reactor. Any other duty cycle at current not exceeding the short-time current shall be allowed provided that the let-through specific energy of the duty cycle does not exceed the maximum I2t .<br>Moreover, considering possible future use of the banks in making and breaking short-circuit tests, for each reactor it has to be taken into account the following duty cycle:<br>□ 3 numbers, totally asymmetrical short-time withstand current listed in Annexure 1 , each lasting 0.15 s and with an interval between subsequent tests equal to 3 min; a pause of 30 min shall be followed. | | | | |
| 16.2 | Windings | The conductors shall be of either aluminium or electrolytic grade copper free from scales and burrs.<br>The insulation of reactor windings and connections shall be free from insulating compounds which are liable to soften, ooze out, shrink or collapse during service.<br>The coils would be made up, shaped and braced to provide for expansion and contraction due to temperature changes.<br>The conductor shall be transposed at sufficient intervals in order to minimize eddy currents and to equalize the distribution of currents and temperature along the winding.<br>The windings shall be designed to withstand the dielectric tests specified. The type of winding used shall be of time tested and in successful operation for at least 5 year in similar voltage application at the time of design review. An analysis shall be made of the transient voltage distribution in the windings, and the clearances used to withstand the various voltages.<br>All winding insulation shall be processed to ensure that there will be no detrimental shrinkage after assembly. All windings shall be pre-sized before being clamped.<br>Windings shall be provided with clamping arrangements which will distribute the clamping forces evenly over the ends of the winding.<br>The bracing of the windings and connections shall be such that these parts shall safely withstand the cumulative effects of stresses which may occur during handling, transportation, installation and service including fault current flow. | | | | |
| 16.3 | Terminals | Terminals shall be designed to allow for repeatable and safe connection under site conditions to ensure the integrity of the reactor in service.<br>Allowances shall be made on the winding ends for accommodating tolerances on the axial dimensions<br>In particular, rotation or straining of insulated connections shall be avoided during the fastening of removable connecting bars (intended to connect each reactor with the subsequent reactor) to the terminals.<br>The mating faces of bolted connections shall be appropriately finished and prepared for achieving good long lasting, electrically stable and effective contacts.<br>One earthing pad (complete with bolts, plain and spring washers) suitable for connection to the grounding flat shall be provided at position close to earth of the supporting | | | | |
| 16.4 | Supporting structure | Each reactor shall be provided with removable lifting eyes: four symmetrically placed lifting eyed shall be provided so that it will be possible to lift the complete reactor without structural damage to any part of the reactor. The factor of safety at any one point shall not be less than 2. The lifting eye shall be so arranged and located so as to be accessible for use when the reactor is loaded on the transport vehicle. | | | | |
| 16.5 | Rating plate | Each reactor shall be provided with a rating plate of weatherproof material, fitted in a visible position, showing in all cases the appropriate items indicated below.<br>The entries on the plate shall be indelibly marked (for example by etching, engraving or stamping).<br>• type of reactor and number of reactors<br>• indoor application;<br>• reference to the IEC Standard 60076-6,<br>• manufacturer's name,<br>• manufacturer's serial number,<br>• year of manufacture,<br>• insulation level(s),<br>• rated frequency,<br>• highest voltage for equipment,<br>• rated short-time current (kArms and kApeak) and duration,<br>• inductance/impedance value, | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 17 | Bank frame | The bank frame consists of lengths of busbars and supporting / distancing insulators. The technical requirements for these components of the three single-phase MV Current Limiting Reactor banks are are given in Annexure -2 attached. | | | | |
| 17.1 | Busbar segment | All busbars shall be made of electrolytic copper 99,95% or high-strength aluminium alloy.<br>Rigid conductors shall preferably be flat bars, cylinders and round tubes. Other beams or special profiles can be proposed, being their use justified by a sensible improvement in mechanical/ thermal characteristics.<br>Flexible conductors shall be stranded wires, bundle disposed when necessary.<br>Rigid conductors can be bent, up to 45°. In case higher angles required, special clamps shall be used.<br>The surface of conductors shall be smooth and free from scratch, rust, crack and any other defects.<br>Joints and clamps shall be capable of withstanding relevant thermal and mechanical stresses.<br>Provisions to keep the contact surface resistance for bolted connections and clamps as low as possible shall be considered. Bolts material shall be selected in such a way that the thermal expansion of bolts and busbars does not affect the efficiency of the contact surface. | | | | |
| 17.2 | Supporting / distancing insulators | Supporting / distancing insulators shall be capable of statically withstanding the total busbar loading and shall have sufficient mechanical strength to withstand the short circuit forces, under dynamic conditions.<br>They shall also withstand dielectric stresses following both the normal operating conditions and the fault events. Insulators can be made of porcelain or composite materials, depending on the type of installation (depending on the size of the reactors) | | | | |
