

**JODHPUR VIDYUT VITARAN NIGAM LIMITED**  
**MATERIAL MANAGEMENT & CONTRACT**  
**NEW POWER HOUSE, INDUSTRIAL AREA, JODHPUR-342003**  
**Phone: (0291)2742223/Fax: (0291) 2746539/E-Mail-semmcjdvvn@gmail.com**

**TENDER SPECIFICATION NO. JdVVNL/SE (MM&C)/EIAI/TN-1789**

**Tenders** are hereby invited in e-tender system for Purchase of 11/0.433 KV, **STAR-1, EEL-1**, Distribution Transformers of **160 KVA** rating.

Tenders are to be submitted online in electronic format on website <http://eproc.rajasthan.gov.in>. The details are as under-

S. No.	Name of Item	Quantity (Approx.)
1.	<b>160 KVA, 11/0.433 KV, STAR-1, ENERGY EFFICIENCY LEVEL-I, 3 PHASE, ALUMINIUM WOUND, DISTRIBUTION TRANSFORMERS</b>	<b>275 Nos.</b>

A	NIT No.	TN-1789
B	Cost of tender specifications	Rs. 2500.00 + GST@18% = Rs. 2,950.00 <b>(Non -Refundable)</b> (Rs. Two Thousand Nine Hundred & Fifty Only)
	Cost of tender specifications (For MSME UNITS of Rajasthan)	Rs. 1250.00 + GST@18% = Rs. 1,475.00 <b>(Non -Refundable)</b> (Rs. One Thousand Four Hundred & Seventy Five Only)
C	Processing fee of RISL	<b>Rs. 1000.00 (One Thousand Only) (Non -Refundable)</b>
D	<b>Estimated Tender Value</b>	<b>Rs. 5,65,55,950.00</b>
E	Bid Security to be deposited with the tender	(i) General Bidder: Rs.11,31,119.00 (ii) Sick Unit : Rs. 5,65,560.00 (iii) SSI Units of Rajasthan : Rs. 2,82,780.00*
F	Validity	<b>120 days from the next date of opening of techno-commercial bid.</b>
G	Base date for price variation	<b>01.05.2022 (Irrespective of tender opening date)</b>

**\*In case SSI unit of Rajasthan quotes the less than the tendered quantity, then they are required to furnish Bid security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**

**IMPORTANT DATES**

S.N.	Events	Date & Time	Location
1	Date of downloading of tender specifications	Up to 29.06.2022 (06:00 PM)	<a href="http://www.jdvvn.com">www.jdvvn.com</a> & <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>
2	Deposit of cost of Tender Specifications, Processing fee & Bid Security	Up to 29.06.2022 (3:00 PM)	Office of Sr. A.O (Cash & CPC), JdVVNL , New Power House, Industrial Area, Jodhpur
3	Last Date & time of submission of electronic bid	Up to 30.06.2022 (12:00 PM)	<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>
4	Opening of Technical Bid	30.06.2022 (03:00 PM)	<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>
5	Opening of Price Bid	To be intimated separately to the qualified bidders	<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>

The Micro, Small & Medium Scale Industries of Rajasthan and Sick Industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) shall furnish self attested documentary evidence duly attested by notary to claim the above.

The bid security may be given in the form of banker's cheque or demand draft in favour of Senior Accounts Officer (Cash & CPC), JDVVNL, Jodhpur payable at Jodhpur or bank guarantee, in specified format, of a scheduled bank in favour of Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur up to stipulated date & time, and obtain a receipt/acknowledgement thereof. No other mode of deposit shall be accepted.

**At the time of depositing the Bid security amount in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also furnish self-attested documentary evidence duly attested by Notary of MSME unit of Rajasthan also to submit a letter of quantity offered by them alongwith Appendix-D, declaration by bidder, on non-judicial stamp paper of Rajasthan on Rs.100/- duly attested by Notary public, an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.**

**The Bid Security bank guarantee of requisite amount shall be furnished on non-judicial stamp paper of Rajasthan State.**

**NOTE:-**

- 1. Wherever EMD and Security Bank Guarantee (SBG), are appearing in the ITB, GCC & other Bidding Documents, same is hereby replaced by BID SECURITY as above.**
- 2. VENDOR REGISTRATION: The relaxation/exemption given to the registered vendors of the Nigam in respect of EMD/SBG, wherever appearing in the ITB, GCC & other Bidding documents, are hereby WITHDRAWN.**

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1. Tender documents will be made available on e-Tendering portal <http://www.eproc.rajasthan.gov.in/nicgep/app> . The bidders, in their own interest are requested to read very carefully the tender document before submitting the bid only through online on website <http://www.eproc.rajasthan.gov.in/nicgep/app>. The bidders can download bid upto 6.00 p.m. one day prior to schedule date of opening of respective bid mentioned above

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- documents and submit their bids online upto 12.00 p.m. on schedule date of opening of respective bid mentioned above.
2. Eligible bidders should submit their bid well in advance instead of waiting till last date. JDVVNL will not be responsible for non-submission of Bid due to any website related problems.
  3. The cost of Tender specification **Rs. 2,950.00 or Rs. 1,475.00** (For MSME UNITS of Rajasthan) **(Non-Refundable)** to be paid by Demand Draft/Banker's Cheque in favour of the Sr. Accounts officer (Cash & CPC), JdVVNL, Jodhpur (payable at Jodhpur) and tender processing fees **Rs. 1000/- (Non- Refundable)** shall be payable by Demand Draft/Banker's Cheque in favour of The Managing Director RISL, Jaipur (payable at Jaipur). The bidders are required to deposit all these payments in the office of the SE(MM&C), JdVVNL, Jodhpur up to 3.00 PM one WORKING day prior to schedule date of opening of respective bid otherwise their bids are liable to be rejected. Further, as per notification SO 165 issued by Fin. Dept. dt. 19.11.2015 on reference to RTPP rules, " clause 8(A)" bidding document shall be provided to MSME at 50% of prescribed cost.
  4. The Bid Security amount (as applicable) to be paid by Demand Draft/Banker's Cheque in favour of SR. AO (CASH & CPC), JDVVNL, Jodhpur (payable at Jodhpur) **upto 3.00 p.m. upto one WORKING day prior to schedule date of opening** of respective bid or Bank Guarantee, in specified format, of a scheduled bank in favour of The Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, New Power House, Industrial Area, Jodhpur-342003 **upto 3.00 p.m. upto one WORKING day prior to schedule date of opening** of respective bid **and obtain a receipt / acknowledgement thereof. No other mode of deposit shall be accepted.**
  5. **\*In case SSI unit of Rajasthan quotes the less than the tendered quantity , then they are required to furnish Bid security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**
  6. **Further, while depositing the bid security in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also submit a letter of quantity offered by them alongwith self-attested documentary evidence duly attested by Notary for MSME unit or for sick unit (as applicable) of Rajasthan also to submit a letter of quantity offered by them alongwith Appendix-D, declaration by bidder, on non-judicial stamp paper of Rajasthan on Rs.100/- duly attested by Notary public, an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rajasthan on Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.**
  7. The Bank Guarantee against Bid Security be issued by Nationalized / Scheduled Bank. The same may be accepted after confirmation by issuing Bank. If any Bid Security Bank Guarantee not is proper format / not confirmed by the issuing Bank the same would not be accepted and the bidder would be immediately shorted out from bid process.
  8. The bidders are required to **upload the** receipt of depositing all above payments along with their tender at the relevant place on the scheduled date & time otherwise their bids are liable to be rejected.

- Note :-**
1. All eligible interested bidders are required to get enrolled on e-Tendering portal <http://www.eproc.rajasthan.gov.in/nicgep/app>.
  2. If any difficulty arises, in down downloading/ uploading of tender you may contact in the RISL, Jaipur Rajasthan at following Contact/address.

**Address of RISL: -**

Raj COMP Info Services Limited (RISL)  
 1st Floor, Yojana Bhawan, Tilak Marg, C-Scheme, Jaipur  
 (Rajasthan)  
 Phone: 0141- 5103902, 4031900 Fax: 0141-2228701  
 Web: <http://risl.rajasthan.gov.in>  
 Email: [info.risi@rajasthan.gov.in](mailto:info.risi@rajasthan.gov.in)

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**Phone: (0291)2742223/Fax: (0291) 2746539/E-Mail-[semmcjdvvnl@gmail.com](mailto:semmcjdvvnl@gmail.com)**  
**Corporate Identity Number (CIN)-U40109RJ2000SGC016483 GST No. 08AAACJ8578R1ZJ**

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**TECHNICAL SPECIFICATION**

**FOR**

**11/0.433 KV, 160 KVA**

**11/0.433 KV, ALUMINIUM WOUND THREE STAR RATING DISTRIBUTION**

**TRANSFORMERS OF RATING 160 KVA**

**WITH CRGO (STACK/WOUND)/AMORPHOUS CORE**

**ENERGY EFFICIENT LEVEL-1(STAR-1)**

**AGAINST TN-1789**

**Section - III****TECHNICAL SPECIFICATION FOR SUPPLY OF 160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION NO.JdVVNL/SE (MM&C)/EIAI/TN-.****1. SCOPE:**

This specification covers the design, engineering, manufacture, assembly, inspection and testing at manufacturer's works before supply and delivery at site of Oil immersed, Oil Natural Air Natural (ONAN) outdoor type 11KV/433 V, three phase, 50 Hz, double wound core type, outdoor Type, Aluminium Wound Three Star Rating Distribution Transformers of 160 KVA rating, complete with fittings and accessories for use in Distribution System.

1.1 The Equipment Offered shall be complete with all parts necessary for their effective and trouble free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in the commercial order or not.

1.1.1 It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The dimensional drawings attached with this specification and the notes thereto are generally of illustrative nature. In actual practice, notwithstanding any anomalies, discrepancies, omissions, incompleteness, etc. in these specifications and attached drawings, the design and constructional aspects, including materials and dimensions, will be subject to good engineering practice in conformity with the required quality of the product, and to such tolerances, allowances and requirements for clearances etc. as are necessary by virtue of various stipulation in that respect in the relevant Indian Standards, IEC standards, I.E. Rules, I.E Act and other statutory provisions.

1.2 The Tendered / supplier shall bind him to abide by these considerations to the entire satisfaction of the Purchaser and will be required to adjust such details at no extra cost to the purchaser over and above the tendered rates and prices.

1.3 Tolerances on all the dimensions shall be in accordance with provisions made in the relevant Indian/ IEC standards and in these specifications. Otherwise the same will be governed by good engineering practice in conformity with required quality of the product.

**2. APPLICABLE STANDARDS:**

Unless otherwise modified in the specifications, the Distribution Transformers, including various accessories, shall generally comply with the following Indian Standards

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/ REC Specifications. The standard(s) shall be with latest amendment, if any, from time to time.

**Note:** Wherever ISS are mentioned, equivalent or better International standards are also acceptable

**IS: 1180 (PART-I)/2014: Specifications for outdoor type oil immersed distribution transformers upto and including 2500 KVA, 33 KV Class.**

IS:8603:2008 – Dimensions for porcelain transformers bushings for use in heavily polluted atmospheres 12/17.5 kV, 24 kV and 36kV (Amalgamating IS 8603 (Parts 1,2&3) : 1977

IS:2026 (PART-I,II,III,IV & V)/1981 – Power Transformers

IS:6600/1978 : Guide for loading of oil immersed Transformers

IS:335/1983 : New insulation oils for Transformers

IS:3347 (Part-I/Sec. 1 & 2) : Dimension of Porcelain parts & Metal parts for Transformer bushing (1.1 KV).

IS:3347 (PART-III/Sec-1 & 2) : Dimensions of Porcelain parts & Metal parts for Transformer bushing (17.5 KV).

IS:12444 : Specification for copper wire rod.

IS:7421 : Porcelain Transformer Bushings for low voltage – upto 1 KV.

IS:2099/1986 : Porcelain Transformer bushing for AC volts above 1000 volts.

IS:3639/1966 : Fittings & accessories for Transformers

IS:1866/1978 : Code of practice for maintenance & supervision of insulating oil in service.

IS:5484 : Specifications for Aluminium wire rods.

IS:9335 : Specifications for insulating kraft paper.

IS:1576 : Specifications for solid insulating press Boards for electrical purposes.

IS:6162 : (Part I) : Specification for paper covered Aluminium round conductors

IS:6162 : (Part II) : Specification for paper covered Aluminium rectangular conductors

IS:104 : Ready mixed paint, brushing zinc chromate, painting

IS:649 : Testing of steel sheets and strips for magnetic circuits.

IS:2362 : Determination of water content in oil for porcelain bushing transformers.

IS: 4257: Dimensions for clamping arrangements for bushings.

IS:5561: Electrical Power Connector

IS:6262: Method of test for power factor and di-electric constant of electrical insulating

liquids.

IS:6792: Determination of electrical strength of insulating oil.

IS 6160 : Rectangular conductor for electrical machines.

IS:10028 : Selection, Installation and maintenance of transformers

IS: 3401 : Silicagel

IS: 5/1961: Colour for ready mixed paints

REC Specification No. 2

REC Specification No. 39/1993

CEA Specification, Chapter 4

**Note:- Besides above changes, the technical parameters of the specifications wherever are deviating from the IS:1180 (Part-I/2014) , the same shall be in accordance with IS:1180 (Part-I/2014) and its latest amendments, if any and the changes where the IS:1180 (Part-I/2014) is silent for technical parameters, same shall be applicable as per Discom specification**

Material conforming to other internationally accepted standards, which ensure equal or higher quality than the standards mentioned above would also be acceptable. In case the Bidders who wish to offer material conforming to the other standards, salient points of difference between the standards adopted and the specific standards shall be clearly brought out in relevant schedule. Four copies of such standards with authentic English Translations shall be furnished along with the offer.

### **3. SERVICE CONDITIONS:**

The distribution transformers to be supplied against this specification shall be suitable for satisfactory continuous operation under the following climatic conditions as per IS 2026 (Part- I) latest revision.

i) Peak ambient temperature	: 50°C
ii) Minimum Ambient Temperature in shade	: -5°C
iii) Maximum average ambient temp. in a 24 hours period in shade	: 45°C
iv) Maximum yearly weighted average ambient temperature	: 35°C
v) Maximum temperature attainable by an object exposed to sun	: 60°C
vi) Maximum relative humidity	: 100 %
vii) Average number of thunder storm days per annum	: 40
viii) Average number of rainy days per annum	: 120
ix) Average annual rainfall	: 15-100 cm
x) Number of months of tropical monsoon conditions	: 4 Months
xi) Maximum wind pressure	: 195 Kg/mt <sup>2</sup>
xii) Altitudes	: Not Exceeding 1000 mtrs.

The equipment shall be for use in moderately hot and humid tropical climate, conducive to rust and fungus growth.

### **4. PRINCIPAL PARAMETERS:**

The Transformers shall be suitable for outdoor installation with three phase 50 Hz 11 KV system in which the neutral is effectively earthed and should be suitable for outdoor service as step down transformers under fluctuations in supply voltage upto



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plus 10% to minus (-) 15% permissible under Indian Electricity Act and rules there under.

The transformer shall confirm to the following specific parameters:

i)	Continuous rated capacity	: 160 KVA
ii)	System Voltage ( Max.)	: 12 KV
iii)	Rated HT voltage	: 11 KV
iv)	Rated LT voltage	: 433 V (P-P)/250 V (P-N)
	Line current HV	: 8.4 A
	Line Current LV	: 213.33 A
v)	Frequency	: 50 Hz
vi)	No. pf phases	: THREE
vii)	Primary connection (HT)	: DELTA
viii)	Secondary connection (LT)	: STAR
ix)	Vector Group	: Dyn-11
x)	Percentage impedance at 75°C	: 4.5 % / 5.0% respectively
xi)	Taps (off circuits)	: TAPS ARE NOT REQUIRED.
xii)	Type of cooling	: ON AN
xiii)	Fault level of the system	: 750 MVA

Primary winding shall be DELTA connected and the secondary winding shall be STAR connected (vector symbol Dyn-11), so as to produce a positive displacement of 30° from the primary to the secondary vectors of the same phase. The neutral of the secondary winding shall be brought out to a separate insulated terminal. The transformers shall be **Aluminium** Wound.

The transformers shall be designed and constructed to withstand without damage the thermal and dynamic stresses of an external short circuit. The manufacturer / supplier shall furnish all relevant design data and calculations in support of having fulfilled this requirement as stipulated in IS:2026 (Part-I)

#### **5. NO LOAD VOLTAGE RATIO:**

The No load voltage ratio(s) shall be 11000/433 Volts.

#### **6. THE LOSSES:**

The total Losses at 50% and 100% loading (at rated voltage and frequency and at 75 deg. C.) shall not exceed the value given below:

RATING (KVA)	MAX. LOSSES AT 50% LOADING (WATTS)	MAX. LOSSES AT 100% LOADING (WATTS)
160	<b>670</b>	<b>1950</b>

The above specified loss values are maximum guaranteed **as per Energy Efficient level-1 (Star-1)**, without any positive tolerance. In case the actual loss values exceed the above guaranteed values, the transformers shall be rejected at the risk, cost and responsibility of the supplier.

**7. TEMPERATURE RISE:**

Each transformer shall be capable of operating continuously at its normal rating without exceeding following temperature rise with the above service conditions given in clause-3.

- i) 35 Deg. C in oil by thermometer.
- ii) 40 Deg. C in winding by resistance

**Temperature rise test shall be conducted on Maximum measured total loss (No load at rated excitation+Load loss at max. current tap at 75 oC at 100% loading shall be supplied during temperature rise test at a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accredited Laboratory/ILAC i.e. International Laboratory Accreditation Cooperation (in case of foreign laboratory)).**

**The transformer shall be capable of giving continuous rated output without exceeding the specified temperature rise. Bids not meeting the above limits of temperature rise will be treated as non responsive.**

It must be noted carefully that readings for hot resistance after shut down shall be taken separately for HV & LV windings, which means, after completing the readings for one winding (HV or LV), the transformer shall be connected again and rated current passed for another 60 minutes (min.) and shut down taken again to take hot resistance readings for the remaining winding. This is in line with the requirement of CBIP manual, to ensure proper resistance v/s time curves.

Hot Spot temperature not to exceed 98 Deg. C when calculated over an annual weighted average ambient temperature of 35 Deg. C as per IS:2026 (Part-II Clause 4.9.4).

However, the transformer shall be designed for class 'A' insulation.

**8. UNBALANCE CURRENT:**

The maximum value of unbalance current in transformers shall not exceed 2% of full load current.

**9. IMPEDANCE:**

The percentage impedance at rated current at 75°C shall be 4.5% with (+/-) 10% tolerance.

**10. TAPPINGS:**

No taps are to be provided in these transformers.

**11. FREQUENCY:**

Transformers shall be designed for normal frequency of 50 Hz, but shall be capable of giving the rated output with the variation of plus/minus (+/-) 5% from the rated frequency.

**12. ELECTRICAL CLEARANCES:****(A) EXTERNAL (IN AIR)**

**I)** Minimum external electrical clearances after mounting the bimetallic terminal connectors in position shall be maintained, as under, however positive tolerance shall be acceptable without any ceiling.

Voltage	Medium	Clearance	
		Phase to phase	Phase to earth
11000 Volt	A I R	255 mm	140 mm
433 Volt	A I R	75 mm	40 mm

**II) Minimum Clearance between live part of HV bushing to Explosion vent:- 140 mm**

**(B) INTERNAL (IN OIL):**

The following minimum internal clearances shall be maintained as per details given hereunder:

PARTICULARS	160 KVA
a) On width side (non bushing side)	25 mm
b) On length side (bushing side HV & LV both)	40 mm
c) Between HV windings & yokes (end insulation)	20 mm
d) Between LV windings to core (Bare conductor)	5 mm
e) From top of yoke to inside of top cover of tank (with gasket)	75 mm
f) Between LV/HV winding (Radial bare conductor Clearance)	11 mm
g) Phase to Phase Clearance between HV limbs	10 mm

The aforesaid external and internal clearances are minimum clearances and no negative tolerance on these clearances shall be allowed.

**13. TEST VOLTAGE:**

Transformers shall be capable of withstanding the power frequency and impulse test voltage prescribed below:

Nominal system test Voltage (RMS)	Highest system voltage (RMS)	Impulse withstand voltage	Power frequency voltage in (RMS)
11 KV 0.433 KV	12 KV ----	<b>Min.75 KV (PEAK)</b> ----	28KV 3 KV

The Transformer shall have fully insulated windings designed for the above impulse level.

**14. HEAT DISSIPATION (COOLING) / RADIATOR CALCULATIONS & E T R/PSR (ELLIPTICAL TUBE RADIATORS) / (PRESSED STEEL RADIATOR) PLACEMENT:**

The transformers shall be capable of giving a continuous output without exceeding the specified temperature rise. Elliptical tube radiators of section 57 of gauge 18 or Pressed Steel radiators (with tolerance as per relevant ISS) shall be acceptable on the transformers.

