REQUEST FOR QUOTATION

MMI:PU:RF:003

BHARAT HEAVY ELECTRICALS LIMITED
Electronics Division
PB No. 2606, Mysore Road Bangalore - 560026
INDIA

RFQ NUMBER: ANK0000253

RFQ DATE : 29.05.2020

Due Date/Day: 22.06.2020 MON
Time : 13:00 HRS
Tender Box : Reception Area
Opening Venue:
NEW ENGG. BLDG

(address for communication) :

(for all correspondence)
Purchase Executive : Ankita Reja
Phone : 08025146134
Fax :
E-mail: ankitareja@bhel.in

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	DS0830006529 110 KVA water cooled transformer * HSN/SAC : 9032 Test Certificate 110 KVA, 430V/240V, indirect water cooled transformer for marine/naval applications.	2	NO	2	27.07.2020

Total Number of Items - 1

1.
2.

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES:
1. This RFQ is governed by:
a) INSTRUCTIONS TO BIDDERS/SELLERS and GENERAL CONDITIONS OF CONTRACT FOR PURCHASE available at **http://edn.bhel.com (RFQ-PO Terms & Conditions)**
b) Any other specific Terms and Conditions mentioned.
2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same.
* The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

Ankita Reja
Contrl Eqpment - ESD

RFQ No. ANK0000253 - SPECIAL INSTRUCTIONS

1. The quotation has to be submitted in TWO parts .
   i.PQC, Techno-commercial unpriced bid AND
   ii.Price bid
   Separately against this RFQ. The PQC and Techno-commercial bids will be opened on the due date specified and shall be evaluated such that all technical and commercial issues are frozen. The date and time of opening of price bids will be intimated to the bidders whose techno-commercial bids are accepted
1. Please drop your offer before due date & time in the tender box named **"MONDAY"** kept at the reception of BHEL-ESD, Electronic city, Bangalore.
2. QUOTATIONS SHOULD BE SENT TO:
   BHEL-ESD, PLOT NO. #98, ELECTRONIC CITY PHASE 1, HOSUR ROAD, BANGALORE- 560100.
3. Offers by e-mail are also accepted. Offers by email should contain separate files for techno-commercial,PQC and price bids. The offers by Email shall be sent to Email ID defnesdmm@bhel.in with the subject ANK0000253_22.06.2020_Monday_Water cooled Transformer .
4. Tender opening Time is 01:30 PM on the tender due date, Place: Tender opening room @ BHEL-ESD, Electronic city Phase-1, Bangalore.
5. Please indicate the price both in figures and words clearly.
6. Please quote Price Bid as Per Price Bid Format Enclosed.
7. Please Submit Unpriced Bid (Copy Of Price Bid After Hiding Price) Along With Technical Bid.
8. Any deviations from or additions to the ITB & GCC - Instructions to bidders & GCC - Instructions to bidders require BHEL's express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
9. Non acceptance / deviations if any to the terms and conditions of the RFQ shall be clearly and explicitly mentioned in the offer, otherwise it will be treated that all the terms and conditions of the RFQ are accepted by the bidder in total.
10. Delivery Period- Within 10 weeks from the date of Drawing Approval and drawings to be submitted within 01 week from the date of PO.
11. Items should be delivered to
    BHEL-ESD,Plot #98,
    Electronic City Phase 1,
    Hosur Road,Bangalore- 560100.

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PRE-QUALIFICATION CRITERIA FOR 110 KVA, DRY TYPE WATER COOLED TRANSFORMER

REVISION 00	APPROVED		
	PREPARED	ISSUED	DATE
			29-05-20

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REVISION HISTORY SHEET

REV NO	DATE	NATURE OF CHANGE	REASON	PREPARED BY	APPROVED BY
00	29-05-20	First Issue	-	SIDDHARTH KRISHNA	P.BARADHI

Pre-Qualification Criteria for 110 KVA, Dry Type Water Cooled Transformer (BHEL P/N: DS0830006529)

1.0 Pre-Qualification Criteria (PQC)

The supplier shall necessarily meet the following conditions.