| 18 | Tests | The type, routine, special and acceptance tests to be performed on the MV Current Limiting Reactor banks | | | | |
| 18.1 | Type tests | The supplier shall submit reports of the below type tests performed on similar equipment fully representative of the offered equipment. Bidder shall submit the Tests reports along with bid. The date of issue of report shall not be older than ten years from the date of techno-commercial bid opening. In absence of such report, the supplier has to perform the type tests on the reactors to be supplied to CPRI on bidders cost.<br>**Reactors :**As per IEC 60076-6,<br>• Lightning impulse test for current-limiting reactors.<br>**Busbar segment**: As per IEC 62271-200:<br>• dielectric tests (lightning impulse and power frequency voltage tests),<br>• measurement of the resistance,<br>• short-time withstand current and peak withstand current tests.<br>**Supporting / distancing insulators:** As per IEC Standard 62231:<br>• dry lightning impulse voltage test,<br>• Power frequency withstand voltage,<br>• mechanical tests. | | | | |
| 18.2 | Routine tests | The supplier shall inform CPRI of the Routine Tests program 60 days in advance and shall allow CPRI representatives to witness them.<br>1. Reactors: As per IEC 60076-6:<br>• measurement of winding resistance,<br>• measurement of impedance/inductance,<br>• winding overvoltage test for current limiting reactors.<br>2. Busbar segment : As per IEC Standard 62271-200 :<br>• power frequency voltage test,<br>• measurement of the resistance,<br>• design and visual checks.<br>3. Supporting / distancing insulators: As per IEC 62231:<br>• visual examination,<br>• tensile load test | | | | |
| 18.3 | Special tests | The supplier shall submit reports of the below special tests performed on similar equipment fully representative of the offered equipment. Bidder shall submit the Tests reports along with bid. The date of issue of report shall not be older than ten years from the date of techno-commercial bid opening. In absence of such report, the supplier has to perform the special tests on the reactors to be supplied to CPRI on bidders cost.<br>Reactors : As per IEC 60076-6 :<br>• Short-circuit current test for current limiting reactors both short-time current and fault short-circuit current listed in Annexure-1.<br>• Separate source a.c. withstand voltage test for dry-type reactors mounted on support insulators. The supplier shall inform CPRI of the special Tests program 60 days in advance and CPRI representatives may witness the test. | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18.4 | Site Acceptance test | The Acceptance Tests at CPRI are aimed to demonstrate that the supplied equipment was correctly assembled, fulfils its technical specification and complies with the relevant standards.<br>The supplier shall make available all the reports concerning the type, special and routine tests performed.<br>The Acceptance Tests shall be considered successfully carried out if the following items are verified: Measurement of reactance/inductance. and<br>• check of the content of delivery for completeness for proper condition of all components and auxiliary devices (User manual, technical documentation, contract drawings),<br>check of weights, dimensions, fitting and accessories, material, finish and workmanship. | | | | | |
| 19 | TECHNICAL INFORMATION TO BE SUPPLIED | The following technical information for all the equipment / components of the supply shall be included in the bid :<br>• design description,<br>• ratings,<br>• installation and use constraints,<br>• dimensions in operation conditions (length, width, height) [mm],<br>• masses [kg],<br>• dimensions of the heaviest piece for transportation (length, width, height) [mm],<br>The following documents for all the equipment / components of the supply shall be provided along with the supply:<br>• Mechanical drawings, electrical schemes, installation drawings.<br>• Operational manual and Maintenance manual: these manuals shall include specific instruction relevant to the handling, installation, troubles shooting and servicing.<br>• Reports on inspection during manufacturing.<br>All documents shall be issued in English language and provided both on paper and software copy. | | | | | |
| 20 | INSTALLATION AND COMMISSIONING | The supply shall include the installation and commissioning activities performed by a team of specialized workers of the Supplier. These activities will be performed in a period defined by the Client/Purchaser, in order to cooradinate with other activities of laboratory. After successful commissioning at CPRI laboratory, training on operation and maintenance of the reactors shall be given to CPRI officials by experienced professionals. Tests shall be demonstrated by conducting test on 10 MVA test transformer or any other rating as offered by CPRI during commissioning tests. This depends on the availability of rating of the transformer under test. | | | | | |
| 21 | SPARE PARTS | The supplier shall suggest an appropriate list of spare parts as well as shall provide the equipment necessary for the maintenance operation not requiring his intervention. | | | | | |
| 22 | Performance Certificate | Performance certificate of similar type of reacotrs from the user to be submitted. | | | | | |
| 23 | Warranty | One Year form the date of Installation and Commissioning.<br>The supplier has to give undertaking regarding post warranty technical support, service and supply of spare parts for successful operation of the equipment's for ten year. | | | | | |



**Annexure 1:** Technical requirements of the six reactors of each single-phase bank

| Parameter | Unit | Values | | | | | |
|---|---|---|---|---|---|---|---|
| Reactor | - | 1 | 2 | 3 | 4 | 5 | 6 |
| Type | - | Air-core, mounted on support insulators | | | | | |
| Inductance | mH | 0.1592 | 0.3185 | 0.6369 | 1.2739 | 2.5478 | 5.0955 |
| Inductance tolerance | % | ±3% | | | | | |
| Inductive reactance at 50 Hz | mΩ | 50 | 100 | 200 | 400 | 800 | 1600 |
| Rated voltage | kVrms | 52 | | | | | |
| Rated frequency | Hz | 50 | | | | | |
| Short-time current for a time of 3 s | kArms | 50 | 40 | 35 | 30 | 20 | 10 |
| Fault sh-c current for a time of 0.5 s (1) | kArms | 100 | 70 | 50 | 40 | 30 | 20 |
| Peak factor (2) | - | 2.55 | | | | | |
| A.C. withstand voltage test for dry-type reactors mounted on support insulators (3) | kVrms | 95 | | | | | |
| Lightning impulse withstand voltage (4) | kVpeak | 250 | | | | | |
| Time constant (L/R) | ms | > 120 | | | | | |
| Lowest internal resonance frequencies (5) | kHz | > 50 | | | | | |
| Insulator minimum creepage distance | mm | 1040 | | | | | |

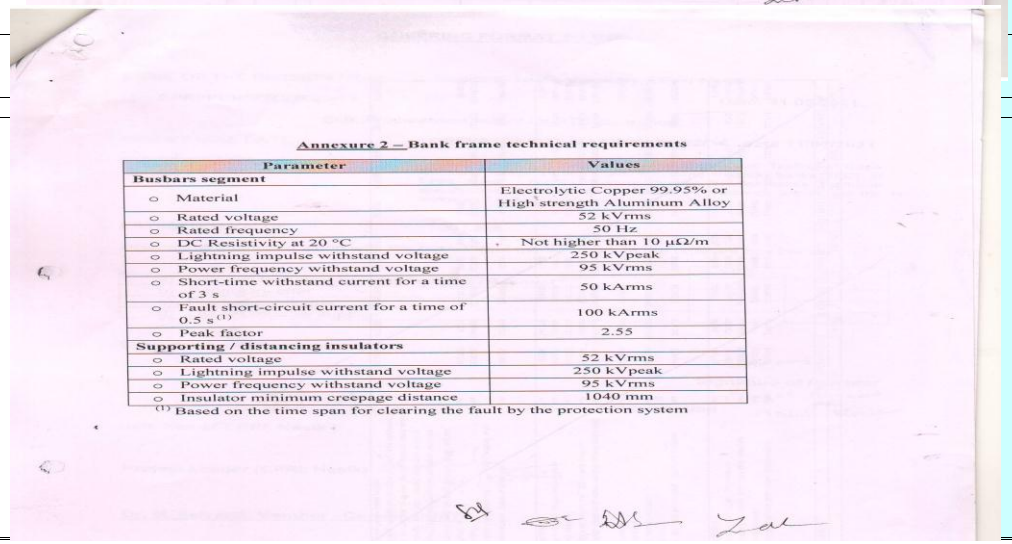
(1) Based on the time span for clearing the fault by the protection system

(2) As per IEC Standard 60076-5, clause 4.2.3, referred to the short-circuit test on cat. II Power Transformer.

(3) As per IEC Standard 60076-6, clause 8.9.8.

(4) As per IEC Standard 60076-6, clause 8.9.12, between terminals and earth.

(5) This requirement, referred to the whole bank, is to be intended for future use of the bank in making and breaking short-circuit tests.



**Annexure 2 – Bank frame technical requirements**

| Parameter | Values |
|---|---|
| **Busbars segment** | |
| ○ Material | Electrolytic Copper 99.95% or High strength Aluminum Alloy |
| ○ Rated voltage | 52 kVrms |
| ○ Rated frequency | 50 Hz |
| ○ DC Resistivity at 20 °C | Not higher than 10 μΩ/m |
| ○ Lightning impulse withstand voltage | 250 kVpeak |
| ○ Power frequency withstand voltage | 95 kVrms |
| ○ Short-time withstand current for a time of 3 s | 50 kArms |
| ○ Fault short-circuit current for a time of 0.5 s (1) | 100 kArms |
| ○ Peak factor | 2.55 |
| **Supporting / distancing insulators** | |
| ○ Rated voltage | 52 kVrms |
| ○ Lightning impulse withstand voltage | 250 kVpeak |
| ○ Power frequency withstand voltage | 95 kVrms |
| ○ Insulator minimum creepage distance | 1040 mm |

(1) Based on the time span for clearing the fault by the protection system