The header pipe connecting radiator bank to the tank shall be rectangular in shape with approximate size of 100x20 mm. Alternatively round pipe of suitable dia. size can also be used for connecting the radiator bank to the tank in case of PSR radiators. The placement of top header pipe to the tank body shall be above the top of yoke, to facilitate cooling for hot oil sump over top yoke.

Cooling area of the tank/radiators should be sufficient to dissipate the guaranteed losses satisfactorily (as per Clause No. 7). Necessary calculations in this regard shall be furnished by the Bidder with their tender. For the purpose of heat dissipation calculations, the following criteria shall be adopted:

i) Plain surface of tank – **500 W / m<sup>2</sup>**

(Note: The area of top/bottom tank surface, headers, HV/LV bushing pocket and conservator shall not be considered for purpose of above calculations).

ii) Elliptical tube of section 57 -- **55 watts/meter length.**

**Note: The provision of radiator is essential in distribution transformers to be supplied against this tender.**

**15. WINDING AND INSULATION:**

i) MATERIALS:

**Super Enameled/Double paper** covered Aluminium Conductors shall be used for 11 KV class transformers of 160 KVA rating. **The covering shall be conformed to applicable ISS.**

ii) CONSTRUCTION:

The High-tension windings shall be concentric with the Low-tension windings. The Arrangement of the windings shall be robust in electrical and mechanical construction and shall permit free circulation of oil and avoid hot spots. The LT conductor shall be rectangular in shape. Two layer of electrical grade insulation **Epoxy Dotted** of 2 mil thickness or one layer of min. 4 mil thickness shall be used for interlayer insulation both for HV and LV Coils. Insulation cylinder made from electric grade pre-compressed board(s) having minimum total thickness of 1.5 mm shall be used between HV and LV windings. Alternatively 20 mil pressphan paper making thickness of the cylinder 1.5 mm having similar electrical properties may also be used.

For phase barrier, 2 Nos. of 1 mm thick press board shall be used for covering the tie rods. Besides, tie rods shall be covered by SRBP tubes of suitable size.

2 mm press board shall be used for base support insulation and core clamping channel insulation.

For bottom and top yoke insulation, only PC Board of min. 2 mm thickness will be used.

Also, vertical spacers between HV and LV coils and radial spacers (tickleys)/ blocks etc. shall be of PC Board only.

A tolerance of upto plus minus 1% shall be permissible on ID and OD and axial length of HV and LV coils. However, the above tolerances are subject to maintaining the min. required clearances. The material and thickness of various insulation provided for phase barrier, foot plate insulation, yoke insulation and core clamp insulation shall be clearly indicated in the drawing and in any case shall not be inferior to those used in type tested transformers.

Min. number of coils on HV side shall be 6 (six) per phase for each rating transformers. Dovetailed shaped radial spacers shall be placed between HV coil sections, suitably – locked with vertical spacers around the circumference of the coils. The number of such spacers shall be minimum 8(eight).

**One No. HV Coil is accepted in case of wound core construction.**

### **Current Density**

The current density for HV and LV conductor shall not exceed the value given hereunder:

Rating	Current density in Amp/mm .sq.	
	HV winding	LV winding
160 KVA	1.6	1.6

### **iii) INSULATION MATERIAL:**

Electrical grade insulating Kraft paper of only Triveni / Ballarpur / Padamjee shall be used. Press Board used shall be of senapathy whitely / Raman make. Perma wood or haldu wood blocks shall be used for Top and Bottom yoke insulation.

### **iv) CONNECTIONS AND TERMINATIONS:**

**A) HV Winding:** The following method shall be adopted for taking out HV connections-

- a) The coil series connections shall be made by soldering / brazing only, after completely removing the insulation from the ends.

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- b) Starting and finishing leads of HT coils shall be covered with empire sleeve(s) of proper size. These leads should be clamped with the body of the winding with the help of cotton twine during manufacture of the coils.
- c) All delta leads from the HT coils as well as HT line leads shall be taken out through **multiple paper covered** (MPC) copper wires of sufficient cross section area to impart the desired mechanical strength. The current density in HV lead wire shall not exceed  $0.8 \text{ A/mm}^2$ . These lead wires shall be provided with multi layer paper insulation of minimum 1.0 mm thickness i.e. minimum increase in diameter due to paper insulation shall not be less than 2 mm. The layer of glass sleeves/ glass tape shall also be provided on the delta MPC wire and it should be further covered with minimum 12 mm dia SRBP tube. The MPC should also be varnish dipped. The SRBP tube shall be extended in such a way that it is entered upto 50% of bushing height.
- d) All the above leads shall then be clamped tightly with cotton twine directly on to the special frame/bracket making **"Pie"** shape connection. This structure could be made up of Bakelite/ Permalli wood/ laminated PC board flats, having minimum size of 25x6.0 mm. Line leads leading to the HV bushing terminals shall be directly clamped to the horizontal support bar of the **"Pie"** structure so that any tension which may develop in the HT leads due to jerks or at the time of making the connection , is not passed to the HT coils.
- e) Delta joint and lead from delta joint to bushing rod shall be made by brazing only.

#### B) LV Winding :

- a) The LV connection shall be taken out by cut on the top yoke channel duly reinforced to compensate for the mechanical strength.
- b) The layers in LV Coil may be either even or odd in numbers but minimum layers shall be two.
- c) LV star point shall be formed of Aluminium flat of sufficient strength. Leads from winding shall be connected to the flat by brazing or M.S. nut-bolts.
- d) Firm connection of LV winding to bushing shall be made of adequate size of " L shape flat". Connection of LV coils to L shape flat shall be by brazing only.
- e) "L" shape Flat shall be clamped to LV Bushing metal part(s) by using nut, lock nut and washer.
- f) Neutral of the Secondary winding (LV) shall be brought out to a separate insulated bushing.
- g) For Aluminium windings, L&T, ALKAPEE aluminium brazing rods with suitable flux will be used.

### **16. CORE CONSTRUCTION & CORE COIL ASSEMBLY DETAILS:**

#### **A. CRGO CORE.**

- (i) The core shall be **stack/wound type** of high grade cold rolled grain oriented annealed steel laminations, having low loss and good grain properties, coated with hot oil proof insulation, bolted together to the frames firmly to prevent vibration or noise. All core clamping bolts shall be effectively insulated. The complete design of core must

ensure the permanency of the core losses with continuous working of the transformers. The value of the flux density allowed in the designs and grade of laminations used shall be clearly stated in the offer, along with the curves. The transformer core shall be constructed out of the prime class of materials. CRGO Lamination used shall be of prime grade and not second grade steel laminations.

(ii) It will be mandatory for all the transformer manufacturers to use only **PRIME grade CRGO Laminations of M-4 grade/ 0.27 mm (with tolerance as per relevant ISS) thickness or better** with specific loss of 0.89 watt per kg. at 1.6 Tesla or any other combination of better grades with any thickness subject to maximum specific loss of 0.89 watt per kg. at 1.6 Tesla will also be acceptable. The bidder shall furnish the core loss (watt/Kg.) and power (VA/Kg) curves of the laminations used. The core shall be properly stress relieved by annealing in inert atmosphere. The transformer shall be suitable for over fluxing (due to combined effect of voltage and frequency) upto 12.5% without injurious heating. The operating flux density shall be such that there is a clear safe margin over the fluxing limit of 12.5%.

(iii) Full mitred core construction technique shall be adopted. Top yoke & bottom yoke pieces shall all be in one single piece and no cut pieces shall be acceptable. The cross sectional area of yoke & limb shall be approximately same.

(iv) The transformer core shall not get saturated for any value of V/f ratio to the extent of 115 % of the rated value of V/f ratio (i.e. 11000/50) due to combined effect of voltage and frequency without injurious heating at full load conditions. The bidder shall furnish necessary design data in support of this situation.

(v) Flux density at rated voltage and frequency of core and yoke shall not be more than **1.6 Tesla. The Over fluxing shall be limited to 12.5 % of rated value and flux density at 112.5 % of rated voltage does not exceed by 1.9 Tesla.**

The No Load Current (magnetising current) of each rating of transformers at rated voltage and at 112.5% of rated voltage shall not exceed the values given below:

Maximum permissible magnetising current in percentage of rated full load current	
At 100% rated voltage	At 112.5% rated voltage
3%	6%

**The tolerance on magnetizing current shall be +30% on declared value of magnetizing current as per IS:2026**

(vi) For free circulation of oil axial and radial ducts of the following minimum thickness shall be provided:

Width of axial duct in mm in between insulating cylinder and		Radial duct between HV coils in mm
HV winding	LV winding	
5	4	8

Tolerance of  $\pm 1$  mm on above axial ducts width shall be allowed provided that total clearance between HV to LV coil (bare conductor) is maintained as minimum 11 mm.

**(B). AMORPHOUS METAL CORE:**

a) The core shall be high quality amorphous ribbons having very low loss formed into wound cores of rectangular shape, bolted together to the frames firmly to prevent vibration or noise. The complete design of core must ensure permanency of the core loss with continuous working of the transformers. The value of the flux density allowed in the design shall be clearly stated in the offer. Curve showing the properties of the metal shall be attached with the offer.

b) Core Clamping – Amorphous Metal and CRGO wound core Transformers

1. Core clamping shall be with top and bottom U-shaped core clamps made of sheet steel clamped with MS tie rods for efficient clamping.

2. MS core clamps shall be painted with varnish or hot oil resistant paint

3. Suitable provision shall be made in the bottom core clamp / bottom plate of the transformer to Arrest movement of the active part.

c) The transformer core shall be suitable for over fluxing due to combined effect of voltage and frequency upto 12.5 % without injurious heating at full load conditions and shall not get saturated. The Bidder shall furnish necessary design data in support of this situation.

d) Flux density should not be more than 1.6 Tesla for Amorphous core. **The Over fluxing shall be limited to 12.5 % of rated value and flux density at 112.5 % of rated voltage does not exceed by 1.9 Tesla.** No load current shall not exceed 3 % of full load current and will be measured by energizing the transformer at 433 volts 50 c/s on the secondary. Increase of voltage of 433 volts by 12.5% shall not increase the no load current disproportionately high and shall not exceed i.e., 6%. Test for magnetic balance by connecting the LV phase by phase to rated phase voltage and measurement of an, bn, cn voltage will be carried out.

NOTE: Equal Weightage shall be given to the transformers with Amorphous metal core and CRGO.

**(C) CORE-COIL ASSEMBLY:**

The core joints shall be interleaved and with full mitre design, as mentioned above. Ample provision for free circulation of oil in the radial gap between the core & LV coils shall be made. Eyes or lugs of sufficient size shall be provided for lifting core and winding assembly out of the tank. The core shall be effectively earthed through copper earthing **foil of 25 mm width & 1 mm thickness** bolted on core frame channels, after removing the channel paint.

For top yoke channels, if cut or holes are made for taking LV connections, suitable reinforcement to channels shall be made by providing adequate size of MS Flat of the thickness not less than 6 mm.

On the core-coil assembly, core clamping channels, tie rods, core studs, spacers, assembly base supports, etc. of each rating shall be provided as per details given hereunder:



Sr. No.	Item	Particulars
a)	Tie rods	Minimum 8 Nos. of 16 mm each properly insulated and covered with SRBP tubes. Tie rods shall also be provided with lock nuts.
b)	Core studs	Minimum 8 Nos. of 16 mm each properly insulated and covered with SRBP tubes. The core studs shall also be provided with lock nuts.
c)	Spacers	Minimum 8 Nos. dovetail type with min. peripheral coverage of 30%.
d)	Support of core assembly base	2 Nos. MS channels OF 100x50x6t mm. with minimum peripheral coverage of 40%.
e)	Channels for clamping core coil assembly	4 MS Channels of 100x50x6t mm. size (applicable for CRGO/ Amorphous Transformers)

Guides on all the four sides shall be provided to prevent shifting of the active parts and thereby accidental touching the tank. Alternatively boss nut arrangement at the top of core coil assembly to lock the same with the transformer tank be provided.

The assembly fixing boss nut(s) are to be welded, 20-30 mm off the centre line (and diagonally) of the tanks, so that assembly shifting during transport etc. is prevented. M S Channel, Tie Rods etc should be painted with hot oil and corrosion resistant paint before use.

All core-coil assembly shall be punched on core channel / an identity plate welded on core channel with following details:

1. Name of Supplier:
2. Order / TN No:
3. Rating:
4. Sr. No. of Transformer:

**In case if above marking is not found on the core assembly of physically opened transformer selected for physical verification during final inspection then no further inspection shall be carried out and re-inspection charges shall be payable by the supplier.**

**Note: 1. If the core is rusted or holes are found during testing at CTL, then the lot may be rejected.**

**2. If the same observation is repeated, then apart from rejecting the lot, firm's balance order would be cancelled and such firms shall not be awarded any order for one year or in next tender of tendered rating to be opened/finalized whichever is later.**

#### **17. TRANSFORMER TANK:**

- (a) Transformer tank shall be rectangular in shape, robust in construction and with adequate strength to withstand the pressures developed at the time of severe fault conditions. **The tank body shall be suitably stiffened with two stiffeners of size 50x50x6 mm angle. The edge of the angle shall be continuously welded full length with the tank cover body as per drawing enclosed at Annexure-A** The tank sheet shall be

electrically continuous welded both from inside and outside to impart proper mechanical strength and to plug leakage of oil. All joints of tank and fittings shall be oil tight and no bulging shall occur during service. The tank design shall be such that the core and windings can be lifted freely. The tank plates shall be of such strength that the complete transformer when filled with oil may be lifted bodily by means of lifting lugs provided. All the welding shall be continuous. The top cover plate shall be sloping down by **more than 15 mm**, opposite LV bushings side. The top cover edge should be extended by **Min. 30 mm** in such a manner to cover gasket each side and it should be bent at **Min. 15° angle**. Accordingly length of the lifting hooks shall be extended. The top cover shall have no cut at point of lifting lug. **No negative tolerance in the tank dimensions is acceptable in actual supply.** The tank shall be fabricated by welding at corners. **The bottom plate shall be extended at least by 5 mm outside on all sides to facilitate proper welding with the vertical tank walls as per drawing enclosed at Annexure-A.** No horizontal or vertical joints in tank side walls and its bottom and top cover will be allowed. **LV Bushing pocket shall be continuously welded on all side from both inside and outside on the tank wall.**

(b) Minimum size of MS Sections to be used in construction of each rating of transformer tanks shall be as under:

Sr. No.	I T E M S	Parameters
1	Tank Cover plate thickness (mm)	5.0 t
2	Tank Sides wall thickness (mm)	4.0 t
3	Tank bottom plate thickness (mm)	5.0 t
4	Conservator body (mm)	3.0 t
5	Detachable Conservator side Cover	N.A.
6	No. of stiffeners (To be welded on four side of the tank in the angle forms inverted "L")	2 No.
7	Size of M. S. stiffener (mm)	<b>50x50x 6 angle</b>
8	Tank Top flange size (mm)	50 x 6 t Flat
9	Cover Bolt Size	As Per IS:1180 Part-1(2014)**
10	Cover Bolt spacings (Maximum)	75 mm
11	Lifting lugs	2 Nos. 10t mm flat
12	Tank Base Channel (ISMC Type) at a C-C distance of 415 mm) shall be continuous welded with tank	2 (100x50x6t mm)

\*\* All screws, nuts, **bolts** /washers and fasteners exposed to atmosphere are as per IS 1180 Part-1/2014 as follows :-

a) Size 12 mm and below:- stainless steel

Above 12 mm:- Steel with suitable finish like electrogalvanized with passivation or hot dip galvanized.

\* Tank base channels shall be provided parallel to the bushing lines.

NOTE: Each cover bolt shall be complete with two flat washers, one nut and one spring washer.

- i) The 12 Nos. nuts & bolts ( 4 Nos. each on length sides & 2 nos. each on widths sides of tank body) to be tag welded on top cover / tank body of the transformer.
- ii) The 04 Nos. Anti Theft Fasteners shall be provided - one each on all four sides in centre of body of transformer. Two holes shall be provided – one on top cover and other on collar of transformer to facilitate providing of 2 Nos. poly-carbonate seals on longitudinal side.

The above mentioned M S sections shall be subject to tolerance as per ISS.

### **MEASUREMENT OF SHEET THICKNESS OF TRANSFORMER TANK:**

**The following measurements shall be carried out at respective Central Testing Lab (CTL) of the Discom(s) on the supplies of distribution transformers:**

**Measurement of Transformer Tank Thickness shall be done as follows:-**

<b>1.</b>	<b>Top Cover</b>	<b>At 2 places to be measured &amp; average is to be taken.</b>
<b>2.</b>	<b>Bottom Cover</b>	<b>-do-</b>
<b>3.</b>	<b>Side Wall(s)</b>	<b>On all four sides (average is to be taken)</b>

For transformer tank sheet thickness verification, the average of top and bottom cover be taken collectively and not individually to decide acceptance/ rejection of transformers.

▪ **The nominal value of sheet thickness will be considered as mentioned in the Specification.**

▪▪ **Rolling tolerance will be as per ISS:1852-1985 with latest amendment and no penalty will be charged on such measured thickness till tolerance limit of ISS.**

▪▪▪ **Sheet thickness of transformer tank for Distribution Transformers as per relevant tender specification are as under for ready reference:**

<b>Sr. No.</b>	<b>Rating</b>	<b>Top Cover (mm)</b>	<b>Bottom Cover (mm)</b>	<b>Side of Tank (mm)</b>
<b>1</b>	<b>160 KVA Three Phase</b>	<b>5.0</b>	<b>5.0</b>	<b>4.0</b>

**The sheet thickness measurements will be carried out on all those sample transformers which are tested in CTL and test results will be applicable to the respective sub-lot or part thereof from which the sample is drawn.**

(c) Lifting Lugs: Two Nos. welded heavy duty lifting lugs of MS plate of 10 mm thickness, suitably reinforced by extended vertical supporting edge of same thickness in

one piece having size 125 mm width and 125 mm length, these shall be so extended that cutting of bent plate is not required.

(d) Top cover gasket & Bolt:

- i) The gasket provided in between top cover plate and tank shall be of min. 6 mm thick neoprene rubberized oil resistant cork sheets conforming to type B or C as per IS 4253 part II.
- ii) Stainless Steel Nut bolts (as per IS:1180 (Part-1/2014)) shall be of as per size M 12 x 40 mm / 4/8x1.5" long with two flat washers, suitably spaced (as specified) to press the cover.
- iii) Height of the tank shall be such that minimum clear height is to be achieved between top of yoke and under side of the tank cover (with gasket in place) as under:
  - a) 160 KVA rating - 75 mm
- iv) All screws, nuts, **bolts/washers** and fasteners exposed to atmosphere are as per IS 1180 Part-1/2014 as follows :-
  - b) Size 12 mm and below:- stainless steel
  - c) Above 12 mm:- Steel with suitable finish like electrogalvanized with passivation or hot dip galvanized.
- v) All sealing washers / gaskets shall be made of oil and heat resistant neoprene or nitrile rubber. Gaskets made of natural rubber sheet are not permissible. The minimum thickness of gaskets shall not be less than 6 mm for tank cover and 4mm for HT/LT gasket washers.
- vi) Talbros make neoprene/nitrile based rubberized cork sheet – grade RC-70-C shall only be used as gasket material. Alternatively, other makes of gaskets having type designations as under can also be used, if 'Talbro's' make gasket is not available:

S. No.	Name of the firm	Commercial name of gasket manufactured by the firm.
1.	M/s. Nu-Cork Products P. Ltd. Gurgaon	Nu-Cork (Neoprene) Nu-Cork 999 RC-70-C
2.	M/s. Bharat Corrub Ind. Vadodara	Chetak (Neoprene) RC-70-C
3.	M/s. Grindbeck. Gujarat	Zebra (Neoprene) RC-70-C
4.	M/s Goodwill Rubber Ind. (P) Ltd., Calcutta.	Mayur (Neoprene) RC-70C
5.	M/s Pristine Technologies & Industries, Jaipur.	VIN CORK-CO1(Type- C, RC 70-C)

(e) Tank shall be reinforced by continuously welded angle on all the four sides of the walls, on the edge of tank, as specified above. The permanent deflection shall not be more than 5 mm upto 750 mm length and 6.5 mm upto 1250 mm length when transformer tank without oil is subjected to the vacuum of 250 mm of Mercury.