Sl. No	Particulars	Supplier's Confirmation (Y/N)
1	The vendor shall be an Original Equipment Manufacturer (OEM) or OEM's authorized dealers/representative. *A latest valid authorization letter from OEM giving full contact details shall be furnished along with offer (by dealer/ representative).*	
2	Offer shall be for new equipment and not for any refurbished or used equipment. All the parts used in the equipment shall be new and not used / refurbished ones. *A declaration to that effect to be furnished along with offer*.	
3	The vendor or vendor's authorized service representatives shall have trained engineers for service for the offered equipment and shall be in a position to provide prompt after sales service. This service network shall necessarily be available in India. *A declaration to that effect to be furnished along with offer*.	

Note:

1) The Pre-Qualification Criteria (PQC) are mandatory requirements and the technical bid will be considered only if all the above PQC are met.

2) All Supporting documents related to PQC shall be enclosed in techno-commercial offer.

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TECHNICAL SPECIFICATION FOR 110 KVA, DRY TYPE WATER COOLED TRANSFORMER

Project: 3.5MW TA-LCP DMDE

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SPECIFICATION FOR 110 kVA DRY TYPE TRANSFORMER

01. GENERAL:

This specification covers the requirement of 110 kVA transformer. The transformer shall be suitable for mounting inside an enclosure. Transformer will be used as an excitation transformer at the input of a controlled thyristor based Rectifier Bridge to provide necessary excitation to field winding of a turbo-alternator which will be mounted onboard a submarine.
Offer shall be submitted in two parts:
Part A: Techno-commercial Bid (without pricing): Unpriced bid to be enclosed in the technical bid. List of type tests and the place/organization where these tests shall be performed shall be clearly indicated in the technical bid.
Part B: Price bid (Type test charges if any shall be quoted separately in the price bid)
Note: for arriving at the lowest bid price, the basic price and cost of type test charges will be considered. Type test is applicable for the first unit only. Type test charges will be paid after successful completion of the tests & acceptance of test reports by BHEL.

02. TECHNICAL SPECIFICATION:

RATING:	110 KVA
NO. OF WINDING:	2 Nos
NO OF PHASES:	3
PRIMARY:	110 kVA, 430 V AC, 3 Phase, 50Hz, Delta connected
SECONDARY:	110 kVA, 240 V AC, 3 phase, 50Hz, Star connected
FREQUENCY:	50 Hz +/- 5%, combined voltage & frequency variation is 10% (Absolute sum)
VECTOR GROUP:	Dyn5
TYPE:	Vacuum Pressure Impregnated Dry type transformer
INSULATION LEVEL:	Rated short duration withstand voltage 3 kV RMS as per IS -11171
Overload capacity:	10 % for 1 hour continuous for every 12 hours 25 % for 60 seconds 50 % for 30 seconds 100% for 10 seconds
SHORT CIRCUIT LEVEL	5 kA RMS for 3 secs (Vendors during detail design stage will provide detail calculations as per IS 2026 & furnish the same to Engg for review for approval)
Primary Taps:	+10%, +5%, 0, -5%, -10% (110 KVA at all taps)

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Core — Should be of either CRGO or amorphous

Insulation class — F (Epoxy encapsulated) or class H(VPI with varnish)

COOLING: — Indirect Water Cooling

NO LOAD CURRENT AT RATED VOLTAGE — Less than 5% of rated current

IMPEDANCE: — Primary - Secondary: 4% on principal Tap (minimum)

TOLERANCE ON %IMPEDANCE FOR DIFFERENT PAIRS OF WINDINGS AT NORMAL & EXTREME TAPS: — As per IS 2026

VOLTAGE/FREQ RATIO: — Shall be designed for 1.1 continuous

NO LOAD LOSS & LOAD LOSS:
(Guaranteed) No load loss (or Iron Loss) expected below 0.40 kW & Copper loss (or Full Load loss) expected below 2kW. However, guaranteed maximum values without any positive tolerance shall be given with the offer (Refer clause no. 13: Data Sheet to be submitted along with the offer. Ref temp as per IS11171-1985

TERMINAL ARRANGEMENT: All terminals to be provided with fasteners (non-rusting). Epoxy bushings shall be provided.

Terminals and holes should be suitable for cable termination of adequate size as per given rating.

TEMPERATURE RISE:

(a) DM water inlet temp : 32°C

(b) Maximum average . Temperature rise of DM water : 10°C by Resistance method

(c) DM Water flow required : Appropriate flow to be indicated

(d) DM water pressure : Appropriate pressure to be indicated

(e) Temperature rise of core, Metallic parts and adjacent materials : The temperature shall in no case reach a value that will damage the core itself, other parts or adjacent materials.