**f). PAINTING & FINISHING:**

Steel surface shall be prepared by sand /shot blast or chemical cleaning including phosphating, as per IS 3618. Inside of tank shall be painted with varnish or oil resistance paint. For external surface, one coat of thermo-setting powder paint or one

coat of epoxy primer followed by 2 coat of polyurethane base paint of olive green colour confirming to shade No. 220 of IS: 5-1961 to be applied in order to distinguish of star level transformers. The paint thickness for normal to medium corrosive atmosphere shall be as per IS 1180 Part-1 2014.

The requirement for paint and the material and Dry film thickness to be used as below.

Paint Type	Area to be Painted	No. of coats	Total Dry film thickness (min.)
a) Thermo setting powder paint	Inside Outside	01 01	30 microns 60 microns
<b>LIQUID PAINT</b>			
a) Epoxy (Primer)	Outside	01	30 microns
b) Polyurethane (finish coat)	Outside	02	25 microns each
c) Hot Oil resistant Paint/varnish	Inside	01	35/10 microns

### **18. FITTINGS & ACCESSORIES:**

"The following standard fittings shall be provided on each transformer:

- a) Earthing terminals of M12x40L/ 4/8x1.5" with tinned lugs and symbol – (2 Nos.)
- b) Lifting lugs – (2 Nos. for main tank).
- c) Rating and terminal marking plate shall be non-detachable and affixed with Min. 10 rivets (One in centre of top and bottom and 4 Nos. each on both vertical sides at equal distance), details to be included in one plate only. The plate shall be of stainless steel/Aluminium only, with details clearly marked. The base plate of the Rating and terminal marking plate shall be continuously welded with the tank (1 No.)
- d) Bi-metallic terminal connectors on HV bushings and L-type connectors on LV bushing shall be fitted before dispatch.
- e) Oil level gauge of minimum 150 mm length of prismatic glass, indicating three positions of oil, marked as follows, shall be provided at centre of the conservator tank:

1)	-5 °C - Min.
2)	30 °C - Nor.
3)	90 °C – Max.

#### **f) Free Air Type Breather – (1 No.)**

- g) Thermometer pocket with cap, 12.5 mm dia with cap. shall be provided — (1 No.)
- h) Oil filling hole (1/4" dia) with cover and gun metal drain valve of 20 mm size on the oil conservator.
- i) a) One filter valve of gun metal of 20 mm size at the top side of the tank.

- b) One drain cum sampling valve of Preferbly Steel at the bottom side of the tank but opposite of the top filter valve. The necessary arrangement for locking on this valve by providing MS Sheet box duly welded on tank body shall be made.
- c) The valve shall be either of Leder or L&T or AUDCO make and wheel type.
- j) **HV Bushings.** These shall be of 17.5 KV/250 A class, porcelain/ polycrate with non adjustable, single gap type arcing horns – (3 Nos.)
- k) **LV Bushings.** 1.1 KV class: (4 Nos.)
- a) 630 A (M 20 stem) – for 160 KVA rating.
- l) Brass rod 12 mm diameter for HT Terminals of each rating – (3 Nos.)
- m) Brass rod for LT Terminals of each rating – (4 Nos.)
- a) 20 mm diameter for 160 KVA rating transformer
- n) 100 mm dial type thermometer for oil temperature indication.
- o) Two pulling eyes one each on opposite side of the tank.

**p) Explosion vent:**

Explosion Vent shall be opening towards ground from LV bushing side with M. S. mesh having Pipe Diameter of minimum 50 mm with 0.025 mm copper shim sheet/ Bakelite thick sheet of 0.4mm thick as diaphragm shall be provided on the top of the cover of the tank such that the pressure released should be directed to the ground & it should be inserted in the top cover of tank, welded outside & inside of top cover. Length of the explosion vent should be minimum 700 mm. Nut bolts of flange of Explosion vent should be tag welded. The other end of the vent pipe shall be guarded with wire mesh for preventing the entry of worms and nesting. The diaphragm shall burst at a pressure of 0.76 to 0.95 kg/ sq.cm. There shall be minimum 140 mm clearance between live part of HV bushing to Explosion vent.

**q) Air release device. on left side (when looked from LV bushing side).**

- r) QR Code:- QR code laminated P touch labels shall be fixed on transformer tank body below the name plate and on the core coil assembly (on core channel) depicting various technical details such as Name of manufacturer, rating, Serial no, TN No. etc. QR Code with desired information to be printed on non-tearable matt finish label and to be covered with transparent label to retain label life for minimum 20 years. Provision of Sr. No. on QR Code to be affixed on Core Coil assembly (on core channel) is optional.

**Note:**

1. **As mentioned above, suitable bi-metallic connectors on HV bushing and L-type connector shall be provided, having capacity of about 1.5 times the rated current of the transformer.**
2. LV/ HV Connector shall not be the integral part of the bushing stems”.

**19. CONSERVATOR:**

When a conservator is fitted, the oil gauge and the breathing device shall be fixed to the conservator. The conservator shall be of cylindrical shape and it should be provided above the HV bushing with a minimum clearance of 50 mm and suitably inclined to maintain the clearance.

The conservator tank should be connected with transformer tank with the help of two hollow connecting pipes and should be located at the centre of tank cover. The Flat shall not be acceptable.

The total inner volume of conservator shall be minimum of 10% of the volume of oil in each rating of transformer. The inside diameter of the pipe connecting the conservator to a main tank shall be min. of 50 mm and it should be projected into conservator in such a way that its end is approximately 25 mm above the bottom of conservator so as to create a sump for collection of impurities. The min. oil level (corresponding to – 5 deg. C.) should be above the sump level. The connecting pipe from conservator tank to main tank shall have a sloping flap so that oil falling from pipe shall not fall directly on the active job.

**The oil filling hole cap of conservator should be welded with tank body with the help of suitable inverted 'U' shape clamp.**

**20.0 FREE AIR TYPE BREATHER:**

The breather shall be only from reputed and approved manufacturer and as per the approved drawing. Inverted 'U' shape pipe shall be used for breather. Mounting arrangement of the breather shall be flanged/threaded type as per details given in the illustrative drawing attached.

**21. H V BUSHING TERMINAL DETAILS :**

The transformer shall be provided with outdoor type 3 Nos. 17.50 **KV / 250 A** class porcelain bushings, conforming to IS:3347/1972 & IS:2099/1973 from the manufacturer of repute. The HV bushings shall be on top of the tank and shall be fitted on a pocket made on top cover. These pockets shall be such that the HV bushing is tilted more towards the HV side. The bushing of R & B may also be tilted sidewise to maintain the required electrical clearance. The bushings rods and nuts shall be made of brass.

The inner porcelain portion of the bushing shall be projected about 50% of the length inside the bushing pocket. **HT bushing(s) mounting bolts should be tag welded.**

The clamping ring of HV bushing shall be of galvanised MS Sheet having minimum thickness of 1.6 mm. The total weight of all the 12 aluminium caste member of HV bushing shall not be less than 210 grams.

The arcing horn(s) shall be single gap and fixed type. HV bushings shall be of reputed make such as BEPCO, JAYSHREE, WSI, SESHASAYEE, JAIPUR GLASS, BPPL Bikaner, Agarwal salt Co. Bikaner, Baid Sanitary Works, Bikaner/ Krishna Ceramics, Nasirabad/ADPRO/SHINE or any other make - approved by the purchaser. The HV bushings shall generally conform to IS: 3347 and IS: 2099. Embossing showing the

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manufacturer's name and month & year of manufacture shall be clearly visible on HV bushings, even after fixing on transformer(s).

## **22. L V BUSHING TERMINAL DETAILS:**

"LV Bushing side shall be on side of the tank but opposite to the HV Bushing side. 4 Nos. LV Bushings (1.1 KV/630 A for 160 KVA rating transformers) shall be mounted on a special pocket on the tank wall. **LV Bushing pocket shall be continuously welded on all side from both inside and outside on the tank wall.** Projection of the LV pocket shall be such that inner portion of the LV stem shall not project more than 20 mm inside the tank, to facilitate unhindered lifting of the core coil assembly. Bushing stem of M 20 size shall be of brass. Rest of the components shall conform to the requirement of IS:3347 (Part I/section 2). The LV bushings shall be of reputed make such as BEPCO, JAYSHREE, WSI, SESHASAYEE, JAIPUR GLASS, BPPL Bikaner, Agarwal salt Co. Bikaner, Baid Sanitary Works, Bikaner/ Krishna Ceramics, Nasirabad/ADPRO/SHINE or any other make - approved by the purchaser. The LV bushings shall generally conform to IS: 3347 and IS: 7421".

## **23. TRANSFORMER OIL:**

The transformer shall be supplied complete with first filling of EHV Grade transformer oil, up to the normal oil level. The oil shall conform to IS: 335-[2018](#) (latest amended) and should be ISI Marked and having the specified aging characteristics. The Break Down Voltage Value of the fresh oil after filtration and before filling in the transformer should be above [70](#) KV and after filling in the transformer it should be above 40 KV.

The make of Transformer Oil shall be either APAR/SAVITA/ RAJ LUBRICANTS/ ANAMIKA/SHARAVATI/ MADRAS PETRO/ RAJ PETROL/ LUBRICHEM, MUMBAI/ OPANAMA PETROCHEM, ANKELSHWAR/ TASHKENT OIL, VADODARA/ COLUMBIA. The transformer oil sample taken from the transformer shall be subject to testing as per provisions of IS:1866.

The oil manufacturer's test certificate shall be made available at the time of inspection to the inspecting officer.

## **24. IDENTIFICATION DETAILS:**

A. **Rating & terminal marking plate:** Each Transformer shall be provided with non detachable name, rating and terminal marking plate fitted in a visible position. All details shall be given on one plate. Material of the plate shall be stainless steel/**aluminium** only. Thickness shall be 0.9 mm (with a tolerance of  $\pm 0.1$  mm). The plate shall be made absolutely undetectable either through welding or riveting or through any other approved method.

Each HV & LV terminal shall be duly indelibly marked with its terminal numbers. (e.g. HV terminal with capital letter 1U, 1V, 1W and LV terminal by corresponding small letters 2u, 2v, 2w and the neutral terminal by 2n) by stamping with Min. letter size of 40x40 mm. In the diagram to be given on the name plate, the relative position of



various terminals- when viewed from top – shall be clearly shown. Inspection shall not be undertaken unless all these details are verified by the Inspecting Officer.

Besides other particulars, following details shall also be given on the name plate:

- i) P.O. No. - Month & year.
- ii) Sr. No. of transformer.
- iii) Date of despatch - month & year
- iii) Date of expiry of guarantee period – month & year
- iv) Maximum Guaranteed Losses at 50% loading & at 100% loading.
- v) Name & Full address of the manufacturer.
- vi) Capacity of the transformer.
- vii) Rating of the transformer.
- viii) Type – Oil filled naturally cooled.
- ix) IS 1180 part-1/2014.**
- x) BIS LEVEL-1 with BIS Licence No.**

ALL DETAILS ON THE NAME RATING AND DIAGRAM PLATE SHALL BE INDELIBLY MARKED i.e. BY ENGRAVING, STAMPING or PUNCHING.

**B. Technical cum Identification Plate** - M.S. plate of size 125 x 75 x 2.5 mm having following details punched with letters of size 8mm X 6mm shall be continuously welded to the main tank body below the middle HV bushing in clearly visible position:-

- A) Name of the Firm
- B) TN No.
- C) Make
- D) Sr.NO.
- E) JAIPUR DISCOM
- F) Rating
- G) Date of Dispatch
- H) Date of Expiry of G. P.
- I) Core :-
  - 1. Core Dia
  - 2. Core Area
- J) LV Coil :-
  - 1. ID/OD Dimensions
  - 2. Conductor Size
- K) HV Coil :-
  - 1. ID/OD Dimensions
  - 2. Conductor Size
- L) Limb Centre
- M) Window Height

Further following details is to be embossed on the width side of the tank preferably in centre opposite to Name & Rating Plate. The dimensions of letters should be 10x10x1 mm. The punching shall be distinct and visible.

**MAKE** \_\_\_\_\_  
**S. No.** \_\_\_\_\_  
**T N** \_\_\_\_\_

**The details of Make, TN No. & Sr. No. of transformer shall also be punched on the top cover.** The punching shall be distinct and visible. **(size of letter 10x10x1 mm).**

25. **GUARANTEED AND OTHER TECHNICAL PARTICULARS FOR TRANSFORMERS:**

Guaranteed Technical particulars of the transformers offered shall be furnished in A-4 size paper by the Tenderer in the proforma appended herewith at **Schedule-V(A)**. Complete details shall be furnished. Tolerances on weight quantity and dimension figures shall be  $\pm 5\%$  at the tender stage, subject to maintaining the minimum electrical clearances as per the specification. However, no negative tolerance shall be allowed on the short circuit type tested design. Electrical performance data shall be subject to tolerances as per ISS, unless otherwise specified in this specification. However, the Total losses at 50% & 100 % loading shall be maximum guaranteed without any positive tolerance.

26. **TYPE TEST CERTIFICATES:**

The bidder shall furnish type test certificates of offered design / similar design (not older than 5 years), wherever available, with the bid.

27. **DRAWINGS AND OTHER DOCUMENTS:**

The tenders shall be accompanied with the following drawings / Calculation sheets, as per the offered designs. The drawings shall be only on A-3 (420 x 297 mm) size paper and calculation sheet shall be on A-4 size paper only.

- a) Name rating / diagram plate drawing.
- b) Outline and general arrangement drawing.
- c) Core-coil assembly drawing.
- d) Core section (for limb and yoke) along with flux density calculation sheet / drawing.
- e) Cooling area calculation sheet.
- f) Thermal Ability short circuit calculation sheet.
- g) Core loss and magnetization curves of the laminations.
- h) Heat dissipation calculations (heat dissipation by tank walls excluding top and bottom should be 500 W/sq.meter).

28. **QUALITY ASSURANCE PLAN:**

The purchaser intends to purchase Transformers only from quality conscious manufacturers.

The tenderer shall furnish the details in respect of following, in the schedules prescribed herein this specification, failing which the offer is liable for rejection.

- a) List of testing equipment and instruments (with class of accuracy) available with tenderer for inspection, testing and checking the Transformers offered, as per tender specification in the schedule of testing facilities. The calibration details should also be included.
- b) List of machines/equipment/T&P available with the tenderer for manufacturing the Transformers, in the schedule of plant and machinery.

- c) Details of type tests conducted on the Transformers offered to supply in the schedule of type test.
- d) List of raw material components and sub-assembly to be used for manufacturing the equipment offered, in the schedule of raw materials and components.
- e) Statement giving list of important raw materials, names of sub-suppliers for the raw materials, list of standards according to which the raw material are tested. List of tests normally carried out on raw materials in the presence of Bidder's representative, copies of test certificates.
- f) Information and copies of test certificates in respect of bought out accessories.
- g) Level of automation achieved and list of areas where manual processing exists

The tenderer should possess adequate facilities for inspection and testing of the Transformers, as per requirement of the relevant ISS and this specification. In case any supplier is found not having all the instruments/equipment required for testing, the offer shall be ignored. No borrowing of instruments / equipment shall be allowed. Testing of the Transformers shall also not be allowed at the works of any other manufacturer. However, testing may be allowed at any Government Testing Laboratory.

## **29. INSPECTION AND TESTING:**

( i ) The inspection and testing shall be conducted as per relevant clause of the General Conditions of Contract (Section-II) at the place of manufacture. The transformers shall be completely assembled and tested at the factory. The inspection may be carried out by the purchaser at any stage of manufacturing. The supplier shall grant free access to the purchaser's representative at all reasonable times when the manufacturing work is in progress. Inspection and testing of any material under this specification by the purchaser shall not relieve the supplier of his obligation of supplying the material in accordance with the specification and shall not prevent subsequent rejection if the material is found to be defective.

( ii ) The supplier shall afford the inspector representing the purchaser all reasonable facilities, without charge, to satisfy him that the material is being manufactured in accordance with the specification. The bidders must have adequate set of instruments for conducting testing as per ISS/ Specification. The instruments for measurement of losses shall be of accuracy class of 0.5 or better. The instruments shall be duly calibrated and Calibration Certificate should not be older than one year on the date of presentation to the Inspecting Officer. The calibration shall be arranged from NABL accredited testing house. A comprehensive list of testing equipment/ instruments indicating make, Sr.No., type, class of accuracy, calibrating agency, calibration date etc. should be furnished alongwith the bid. The calibrated instruments shall be duly sealed by calibrating agency to avoid any tampering with calibration and the details thereof shall be clearly mentioned in the Calibration Certificate(s).

( iii ) The supplier shall keep the purchaser informed in advance, about the manufacturing programme so that arrangements can be made for inspection. The supplier shall give minimum fifteen days advance intimation to enable the purchaser to depute his authorised representative for witnessing of various tests on the equipment/ material as detailed below:

**NOTE: Penal provision shall be made for any short technical parameters found / noticed in the transformers at any time even beyond guarantee period.**

### **30.0 ROUTINE/ACCEPTANCE TESTS:**

**A) 100% testing of the Distribution Transformers shall be carried out at firm's works for measurement of total load losses at 50% & 100 % loading. Remaining testing shall also continue to be carried out as per practice.**

**B) All the assembled/ finished transformers prior to despatch shall be subjected to routine tests as per IS:2026. Minimum 25% of the offered lot size samples subject to minimum 5 Nos will be taken for routine and acceptance tests. The supplier shall invariably furnish manufacturer's routine test certificate along with inspection call of the offered transformers for pre-despatch inspection. **The inspection offers without furnishing of routine test certificates as per ISS of all the transformers offered for final inspection shall not be entertained, and any delay on this account shall be to firm's account.****

**C) The selected samples shall be subjected to the following routine / acceptance tests at the manufacturer's works in accordance with the relevant ISS:**

1. Insulation resistance
2. Separate source voltage withstand test
3. Induced over voltage withstand test
4. Measurement of windings resistance cold (at or near the test bed temperature)
5. Measurement of Voltage ratio and check of voltage vector relationship
6. Measurement of Impedance voltage.
7. Measurement of total losses at rated voltage and normal frequency (at 50% & 100% loading).
8. Measurement of No load current at 100 % and 112.5% of rated voltage and normal frequency.
9. Checking of rating and terminal marking plate.
10. Pressure Test (As per IS 1180 Part-1:2014)
11. Oil leakage Test (As per IS 1180 Part-1:2014)
10. Checking of weights , dimensions, fittings and accessories, tank sheet thickness, oil quantity , material, finish , paint thickness and workmanship as per purchase order and contract drawings.
11. Physical verification of core – coil dimension, internal clearances, provisions of required oil ducts in the HV and LV winding, conductor sizes, individual weights of HV and LV winding core laminations etc., with reference to contract drawings and type test report(s) by dismantling selected unit(s). The physical verification shall be conducted on units equivalent to one unit per 50 Nos or part thereof of offered quantity randomly selected from the offered lot. The dismantled unit(s) after re-assembly shall be accepted by the purchaser after routine testing in presence of his representative.

**During final inspection, sheet thickness shall also be measured of the transformer opened for physical verification. The instrument for measurement of sheet thickness will be provided by the supplier.**

12. Oil dielectric strength (break down voltage) test shall be carried out on the transformers opened for physical verification and average value shall be calculated.
13. Checking of manufacturer's test certificates and invoices for major raw materials shall be done and copies thereof duly signed by firm's representatives and inspecting officers shall be enclosed with the inspection report.

**D)** Invoices of CRGO material shall be provided by the supplier to the inspecting officer at the time of inspection and same shall be verified by the inspecting officer.

**E) Following tests shall also be carried out at manufacturer's works on one complete unit of 160 KVA Transformer.**

- i) Over Flux Density Test (in the first lot and may be repeated in subsequent lots if desired by purchaser).
- ii) Measurement of unbalance current.
- iii) Magnetic Balance Test (See note below)
- iv) Oil Leakage Test (See note below)

**Note: It will be mandatory for the manufacturer firms to maintain record of BDV value of the transformer oil and shall furnish to the inspecting officer who in turn shall furnish the same to the Nigam's CTL for verification purpose. The Inspecting Officer during inspection shall verify record of Meggar value of the offered DT's and furnish the same with inspection report to the Nigam's CTL. Simultaneously, record of Air Pressure Test shall also be checked by the inspecting officer and same be furnished with report to the CTL. CTL will conduct testing of DT's only after receipt of record of BDV value, Meggar value and air pressure test results.**

**F)** Fifteen days clear notice shall be arranged for pre-despatch inspection by purchaser's representative as per General Conditions of Contract.

**G)** After successful inspection, the inspecting officer shall seal **each and every transformer by sealing the transformer with 2 Nos. poly-carbonate seals on longitudinal side as per the manner mentioned in Clause No. 17 above.** Before sealing, the inspecting officer will ensure that all the offered transformers are completed and duly fitted with name, rating and diagram plate, identification plate (on tank body & Top cover) as specified in this specification.

**H)INSULATION RESISTANCE MEASUREMENT:**

Insulation resistance of selected samples shall be measured with a 2500 V Megger, of standard make such as M/s AVO, M/s Sakova, M/s Wako, M/s Evershed, Vignole or Metrawatt. The minimum insulation resistance, in Mega Ohms, shall be as indicated in the table below:

	20 Deg.C.	30 Deg.C.	40 Deg.C	50 Deg.C.	60 Deg.C.
11000 Volts (HV)	800	400	200	100	50
433 Volts (LV)	400	200	100	50	25

**I) PRESSURE TEST (Routine Test):-**

**The transformer with bolted cover shall be tested at an air pressure of 35 KPa above atmosphere pressure maintained inside the tank for 10 min. There should be no leakage at any point.**

**J) MAGNETIC BALANCE TEST:**

This test shall be conducted as an additional test on one sample transformer from each lot offered for inspection.

The application of low voltage to the middle limb will induce approximately equal voltages on the two end limbs. The application of voltage to the end limbs will induce greater voltage in the middle limb and less voltage in the other end limb. Uniformity of induced voltages shall confirm the healthiness of the transformer windings.

The procedure for the test shall be as under:

- a) Apply 250 Volts between LV terminals-2u-2n and measure voltages between 2v-2n & 2w -2n.
- b) Apply 250 Volts between 2v-2n and measure voltages between 2u-2n & 2w-2n.
- c) Apply 250 Volts between 2w-2n and measure voltages between 2u-2n & 2v-2n.

The measured voltages shall satisfy the conditions detailed as above.

**K) OIL LEAKAGE TEST ( As per IS 1180 Part-1/2014):**

The assembled transformer for non-sealed and sealed Type with all fittings including bushing in position shall be tested at a pressure equivalent to twice the normal head measured at the base of tank for 8 hrs. There should be no leakage at any point.

**31. TYPE TESTS:**

In addition to above tests the following type tests shall be arranged **on one transformer only as per IS :1180 (Part-1/2014)** in accordance with IS:2026 (Part I to III).

- i) Short circuit test for dynamic and thermal ability: The short circuit test for dynamic and thermal ability shall be arranged at a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accredited Laboratory/ ILAC i.e. International Laboratory Accreditation Cooperation (in case of foreign laboratory) on one unit of each rating. The transformer(s) for the test shall be selected/ sealed by our inspecting officer from the first lot which shall be of minimum 02 Nos. or 5 % of ordered qty. whichever is more. The short - circuit test shall be conducted only after successful routine tests including measurement of no-load and load losses.

The supply shall be accepted only after arranging successful type test on the selected transformer(s).

- ii) Impulse voltage withstand test: The impulse voltage withstand test shall be arranged at any testing house accredited to NABL or a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accredited Laboratory/ ILAC i.e. International Laboratory Accreditation Cooperation (in case of foreign laboratory) for purpose of impulse test. The test shall be conducted on one unit of each rating to be selected by our inspecting officer from the first lot which shall be of minimum 02 Nos. or 5 % of ordered qty. whichever is more. The test procedure shall conform to the requirement of Clause 13 of IS: 2026 (Part-III). Impulse voltage withstand test shall be of **Min.75 KVp** The supply shall be accepted only after arranging successful impulse test on the selected transformer(s).

- iii) **TEMPERATURE RISE TEST** : [ As per IS 2026 (Part 2) ]  
**Temperature rise test shall be conducted on Maximum measured total loss (No load at rated excitation+Load loss at max. current tap at 75 oC) at 100% loading shall be supplied during temperature rise test** at a Govt. approved/ a Govt. recognized/ NABL accredited laboratory/ILAC i.e. International Laboratory Accredited Laboratory/ ILAC i.e. International Laboratory Accreditation Cooperation (in case of foreign laboratory).

**iv) PRESSURE TEST:( As per IS 1180 (Part 1):2014)**

This test shall be conducted as type test at a Govt. approved/ a Govt. recognized/ NABL accredited laboratory.The pressure gauge and vacuum gauge shall be duly calibrated and sealed by an independent recognised test lab(s).

The test procedure shall be as detailed below :

The tank subjected to air pressure of 80 KPa for 30 minutes and vaccume of 250 mm of mercury for 30 minutes. The Permanent deflection of flat plate, after pressure/vaccume has been released, shall not exceed the values given below:

<b>Length of plate up to</b>	<b>Deflection</b>
750 mm	5.0 mm
751 to 1250 mm	6.5 mm
1251 mm to 1750 mm	8.0 mm

No extra time shall be allowed for arranging these type tests. The cost of above Type Tests shall be borne by the supplier.

The programmed indicating date and place of type test(s), be intimated enabling purchaser to depute his representative to witness the test if desired. The testing house shall be advised to arrange type test result directly alongwith drawings duly attested by the testing authority for our scrutiny and approval. The type-tested transformer(s) shall also be accepted as the part of the supplies.

The requirement of arranging short circuit & impulse voltage withstand test shall however, not to be insisted on the suppliers who have arranged Dynamic & Thermal Ability to withstand Short Circuit Test/ impulse voltage withstand test within last 5 years from the date of opening of this tender on similar design. Minor changes in the present specification will not necessitate repetition of type test(s), if design of core-coil assembly is similar in essential details.

### **32. RANDOM SELECTION AND TESTING (RST):**

**32.1** The purchaser may select transformer(s) from the supplied lot(s) at random from the stores for conducting the following type tests, at any test house(s) as mentioned above. The supplier shall arrange these tests including loading, unloading and to & fro transportation from our stores to the test house(s). The charges for such tests shall be reimbursable to the supplier on actual basis on production of documentary evidence in case the selected sample successfully withstand type test(s). In case of otherwise, no charges will be reimbursed.

- i) Short circuit withstand test for Dynamic & Thermal ability. Measurement of No load Loss & Load Loss shall form part of tests conducted before and the after the short circuit test and recorded in the report.
- ii) Impulse test at **Min.75 KVp** as per Clause No.13 (with chopped wave) of IS:2026 (Part-III).
- iii) Temperature rise Test.
- iv) Pressure Test at 80 KPa for 30 minutes and vacuum of 250 mm of mercury for 30 minutes for transformer upto 200 KVA rating as per IS:1180 Part-I:2014.
- v) Purchaser reserves the right to carry out any site tests he may decide upon at his own expenses. In case equipment/ material are not found as per P.O., all expenses incurred during the testing will be to supplier's account and material shall be replaced by the supplier at site free of cost.

#### **FAILURE IN TYPE TEST(S):**

In the event of failure / unsatisfactory results of the transformer(s) in Dynamic & Thermal Ability to withstand Short Circuit Test / impulse type tests /**Temperature Rise Test / Pressure Test**, the supplier shall have to replace the supplies already made and no further transformers shall be accepted. The purchaser however, at his option, may accept the transformers already supplied with the following conditions:

- i) Guarantee period of the supplied transformers issued to the field shall be increased by double the normal Guarantee period.
- ii) Bank Guarantee shall be extended to cover the additional Guarantee period.
- iii) For failure in any of the type tests listed under RST i.e., short circuit test, Impulse withstand test, **Temperature Rise Test & Pressure Test**, no further supplies shall be accepted. The type test charges shall also not be reimbursable in this case and shall be borne by the supplier.
- iv) The transformers lying in the store(s) shall be replaced as per sub para (v) below.



- v) The bidder shall, however, be allowed to check the reasons of failure and if need be, to improve / modify the design. Further supplies, including replacements against supplies already made, shall be accepted only after successful type test(s) are arranged on fresh transformer(s) selected by the authorized representative of the purchaser. All the type tests shall be arranged in case there is change in the design, otherwise, type test shall be repeated only for the test in which failure has occurred. Charges for such test(s) shall be borne by the supplier. However, in the event of failure of transformer in the repeat type test, the purchaser may take following actions:
- a) Cancel pending orders of the rating in which failure(s) has occurred, &
  - b) Not place any order of Distribution Transformers on the firm for one/ two year(s)

### 32.2 Measurement of total losses (at 50% & 100% loading):

(i) After pre-dispatch inspection of material at firm's works, the dispatch instructions will be issued for the respective store(s) as per requirement of Nigam. Sample(s) will be drawn from the lot(s) received in store(s) and will be subjected to the following test(s):

- a) One transformer will be selected out of every lot of 10 Nos. or part thereof for measurement of No load Losses at rated voltage; No Load current (at 100% and 112.5% of rated voltage); Impedance voltage, thickness of tank body sheet and total Losses at 50% and 100% loading at rated current. The testing shall be arranged either at purchaser's own testing lab and / or at independent test lab. The testing charges for such tests shall be borne by the purchaser. The test results will be applicable to the respective lot of 10 Nos. from which sample was drawn.
- b) In case if dispatch instructions are less than 10 Nos. than one sample shall be selected from each store (s) and the test result so obtained shall be for the quantity consigned / received by the store (s).

The percentage impedance voltage at rated current shall not exceed the permissible limit as specified with allowable tolerance failing which the sub lot of transformers represented by the sample shall be rejected. The transformers selected for total Losses shall also be subjected to magnetizing current and in case found beyond the limit, the lot shall stand rejected.

The I.R. values of the sample(s) shall be measured at CTL, Jaipur and it must be more than 50 MEGA-OHM.

One sample out of 100 Nos. transformers or part thereof (**randomly selected by CTL**) shall be selected for physical verification/ checking of window height, limb centre and checking of insulation of HV and LV windings at CTL.

Metal Parts of Bushing assembly shall be checked in CTL as per specification/IS on the transformer which is physically opened in CTL (from the lot of 100 Nos. or part thereof). The tolerance may be allowed in accordance with coarse class of IS 2102-1969. If sample does not confirm the requirement of specification/IS, then lot of 100 nos. or part thereof shall be rejected.

**The No Load Voltage Ratio (Transformer Turn Ratio) shall be checked in CTL with the tolerance as per specification/ IS 2026 on the transformer from the lot of 10 Nos. or part thereof and the concerned sub lot shall be rejected if not meet out the requirement of IS.**

**Further, Internal clearances shall be checked without opening of core coil assembly in each of the transformers which have been selected for physical verification at CTL (i.e. one sample from a lot of 100 nos. or part thereof) in presence of firm's representative. No negative tolerance shall be admissible. If clearances are not found as per specification then the lot of 100 Nos. or part thereof shall be rejected.**

**The sample of Oil be taken at CTL from the Transformer opened for physical verification in presence of firm's representative and same shall be tested at Nigam's CTL/NABL accredited Lab.** If sample does not confirm the requirement of specification, then lot of 100 nos. or part thereof shall be rejected.

**Besides above points following shall also be checked in CTL** opened for physical verification and if the sample(s) does not meet the above requirements then the entire lot shall be rejected:

- 1.** Marking on HV terminals on transformer tank by stamping (i.e. 1u, 1v, 1w).
- 2.** Marking on LV terminals on transformer tank by stamping (i.e. 2u, 2v, 2w & 2n).
- 3.** The earthing of the core through tinned copper earthing Foil of 25 mm width & 1 mm thickness bolted on core frame channels, after removing the channel paint.

If the core is rusted or holes are found during testing at CTL, then the lot may be rejected. If the same observation is repeated, then apart from rejecting the lot, firm's balance order would be cancelled and such firms shall not be awarded any order for one year or in next tender of tendered rating to be opened/finalized whichever is later.

**NOTE:**

If the total losses are found more than 10% of specified losses at 100% loading then apart from rejecting the lot, firm's balance order would be cancelled and such firms shall not be awarded any order for one year or in next tender of tendered rating to be opened / finalized whichever is later.

If the window height and limb centre are found more than 7.5 mm, then apart from rejecting the lot, firm's balance order would be cancelled and such firms shall not be awarded any order for one year or in next tender of tendered rating to be opened / finalized whichever is later. However, a tolerance of  $\pm 2$ mm shall be allowed in window height and limb centre.

If the contractor / supplier fails to lift the material declared rejected or any part thereof from the consignee within a period of 15 days from the date of dispatch of information from the purchaser, the purchaser shall be entitled to effect recovery along with other actions as per Clause No. 1.62 of Section-II (General Condition of Contract).

**32.3 CHALLENGE TESTING CLAUSE:**

**The other manufacturer who have either participated in the instant tender enquiry can request challenge testing for tests covered in this clause based on specification & losses. The challenger would request for testing with testing fee. The cost of to & fro transportations of all transformer tested under the provision**

of this clause along with loading & unloading and transit insurance at actual shall be borne by Challenger firm. The challenge testing fees shall be at least three times the cost of testing. The challenger would have the opportunity to select the sample from the store. The party challenged ,challenger & the utility could witness the challenge testing. The challenge testing would cover the

- i. Measurement of Magnetizing current
- ii. No Load Losses test
- iii. Load Losses test
- iv. Temperature Rise Test.

The challenge test could be conducted at any Govt. / NABL accredited Lab. like ERDA /CPRI. If the values are within limits as per specification including tolerance allowed in CTL, the products gets confirm else not confirmed. If the product is not confirmed, the manufacturer will pay the challenge fee and challenger would get the fee refunded. However, as a redressal system, the manufacturer (challenged firm) would be allowed to ask for fresh testing of two more samples from the store and the same be tested in a NABL/Govt. laboratory in presence of party challenged, challenger & the utility. If any one or both sample does not confirm the tests then the product is said to have failed the test. In such cases, the manufacturer (challenged firm) will be declared as unsuccessful manufacturer for the said product and balance supply shall not be availed and the balance order shall be cancelled with levy of maximum penalty. Firm shall also be debarred for one year or participating against next tender for that rating, whichever is later. The transformers already supplied (including tested in challenge testing) shall be accepted with the following conditions:

- i) Guarantee period of the supplied Transformers shall be increased by double the normal guarantee period.
- ii) Bank guarantee shall be extended to cover the additional guarantee period.

### **33 GUARANTEE PERIOD:**

- I. Performance guarantee of the transformer(s) with LT protection unit shall be for the period of 36 (Thirty Six) months from the date of dispatch of material. The date of expiry of guarantee period shall be marked on the rating plate. Transformer(s) alongwith LT protection unit failed within such guarantee period shall have to be **replaced** free of cost expeditiously. **The Manufacturer may use Core and Transformer Tank of the GP failed Distribution Transformer. All other materials shall be replaced by new materials such as Transformer Oil, HV & LV Windings, Metal Parts and Fittings & Accessories, etc. The Testing Procedure of such replaced Distribution Transformer including Physical Verification shall be same as per Testing of New Distribution Transformer at Firm's Works as well as at CTL without any tolerance in the losses at 50% and 100% loading.**
  - i) The firm will **replace** all type of GP failed Distribution Transformers without asking any segregation on account of manufacturing defect. **However, the Discom will compensate the cost of missing parts as per practice in vogue.**

- ii) The guarantee period failed transformers will directly be lifted by the suppliers from the respective circle store **within a period of 60 days from the date of intimation by the respective consignee and will replace Distribution Transformers against G.P. failed within 30 days from the date of lifting** in the ACOS store/Nigam Store/central store, if operative, along with the joint inspection sheet of missing parts issued by the respective consignee. After receiving the material at ACOS store/Nigam Store/central store, the same shall be tested at CTL as per provisions of the relevant contracts and will be issued to the circle store as per requirement on Nigam's account. The invoices of missing parts shall be verified by the ACOS store/Nigam Store/central store as per the joint inspection sheet issued by the circle store as per practice in vogue and accordingly, the Sr. A.O. (CPC) will make the payment of missing parts, if any.
- iii) The loading of G.P. failed Distribution Transformers at circle store and un-loading of **replaced Transformer** at ACOS will be on suppliers' account.
- iv) The firm will **replace** G.P. failed transformers irrespective of breakage of body seals as well as physical damage of transformer tank body due to bursting. The period during which transformer remained defective/failed will not be accounted in the performance Guarantee period. The period of defective will be reckoned from the date of first intimation (i.e. field officer/consignee whichever is earlier) to date of delivery **replaced transformer**.

(a) Firms shall lift the G.P. failed Transformer(s) within a period of 60 days from the date of issue of notice/email by the SE (I&S)/DCOS/concerned circle ACOS from where the supplier has been authorized to lift the transformer.

(b) However, the period during which Transformer remained defective/failed will not be accounted in the Performance Guarantee Period. The period of defective/failed will be reckoned from the date of first intimation (i.e. field officer/consignee, whichever is earlier) to the date of delivery after successful replaced transformer. The record of Performance Guarantee Period of Distribution Transformer will be worked out in the above manner and record of the same shall be maintained by the SE (I&S)/ DCOS/ concerned ACOS at their level to ensure that Distribution Transformer shall work for the complete Guarantee Period.

(c) The supplier will deliver back after successful replacement of G.P. failed Distribution Transformers within 90 days from the date of issue of Notice/email as mentioned above positively as mentioned at point No.(a).

(d) In case firm fails to deliver replaced Transformer(s) within 90 days from date as mentioned at point No.(a) above, the cost of the transformer(s) shall be withheld from firm's financial hold and a penalty at the rate similar to that of delay in delivery (as for new supplies) subject to maximum 5%, shall be levied for the late delivery of replaced Transformer(s). The delay in delivery of G.P. replaced Distribution Transformer shall be worked out from the date of issue of notice/email by the concerned circle ACOS/ ACOS (JCC) from where the supplier has been authorized to lift the transformer.

- (e) In case firm fails to lift the G.P. failed Distribution Transformer(s) beyond 3 months (90 days period) as mentioned in point no. (a), Ground rent shall be recovered @1% per month or part thereof (for actual delay in lifting the material beyond 3 months (90 days) from the date as mentioned above, subject to a maximum of 5%. This amount of 5% will be in addition to recovery mentioned in point no. (d). After this clause following clause will also come into effect.
- (f) In case firm fails to lift the G.P. failed Transformer(s) within 6 months from date mentioned in point no. (a), then Nigam may proceed for auction of these GP failed Distribution Transformer at the risk and cost of the supplier after giving 30 days final notice to the firm. The amount recovered through auction may be adjusted in any type of recoveries (if any). The recoveries of this point will be in addition to recoveries mentioned in point no. (d) and (e).

**Firm shall lift G.P. failed transformers after furnishing safe custody bank guarantee, the slab of safe custody Bank Guarantee shall be as under.**

**34. Safe custody Bank Guarantee :-**

**The Safe Custody Bank Guarantee (SCBG) shall be 1% of the value of the contract or as per following SCBG slabs whichever is lower:**

**In case if order is upto 1000 Nos. DT's the firm have to give safe custody Bank Guarantee for Rs.5.00 Lacs and if order is more than 1000 Nos. but upto 3000 Nos. then the safe custody BG for Rs.10.00 lacs and for orders more than 3000 Nos. DT's the value of safe custody BG shall be Rs.20.00 Lacs. The safe custody bank Guarantee (SCBG) shall be of 1% of the value of the contract or as per above mentioned slab, whichever is lower.** The safe custody BG shall be valid for a period of 12 months over and above the normal GP. After a period of 16 months from normal GP the safe custody BG shall be returned back unless there is some specific direction from the purchaser.

In case firm fails to furnish the safe custody BG the amount equivalent to safe custody BG shall be deducted from firm's first bill due for payment. On furnishing of safe custody BG the amount so deducted shall be returned to the firm. The safe custody BG shall be valid for a period of 12 months over and above the normal GP. After a period of 16 months from normal GP the safe custody BG shall be returned back unless there is some specific direction from the purchaser.

**The Safe custody Bank Guarantee (SCBG) shall be returned back after expiry of overall Guarantee Period of all the Transformers and effecting all the applicable recoveries as per contract.**

- II.** All the **replaced** transformers by the manufacturer under guarantee clause shall carry a further guarantee of 12 months after **replacement** or unexpired guarantee of 36 months from the date of supply, whichever is later, after **replacement**. The bank guarantee equivalent to cost of **replaced** transformers shall be furnished after expiry of performance guarantee period to cover **such guarantee**. The purchaser also reserves the right to withhold the payment of supplier firm, under any other contract, if the performance of the supplier in

**replaced** transformers is not satisfactory. Each supplier shall invariably furnish the detailed information about the total number of transformers failed and **replaced** by them, every month after commencement of supplies.

**III.** In order to ascertain that transformers have successfully completed guarantee period the following details shall be provided on the transformer body:

**A. A replacement identification steel plate on replaced transformer against G.P. failed transformer of size 75 x 75 x 2.5 mm duly engraved with following details shall be welded on the transformer body.**

Particulars	Original Supply	1 <sup>st</sup> Replacement	2 <sup>nd</sup> Replacement	3 <sup>rd</sup> Replacement
Firm's Name/Logo				
TN				
Rating (KVA)				
Sr. No.				
Date of Dispatch				
Date of failure				
Guarantee period Upto				

**B.** Such metallic plate fixed on first **replacement** should not be removed at the time of second **replacement** or any subsequent **replacement**. However, necessary details of failure and **replacement** shall be graved on **the identification plate**, each time it is **replaced** in guarantee.

**Note:-All other plates such as rating and terminal marking plate and Technical cum Identification Plate have to be affixed on the replaced transformers. In case it is felt that these are loose, then it should be repaired suitably by welding or riveting.**

**C.** The **replaced** transformer shall be provided with 40 mm wide red color band all around transformers including radiator each time it is **replaced** in G.P. Thus if a transformer is **replaced** three time in G.P. then there should be three colored bands each of size 40 mm.

**IV.** Test checking of G.P. failed transformers will be allowed to the supplier at Nigam's store before lifting of G.P. failed distribution transformers to repair at supplier's works so that minor mistakes like losing of connections/replacement of fuse wire/replacement of MCCB be carried out at Nigam's stores.

**V.** The Testing Procedure of such replaced Distribution Transformer including Physical Verification shall be same as per Testing of New Distribution Transformer at Firm's Works as well as at CTL without any tolerance in the losses at 50% and 100% loading.

NOTE:-1. Firm shall keep the records for at least 8 years of transformers supplied by them.

**35. PRICE:**

The prices shall be quoted on F.O.R. destination basis in the manner detailed in **BOQ** indicating details of Ex-works price, Freight & Insurance charges, CGST and SGST or IGST for delivery at our stores. The quoted prices shall be variable as per IEEMA price variation formula attached herewith at **Schedule-II**, without any ceiling for distribution transformers. **The Base date for transformer will be 01.05.2022** irrespective of date of tender opening. The offers where the prices have not been quoted in prescribed manner are liable for rejection.

The bidder shall submit transformer cost analysis sheet along-with the tender—including the cost of raw materials, overhead expenses, estimated profit, etc., for each rating separately, as per the annexure attached with the specification. In case the cost analysis sheet is not enclosed Nigam may consider to ignore such offers.

**NOTE:**

- (i) Payments shall be made only after receipt of successful test report from our Central Testing Laboratory (CTL) on the samples selected from the material received at the stores, however, the payment priority shall be maintained from the date of submission of bills along with receipted challans to the Sr. Accounts Officer (CPC), JdVVNL, Jodhpur.
- (ii) **Payment shall be made only through electronic mode i.e. RTGS or NEFT. The charges being levied by the bank for providing this service shall be to supplier's account on actual. For this, the required details viz; name of supplier in which the bank account is established, bank account number, name and address of the branch of the bank along with its IFS code are required to be obtained from the payee on its letter head duly signed by the supplier or its authorized signatory.**

**36. DELIVERY SCHEDULE:**

The bidders are required to indicate the delivery period in the schedule attached herewith. The commencement period shall include the time taken for conducting the type test and approval of drawings etc. The maximum commencement period should not be more than 45 days from the date of receipt of P.O. Further the monthly delivery quoted shall be such that the entire offered quantity shall be completed within a period of 10 months from date of receipt of P.O. including commencement period.

The offers deviating in deliveries as per above schedule given, shall be considered as non-responsive. The monthly delivery shall be quoted irrespective of the offered / ordered quantity and offers with any conditional deliveries shall be considered as non-responsive.

**37. PERFORMANCE SECURITY:**

Performance security shall be solicited from all successful bidders except the departments of the State Government and undertakings, corporations, autonomous bodies, registered societies, co-operative societies which are owned or controlled or managed by the State Government and undertakings of the Central Government.

However, a performance security declaration shall be taken from them. The State Government may relax the provision of performance security in particular procurement or any class of procurement.

The amount of performance security shall be as under:-

- a) 2.5%, or as may be specified in the bidding documents, of the amount of supply order in case of procurement of goods and service and 3% of the amount of work order, in case of procurement of works.
- b) 0.5% of amount of quantity ordered for supply of goods, in case of Small Scale Industries or MSME unit of Rajasthan; and
- c) 1% of the amount of supply order, in case of sick industries other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR).

The bank guarantee shall be initially valid for **36 months** and shall be further extended to cover the balance guarantee period whenever required by the purchaser. The performance bank guarantee shall be furnished in the prescribed proforma on a Rajasthan Govt. Non-Judicial stamp paper (where-ever applicable) amounting to 0.25% of the B.G value or Rs. 25,000/- , whichever is less. (It will also applicable on other type of Bank guarantee(s)). Out side the state of Rajasthan firms not furnishing the bank guarantee on non-judicial stamp paper of Rajasthan Govt. then they shall have to furnish difference amount of stamp duty on Non-Judicial stamp paper of Rajasthan Govt. You shall also furnish manufacturer's warranty on Rajasthan Govt. Non-Judicial stamp paper amounting Rs. 500/- as per clause No.1.41.2 (a) of GCC in the prescribed proforma.

### 38. QUANTITY:

S. N	ITEM	QUANTITY
1.	11/0.440 KV, 160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS	275 Nos.

The prices of Distribution Transformers shall be variable as per IEEMA Price Variation Formula without any ceiling (The Base date will be **01.05.2022**).

### NOTE:-

- A) Price bids shall be opened only of the firms who are having "BIS Certificate" as on opening of technical bid.
- B) Besides above changes, the technical parameters of the specifications wherever are deviating from the IS:1180 (Part-I/2014), the same shall be in accordance with IS:1180 (Part-I/2014) and its latest amendments, if any and the changes where the IS:1180 (Part-I/2014) is silent for technical parameters, same shall be applicable as per Discom specification.
- C) The Star Rated will be as per notification letter dated 16.12.2016, Ministry of Power, Govt. Of India, New Delhi.**



**39. ADDITIONAL ORDER**

Repeat orders for additional quantities, up to 50% of original ordered quantities, may be placed by the Nigam, on the same rates, terms and conditions given in the contract.

**40. Make of Brought Out Items:**

The Make of brought out items like Bushings, Transformer Oil, MCCB etc. other than Make specified in the specification/work order may be accepted if confirms to relevant IS with due approval of JdVVNL.

**41. TRANSFORMER LIFE:-Transformer shall be designed/manufactured with expected service life of 10 years, because as per Distribution code of JVVNL, the Distribution transformers should be dismantled and sent to testing and repair shop for overall inspection of the transformers with frequency of overhauls as 10 yearly.**

**Schedule – I****SCHEDULE OF REQUIREMENT**

**160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND DISTRIBUTION TRANSFORMER UNDER SPECIFICATION NO. JdVVNL/SE (MM&C)/EIAI/TN-1789.**

<b>Sr. No.</b>	<b>Item/Rating</b>	<b>Quantity (in Nos.)</b>
1	160 KVA, 11/0.433 KV Aluminium Wound BIS LEVEL-1 (STAR-1) Distribution Transformers. The prices of transformer shall be variable as per IEEMA Price Variation Formula without any ceiling <b>(with base date 01.05.2022)</b>	<b>275 Nos.</b>

**NOTE:-**

- 1. The quantities as mentioned in the schedule of requirements are tentative and may increase/decrease as per the requirement of the Nigam.**
- 2. Price bids shall be opened only of the firms who are having “BIS Certificate” as on opening of technical bid.**
- 3. Besides above changes, the technical parameters of the specifications wherever are deviating from the IS:1180 (Part-I/2014), the same shall be in accordance with IS:1180 (Part-I/2014) and its latest amendments, if any and the changes where the IS:1180 (Part-I/2014) is silent for technical parameters, same shall be applicable as per Discom specification.**
- 4. The Star Rated will be as per notification letter dated 16.12.2016, Ministry of Power, Govt. Of India, New Delhi.**

**SCHEDULE- II**

PRICE VARIATION CLAUSE FOR ALUMINIUM WOUND DISTRIBUTION TRANSFORMERS COMPLETE WITH ALL ACCESSORIES AND COMPONENTS (FOR SINGLE AND THREE PHASE OF RATINGS UPTO 2500 KVA AND VOLTAGE UPTO 33 KV)(BEE / ENERGY EFFICIENCY LEVEL AS PER IS:1180(PART-I): 2014) Supplied against domestic contracts UNDER **TN-1789**

This price variation clause is applicable for 'Single Phase & Three Phase Aluminum Wound Distribution Transformers' for BEE / Energy Efficiency Level as per IS:1180 (Part-I):2014 of rating upto 2500 KVA and voltages upto 33 KV. The clause is to be used for domestic contracts.

The price quoted/ confirmed is based on the input cost of raw material / components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price Index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with following formula.

$$P = \frac{P_o}{100} \left\{ 8 + 22 \frac{AL}{ALO} + 36 \frac{ES}{ESo} + 12 \frac{IS}{ISo} + 5 \frac{IM}{IMo} + 10 \frac{TO}{TOo} + 7 \frac{W}{Wo} \right\}$$

Wherein

- P** = Price payable as adjusted in accordance with the above formula.  
**Po** = Price quoted/ confirmed.  
**ALo** = Price of LME CSP Average of Aluminium (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of tendering.  
**ESo** = Price of CRGO Electrical Steel Lamination (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of tendering.  
**ISo** = **Price of HR coil of 3.15 mm thickness** (refer notes).  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of tendering.  
**IMo** = Price of insulating Materials (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of tendering.  
**TOo** = Price of Transformer Oil (Refer notes).  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of tendering.  
**Wo** = All India average consumer price index number for industrial workers as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base 2016=100) This index number is as applicable on the first working day of the month, three months prior to the date of tendering.

For example, if date of tendering falls in December, 2021, applicable price of Aluminium (ALo) and Transformer Oil (TOo) CRGO Steel Sheets (ESo), HR Coil (ISo) and insulating material (IMo) should be as on 1<sup>st</sup> November, 2021 and all India average consumer price Index number (Wo) should be for the month of September, 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA (PVC) / PWR\_DIST\_TRF (R-1)/-/- one month prior to the date of tendering.

- AL** = Price of LME CSP Average of Aluminium (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of delivery.
- ES** = Price of CRGO Electrical Steel Lamination (refer note)  
This price is as applicable on the 1<sup>st</sup> working day for the month, one month prior to the date of delivery.
- IS** = **Price of HR coil of 3.15 mm thickness** (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of tendering.
- IM** = Price of insulating Materials (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of delivery.
- TO** = Price of Transformer Oil (refer notes)  
This price is as applicable on the 1<sup>st</sup> working day of the month, one month prior to the date of delivery.
- W** = All India average consumer price index number for Industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base 2016=100) This index number is as applicable on the first working day of the month, three months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in Dec. 2021, the applicable price of aluminium (AL) and Transformer Oil (TO), CRGO steel sheets (ES), HR coil (IS) and insulating material (IMo) should be as on 1<sup>st</sup> Nov. 2021 and all India average consumer price index number (W) should be for the month of Sept. 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA (PVC) / PWR\_DIST\_TRF (R-1)/-/- one month prior to the date of delivery.

The date of delivery is the date on which transformer is notified as being ready for inspection / despatch (in the absence of such notification, the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

The claim of price variation shall be governed as per the Clause No. 1.10.2 of Instructions to Bidders.

**NOTE- The Base date will be 01.05.2022 irrespective of date of tender opening.**

**SCHEDULE II A****PRICES & PRICE VARIATION**

- a) The prices quoted shall be variable as per Price Variation Formula given in the Specification (Schedule-II) without any ceiling.
- b) If the price variation formula/**Indices** is changed, the same shall be applicable for the price variation. During the transit period when both old and new indices are being circulated, then the admissible Price Variation shall be applicable, which is advantageous to Nigam, and the period from which the old indices are discontinued then the P.V. shall be admissible with the new indices.
- c) The date of delivery applicable for claiming price variation shall be the date prevailing on the first day of Calendar month which shall be determined in the manner prescribed hereunder:-
- (i) When the material is offered within stipulated delivery schedule : For allowing P.V. the date of delivery shall be considered the date on which material is notified as being ready for inspection or date of receipt of inspection call in the office.
- (ii) When the material is offered after expiry of stipulated delivery schedule : For allowing P.V. in the cases supplies are made after the expiry of scheduled delivery, the price prevailing in the last month of the stipulated scheduled delivery or the date on which material is notified as being ready for inspection or date of receipt of inspection call in the office, whichever is beneficial to Nigam shall be allowed.
- (iii) When the material is offered ahead of delivery schedule on the request of Jodhpur Vidyut Vitran Nigam Limited : Normally supplies ahead of delivery schedule shall not be accepted. However in case of urgency of material, if supplies are accepted ahead of delivery schedule, PV shall be allowed on the basis of the material is notified as being ready for inspection or date of receipt of inspection call in the office.
- (iv) When the material is offered ahead of delivery schedule by firm at their own and accepted by Nigam on the request of firm: Normally the request of the firm to accept the material ahead of delivery schedule will not be accepted. In case firm offers supplies ahead of delivery schedule at their own and such request is accepted by Nigam, the price prevailing in the last month of stipulated delivery schedule or the date on which material is notified as being ready for inspection or date of receipt of inspection call in the office, whichever is beneficial to Nigam shall be allowed.

**Schedule – III****JODHPUR VIDYUT VITRAN NIGAM LIMITED**

**A Govt. of Rajasthan Undertaking**  
**Prescribed technical specification for supply of**  
(Name of Material/Equipment/Machinery/T&P etc.)

S.No.	Technical specification	Name of IS/other	Other particulars
	to which material/equipment/ Machinery/T&P shall confirm	standard specification to which material should confirm	if any.

Certified that we agree to all the aforesaid technical specification except at S.No. í . for which our technical specification shall be as under:-

S.No.	Technical specification	Name of IS/other	Other
	particulars to which material/equipment/ confirm to which material should confirm	standard specification	if any. Machinery/T&P shall

**(Signature)**  
Name & Designation  
with seal of the bidder.

**SCHEDULE-III-A****QUALIFICATION REQUIRMENT FOR PURCHASE OF 160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION NO. JdVVNL/SE (MM&C)/EIAI/TN-1789.**

The bidder should fulfill following qualifying requirements for successful participation in the tender along with relevant documentary evidence supporting each qualifying requirement without which the offer shall be considered non-responsive & rejected.

I) The bidder should be a manufacturer of offered items. The offers from sole selling agent/ authorized dealers shall not be entertained.

II) The bidder is required to quote for **minimum 10% of tendered quantity**, failing which the offer may be considered Non-Responsive.

IIA) **The bidders should be qualified, not be insolvent, not be in receivership, not be bankrupt or being wound up, should not have affairs administered by a court or a judicial officers, should not have business activities suspended, should not be blacklisted or debarred by any utility/ government agency, should not have a conflict of interest. For this bidder is required to furnish a Declaration as per Appendix-F, on Rajasthan Non-judicial Stamp Paper of Rs. 100/ (excluding surcharge on Stamp Paper, as per rules)**

III) **The bidder should have designed, manufactured/fabricated, tested and supplied to Licensed Power Utility/Discoms/Govt. Departments Distribution Transformers at least 2XQQ (QQ being the quoted quantity) of similar or higher rating in last three financial years from the date of opening of techno commercial bid (For quantity verification C.A. Certificate should be furnished in prescribed proforma as per schedule-VII(A) only). However, this will not be applicable for transformers having different number of phases i.e. quantity supplied in three phase transformers will not be considered for single phase and vice-versa.**

**Note:**1. The material supplied and accepted for same/ higher rating for Turnkey projects to a licensed power utility/Govt. shall be considered for the purpose of evaluating criteria. The certificate given by C.A. shall indicate above quantity separately.

2.The CA Certificate should be furnished on the letter head of CA and must be signed by the bidder and C.A. firm. **The details i.e. address of C.A., UDIN No. & membership No. shall clearly be mentioned on C.A. certificate.** In case C.A. certificate is not signed by the bidder/furnished without membership No., UDIN No. & address of C.A. then same may not be considered for which responsibility rests with the bidder.

In support of fulfillment of the past supply criteria, the bidder shall furnish documentary evidence in the form of certificate from Chartered Accountant in the enclosed prescribed proforma only. This prescribed proforma should be furnished either in original or copy duly attested by Notary. The bidder shall also sign and affix seal on the C.A. Certificate. The certificate should have membership number with the name & address of the chartered accountant. Certificate should clearly indicate the quantity supplied, period of supply, voltage Class, Rating of the Transformer etc. in the format prescribed, any deviation to format or information diverted format, will not be considered and rejected.

**The bidder is also advised to furnish an undertaking regarding correctness of CA certificate in enclosed ANNEXURE-I.**

IV) The BIS is must for participation in the bid along with the type test reports of offered type and design which should not be older than five years as on date of opening of technical bid. The type test should be conducted on one unit i.e. Short Circuit Withstand Test, Lightening Impulse Voltage Withstand Test, Temperature Rise Test and Pressure Test as per IS:1180 (Part-I)/2014 .The firm will furnish Type Test BG of Rs.5.0 lac in lieu of non furnishing of Type Tests Reports of offered type & design. The firm will also furnish the valid BEE Certificate (160KVA 3-Phase DT) and inclusion of offered rating in the BIS Certificate before commencement of supply.

**Note: The price bid of only those bidders shall be opened whose BIS Certificate is valid as on the date of opening of Technical Bid. However, if the BIS License validity is expired as on date of opening of technical bid then the bid may be considered if BIS License is operative as on date of opening of technical bid and firm furnish the proof of deposition of renewal fee to BIS on or before expiry date of validity of BIS license.**

V) The bidder shall furnish valid type test certificates of same rating of offered item from a Govt. approved/Govt. recognized/NABL Accredited laboratory/ILAC i.e. International Laboratory Accredited Laboratory (in case of foreign laboratory). Such type test certificates should not be older than 5 years as on the date of opening of tender. For this purpose date of conducting type test will be considered. The date of conducting type test shall be before the date of opening of technical bid. Type test conducted at supplier's own NABL accredited lab shall not be considered. The following Type Test shall be conducted on one unit at NABL/Govt. Approved Lab as per IS:1180 part-1/2014 (Details of Test given in the specification)

- a) Lightening Imp. Voltage Test at Min 75 KV
- b) Short Circuit Test
- c) Temperature Rise Test
- d) Pressure Test.

**NOTE: As per CEA letter no. CEA-PS-14-80/1/2019-PSETD Division Part (2) / 517-96 dated 17.09.2021, the Type Test Reports, which could not be revalidated due to COVID Pandemic since 23<sup>rd</sup> March 2020, shall be treated as valid upto 30<sup>th</sup> September 2022.**

VI) In case the bidder is not in a position to furnish type test certificate of same rating of offered item and furnish type test certificate of higher rating from CPRI/independent NABL Accredited laboratory/Govt. approved lab (which does not belong to tenderer) at the time of submission of bid, the bid of the bidders may be considered as responsive, **if bidder furnish undertaking alongwith type test security BG/DD/Pay Order for type test of rating offered shall be arranged from first lot (without asking for any delivery extension) or shall furnish the valid Type Test reports before commencement of supply, from ERDA/CPRI/independent NABL accredited lab/Govt. approved lab.**

The bank guarantee from a Scheduled Bank/DD/Pay Order should be for an amount of Rs. 5.0 Lacs towards furnishing of satisfactory type test reports **from first lot (without asking for any delivery extension) or shall furnish the valid Type Test reports before commencement of supply. However, the date of issuing of Type Test Bank Guarantee in lieu of non-furnishing of Type Test reports shall be before the date of opening of technical bid & the Type test BG issued on or after opening of technical bid shall not be accepted.** In case the bidder fails to furnish successful type test certificates from the offered lot(s) **or does not furnish the valid Type Test reports before commencement of supply.**, their bank guarantee/DD/Pay Order will be invoked/forfeited (Proforma for submitting undertaking a bank guarantee is enclosed at Schedule-III B. **The initial validity of B.G. shall be nine months with grace period of three months.**



**The firms may furnish the Type Test Reports of offered type & design or of higher rating with a Bank Guarantee of Rs. 5.0 lacs alongwith the Technical Bid. However, the date of issuing of Type Test Bank Guarantee in lieu of non-furnishing of Type Test reports shall be before the date of opening of technical bid & the Type test BG issued on or after opening of technical bid shall not be accepted.**

Note:-New state units & also those units located in Raj. which do not meet Qualifying Criteria may be considered for trial order subject to technical competency and furnishing of BG of Rs. 5.00 Lacs in lieu of non furnishing of Type test report of offered items and design but BIS Certificate must be valid as on date of opening of Technical Bid failing which the bid shall be considered Non-Responsive. **However, the date of issuing of Type Test Bank Guarantee in lieu of non-furnishing of Type Test reports shall be before the date of opening of technical bid & the Type test BG issued on or after opening of technical bid shall not be accepted.**

VII) The bidder should possess adequate testing facilities for carrying out routine & acceptance test of items as per relevant standard at their works. The bidder shall furnish documentary evidence in support for conducting routine & acceptance test.