(f) Max.temperature rise : hot spot at any point to be indicated

RELATIVE HUMIDITY: — 98%

WINDING MATERIAL: — Electrolytic grade copper

NOISE: — Less than 60 db.

STANDARDS: — Generally as per IS 11171-1985 & IS 2026-1977 following Latest amendments

TEMPERATURE MEASUREMENT	RTDs for winding (R,Y,B phase) & core temperature Measurement. Temp Switch for winding (R,Y,B phase) & core temperature Alarm (high temp) & trip (very high) contact, to be provided
Harmonics	Shall be designed to suppress harmonics, especially 3rd.
Limiting Dimension (mm)	800(L) X 700(H) X 400(D) (without enclosure)
Marine/Naval application	Transformer should be of rugged construction, suitable for marine/naval applications. Product should be of high reliability.
SHOCK LEVELS	Should withstand shock of the levels of 5g or better for 11 msec pulse.
EMI/EMC	EMI/EMC as per MIL standard 461E to be ensured. Preferably with Mu-metal shielding.

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03 . IMPORTANT NOTES:

Following points to be taken care by the supplier during design and manufacturing of transformer.

a) It should be suitable for marine/naval applications.

b) Temperature rise & terminal marking of the transformer shall be as per IS 11171:1985. SC withstand ability of transformer shall be as per IS 2026:1977.

c) 2 Nos earthing terminals shall be provided at the bottom on opposite sides of the transformer for earthing of transformer enclosure (M20 bolts).

d) All hardware (nuts & bolts) used for transformer assembly shall be hot dip galvanized or cadmium plated or zinc passivated.

e) Transformer core shall be earthed to main frame of the enclosure at two independent points.

f) The construction of transformer shall be rugged enough to withstand frequent transit & vibration.

g) Transformer shall be provided with suitable rating plate, weather proof diagram plate & lifting lugs. Supplier to ensure that lifting lugs have sufficient safety factor and high tensile strength suitable to take transformer load.

h) Cable terminal identification label (1U, 1V, 1W and 2U, 2V, 2W) of suitable size to be provided for identification.

i) Only tinned copper or phosphor bronze washer / spacer to be used. Also phosphor bronze screws shall be used, wherever required.

j) Only epoxy insulators to be used.

k) Voltage/ freq ratio shall be designed for 1.1 continuous.

l) Electrostatic shield/Metallic Shield to be provided between primary and secondary windings

m) Transformer will be supplied without enclosure, however mounting arrangement necessary to mount in an enclosure will be provided. Provision should be given on horizontal and vertical axis for mounting of transformer into enclosure. Transformer will include all necessary cooling water arrangement and accessories.

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04. RATING PLATE:

Stainless steel / Anodised aluminium rating plate shall have information as per IS 11171-1985. Following minimum information to be provided necessarily on the rating plate.

a) Transformer type

b) IS followed

c) Manufacturers name

d) Manufacturers Sl No for the transformer

e) Year of manufacturing

f) Class of insulation

g) Max allowable temperature rise

h) No of Phases

i) Rated Frequency

j) Rated Voltage

k) Rated current

l) Connection symbol

m) Vector group

n) Type of cooling

o) Total weight

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05. TESTS TO BE CONDUCTED AT SUPPLIER'S WORKSPACE

5.1Routine Tests:

a) Measurement of winding resistance in HV side and LV side

b) Measurement of voltage ratio and checking of voltage vector relationship.

c) Measurement of impedance, short circuit impedance & load losses.

d) Measurement of no load loss & no load current.

e) Separate source voltage with stand test

f) Induced voltage with stand test

g) Measurement of IR

h) Core and Bolt test

5.2 Type Tests:

5.2.1 Temeprature Rise Test(with water cooling arrangement)

5.2.2 Measurement of acoustic sound level under factory ambient

06. TEST PROTOCOL

Supplier shall submit test protocol and standard testing procedure (or instructions) for Routine & Type tests along with techno-commercial offer. List of tests are as per clause 5.0 of this specification.

07. PRE-SHIPMENT INSPECTION

Pre-shipment inspection will be carried out by BHEL engineer as per the approved test protocol. BHEL engineers will witness Routine & Type tests before dispatch.