VIII) The bidder shall clearly indicate the deviations such as Technical Deviation & Commercial Deviations in the prescribed proforma only. The deviations indicated elsewhere in the bid shall not be accepted.

VIII a) The bidder must clearly fill up each and every particular of Guaranteed Technical Particulars annexed with Technical Specification otherwise he will be responsible for Technical Non-Responsiveness.

VIII b) The type test certificates shall be furnished either in original or copy duly attested by notary.

#### **IX) PERFORMANCE CRITERIA:-**

i) If a bidder has supplied upto 50% of ordered quantity in previous tender upto date of opening of subsequent tender and scheduled delivery period expired, the bid of such bidder will not be opened in the Discom for that item.

ii) However, if the supplies have been completed for a quantity more than 50% but not completed upto date of opening of subsequent tender and scheduled delivery period expired, the quantity equal to the quantity pending in previous tender for that item shall be reduced from the subsequent tender quantity to be allocated to the bidder.

#### **X) POOR RECORD OF PERFORMANCE AND DELIVERY:**

The bidder(s) who have been black listed **in any of the state Discom** or with whom business relations have been severed in Jodhpur Discom shall not be considered. Severment of business relations will be done in case of following circumstances for the period and with the recovery mentioned against each:

i) When vendor does not accept order awarded on its accepted price and terms and conditions and does not comply with contractual formalities.	Forfeiture of EMD/cancellation of vendor registration to recover amount of EMD along with severment of business relations for three years from the date of issue of order.
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ii) When vendor complies with contractual formalities but does not commence supplies.	Levy of maximum recovery on account of delay in delivery along with severement of relations for a period of 2 years from the date of issue of order or in next two bids whichever is later.
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A Bidder debarred under section 46 of the RTTP Act shall not be eligible to participate in any procurement process undertaken by -

- (a) any Procuring Entity, if debarred by the State Government; and
- (b) a Procuring Entity if debarred by such procuring Entity.

## **XI ) Black Listing:**

### **(A) Black Listing of Firms-**

After having given Show Cause Notice of 30 days, and having established & cogent reasons for blacklisting of the firm as given below, the firm should immediately be blacklisted for a period of 5 years indicating reasons of doing so, in the letter itself, and a copy of such blacklisting should be given to the firm, with the approval of CLPC:-

(i) There are sufficient and strong reasons to believe that the supplier or his employee has been guilty of malpractices such as manhandling/misbehaviour with Government official by supplier or his partner/employee, bribery, corruption or abatement of such a offence in a position where he could corrupt Nigam's official, fraud, vitiating fair tender process including substitution of or interpolation in tender, mis-representation, pilfer-aging or unauthorized use or disposal of Nigam's material issued for specific work etc.

(ii) Where a supplier or his partner or his representative has been convicted by a court of Law for offences involving moral turpitude in relation to the business dealing or where security considerations including suspected disloyalty to the Nigam/state so warrant the blacklisting.

(iii) If the State Bureau of Investigation or any other authorized investigating agency recommends for blacklisting after completing the investigation.

#### **Note: - 1**

If a supplier after having tendered for a supply or after negotiations gives application voluntarily vitiating the fair tendering process, it shall also tantamount to malpractice.

#### **Note: - 2**

A Black listed supplier –

- (i) shall not be entitled for registration in any of the Discom
- (ii) shall not be awarded any supply order in future in any Discom during the notified period.
- (iii) his registration if any shall stand cancelled immediately and his registration security/EMD/S.D. shall stand forfeited.
- (iv) In case of blacklisting of the firm by any one of Discom for the cogent prescribed reason(s) as stipulated above, the same shall be applicable to all the three Discoms and as a consequence of blacklisting, all the pending orders to that firm, will be cancelled in all three (3) Discoms with immediate effect. However in respect of completed/executed contract G.P. obligations as well as other liabilities shall be fulfilled by the supplier.

**B. Severement of Business relation:**

After having given Show Cause Notice of 30 days, and having established & cogent reasons for Severement of business relation as given below, the firm should immediately be severed the business relations for a period of 2 to 3 years indicating reasons of doing so, in the letter itself, and a copy of such severement should be given to the firm, with the approval of CLPC:-

- i. The supplier continuously refuses to pay Nigam dues without showing adequate reasons and where the purchasing authority is satisfied that no reasonable dispute attracting reference to Settlement Committee or Court of Law exists for the supplier's action of non-supply.
- ii. When vendor does not accept LOI/detailed purchase order awarded on its accepted prices and terms & conditions or does not comply with the contractual formalities.
- iii. When vendor/supplier who otherwise completed contractual formalities but does not commence supplies on the date of opening of technical bid of the fresh tender/completion of schedule delivery period whichever is later.

**Note:-**

1. In case supplier does not deposit outstanding dues towards Nigam, even after completion of severement period, the period of severement will continue.
2. Severement done purely/ mainly on account of non-deposition of dues against the supplier/vendor/contractor could be lifted by CLPC, if the dues are deposited prior to the expiry of such severement period.
3. Severement done by one Discom for non-supply of material and /or corresponding non-recovery of dues will not be effective in other Discoms **except in respect of common purchase cases of Three Discoms.**
4. On severement of business, the EMD/SD/vendor registration security will be forfeited.
5. The orders in execution satisfactorily will not be cancelled other than the order on which severement have been done.

**C. DEBARMENT:-**

Reasons on which Debarment can be made:-

- (i) The competent authority may debar the supplier on account of his performance or other disabilities, if it is no longer considered fit to remain under vendor registration as per his obligation under vendor registration.
- (ii) If at any subsequent stage of inspection of firms after award of contract, it is found that firm does not have sufficient tech. staff or required/necessary technical equipment, the purchasing authority can debar the firm for one year or next tenders whichever is later. The debarment will be lifted only on re-inspection of firm's works; the defects noticed earlier are fully rectified to the satisfaction of Nigam.
- (iii) When contract agreement executed and supplies commenced but could supply only up to 50% of ordered quantity and scheduled delivery period expired, then the firm can be debarred for one year or next tender whichever is later in that Discom only for that particular item/rating/capacity/size etc.
- (iv) The suppliers who have been awarded contract for supply of material is not adhering to the periodic delivery schedule, the contract awarding

authority reserve the right to terminate the contract and may debar the firm in participating in tender for a period of 2 to 3 years.

**Note:-1.** On debarment, the EMD/SD/Vendor Registration security shall be forfeited.

**Note:-2.** If the firm is debarred in one Discom for any reasons then the same should not be applicable in other Discom **subject to exception that in case of common Discoms purchases such debarment of a firm would be applicable to all three Discoms for that particular item and rating/capacity/size etc.**

## **XII) Panel Provisions against defaulter bidder:-**

**As per RTPP Act 2012 clause 42 (2) A bidder who-**

- (a) withdraws from the procurement process after opening of financial bids;**
- (b) withdraws from the procurement process after being declared the successful bidder;**
- (c) fails to enter into procurement contract after being declared the successful bidder;**
- (d) fails to provide performance security or any other document or security required in terms of the bidding documents after being declared the successful bidder, without valid grounds, shall, in addition to the recourse available in the bidding documents or the contract, be punished with fine which may extend to fifty lakh rupees or ten per cent of the assessed value of procurement, whichever is less**

## **XIII) APPEALS AND APPLICATIONS:**

Appeal against the order of blacklisting, severement and debarment can be filed before BOD within a period of 3 months from the date of intimation. The letter of appeal will be addressed to the order placing authority. Who will process the case for placing the matter in B.O.D. with in a period 60 days. The BOD may reduce or waive the penalty, if sufficient reasons/supporting documents are furnished by the supplier.

**Schedule – III -B****BANK GUARANTEE IN LIEU OF FURNISHING OF TYPE TEST CERTIFICATE  
UNDER TN-1789****(On Rajasthan Non-Judicial Stamp Paper worth Rs.1250/-)**

To,

The Superintending Engineer (MM&C)  
Jodhpur Vidyut Vitran Nigam Limited  
New Power House Premises,  
Industrial Area,  
Jodhpur.

Dear Sir,

Whereas Jodhpur Vidyut Vitran Nigam Limited, Jodhpur (hereinafter called the Purchaser) has issued a tender enquiry under TN\_\_\_\_\_ for procurement of \_\_\_\_\_ (name of material).

Whereas M/s \_\_\_\_\_ (hereinafter called the bidder) has furnished a bid for supply of \_\_\_\_\_ to the Superintending Engineer (MM&C), Jodhpur Vidyut Vitran Nigam Limited, Jodhpur or his nominated officer(s).

Whereas in accordance with the provision of the specification of the aforesaid TN\_\_\_\_\_, the bidder can deposit a bank guarantee in lieu of the requirement of furnishing the type test certificates.

Whereas M/s \_\_\_\_\_ (the bidder) have requested us (Name of the Bank) to furnish the bank guarantee, in lieu of the type test certificate, for an amount equivalent to Rs.\_\_\_\_\_ (in words also) only.

Under this Bank Guarantee, we (Name of the Bank) hereby undertake unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to the purchaser on his first demand without whatsoever right of objection on our part and without his first claim to the bidder, in the amount not exceeding (amount of guarantee in figures and words).

Payment pursuant to this undertaking will be demanded by the purchaser from the Bank and will be met by the Bank without question in the case in which the bidder, on receipt of the order and/ or after the acceptance of this tender, makes default in furnishing the required type test certificates. As to whether the occasion or ground has arisen for such demand the decision of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitran Nigam Limited, Jodhpur shall be final.

The liability of the Bank shall not at any time exceed Rs.\_\_\_\_\_ (Rupees \_\_\_\_\_).

The undertaking will be determined on but will not withstanding such determination, continue to be in force till the expiry of 3 months from that date.

No indulgence or grant of time by the purchaser to the bidder without the acknowledgement of the Bank will discharge the liabilities of the Bank under this guarantee.

The guarantee herein contained shall not be affected by any change in the constitution of the bidder.

All disputes arising under the said guarantee between the Bank and the bidder or between the bidder and the purchaser pertaining to the guarantee shall be subject to the jurisdiction of Courts only at JODHPUR in Rajasthan.

The Bank further undertake not to revoke this guarantee during its currency except with the previous consent of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitran Nigam Limited, Jodhpur.

Notwithstanding anything contained herein before, the Bank's liability under this guarantee i.e. restricted to Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) and the guarantee shall remain in force upto \_\_\_\_\_. Unless demand or claim in writing is presented on the Bank within three months from that date, the Bank shall be released and discharged from all liabilities there-under. However, the validity of the bank guarantee shall be extended as and when required by the purchaser.

IN WITNESS WHEREOF the Bank has executed these presents the \_\_\_\_\_ day \_\_\_\_\_ month \_\_\_\_\_ and year \_\_\_\_\_.

Yours faithfully,

(Bankers)  
EXECUTANT

Witnesses:

1.

2.

**SCHEDULE-IV `A`****Must be filled-in by the tenderer and attach with technical bid (Part-I)**

To,

The Superintending Engineer (MM&C),  
Jodhpur Vidyut Vitran Nigam Limited,  
Jodhpur.

Dear Sir,

With reference to your invitation to tender against specification No JDVVNL/SE (MM&C)/E1A1/TN-1789 we agree to supply the following quantity:-

S. No	Particulars of item	Tendered Quantity	Qty. Offered	Justification of quantity offered as per Qualifying Requirement.	Status of Type Test Certificates.
1	2	3	4	5	6
1	Purchase of 11/0.440 KV, 160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS UNDER SPECIFICATIONS TN-1789.	275 Nos.			

- The offer is valid for a period of 120 days from the next date of opening of this tender.
- Bidders are requested to quote separate price of both i.e. Transformer & M&P Box otherwise their bid offer shall be ignored/rejected.** The base date for transformer will be **01.05.2022** irrespective of date of tender opening.
- It is noted that the quantities as mentioned in the specification are approximate and we agree to supply any quantity as per your requirement.
- The delivery shall strictly be in accordance with our delivery clause as given in **Schedule-VIII** of this specification. In case we fail to deliver the material as indicated in the clause No. 1.23, we are liable to pay recovery for delay in delivery as per clause No. 1.24 of this Schedule-II of this specification. The material shall conform to your specification No. JDVVNL/SE(MM&C)/TN-1789 and as per relevant ISS in all respect.
- We confirm that we agree to all the terms & conditions as well as the technical stipulations of your specification No. JDVVNL/SE(MM)/TN-1789 and there are no deviations other than as specified in the **Schedule VI (A&B)**.

Yours faithfully,

Signature of tenderer  
with stamp  
Date

**Schedule – V****JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking**

Statement of guaranteed technical particulars and other performance data for supply of í í í í í í í í í í í í í í í í .. (Name of material) against specification no..í í í í í í í í í í ..

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S.No.	Particulars of technical & other performance data guaranteed.
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Certified that we agree to all the aforesaid technical particulars and other performance data except following :-

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S.No.	Particulars of technical & other Performance data	Reasons for deviations/departure.
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**(Signature)**

Name & Designation  
with seal of the bidder.



**Schedule – V(A)****MANUFACTURER'S GUARANTEED TECHNICAL PARTICULARS OF 160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION TN-1789.**

<b>S. No.</b>	<b>PARTICULARS</b>	<b>AS OFFERED (160 KVA)</b>
1.	Manufacturer's Name and Address	
2.	Service (Outdoor, continuously rated)	
3.	Type (CRGO / Conventional)	
4.	Continuous max. Rating under peak ambient temp. of 50 ° C	
5.	Rated voltage : (a) H V (b) L V	
6.	Rated current (a) H V (b) L V	
7.	Rated Frequency	
8.	No. of phases	
9.	Method of connection : (a) H V (b) L V	
10.	Vector group reference	
11.	Method of cooling	
12.	Max. temperature rise obtained by the transformer when run at the maximum ambient temp. of 50 ° C (a) Of top oil by thermometer (b) Of winding by resistance	
13.	Hottest spot temperature, at rated current and voltage, calculated corresponding to the yearly weighted average ambient temp. of 35 ° C	
14.	<b>Total losses At rated current and at 75° C</b> i) At 50% loading ii) At 100% loading	
15.	Percentage impedance at full load and at 75 ° C	
16.	Percentage resistance at full load and at 75 ° C	
17.	Percentage reactance at full load	
18.	Efficiency at 75 ° C :- a) At unity power factor :- i) At 125% of full load ii) At 100% of full load iii) At 75% of full load iv) At 50% of full load v) At 25% of full load b) At 0.8 power factor :- i) At 125% of full load	

S. No.	PARTICULARS	AS OFFERED (160 KVA)
	ii) At 100% of full load iii) At 75% of full load iv) At 50% of full load v) At 25% of full load	
19.	Maximum efficiency	
20.	Load at which maximum efficiency occurs	
21.	% regulation at full load & at 75 ° C: a)At unity power factor b)At 0.8 power factor	
22.	Max. flux density at rated voltage and rated frequency	
23.	Percentage no load current at rated frequency (without any positive tolerance) a) At rated voltage b)At 112.5% rated voltage	
24.	Insulation level of transformer :- a) Impulse strength of HV b)Power frequency withstand voltage HV LV	
25.	H V Bushing details:- (a) Rating of the bushing (b) Impulse strength (c) Power frequency withstand voltage, dry and wet (d) IS reference	
26.	LV Bushing details :- (a) Rating of the bushing (b) Power frequency withstand Voltage, dry and wet (c) IS reference	
27.	<b>H V coil constructional details:-</b> (a) type of winding (b)No. of coils per phase (c)Conductor cross Section(min.) (d)Bare conductor dia (e)Covered conductor dia (f) `Phase current (H V) (g)Current density (h)Coil I. D (i)Coil O.D (j)Coil axial length (k) Total no. of turns per phase (l) Resistance per ph. at 75 ° C (m) Weight of covered conductor per transformer (n) Inter layer insulation (o) No. of vertical spacers per circle (in the annular gap between LV & HV)	

S. No.	PARTICULARS	AS OFFERED (160 KVA)
28.	<p><b>LV coil constructional details:-</b></p> <p>(a) type of winding            (b)No. of coils per phase            (c) Conductor cross section(min.)            (d)Bare conductor size            (e)No. of conductors in parallel            (f)Covered conductor size            (g)Phase current ( L V )            (h)Current density            (i)Coil I.D.            (j)Coil O.D.            (k)Coil axial length            (l)Total no. of turns per phase            (m) Resistance per phase at 75 ° C            (n) Weight of covered conductor per transformer            (o) Inter layer insulation            (p) No. of vertical spacers per circle</p>	
29.	<p>Minimum external clearances in air (with B M C s mounted)</p> <p>(a) HV phase to phase            (b) HV phase to earth            (c) LV phase to phase            (d) LV phase to earth</p>	
30.	<p>Minimum internal clearances (in oil)</p> <p>(a)Between HT outside surface and tank inside (non bushing side)            (b)Between HT outside surface &amp; tank inside ( HV &amp; LV bushing side)            (c)Between HV windings and yokes (end insulation)            (d )LV windings &amp; yokes            (e) From top of yoke to inside of top cover of tank (with gasket)            (f)LT / HT coil annular gap. (bare Conductor)            (g)Radial clearance between core &amp; LV coil (Bare conductor)            (h)Phase to phase Clearance between Limbs (HV Conductors), with a minimum of 2 Nos. x 1mm Press board covering the tie rods            (i) Minimum thickness of locking Spacers between HV coil sections (including 1 mm ring of press board)            (j) Maximum clearance of core channels from tank walls at each end</p>	
31.	<p>Tank details :-</p> <p>(a) Clear inside tank dimensions:</p> <p>(i) Length            (ii) Breadth            (iii) Height</p>	

S. No.	PARTICULARS	AS OFFERED (160 KVA)
	(b) Tank sheet thickness (i) Sides (ii) Top (iii) Bottom (c) Tank stiffener details (i) No. of stiffeners around the tank (ii) Size	
32.	Cooling radiator details : (a) Cooling tube size (b) Total length of tubes used (c) Whether cooling calculations attached? (d) No. of tubes on each side	
33.	Core Details	
(i)	Size of core frame channels	
(ii)	Core diameter (mm)	
(iii)	Core stud details	
(iv)	Core coil assembly base supports ( 2 Nos )	
(v)	Window Height (mm)	
(vi)	Limb Center (mm)	
(vii)	Tie Rod Details	
34.	Transformer weight details: (a) Core coil assembly (b) Tank with fittings (c) Oil weight (d) Total weight of transformer (e) Volume of oil (minimum quantity for first filling)	
35.	Overall dimensions (a) Length (b) Breadth (C) Height	
36.	<b>Whether the bidder is an ISO : 9001 / 9002 certified company?</b>	
37.	<b>All the standard fittings &amp; accessories shall be provided as per IS:1180 ( part-1)-2014/spec.</b>	<b>Yes</b>
38.	Whether the metal parts of HV/LV Bushing are as per relevant IS and not under size (YES/NO). If Metal parts are under size, then the lot may be rejected at firm's works.	YES/NO
39.	Whether the BEE Label sticker has been affixed on transformer. If No, then the lot may be rejected at firm's works.	YES/NO
40.	Whether the HV terminals on transformer tank are duly indelibly marked by stamping (i.e. 1u, 1v, 1w) with Min. letter size of 40x40 mm. If No, then the lot may be rejected at firm's works.	YES/NO
41.	Whether the LV terminals on transformer tank are duly indelibly marked by stamping (i.e. 2u, 2v, 2w & 2n) with Min. letter size of 40x40 mm. If No, then the lot may be rejected at firm's works.	YES/NO
42	Whether the Two Nos. welded heavy duty lifting lugs of MS plate of 10 mm (160 KVA to 500 KVA) thickness, suitably reinforced by extended vertical supporting edge of same thickness in one piece having size 125 mm width and 125 mm length has been provided, these shall be so extended that cutting of bent plate is not required. If No, then the lot	YES/NO

S. No.	PARTICULARS	AS OFFERED (160 KVA)
	may be rejected at firm's works.	
43.	Whether the LV Bushing Pocket has been continuously welded from both inside and outside on tank wall. If No, then the lot may be rejected at firm's works.	YES/NO
44	Whether the HV leads from delta joint to HV bushing stem are terminated by brazing. If No, then the lot may be rejected at firm's works.	YES/NO
45.	Whether the Core has been earthed through copper earthing foil of 25 mm width & 1 mm thickness bolted on core frame channels after removing channel paint. If No, then the lot may be rejected at firm's works.	YES/NO
46.	Whether the Sloping flap are provided on conservative pipe to main tank inside top cover. If No, then the lot may be rejected at firm's works.	YES/NO
47	Whether the Rating & Terminal Marking Plate is non-detachable & has been affixed with Min. 10 rivets and the base of the Rating & Terminal Marking Plate is continuously welded with the tank. If No, then the lot may be rejected at firm's works.	YES/NO
48	Whether the Internal electrical clearances in oil are found as per specification. If No, then the lot may be rejected at firm's works.	YES/NO
49	Whether all the External Electrical clearances are found as per specification.If No, then the lot may be rejected at firm's works.	YES/NO
50	Whether two flat washer, one nut and one spring washer have been provided with top cover nut bolts. If No, then the lot may be rejected at firm's works.	YES/NO
51	Whether Conservator is provided above the HV bushing with min. clearance of 50 mm. If No, then the lot may be rejected at firm's works.	YES/NO
52	Whether any core stamping found rusted & damaged (hole observed in stamping). If Yes, then the lot may be rejected at firm's works.	YES/NO
53	Whether the top cover and tank top flange is deformed and sunked at center of non bushing side or hammer marks are also observed, as such top cover is not sloping down opposite LV bushing side as per requirement. If Yes, then the lot may be rejected at firm's works.	YES/NO
54	Explosion vent (opened towards LV bushing side) with M.S. mesh having Pipe Diameter of minimum 50 mm & it should be inserted in the top cover of tank, welded outside & inside of top cover and its Pipe connected with Conservator. Length of the explosion vent should be minimum 700 mm. Nut bolts of flange of Explosion vent should be tag welded. The position of vent pipe should be on right side of tank and oil leakage plug on left side (when looked from LV bushing side). If not found as mentioned above, then the lot may be rejected at firm's works.	Required as per spec.
55	Whether the Details of Make, Rating, Sr. No. and TN/Order No. are punched or an identity plate with said details is welded on core coil assembly. If No, then the lot may be rejected at firm's works.	YES/NO
56	Whether Bi-metallic connectors on Bushings are provided as per specification. If No, then the lot may be rejected at firm's works.	YES/NO
57	Whether the 12 Nos. nuts & bolts (4 Nos each on length sides & 2 nos each on widths sides of tank body) have been tag welded on top cover. If No, then the lot may be rejected at firm's works.	YES/NO
58.	Whether the tank base channel and stiffeners are continuously welded. If No, then the lot may be rejected at firm's works.	YES/NO
59	Whether the header pipe connecting radiator bank to the tank is rectangular in shape with approximate size of 100x20 mm. Alternatively round pipe (of dia 80 mm in case of 160 KVA to 500 KVA Three Phase Distribution Transformers) can also be used for connecting the radiator bank to the tank. Whether the placement of top header pipe to the tank	YES/NO

S. No.	PARTICULARS	AS OFFERED (160 KVA)
	body is above the top of yoke, to facilitate cooling for hot oil sump over top yoke. If No, then the lot may be rejected at firm's works.	
60	Whether 2 Nos. of 1 mm thick press board has been used for covering the tie rods for phase barrier. Besides, tie rods have to be covered by SRBP tubes of suitable size. If No, then the lot may be rejected at firm's works.	YES/NO
61	Whether 2 mm press board has been used for base support insulation and core clamping channel insulation. For bottom and top yoke insulation, only PC Board of min. 2 mm thickness has to be used. Also, vertical spacers between HV and LV coils and radial spacers (tickleys)/blocks etc. shall be of PC Board only. If No, then the lot may be rejected at firm's works.	YES/NO
62	Whether Press Board used has been of senapathy whitely / Raman make and Perma wood or haldu wood blocks has been used for Top and Bottom yoke insulation. If No, then the lot may be rejected at firm's works.	YES/NO
63	Whether the size of core clamping MS Channel used on top and bottom (for stacked core transformers) is as per specification. If No, then the lot may be rejected at firm's works.	YES/NO
64	Whether core clamping Channel on LV side has been reinforced at equidistance, if holes/cutting is done for LT lead in order to avoid bending of channel. If No, then the lot may be rejected at firm's works.	YES/NO
65	Whether core clamping MS channel has been painted with varnish or oil-resistant paint. If No, then the lot may be rejected at firm's works.	YES/NO
66	Whether Tie-rods used in core clamping arrangement has been effectively insulated as per specification. If No, then the lot may be rejected at firm's works.	YES/NO
67	Whether all top and bottom yoke nuts & bolts and tie rods has been painted with oil and corrosion-resistant paint and phosphate coated paint for tie rods before use. If No, then the lot may be rejected at firm's works.	YES/NO
68	Whether the sizes of following items are as per specification: i. Tank top flange ii. Cover Bolt (As per IS 1180, PART-1) iii. Cover Bolt Spacings iv. Tank Base Channel (continuous welded) If No, then the lot may be rejected at firm's works.	YES/NO
69	Whether top cover edge has been extended by Min. 30 mm in such a manner to cover gasket each side and it has been bent at Min. 15° angle. If No, then the lot may be rejected at firm's works.	YES/NO
70	Whether 04 Nos. Anti Theft Fasteners has been provided - one each on all four sides in centre of body of transformer. If No, then the lot may be rejected at firm's works.	YES/NO
71	Whether two holes has been provided – one on top cover and other on collar of transformer to facilitate providing of 2 Nos. poly-carbonate seals on longitudinal side. If No, then the lot may be rejected at firm's works.	YES/NO
72	Whether dry type film thickness (DFT) of paint is as per specification. If No, then the lot may be rejected at firm's works.	YES/NO
73	Whether Oil level gauge of minimum 150mm length of prismatic glass has been located at center of conservator tank. If No, then the lot may be rejected at firm's works.	YES/NO
74	Whether make of HV/LV Bushings is as per specification/PO. If No, then the lot may be rejected at firm's works.	YES/NO
75	Whether HV Bushing pockets are such that the HV bushing is tilted more towards the HV side. The bushing of R & B phases may also be tilted sidewise to maintain the required electrical clearances. If No, then	YES/NO

<b>S. No.</b>	<b>PARTICULARS</b>	<b>AS OFFERED (160 KVA)</b>
	the lot may be rejected at firm's works.	
76	Whether Technical cum Identification Plate of size 125 x 75 x 2.5 mm having details as per specification punched with letters of size 8mm X 6mm has been continuously welded to the main tank body below the middle HV bushing in clearly visible position. If No, then the lot may be rejected at firm's works.	YES/NO
77	GST No.	

**(Signature)**

Name & Designation with seal of the bidder

**Schedule – VI (A)****JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking****DEPARTURE/DEVIATION FROM TECHNICAL SPECIFICATION**

The bidder shall state under this schedule the departure from the Purchaser's specification in respect of technical is as under:-

S.No.	Main Deviations from Technical Specification.
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Certified that we agree to all the technical specification of the NIT except for the deviation to the extent indicated above.

**(Signature)**  
Name & Designation  
with seal of the bidder.



**Schedule – VI (B)****JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking****DEPARTURE FROM COMMERCIAL TERMS & CONDITIONS OF THE  
SPECIFICATION**

The bidder shall state under this schedule the departure from the Purchaser's specification in respect of Commercial terms & conditions:-

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S.No.	Main Deviations from Specification.
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Certified that we agree to all the commercial terms & conditions as laid down in General Conditions of Contract to the specification except for the deviation to the extent indicated above.

**(Signature)**  
Name & Designation  
with seal of the bidder.

**Schedule – VII****JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking  
LIST OF PAST SUPPLIES**

The bidder shall state under this schedule whether material and equipments, similar to those offered in the tender have been previously supplied by him. A list shall be given of such orders executed by him together with information regarding the names of purchasing organizations, quantities supplied and when the supplies were effected. This list should be in form given below:-

S. No.	Detailed particulars of Items supplied	Qty. in Nos.	Order No. & Date	Name & details of purchasing authority	Date of Completion
1	2	3	4	5	6

If executed partially to be mentioned (Qty. in Nos.)	whether still to be executed	Delivery stipulated in order	Remarks
7	8	9	10

**Note:** Separate schedules are to be furnished by the bidder for past supply to the JDVVNL/AVVNL/JdVVNL, other State Electricity Boards and other Departments /Organisations.

**(Signature)**

Name & Designation  
with seal of the bidder.

**SCHEDULE-VIIA****TN-1789****TO WHOMSOEVER IT MAY CONCERN**

This \_\_\_\_\_ is \_\_\_\_\_ to \_\_\_\_\_ certify \_\_\_\_\_ that \_\_\_\_\_ M/s. \_\_\_\_\_ (Complete with address) have manufactured and supplied the goods / equipments / material during the following financial year(s) to the Licensed Power Utilities / Government Departments / Discoms/ SEBs as detailed out below:

**FOR THE LAST THREE FINANCIAL YEARS FROM THE DATE OF OPENING OF TECHNO-COMMERCIAL BID.**

S. No	Financial year in which material supplied	Detailed Particulars of item(s) supplied	Name and particulars of purchasing authority	Order No. & date against which item(s) supplied	Unit	Ordered		Actual Supplied during the financial year		Remarks
						Quantity	Value (Rs)	Quantity	Value (Rs)	
1	2	3	4	5	6	7	8	9	10	11

Signature ,  
Name & Designation  
With Seal of the Bidder  
Date \_\_\_\_\_  
Place \_\_\_\_\_

Signature of C.A  
Name :  
Address:

Membership No  
**UDIN No.**

The above particulars are true and correct based on explanations, records and books of accounts produced before us. Further the above certificate issued on the request of the company

CA Firm (\_\_\_\_\_)

**Note:- The CA Certificate should be furnished on the letter head of CA and must be signed by the bidder and C.A. firm. The details i.e. address of C.A. & membership No. shall clearly be mentioned on C.A. certificate. In case C.A. certificate is not signed by the bidder/furnished without membership No. & address of C.A. then same may not be considered for which responsibility rests with the bidder.**

**SCHEDULE-VIII**

**JODHPUR VIDYUT VITRAN NIGAM LIMITED**  
**DELIVERY SCHEDULE AGAINST TN-1789**

**PART-A**

The delivery schedule of the material by the Purchase Officer is as mentioned hereunder:

<b>Sr. No</b>	<b>Particulars of Material</b>	<b>Commencement period</b>	<b>Rate of supply per month of delivery of entire material</b>	<b>Period for completion of delivery material</b>
1.	<b>160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS</b>	45 days from the date of receipt of P.O.	_____ Nos. Per month (to be quoted by tenderer)	Eight and half months excluding commencement period (Max.)

**PART-B**

In case tenderer deviates from the delivery schedule mentioned by the purchaser in Part-A then the delivery schedule by the tenderer shall be indicated/ mentioned as under:

<b>Sr. No</b>	<b>Particulars of Material</b>	<b>Commencement period</b>	<b>Rate of supply per month of delivery of entire material</b>	<b>Period for completion of delivery material</b>
1.	<b>160 KVA, 11/0.433 KV 3 PHASE ALUMINIUM WOUND ENERGY EFFICIENT LEVEL-1 (STAR-1) DISTRIBUTION TRANSFORMERS</b>			

**NOTE:**

- (i) **The offers deviating in deliveries mentioned above at part 'A' shall be considered as non responsive** in accordance to Clause No. 35 of the technical specification Section - III. **In case if ordered quantity is different than quoted quantity then monthly deliveries shall be adjusted proportionately.**
- (ii) During the commencement period the contractual formalities shall be got completed.

Signature

Name & Designation  
With seal of the tenderer

**Schedule – IX****JODHPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking****List of Equipments and Technical Hands Available with the Firm**

(To be filled in by the bidders &amp; enclosed with the bid)

Manufacturers and / or their authorized agents who are quoting against this bid are requested to furnish the following information along-with the bid. The Purchaser will have the discretion to ignore the bid without the under noted particulars and/or ignore the bid particulars.

1	<b>Name and Address of Manufacturer. (with landline Phone No., Mobile No. &amp; Fax No.)</b>	
2	<b>Official email ID</b>	
3	<b>GSTIN</b>	
4	<b>Pan No.</b>	
5	Whether firm is proprietorship/partnership/ Limited (Please give details and also enclose copy of memorandum of constitution offirm along with name of directors/ partners/proprietor & theiraddress	
6	<b>Place where works exist (indicate the name of the only one works from where you want to supply the offered material).</b>	
7	Details of machinery particularly with B.H.P. of each item installed.	
8	Details of staff employed in the works.	
9	Date when started the manufacturing of item under reference.	
10	List of items manufactured.	
11	Literature and drawings of items manufactured showing their description, size, design and other important technical particulars.	
12	Details of order so far, executed along with the names of organization to whom supplied.	
13	Manufacturing capacity.	
14	Is the workshop open for inspection by the representative of the board, if required?	
15	Statement of financial resources and Banking Reference along with Balance-Sheet for previous two years.	
16	Testing facilities available for the manufactured articles in the testing laboratory of works.	
17	Whether the Firm is a <b>small/medium/large scale industry. (Type of Firm)</b>	
18	Registration No. with :- i. Small Scale, National/State ii. DGTD iii. State Industries Department.	

**(Signature)**Name & Designation  
with seal of the bidder.

**SCHEDULE-X****GENERAL PARTICULARS ABOUT THE TENDER IN BRIEF****JODHPUR VIDYUT VITARAN NIGAM LIMITED****MATERIAL MANAGEMENT & CONTRACT****NEW POWER HOUSE, INDUSTRIAL AREA, JODHPUR-342003****Phone: (0291)2742223/Fax: (0291) 2746539/E-Mail-[semmcjdvnvl@gmail.com](mailto:semmcjdvnvl@gmail.com)****SPECIFICATION FOR SUPPLY OF 160 KVA, 11/0.433 KV, STAR-1, ENERGY EFFICIENCY LEVEL-I, 3 PHASE, ALUMINIUM WOUND, DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION NO.JDVVNL/SE(MM&C)/EIAI/TN-1789.**

<b>A</b>	<b>NIT No.</b>	<b>TN-1789</b>
<b>B</b>	Cost of tender specifications	Rs. 2500.00 + GST@18% = Rs. 2,950.00 <b>(Non -Refundable)</b> (Rs. Two Thousand Nine Hundred & Fifty Only)
	Cost of tender specifications (For MSME UNITS of Rajasthan)	Rs. 1250.00 + GST@18% = Rs. 1,475.00 <b>(Non -Refundable)</b> (Rs. One Thousand Four Hundred & Seventy Five Only)
<b>C</b>	Processing fee of RISL	<b>Rs. 1000.00 (One Thousand Only) (Non -Refundable)</b>
<b>D</b>	<b>Estimated Tender Value</b>	<b>Rs. 5,65,55,950.00</b>
<b>E</b>	Bid Security to be deposited with the tender	(i) General Bidder: Rs. 11,31,119.00 (ii) Sick Unit : Rs. 5,65,560.0 (iii) SSI Units of Rajasthan : Rs. 2,82,780.00*
<b>F</b>	Validity	<b>120 days from the next date of opening of techno-commercial bid.</b>
<b>G</b>	Base date for price variation	<b>01.05.2022 (Irrespective of tender opening date)</b>

**\*In case SSI unit of Rajasthan quotes the less than the tendered quantity, then they are required to furnish Bid security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**

**IMPORTANT DATES**

<b>S.N.</b>	<b>Events</b>	<b>Date &amp; Time</b>	<b>Location</b>
1	Date of downloading of tender specifications	Up to 29.06.2022 (06:00 PM)	<a href="http://www.jdvvnvl.com">www.jdvvnvl.com</a> & <a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>
2	Deposit of cost of Tender Specifications, Processing fee & Bid Security	Up to 29.06.2022 (4:00 PM)	Office of Sr. A.O (Cash & CPC), JdVVNL , New Power House, Industrial Area, Jodhpur
3	Last Date & time of submission of electronic bid	Up to 30.06.2022 (12:00 PM)	<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>
4	Opening of Technical Bid	30.06.2022 (03:00 PM)	<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>
5	Opening of Price Bid	To be intimated separately to the qualified bidders	<a href="http://eproc.rajasthan.gov.in">http://eproc.rajasthan.gov.in</a>

The Micro, Small & Medium Scale Industries of Rajasthan and Sick Industries, other than Small Scale Industries, whose cases are pending before the Board of

Industrial and Financial Reconstruction (BIFR) shall furnish self attested documentary evidence duly attested by notary to claim the above.

The bid security may be given in the form of banker's cheque or demand draft in favour of Senior Accounts Officer (Cash & CPC), JDVVNL, Jodhpur payable at Jodhpur or bank guarantee, in specified format, of a scheduled bank in favour of Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur up to stipulated date & time, and obtain a receipt/acknowledgement thereof. No other mode of deposit shall be accepted.

**At the time of depositing the Bid security amount in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also furnish self-attested documentary evidence duly attested by Notary of MSME unit of Rajasthan also to submit a letter of quantity offered by them alongwith Appendix-D, declaration by bidder, on non-judicial stamp paper of Rajasthan on Rs.100/- duly attested by Notary public, an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.**

**The Bid Security bank guarantee of requisite amount shall be furnished on non-judicial stamp paper of Rajasthan State.**

**NOTE:-**

- 1. Wherever EMD and Security Bank Guarantee (SBG), are appearing in the ITB, GCC & other Bidding Documents, same is hereby replaced by BID SECURITY as above.**
- 2. VENDOR REGISTRATION: The relaxation/exemption given to the registered vendors of the Nigam in respect of EMD/SBG, wherever appearing in the ITB, GCC & other Bidding documents, are hereby WITHDRAWN.**

**VERY VERY IMPORTANT:**

1. The bids not accompanied with qualification requirement , technical requirement indicated in the specification and other requirement given here under will be considered as incomplete offer and sufficient grounds for offer to be passed over:

- i) Capacity, capability and competency proofing documents.
  - a) Capacity /orders of similar and higher rating of tendered equipment booked as on date of bidding with type and rating and construction details of equipment for which order received be indicated.
  - b) Copy of purchase orders of Erstwhile RSEB /SEB`S / Electric Utilities / Govt. Departments / Discom for similar or higher rating equipment latest executed.
- ii) Year wise past experience for last 5 years of similar or higher rating of tendered equipment.
- iii) The details of testing facilities available at the works and copies of latest type test certificates, carried out on similar ITEM.

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- iv) Quality assurance plan.
  - v) Complete guaranteed technical particulars, out lines and general arrangement drawings along with Bill of Material.
2. Bids without Section-I, II, III & Schedules (I to X) shall be rejected.
  3. Bids shall be furnished in single copy.
  4. JDVVNL has the right to reject any offer on the basis of track record of poor performance in execution of previous order / equipment supplied /after sales service while evaluating the Techno-Commercial bid.
  5. JDVVNL reserves the right to accept minor deviations in standard terms and conditions and also in technical and constructional features as specified in the technical specification **(Section-III)**.
  6. Deviation of any kind shall not be quoted in price bid, if found quoted, the same shall be ignored.
  7. The following facilities are to be provided by the supplier at his own cost to the inspecting officer of Nigam (JdVVNL).
    - i) Suitable accommodation.
    - ii) Local conveyance between arrival point, place of stay, works and departure point.
    - iii) The supplier shall assist in arranging return ticket and reservation on the request of the inspecting officer for which the payment shall be made by the inspecting officer. In case of joint inspection, single or shared double room accommodation shall be provided.

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**Schedule - XI**

**Format of Affidavit for MSME**  
**(TO BE FURNISHED ON NON-JUDICIAL STAMP WORTH Rs.100/- & DULY NOTARIZED)**

I, \_\_\_\_\_ S/o \_\_\_\_\_ Aged \_\_\_ Years residing at \_\_\_\_\_  
 \_\_\_\_\_ Proprietor/ Partner/ Director of M/s \_\_\_\_\_  
 \_\_\_\_\_ do hereby solemnly affirm and declare that:-

- (a) My/ our above noted enterprise M/s \_\_\_\_\_ has been issued acknowledgement of Entrepreneurial Memorandum Part-II by the District Industries Center, \_\_\_\_\_. The acknowledgement No. is \_\_\_\_\_ dated \_\_\_\_\_ and has been issued for manufacture of following items:-
- (i)  
 (ii)  
 (iii)  
 (iv)
- (b) My/ our above noted acknowledgement of Entrepreneurial Memorandum Part-II has not been cancelled or withdrawn by the Industries Department and that the enterprise is regularly manufacturing the above items.
- (c) My/our enterprise is having all the requisite plant and machinery and is fully equipped to manufacture the above noted items.
- (d) The present status of the firm is as per acknowledgment of Entrepreneurial Memorandum Part-II issued on the date of District Industries Center, \_\_\_\_\_.

Place  
 Director/

Signature of Proprietor/

Authorized Signatory with Stamp and Date

**VERIFICATION**

I, \_\_\_\_\_ S/o \_\_\_\_\_ Aged \_\_\_ Years residing at \_\_\_\_\_  
 \_\_\_\_\_ Proprietor/ Partner/ Director of M/s \_\_\_\_\_  
 \_\_\_\_\_ verify and confirm that the contents at (a), (b), (c) & (d) above are true and correct to the best of my knowledge and nothing has been concealed therein. So, help me God.

**DEPONENT**

**APPENDIX-A****Bank Guarantee No.** \_\_\_\_\_.

Security Amount : \_\_\_\_\_.

Issued on dated : \_\_\_\_\_.

Valid upto : \_\_\_\_\_.

Claim upto / Grace period: \_\_\_\_\_.

**PERFORMA OF BANK GUARANTEE FOR BID SECURITY**

(Bank Guarantee in lieu of bid Security on non-judicial Stamp Paper of Rajasthan State of 0.25% of the B.G. value or Rs.25,000/-, whichever is less)

To,

The Superintending Engineer (MM&C),  
Jodhpur Vidyut Vitaran Nigam Limited,  
Jodhpur.

1. Whereas \_\_\_\_\_ (name of the Bidder) (hereinafter called "the Bidder") has submitted its bid dated \_\_\_\_ (date of submission of bid) for \_\_\_\_\_ (name of contract/ name of the material with Bid no. / TN No. \_\_\_\_\_) (hereinafter called "the Bid").
2. KNOW ALL PEOPLE by these presents that WE \_\_\_\_\_ (name and address of branch of Bank ) of \_\_\_\_\_ (name of country), having our registered office at \_\_\_\_\_ (addresses of bank) (hereinafter called "the Bank"), are bound unto \_\_\_\_\_ (name of Purchaser) (hereinafter called "the Purchaser") in the sum of Rs. \* \_\_\_\_\_ for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents sealed with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.
3. THE CONDITIONS of this obligation are :
  - i. If the bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Bid Form; or
  - ii. If the bidder refuses to accept the correction of error in his Bid; or
  - iii. If the bidder, having been notified of the acceptance of its Bid by the purchaser during the period of bid validity:
    - a. Fails or refuses to execute the Contract Agreement within the time specified in purchase / work order, if required, or
    - b. Fails or refuses to furnish the performance security within the time specified in purchase / work order in accordance with the GCC, or
    - c. Fails to commence supply of goods or services or execute work as per purchase / work order within time specified.
  - iv. If the bidder breaches any provision of the Code of integrity specified in the RTPP Act and Chapter VI of the RTPP Rules.
4. We undertake unconditionally and irrevocably to guarantee as primary obligator and not as surety merely to pay to the purchaser a sum of Rs. \_\_\_\_\_ (in words Rs. \_\_\_\_\_) upon receipt of its first written demand, without the purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or all of the three conditions specifying the occurred condition or conditions.
5. The decision of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitaran Nigam Limited, Jodhpur shall be final whether breach has been

- committed on the right to demand the amount of guarantee from us which has accrued to the purchaser.
6. This guarantee shall not cease or determine, if the purchaser grants time or indulgence or vary the terms of the contract with the Contractor or without our consent or knowledge.
  7. The guarantee herein contained shall not be affected by any change in the constitution of the Contractor.
  8. We \_\_\_\_\_ (Bank Name) further undertake not to revoke this guarantee during its currency except with the previous consent of the Superintending Engineer (MM&C), Jodhpur Vidyut Vitaran Nigam Limited, Jodhpur.
  9. All disputes arising under the said guarantee between the Bank and the Nigam or between the Contractor and the Nigam pertaining to the guarantee, shall be subject to the jurisdiction of the Courts in Jodhpur, Rajasthan alone.
  10. This guarantee will remain in force up to and including one hundred eighty (180) days after the date of the opening of bids, i.e. upto \_\_\_\_\_, with a further grace period of Ninety (90) days and any demand in respect thereof should reach the Bank not later than the above date.

Yours faithfully,  
Bankers (EXECUTANT)

Signed by the above named Bank in presence of :  
(signature with full Name and Address)

Witness :

1. \_\_\_\_\_.
2. \_\_\_\_\_.

Attested by Notary Public, First Class Magistrate or directly confirmed by the executing Bank.

\* The Bidder should insert the amount of the guarantee in words and figures denominated in the currency of bid.

**Note :** In case the bid is submitted by a Joint Venture, the Bid Bank guarantee shall be in the name of Lead partner or in the name of joint venture partners submitting the Bid covering all the partners of the joint vent

**APPENDIX-D****Declaration by the Bidder****(On Rajasthan Non-Judicial Stamp Paper worth Rs.100/- + Surcharge on Stamp Paper as per rules)**

In relation to my/ our bid submitted to SE (MM&C) JdVVNL, Jodhpur, For procurement of \_\_\_\_\_ in response to their notice inviting bids under TN- \_\_\_\_\_ I/ We hereby declare under section 7 and 11 of Rajasthan Transparency in Public Procurement Act, 2012, that:

1. I/We possess the necessary professional, technical, financial and managerial resources and competence required by the bidding document issued by the procuring entity.
2. I/We have fulfilled my/ our obligation to pay such of the taxes payable to the Union and the State Government or any local authority as specified in the bidding document.
3. I/We are not insolvent, in receivership, bankrupt or being wound up, not have my/ our affairs administered by a court or a judicial officer, not have my/ our business activities suspended not blacklisted by any utility/ Govt. agency, not have a conflict of interest and not the subject of legal proceeding for any of the foregoing reasons.
4. I/We further undertake that I/We have not been debarred under the provisions of Section 46 of RTPP ACT, and Rules as mentioned hereunder by any procurement entity/ Govt. agency:-
  - a) We are not convicted of an offence under the prevention of corruption Act, 1988 (Central Act No, 49 of 1988); or
  - b) We are not convicted of an offence under the Indian Penal Code, 1860 (Central Act No,45 of 1860) or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a public procurement contract; or
  - c) We have not breached the code of integrity prescribed in terms of Code of integrity.
5. I/We do not have, and our directors and officers not have, been convicted of any criminal offence related to my/ our professional conduct or the making of false statements or misrepresentations as to my/ our qualifications to enter into a procurement contract within a period of three years preceding the commencement of this procurement process, or not have been otherwise disqualified pursuant to debarment proceedings.
6. I/We do not have a conflict of interest as specified in the Rajasthan Transparency in Public Procurement Act, 2012, Rajasthan Transparency in Public Procurement Rules, 2013 and the bidding document, which materially affects fair competition.
7. I/We have complied and shall continue to comply with the Code of Integrity as specified in the Rajasthan Transparency in Public Procurement Act 2012, Rajasthan Transparency in Public Procurement Rules, 2013, and this Bidding Document, till completion of all obligations under the Contract.

Date :  
Place :

Signature of bidder  
Name :  
Designation :  
Address :

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**APPENDIX-E****COMPLIANCE WITH THE CODE OF INTEGRITY AND NO CONFLICT OF INTEREST  
(Must be signed by the bidder and attached with Techno-commercial bid)****1. COMPLIANCE WITH THE CODE OF INTEGRITY**

Any person participating in a procurement process shall:

- a) Not offer any bribe, reward or gift or any material benefit either directly or indirectly in exchange for an unfair advantage in procurement process or to otherwise influence the procurement process;
- b) Not misrepresent or omit information that misleads or attempts to mislead so as to obtain a financial or other benefit or avoid an obligation;
- c) Not indulge in any collusion, Bid rigging or anti-competitive behaviour to impair the transparency, fairness and progress of the procurement process;
- d) Not misuse any information shared between the procuring Entity and the bidders with an intent to gain unfair advantage in the procurement process;
- e) Not indulge in any coercion including impairing or harming or threatening to do the same, directly or indirectly, to any party or to its property to influence the procurement process;
- f) Not obstruct any investigation or audit of a procurement process;
- g) Disclose conflict of interest, if any;
- h) Disclose any previous transgressions with any entity in India or any other country during the last three years or any debarment by any other procurement entity.

**1. Conflict of Interest**

A Bidder may be considered to be in Conflict of Interest with one or more parties in a bidding process if, including but not limited to:

- a. have controlling partners/ shareholders in common; or
- b. receive or have received any direct or indirect subsidy from any of them; or
- c. have the same legal representative for purposes of the Bid; or
- d. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Procuring Entity regarding the bidding process; or
- e. the Bidder participates in more than one Bid in a bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which the Bidder is involved. However, this does not limit the inclusion of the same subcontractor, not otherwise participating as a Bidder, in more than one Bid; or
- f. the Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Goods, Works or Services that are the subject of the Bid; or
- g. Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as engineer-in-charge/ consultant for the contract.

(Bidder's Signature)

Name & Designation with seal of the bidder

**Annexure-I****UNDERTAKING FOR CA CERTIFICATE**

**(TO BE FURNISHED ON NON-JUDICIAL STAMP WORTH Rs.100/- & DULY NOTARIZED)**

I/WE UNDERTAKE THAT THE CA CERTIFICATE SUBMITTED AS PER THE REQUIREMENT OF PRE-QUALIFICATION REQUIREMENTS, FOR ADJUDGING THE PAST SUPPLIES ,UNDER THE SUBJECT TENDER, **TN-1789**, IS CORRECT AND I , UNDERSIGNED WILL BE SOLELY RESPONSIBLE FOR ANY DEVAITION/DISCREPANCY/IN-CORRECT INFORMATION, IF EVER NOTICED IN THE CA CERTIFICATE.

FURHER, IN CASE, IF ANY DEVAITION/DISCREPANCY/IN-CORRECT INFORMATION IS NOTICED IN THE CA CERTIFICATE FURNISHED WITH THE BID, AT ANY STAGE DURING PROCESSING/ CURRENCY OF TENDER, DISCOM CAN TAKE THE ACTION AGAINST THE FIRM M/s

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AS PER THE RULES & REGULATIONS.

**(SIGNATURE)**  
NAME & DESIGNATION  
WITH SEAL OF THE BIDDER.

**AMENDMENT IN ITB AND GCC**

- 1) **Wherever EMD and Security Bank Guarantee (SBG), are appearing in the ITB, GCC & other Bidding Documents, same is hereby replaced by BID SECURITY as under:-**  
**BID SECURITY**

Bid security shall be 2% of the estimated value of subject matter of procurement put to bid. In case of Small Scale Industries of Rajasthan it shall be 0.5% of the quantity offered for supply and in case of sick industries, other than Small Scale Industries, whose cases are pending with Board of Industrial and Financial Reconstruction, it shall be 1% of the value of bid. Every bidder, if not exempted, participating in the procurement process shall be required to furnish the bid security as specified in the notice inviting bids.

**In case SSI unit of Rajasthan quotes the less than the tendered quantity, then they are required to furnish Bid Security @ 0.5% of the estimated value of the quantity offered by them, failing which bid shall be considered non-responsive.**

The Bid Security amount (as applicable) to be paid by Demand Draft/Banker's Cheque in favour of SR. AO (CASH & CPC), JDVVNL, Jodhpur (payable at Jodhpur) **upto 3.00 p.m.upto one WORKING day prior to schedule date of opening** of respective bid or Bank Guarantee, in specified format, of a scheduled bank in favour of The Superintending Engineer (MM&C), JDVVNL, Jodhpur, be deposited to the Sr. Accounts Officer (MM&C), JDVVNL, New Power House, Industrial Area, Jodhpur-342003 **upto 3.00 p.m.upto one WORKING day prior to schedule date of opening of respective bid and obtain a receipt / acknowledgement thereof. No other mode of deposit shall be accepted.** Further, while depositing the bid security in the office of the Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur, the bidder shall also submit a letter of quantity offered by them alongwith self-attested documentary evidence duly attested by Notary for MSME unit or **for sick unit (as applicable)** of Rajasthan also to submit a letter of quantity offered by them **alongwith Appendix-D, declaration by bidder, on non-judicial stamp paper of Rajasthan on Rs.100/- duly attested by Notary public,** an Affidavit for MSME unit of Rajasthan in the enclosed format as per Schedule XI is to be furnished on non-judicial stamp paper of Rs.100/- duly attested by Notary public, to the office of Sr. Accounts Officer (MM&C), JDVVNL, Jodhpur. Also furnish the undertaking for the CA certificate in the enclosed format as per Annexure-I on non-judicial stamp paper of Rs.100/- duly attested by Notary public alongwith the original / notarised CA certificate as per requirement of tender specifications.

The Bank Guarantee against Bid Security be issued by Nationalized / Scheduled Bank. The same may be accepted after confirmation by issuing Bank. If any Bid Security Bank Guarantee not in proper format / not confirmed by the issuing Bank the same would not be accepted and the bidder would be immediately shorted out from bid process.

The Micro, Small & Medium Scale Industries of Rajasthan and sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR) shall furnish self-attested documentary evidence duly attested by Notary to claim the above.

- 2) **Wherever Performance Bank Guarantee (PBG) and Composite Bank Guarantee (CBG) are appearing in the ITB, GCC & other Bidding Documents, same are hereby replaced by PERFORMANCE SECURITY as under:-**  
**PERFORMANCE SECURITY**

The Performance security wherever appearing in the tender document may be read as under:-

- (a) 2.5%, or as may be specified in the bidding documents, of the amount of supply order in case of procurement of goods and services and 3.0% of the amount of work order, in case of procurement of works;
- (b) 0.5% of the amount of quantity ordered for supply of goods, in case of Small Scale Industries or MSME units of Rajasthan; and

(c) 1% of the amount of supply order, in case of sick industries, other than Small Scale Industries, whose cases are pending before the Board of Industrial and Financial Reconstruction (BIFR); and

In case of successful bidder, the amount of bid security may be adjusted in arriving at the amount of the performance security, or refunded if the successful bidder furnishes the full amount of performance security.

**3) VENDOR REGISTRATION**

The **relaxation/exemption given to the registered vendors of the Nigam in respect of EMD/SEB, wherever appearing in the ITB, GCC & other Bidding documents, are hereby WITHDRAWN.**

**4) The indirect taxes i.e. Excise Duty, Service Tax, VAT/CST, Entry Tax etc. mentioned in G.C.C., may now be read as G.S.T.**

**5) G.S.T. will be charged extra at the prevailing rate on all the Settlement Fees as applicable and amended time to time.**

**6) The Clause No. 1.43 of GCC has been amended to the extent as under:**

**1.43 DUE DATE OF PAYMENT:**

Payment shall be due and payable by the purchaser in accordance with the provision of the contract within a reasonable period from the date of receipt of each invoice by the contractor / supplier duly supported by a certificate of the Engineer. The purchaser will take all possible effort to make payment to the contractor / supplier generally on **45<sup>th</sup> day** after receipt of duly verified challans / receipts / bill in the office of paying authority (Sr. Accounts Officer (Cash & CPC) Jodhpur Discom, Jodhpur / Concerned Circle Accounts Officer) and completion of contractual formalities. But in case of delay in payment the purchaser shall not be liable to pay any interest on the outstanding amount to the contractor / supplier.

**7)** In case the terms & conditions mentioned in PO, ITB & GCC are modified/differ from RTPP Act, then RTPP Act shall supersede.

**8)** The purchaser reserves the right for reducing the quantity indicated in the Bid Document at the time of placing the order, looking to the existing requirement & availability at that time.

**9)** A Bidder debarred under section 46 of the RTPP Act shall not be eligible to participate in any procurement process undertaken by -

- (a) any Procuring Entity, if debarred by the State Government; and
- (b) a Procuring Entity if debarred by such procuring Entity.

**10)** The contract agreement must be submitted to the purchasing authority within 15 days of receipt of Purchase Order.

**11) APPEAL:**

- i. If any Bidder or prospective bidder is aggrieved that any decision, action or omission of the procuring entity is in contravention to the provisions of this Act or the rules or guidelines issued there under, he may file 1st & 2nd appeal under section 38 of RTPP Act-2012 to the following appeal authorities **within a period of ten days from the date of such decision or action, omission, as the case may be, clearly giving the specific ground or grounds on which he feels aggrieved:**



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Sr.	Type of Appeal	Name & Designation of appellate authority
1	First appeal	Chairman DISCOMS
2	Second appeal	Energy Department, Government of Rajasthan

- ii) The form of appeal shall be as per Rule 83 of RTPP Rules, 2013 and memorandum of appeal shall be filled as per form-1 as prescribed under RTPP Rules, 2013.  
 Fee for appeal: - Subject to rule 84 of the RTPP Rule 2013 the fee shall be as under:-  
 a. For First Appeal:- Rs. 2,500/- (Rupees Two Thousand Five Hundred Only)+GST.  
 b. For Second Appeal:- Rs. 10,000/- (Rupees Ten Thousand Only)+GST.
- iii) It is further intimated that the fee shall be paid in the form of Demand Draft of Bankers Cheque of a Scheduled Bank payable in the name of Sr. Accounts Officer (Cash & CPC) Jodhpur DISCOM, Jodhpur.
- iv) Provided that after the declaration of a Bidder as successful the appeal may be filed only by a Bidder who has participated in procurement proceedings:
- v) Provided further that in case a Procuring Entity evaluates the Technical Bids before the opening of the Financial Bids, an appeal related to the matter of Financial Bids may be filed only by a Bidder whose Technical Bid is found to be acceptable.
- vi) The officer to whom an appeal is filed under para (1) shall deal with the appeal as expeditiously as possible and shall endeavour to dispose it of within thirty days from the date of the appeal.
- vii) If the officer designated under para (1) fails to dispose of the appeal filed within the period specified in para (2), or if the Bidder or prospective bidder or the Procuring Entity is aggrieved by the order passed by the First Appellate Authority, the Bidder or prospective bidder or the Procuring Entity, as the case may be, may file a second appeal to Second Appellate Authority specified in the Bidding Document in this behalf within fifteen days from the expiry of the period specified in para (2) or of the date of receipt of the order passed by the First Appellate Authority, as the case may be.
- 12)** The bidders should be qualified, not be insolvent, not be in receivership, not be bankrupt or being wound up, should not have affairs administered by a court or a judicial officers, should not have business activities suspended, should not be blacklisted or debarred by any utility/ government agency, should not have a conflict of interest. For this bidder is required to furnish a Declaration as per Appendix-F, on Rajasthan Non-judicial Stamp Paper of Rs. 100/ (excluding surcharge on Stamp Paper, as per rules).

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### **ADDENDUM IN ITB**

**Addendum in the provision of Instruction to bidder (ITB) in the clause No. 1.12.2 for quantity allocation as per award criteria of purchase manual in accordance to the clause no. 74 of RPPP rules:**

**1.12.2(A) for quantity allocation**

**(i) Trial order under Para No. 22.17 (a) & (b) of purchase manual**

(a) Any bidder located within or outside the state of Rajasthan has participated for the first time in a particular Discom & meeting minimum qualification requirement and has supplied the tendered material/or of higher rating in other utility shall be treated as an old supplier. Rajasthan's firms although supplied in past but not meeting minimum quantity supplied criterion including altogether new units which have not supplied any quantity but having adequate & required manufacturing and testing facility and technical know-how of the tendered material shall be considered as new firms and would be eligible for trial order only. In case of supply made to the licensed power utility out side India, the C.A. certificate furnished by firm shall be considered.

**Note:** - The material supplied and accepted for same/higher rating for turnkey project(s) to a licensed power utility/Govt. shall be considered for the purpose of evaluating criteria. The certificate given by C.A. shall indicate above quantity separately.

- (b) (i) The trial order for a particular item shall not generally exceed 10 % of the total quantity considered for placement of order. This ceiling may, however, be relaxed by the corporate level purchase committee up to the extent of 30 %, to take the advantage of lower price where situation of differential prices offering is arising.
- (ii) The capacity & capability assessment of a bidder located outside state of Rajasthan who otherwise qualifies but is participating for the first time shall not be carried out. Similarly, For the tendered item(s) where the valid BIS license is an essential qualification requirement and the bidder possesses the valid BIS but new to the utility. The capacity/capability assessment of such a bidder shall also not be carried out.

**(iii) Award criteria under Para No. 10.2 (iii) of purchase manual**

(a) In case of distribution transformers of rating 40 KVA and below, LT cables & conductors and fabricated steel items, order quantity may be distributed in the following manner: -

**20% to L1  
15% to L2  
10% to L3  
05% to L4**

50% to be distributed equally among other firms subject to the condition that not more than 5% of the quantity to be purchased will be allotted to any one of such firms. The balance, if any will be distributed in the same proportion as indicated above among the first four firms.

(b) In case of other items except poles, order quantity may be distributed in the following manner:

**40% to L1  
20% to L2  
10% to L3  
06% to L4**

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The balance quantity may be equally distributed among other firms subject to the condition that not more than 4% of the quantity to be purchased will be allotted to any such firm. The balance, if any, will be distributed in the same proportion as indicted above the first four firms.

(c) In case of poles, the order may be awarded on the basis of landed cost (material and transportation taken together). The allocation of quantity location/destination wise may be made among the eligible firms in equal proportion as far as possible.