08. MECHANICAL OULTINE:

Supplier to prepare detailed drawings (including mounting arrangement) & submit to BHEL for approval before commencing manufacturing process.

09.WARRANTY:

Supplier shall provide the guarantee / warrantee for the offered transformer for 12 months from the date of commissioning or 18 months from the date of supply, whichever is earlier.
However supply will undertake to provide long term support for the product supplied.

10. PACKING

The Transformer should be suitably water proof packed for transportation to BHEL ESD Bangalore.

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11. DOCUMENTATION

11.1 Information required along with techno commercial offer

11.1.1. Supplier shall furnish clause wise confirmation/comments to the technical specification in the typical format given below. Deviation, if any, shall be clearly brought out indicating the clause number, original specification, deviation sought with proper technical backup (catalogue, technical brochure, international standards, calculations etc.)
11.1.2. If no deviations required, then supplier shall furnish certificate indicating "NO DEVIATION REQUESTED" and their full compliance with all the technical requirements of this specification no.
11.1.3. Supplier shall take a copy of this specification and sign on each page and submit the signed copy along with offer.
11.1.4. Supplier shall furnish winding material, winding resistance, winding cross section.
11.1.5. Supplier shall furnish the type of core used along with technical details of core.
11.1.6. Filled up data sheet as per Clause 13 of the specification

11.2. Information required after the placement of order
11.2.1. Detailed dimensional drawing/GA for BHEL approval
11.2.2. Cooling system arrangement drawing
11.2.2. Test protocol for BHEL approval.

11.3. Information required along with material supply.
11.3.1. Two sets of Test certificates.
11.3.2. BHEL engineer witnessed Pre inspection report.

12. ACCEPTANCE

12.1. Dimensions as per approved drawing
12.2. Routine test certificate as per specification
12.3. Type test certificate and inspection as per specification

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ANNEXURE-A

Date:

Commercial Terms Disscussion For ANK0000253(Water Cooled Transformer)

Sl. No.	BHEL Terms	Complied (Yes/No)	Remarks
1	**Payment Terms-For quotes in INR** 100% within 45 days after receipt and acceptance of material		
2	**Payment Terms-For quotes other than INR** 100% against sight draft with 45 days credit on negotiation of complete set of documents.		
3	**Penalty** (0.5% per week on the basic value of the undelivered quantity max upto 10%)		
4	**Delivery time** Within 10 weeks from the date of Drawing Approval and drawings to be submitted within 01 week from the date of PO		
5	**Price Firm** (PVC not acceptable- Prices should be firm till execution of order)		
6	**Packing And Forwarding By Supplier**		
7	**For quotes in INR**-Free Door Delivery at BHEL ESD, Electronic City		
8	**For quotes other than INR**-FCA International Gateway Airport (For shipment by air, Refer Annexure II for details) OR CIF, ICD Bangalore. Port of discharge either Mumbai/Chennai (for shipment by sea)		
9	**Offer Validity** (90 days from the tender opening)		
10	**Taxes & duties to be mentioned in offer (Applicable GST%)**		
11	**HSN Code**		
12	**Documents to be provided at the time of delivery of the item.Confirmation for the same is required in technical offer.**		
a	Test Certificate		
13	**Documents to be submitted along with the Technical offer: Datasheets/Catalogs and Distributor's Authorisation Certificate**		

Signature & Seal

PRICE BID						
Price bid - ANK0000253						
Sl. No.	**Description**	**Quantity (NO)**	**Currency**	**Unit Price**	**Total Price**	**Remarks**
1	DS0830006529 110 KVA Water Cooled Transformer	2				
2	GST (if applicable indicating %)	2				
A	**Total cost including equipment and applicable taxes (in figures)**	2				
	Total cost including equipment and applicable taxes (in words)					

Note: 1. Type test charges if any shall be quoted separately in the price bid else it shall be treated as free of cost to BHEL.
2. Kindly mention the GST rate applicable on Type Test Charges (if any).
3.For arriving at the lowest bid price, the basic price and cost of type test charges will be considered. Type test is applicable for the first unit only. Type test charges will be paid after successful completion of the tests & acceptance of test reports by BHEL.
Type Test Charges :
GST % on Type Test Charges
Total of Type Test Charges including GST: