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Note: The bidders, in their own interest are requested to read very carefully Section-I (Instruction to Bidders), Section-II (General Condition of Contract) & Section-III (Technical Specification) before filling the bid. The Bid documents be downloaded from JVVNL website www.jaipurdiscom.in . No hard copy of the bidding documents will be provided to the bidders through this office. In case of any discrepancy found in the bidding documents downloaded from the website and appended with the bid (as a bid document) and the original copy of such document available in the office of Superintending Engineer (MM), Jaipur discom, Jaipur then the copy available with Superintending Engineer (MM), Jaipur discom, Jaipur will be considered as final document for all purposes. The cost of Bid document as published in NIT shall be furnished along with downloaded bid document in the manner prescribed in bid document.

**JAIPUR VIDYUT VITARAN NIGAM LIMITED
(MM CIRCLE)
OLD POWER HOUSE PREMISES, BANI PARK, JAIPUR -06**

TELEPHONE: 0141-2202607

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BID DOCUMENTS FOR PURCHASE OF 11/ $\sqrt{3}$ KV / 240 V, 10, 16 & 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE COPPER WOUND DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION NO.JPD/SE/MM/SPO-VI/TN-2139.

S. No	ITEM	QUANTITY
1	11/ $\sqrt{3}$ KV / 240 V, 10 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	8625 Nos.
2	11/ $\sqrt{3}$ KV / 240 V, 16 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	6750 Nos.
3	11/ $\sqrt{3}$ KV / 240 V, 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	3825 Nos.

LAST DATE AND TIME FOR : 10.06.2011 up to 2.30 PM
RECEIPT OF BID

DATE AND TIME OF : 10.06.2011 (AT 3.00PM)
OPENING OF BID

EARNEST MONEY TO BE DEPOSITED : Rs.7,50,000.00(Rs. Seven Lac Fifty Thousand only/ Exemption Certificate or Vender Registration of class "A" category)

COST OF THE SPECIFICATION : RS.2500.00(non refundable)

VALIDITY : 120 DAYS FROM THE NEXT DATE
OPENING OF TECHNO-COMMERCIAL
BID.

NOTE: The bidders, in their own interest are requested to read very carefully Section-I (Instruction to Bidders), Section-II (General Condition of Contract) & Section-III (Technical Specification) before filling the bid. The Bid documents be downloaded from JVVNL website www.jaipurdiscom.in . No hard copy of the bidding documents will be provided to the bidders through this office. In case of any discrepancy found in the bidding documents downloaded from the website and appended with the bid (as a bid document) and the original copy of such document available in the office of Superintending Engineer (MM), Jaipur discom, Jaipur then the copy available with Superintending Engineer (MM), Jaipur discom, Jaipur will be considered as final document for all purposes. The cost of Bid document as published in NIT shall be furnished along with downloaded bid document in the manner prescribed in bid document.

JAIPUR VIDYUT VITARAN NIGAM LIMITED

OLD POWER HOUSE, NEAR RAM MANDIR, BANI PARK, JAIPUR-302006

Phone: 2202607 Fax: (0141) 2202025

TECHNICAL SPECIFICATION

FOR

11/√ 3KV/240 V, 10KVA, 16 KVA & 25 KVA RATING OUTDOOR TYPE

COMPLETELY SELF PROTECTED SINGLE PHASE

COPPER WOUND

DISTRIBUTION TRANSFORMERS (WITH CRGO/ AMORPHOUS METAL CORE)

AGAINST TN-2139

TECHNICAL SPECIFICATION FOR SUPPLY OF 11/ $\sqrt{3}$ KV / 240 V, 10, 16 & 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE COPPER WOUND DISTRIBUTION TRANSFORMERS AGAINST TN-2139.

1) SCOPE:

This specification covers design, engineering, manufacture, assembly, stage testing, inspection & testing before supply and delivery at Nigam store(s) anywhere in Rajasthan of the oil immersed, oil natural air natural (ONAN) out door type 11kV / $\sqrt{3}$ / 240 V, 50 Hz, Single Phase with copper wound complete with fittings and accessories with meter protection unit on LT side of distribution transformers for use in distribution systems.

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 Tender / supplier shall bind himself 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:**

The materials shall conform in all respects to the relevant Indian Standard Specifications with latest amendments thereof; some of them are listed below:

IS: 5/1961: Colour for ready mixed paints

IS: 1180 (PART I): Specifications for outdoor type three phase distribution Transformers upto and including 100 KVA, 11 KV Class.

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: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:9335 : Specifications for insulating kraft paper.

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

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 6160 : Rectangular conductor for electrical machines.

IS:10028 : Selection, Installation and maintenance of transformers.

IS: 12444: Specifications for Copper wire rods.

REC Specification No. 2.

REC Specification No. 39/1993.

CEA Specification, Chapter 4.

IEC: 994: Specification Part4 for Surge Arresters without gap for AC system.

IS: 3070 (PartIII): Specification for Lightning Arresters for alternating current System Part.III.

IS: 3073/1974 : Specification for Lightning Arresters.

IS: 2629: Recommended practice for hot dip galvanizing of iron and steel.

IS: 2633: Method for testing uniformity of coating on Zinc coated articles.

IS: 5621: Specification for large hollow porcelain for use in electrical installation.

IS: 13947 (PartII) latest : Specification for Single Pole MCCB.

IS: 2147: Degree of protection provided by enclosures for low voltage switchgear and control gear.

IEC Pub 609472: Specification for Low Voltage Switch Gear and Control gear.

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 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 ²
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 single phase transformers of standard ratings 10 KVA, 16 KVA and 25 KVA shall be suitable for outdoor installation with Single Phase, 50 Hz, 11KV system in which the neutral is effectively earthed and should be suitable for outdoor service under fluctuations in supply voltage upto plus 10% to minus 15%.

The transformer shall conform to the following specific parameters.

Sr.No	ITEM	SPECIFICATION		
		10 KVA	16 KVA	25 KVA
1	Continuous rated capacity	10 KVA	16 KVA	25 KVA
2	System voltage (max.)	12KV	12KV	12KV
3	Rated voltage HV	11/ $\sqrt{3}$ KV	11/ $\sqrt{3}$ KV	11/ $\sqrt{3}$ KV
4	Rated voltage LV	240 V	240 V	240 V
5	Line current HV	1.57	2.519 A	3.94
6	Line current LV	41.67 A	66.66 A	104.17 A
7	Frequency	50 c/s +/- 3%	50 c/s +/- 3%	50 c/s +/- 3%
8	No. of phases	Single	Single	Single
9	Vector Group	IiO	IiO	IiO
10	Type of transformer	Outdoor	Outdoor	Outdoor
11	Type of cooling	ONAN	ONAN	ONAN
12	Class of insulation	Class A	Class A	Class A
13	Winding Material	Copper	Copper	Copper
14	Type of core construction	Wound	Wound	Wound
15	Over fluxing limit (due to combined effect of voltage and frequency)	12.5 %	12.5 %	12.5 %
16	Permissible temperature over ambient under full load condition:			
		i)Of top oil measured by thermometer	35 Deg.C	35 Deg.C
	ii) Of winding measured by resistance	40 Deg.C	40 Deg.C	40 Deg.C

17	Minimum clearances in air a) Phase to earth (mm) H.T b) Phase to earth (mm) LT	140 40	140 40	140 40
18	Total losses (watts) at 75 Deg. C. (Max.) i)At 50% loading ii)At 100% loading	58 180	90 225	100 315
19	% age Impedance (with a tolerance of $\pm 10\%$)	3.75%	3.75%	3.75%
20	Max. Flux Density at Normal voltage and frequency	1.47 Tesla	1.47 Tesla	1.47 Tesla
21	Max. Current density	2.2 A/mm Sq	2.2 A/mm Sq	2.2 A/mm Sq
22	a) LT Breaker OR b) MCCB	Internally mounted Externally Mounted	Internally mounted Externally Mounted	Internally mounted Externally Mounted
23	Radiator required	Not required	Not required	Not required
24	Magnetizing Current (max.) a) At 100% rated voltage b) At 112.5% rated voltage	1.5% of rated full load current 3 % of rated full load current	1.5% of rated full load current 3 % of rated full load current	1.5% of rated full load current 3 % of rated full load current

ELECTRICAL CLEARANCES:

a) Minimum External Clearances (in air as per IS:1180)

- i) HV phase to earth (mm) 140
- ii) LV phase to earth (mm) 40

b) Minimum Internal Clearances

- i) Clearance between inner wall of tank and coil (mm) -- 12
- ii) Radial clearance between HV & LV windings (mm) -- 2
- iii) Radial clearance of LV coil from core (mm) -- 2
- iv) End clearance of HV coil from Yoke (mm) -- 15
- v) Minimum clearance between core & tank bottom (mm) -- 3

5) DESIGN & CONSTRUCTION:

5.1 Winding connection & terminal arrangements:

For HV, live end should be brought out through 12kV bushing and the other end of HV, which is intended to be earth, shall be brought out on 1.1kV bushing (HV Neutral bushing). Provision shall be made for connecting the neutral HV terminal to local earth. The secondary (LV) winding shall be connected to LV bushings. The 12 KV HV bushing (live) shall be provided on top cover and the remaining three bushing(s) shall be provided on the sidewall of the tank and below top cover.

Two layer of electrical grade insulation craft paper (epoxy dotted) of 2 mil thickness or one layer of minimum 4 mil thickness shall be used for interlayer insulation both for HV and LV Coils.

5.2 INSULATION MATERIALS:

The following approved make of electrical grade insulation craft papers and boards shall be used in the transformer.

Sr. No.	Name of insulating material	Name of Firms
1.	Press board	(a) Senapathy whitely (b) Raman Board (c) Techno Electric, Hyderabad
2.	Kraft Paper	(a) Ballarpur (b) Padamjee (c) ITC Tribeni Tissue Paper Ltd., Kolkata (d) Munskjo, Sweden
3.	Press phan paper	Senapathy whitely
4.	Gaskets	(a) New cork (b) Talbros

5.3 Bushings

- i) The bushing shall conform to IS: 2099/3347 as amended upto date. Bushings having the creepage distance suitable for highly polluted atmosphere and having type tested as per IS: 3347 and IS:2099 latest version shall only be accepted.
- ii) For HV, 12kV class bushings and for earth/neutral of HV winding 1.1kV class bushing(s) shall be used and for LV, 1.1kV class bushing(s) shall be used.
- iii) The terminal arrangement shall not require a separate oil chamber.
- iv) The HV bushing shall be mounted on top cover and LV bushing(s) shall be mounted on side wall of tank below top cover. The bushing rods and nuts shall be of brass.

- v) The HV bushings shall not have arcing horns.
- vi) HV bushing mounting bolt should be tag welded.

5.4 CORE, WINDING AND OIL

5.4.1 CORE MATERIAL:

a) CRGO MATERIAL:

Transformer core shall be wound core construction in shell type or core type, using prime grade imported M4 or better COLD ROLLED GRAIN ORIENTED (CRGO) laminations or any other combination of better grade be acceptable. The bidder shall furnish the core loss (watt per Kg.) and power (VA per 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) up to 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%.

CRGO Laminations used shall be of prime grade and not second grade steel laminations. Only those bidders who directly imported CRGO either from the manufacturer or through their accredited marketing organization of repute (and not through any agent) shall be considered.

ALTERNATIVE

B) AMORPHOUS METAL CORE

The core shall be made of 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 losses with continuous working of the transformers. The value of the maximum 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. 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 data in support of this situation.

Core clamping for Amorphous metal transformers.

1. Core clamping shall be with top and bottom U-shaped core clamps made of sheet steel clamped with HT steel strap for efficient clamping.
2. MS core clamps shall be painted with varnish or 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.

NOTE: Equal weightage shall be given to the transformer with amorphous metal core and CRGO core.

5.4.2 FLUX DENSITY:

Flux density should not be more than 1.47 Tesla at the rated voltage and frequency. Transformer core should be designed in such a

way that it will not get saturated for any value of V/f (Voltage/frequency) ratio to the extent of 112.5% of rated value of V/f ratio (i.e., 11000/50). Actual core design along with calculations in support of it should be enclosed with the offer.

5.4.3 WINDING:

HV and LV windings shall be wound from Copper conductors with DPC/Polyesterimide enamel (Class H) insulation. The enamel covering shall conform to Grade-II of IS:13730 Part8 or IEC 60317 Part8. The windings shall be progressively wound in LVHV coil design for better voltage regulation and mechanical strength. The inter layer insulation shall be of Epoxy resin bond paper. The type of winding i.e. whether LV windings are of conventional type or foil wound shall be indicated in the tender. Winding must be done in cleanest possible atmosphere to prevent possible accumulation of dust particles. The coil shall be further processed for dimensional control, improved bonding and for improving short circuit withstanding capability.

The current density of winding shall not be more than 2.2 Amp./sq.mm for copper. The test reports for material characteristics like density, tensile strength and elongation, moisture content, ash content, dielectric strength, thickness of resin etc. for epoxy dotted paper shall be submitted during stage inspection.

5.4.4 CORE COIL ASSEMBLY:

Core coil assembly shall be further processed in oven for removal of moisture.

Ample provision for free circulation of oil in the radial gap between the core & LV Coil shall be made. The core shall be effectively earthed through copper foil bolted on core clamps, after removing the core clamp paint.

All core-coil assembly shall be indelibly marked / punched on core channel / a 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.

5.4.5 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: 335/1993 (latest amended) and should be ISI Marked and having the specified aging characteristics.

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.

5.5 BUSHING TERMINALS:

5.5.1 H.V. TERMINALS:

HV terminals shall be designed to directly receive ACSR conductor up to 7/3.35 mm (without requiring the use of the lug).

Starting and finishing leads of HT coils shall be covered with empire sleeve(s) or paper tube(s) of proper size. These leads should be clamped with the body of the winding with the help of cotton twine or permacel tape during manufacturing of the coils.

The transformer shall be provided with outdoor type 01 No. 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 or any other make - approved by the purchaser. The HV bushings shall generally conform to IS: 3347 and IS: 2099. Embossing showing the manufacturer's name and month & year of manufacture shall be clearly visible on HV bushings, even after fixing on transformer(s).

5.5.2 L.T TERMINALS:

The LV coil shall be taken by cut on the top core clamp duly reinforced to compensate for the mechanical strength.

In case of internal L.T. Breaker, the L.T. bushing and the terminals shall be suitable for being concealed inside the distribution box having insulated aluminum bus bar of suitable size (as per the enclosed drawing) from where the connections shall be taken for two or three numbers single core L.T. Aluminum Bunched Cable of size 16 sq.mm through cable glands for release of single phase connections to the consumer.

OR

In case of externally mounted L.T. Breaker (MCCB), the L.T. bushing and the terminals shall be suitable for being concealed inside the MCCB cum distribution box having insulated Aluminum bus bar of suitable size (as per enclosed drawing) from where the connections shall be taken for two or three numbers single core L.T. Aluminum Bunched Cable of size 16 sq.mm through Cable Gland for release of single phase connection to the consumer.

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 or any other make - approved by the purchaser. The LV bushings shall generally conform to IS: 3347 and IS: 7421".

5.6 TANK:

The oil volume inside the tank shall be such that even under the extreme operating conditions, the pressure generated inside the tank does not exceed 0.4 kg/sq.cm positive or negative. There must be sufficient space from the core to the top cover to take care of oil expansion.

The tank cover shall have plasticised surface on live parts to guard against bird faults. Alternately, suitable insulating shrouds shall be provided on the bushing terminals.

a) The tank cover shall have plasticised surface on live parts to guard against bird faults. Alternately, suitable insulating shrouds shall be provided on the bushing terminals.

- i) Main Tank : 2.0 mm (Min)
- ii) Top Cover : 2.5 mm (min.)
- iii) Bottom Cover : 2.5 mm (min.)

- b) The tank without oil shall be capable of withstanding a pressure of 0.8 kg/cm^2 (g) above atmosphere at a vacuum of 760 mm of Hg for 30 minutes without any permanent deflection (Air pressure test shall be conducted as per IS -1180 Part-II). The permanent deflection should not be more than the limits specified in IS:1180 Part-II. The pressure test shall be performed carefully at the time of first inspection only to confirm the adequacy of the tank strength and to be certified by our officer.
- c) **MEASUREMENT OF SHEET THICKNESS OF TRANSFORMER TANK/ METER & PROTECTION BOX:**

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:-

1.	Top Cover	At 2 places to be measured & average is to be taken.
2.	Bottom Cover	-do-
3.	Side Wall(s)	On all four sides (average is to be taken)
4.	M&P Box.	Both sides and front (average is to be taken)

- 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/ M&P Box for Distribution Transformers as per relevant tender specification are as under for ready reference:

Sr. No.	Rating	Top Cover (mm)	Bottom Cover (mm)	Side of Tank (mm)	M&P Box (mm)
1	25 KVA Single Phase	2.5	2.5	2.0	1.6
2	16 KVA Single Phase	2.5	2.5	2.0	1.6
3	10 KVA Single Phase	2.5	2.5	2.0	1.6

Further it is also intimated that 5% variation beyond tolerance limit in measurement of sheet thickness on negative side shall be acceptable by the Discom with levy of penalty. The rate of penalty will be Rs.80.00 per Kg.

For example:

Weight of 25 KVA Transformer Tank and M&P Box	120 Kg. (approx.)
Variation in thickness of tank/M&P Box	5% (beyond tolerance limit)
Then penalty levied will be	120x80x5 = Rs.480.00
	----- 100

In case any dimension in transformer tank/ M&P Box sheet thickness found beyond aforesaid limit of (-) 5% will not be acceptable to the Discom and the relevant sub-lot shall stand rejected and the lot of such transformers will have to be replaced by the firm.

The highest percentage variation on negative side in respect of measurement of sheet thickness of any part of tank & M&P Box will be applicable on the entire dimensions for levy of penalty.

Transformer having thickness even more than 5% after allowing rolling tolerance shall be acceptable.

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.

5.7 The following shall also be adhered:

- The long seam joint, CSEAM joint, fittings & accessories and other welds shall be oil tight and no deflection/ bulging should occur during service.
- Manufacturer should carry out the all welding operations as per relevant ASME standards and submit a copy of the welding procedure, qualifications and welder qualification certificate.
- The circular bottom plate edges of the tank should be folded upward, for at least 25mm to have sufficient over lap with vertical sidewall of the transformer.

Tank shall have permanent lugs for the lifting the Transformer body and there shall be facilities for lifting the core coil assembly separately.

The Transformer shall be provided with two mounting lugs suitable for fixing the transformer to a single pole by means of 2 bolts of 20 mm diameter as per ANSIC 57.12.201988. Both mounting lugs shall be made of steel of min. 6 mm thickness. Jump proof arrangements shall be provided on upper mounting lugs and lips shall be provided on lower mounting lugs for

proper mounting of transformer on the pole. Both mounting lugs faces shall be in one plane (as per drawing enclosed at 'C').

The Transformer tank and the top cover shall be designed in such a manner as to leave no external pockets in which water can lodge. The top cover shall be fixed to the tank by proper arrangement to avoid ingress of moisture. Design of the top cover shall be such that no water can lodge on the top side. HV bushing pocket shall be embossed to top side of the top cover so as to eliminate ingress of moisture and water. The edges of the top cover shall be formed, so as to cover the top end of the tank and gasket (as per drawing enclosed at 'D').

Minimum & Maximum Oil level mark shall be embossed inside the tank. Nitrite/neoprene rubber gaskets conforming to latest IS:4253 Part-II shall be provided between tank and top cover.

Continuous welding of one inch length each should be provided at four places on ring (i.e. welding the clamping ring at top cover as well as with tank) and nut bolt of the ring should be tag welded.

On each transformer stainless steel anti theft fastener of suitable size shall be provided for clamping rim to hold fast tank and tank cover. In case of flange provided on top cover 2 Nos. stainless steel anti theft fastener shall be used and in case of rim type tank top cover 1 No. anti theft fastener shall be used. **Alternatively Dome shaped side clamping type construction of clamping bolts with stopper washer with tack welding for antitheft purpose for top cover.**

6) TANK SEALING:

The space on the top of the oil shall be filled with dry air or nitrogen. The dry air (or nitrogen) plus oil volume inside the tank shall be such that even under extreme operating conditions, the pressure generated inside the tank does not exceed 0.4 kg/sq.cm positive or negative. The nitrogen shall conform to commercial grade of relevant standards.

7) SURFACE PREPARATION & PAINTING :

7.1 General:

All paints shall be applied in accordance with the paint manufacturer's recommendations. Particular attention shall be paid to the following:

- a) Proper storage to avoid exposure as well as extreme of temperature.
- b) Surface preparation prior to painting.
- c) Mixing and thinning.
- d) Application of paints and the recommended limit on time intervals between coats.
- e) Shelf life for storage.

All paints, when applied in a normal full coat, shall be free from runs, sags, wrinkles, patchiness, brush marks or other defects.

All primers shall be well marked into the surface, particularly in areas where painting is evident and the first priming coat shall be applied as soon as possible after cleaning. The paint shall be applied by airless spray according to manufacturer's recommendations. However, wherever airless spray is not possible, conventional spray shall be used with prior approval of Purchaser.

The manufacturer shall, prior to painting protect nameplates, lettering gauges, sight glasses, light fittings and similar such items.

7.2 Cleaning and Surface Preparation:

After all machining, forming and welding has been completed, all steel work surfaces shall be thoroughly cleaned of rust, scale, welding slag or spatter and other contamination prior to any painting.

Steel surfaces shall be prepared by SAND/SHOT blast cleaning to Grade Sa. 2.5 of ISO 85011 or Chemical cleaning by Seven Tank Process including Phosphating (IS 3618).

The pressure and volume of the compressed air supply for blast cleaning shall meet the work requirements and shall be sufficiently free from all water contamination to ensure that the cleaning process is not impaired.

Chipping, scraping and steel wire brushing using manual or power driven tools cannot remove firmly adherent millscale and shall only be used where SAND/ shot blast cleaning is impractical. Manufacturer shall indicate such location, for owner's information, in his offer.

7.3 Protective Coating:

As soon as all items have been cleaned and within four hours of the subsequent drying, they shall be given suitable anticorrosion protection.

7.4 Paint Material:

Following are the types of paint that may be used for the items to be painted at shop and supply of matching paint to site:

Heat resistant paint shall be (Hot oil Proof) for inside surface.

For external surfaces one coat of Thermosetting Paint or one coat of Zinc Chromate primer followed by two coats of Polyurethane base paint. These Paints can be either airdrying, or stoving.

The color of the finishing coats shall be olive green colour conforming to Shade No. 220 of IS -5 of 1961 in order to distinguish of star level transformers.

7.5 Painting Procedure:

All painting shall be carried out in conformity with both specification and with the paint manufacturer's recommendation. All paints in any one particular system, whether shop or site applied, shall originate from one paint manufacturer.

Particular attention shall be paid to the manufacturer's instructions on storage, mixing, thinning and pot life. The paint shall only be applied in the manner detailed by the manufacturer e.g. brush, roller, Conventional air spray and shall be applied under the manufacturer's recommended condition.

Minimum and maximum time intervals between coats shall be closely followed.

All prepared steel surfaces should be primed before visible rerusting occurs or within 4 hours, whichever is sooner. Chemical treated steel surfaces shall be primed as soon as the surface is dry and while the surface is still warm.

Where the quality of the film is impaired by excess film thickness (wrinkling, mud cracking or general softness) the supplier shall remove the unsatisfactory paint coating and apply another. As a general rule, dry film thickness should not exceed the specified minimum dry film thickness by more than 25%. In all instances where two or more coats of the same paint are specified, such coatings may or may not be of contrasting colours.

Paint applied to items that are not to be painted shall be removed at Supplier's expense, leaving the surface clean, unstained and undamaged

7.6 Damaged Paintwork:

Any damage occurring to any part of a painting scheme shall be made good to the same standard of corrosion protection and appearance as that originally employed.

Any damaged paintwork shall be made good as follows:

- a) The damaged area, together with an area exceeding 25 mm around its boundary, shall be cleaned down to bare metal.

- b) A priming coat shall be immediately applied, followed by a full paint finish equal to that originally applied and exceeding 50 mm around the perimeter of the original damage.
- c) The repainted surface shall present a smooth surface. This shall be obtained by carefully chamfering the paint edges before and after printing.

7.7 Dry Film Thickness:

To the maximum extent practicable the coats shall be applied as a continuous film of uniform thickness and free of pores. Over spray, skips, runs, sags and drips should be avoided. The different coats may or may not be of the same colour.

Each coat of paint shall be allowed to harden before the next is applied as per manufacturer's recommendation.

The requirement for the dry type film thickness (DFT) of paint and the materials to be used shall be as given below.

Sl. No.	Paint Type	Area to be Painted	No. of coats	Total Dry film thickness (min.)
1.	Thermosetting Paint	Inside Outside	01 01	20 microns 60 microns
2.	Liquid Paint			
	a) Zinc chromate (Primer)	Outside	01	30 microns
	b) Polyurethane base (Finish coat)	Outside	01	25 microns each
	c) Heat resistance paint (Hot oil proof Paint)	Outside	01	35/10 microns

7.8 Tests:

The painted surface shall be tested for paint thickness.

The painted surface shall pass the Cross Hatch Adhesion Test.

8 RATING AND TERMINAL PLATES

- 8.1 **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 only. Thickness shall be 0.9 mm (with a tolerance of ± 0.1 mm). The plate shall be made absolutely undetectable either

through welding or riveting or through any other approved method.

There shall be a rating plate on the transformer containing the information given in the relevant ISS.

The HV winding terminals shall be marked 1U & 1N. The corresponding secondary terminals shall be marked as 2u & 2n. In the diagram to be given on the name plate, the relative position of various terminals when viewed shall be clearly visible. 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.
- iv) Date of expiry of guarantee period – month & year.
- v) Maximum Guaranteed Load Losses at 50% and 100% loading.
- vi) Recommended fuse sizes for HV & LV sides.
- vii) Name & Full address of the manufacturer.
- viii) Capacity of the transformer.
- ix) Rating of the transformer.
- x) Type – Oil filled naturally cooled.

ALL DETAILS ON THE "NAME RATING AND DIAGRAM PLATE" SHALL BE INDELIGIBLY MARKED i.e. BY ENGRAVING OR PUNCHING

8.2 Identity Plate: A.M.S. plate of size 50 x 50 x 2 mm shall be continuously welded to the main tank body and in clearly visible position, with following details clearly punched.

DISCOM TN –
 **KVA , S.NO.**
**MAKE**

8.3 Identification Mark:- In addition to above, the following identifying details shall be clearly punched on top cover with minimum 10 mm x 10 mm x 1 mm size punch letters.

MAKE _____
S. No. _____
T N _____

These identification details shall also be punched on two places (i.e. at the top cover and transformer tank). The punching shall be distinct and visible. The dimensions of letters be 10x10x1 mm

The above identification mark shall also be punched / welded to one of the top

core clamping channels.

A) Technical Plate- In addition to existing provision of identity plate and name plate one plate also be affixed on the transformer mentioning the following details:-

- A) Name of the Firm
- B) TN No.
- C) Make
- D) Rating
- E) Core Area
- F) LV Coil :-
 - 1. ID/OD Dimensions
 - 2. Conductor Size
- G) HV Coil :-
 - 1. ID/OD Dimensions
 - 2. Conductor Size
- H) Window Hight

9.0 PRESSURE RELEASE DEVICE:-

The transformer shall be equipped with a selfsealing pressure release device designed to operate at a minimum pressure of 8 PSI (0.564 Kg/Cm²).

10.0 FITTINGS

The following standard fittings shall be provided with each transformer.

- a) Two earthing terminals.
- b) Two lifting lugs.
- c) Rating and terminal marking plates.
- d) Pressure relief device.
- e) MCCB (or) LT Circuit Breaker.
- f) HV Bushings.
- g) LV Bushings.
- h) HV terminal connectors.
- i) Top cover fixing clamps.
- j) Mounting lugs – 2 Nos.
- k) Bird guard or plasticised cover on live parts.
- l) LV earthing arrangement.
- m) Operating Mechanism of LT Circuit breaker/ MCCB.
- n) Signal Light.
- o) Five year Guarantee plate.
- p) Any other fitting necessary for satisfactory performance of the manufacturer.

11.0 FASTENERS

- All bolts, studs, screw threads, pipe threads, bolt heads and nuts shall comply with the appropriate Indian Standards for metric threads, or the technical equivalent.
- Bolts or studs shall not be less than 6 mm in diameter except when used for small wiring terminals.
- All nuts and pins shall be adequately locked.
- All ferrous bolts, nuts and washers placed in outdoor positions shall be treated to prevent corrosion, by hot dip galvanizing except high tensile steel bolts and spring washers, which shall be electro galvanized Appropriate precautions shall be taken to prevent electrolytic action between dissimilar materials.
- Each bolt or stud shall project at least one thread but not more than three threads through the nut, except when otherwise approved for terminal board studs or relay stems If bolts are provided at inaccessible places for ordinary spanners, special spanners shall be provided.
- The length of screwed portion of the bolts shall be such that no screw thread may form part of a sheer plane between members.
- Taper washers shall be provided where necessary. Protective washers of suitable material shall be provided front and back of the securing screws.

12.0 LOSSES:

The total losses at 50% and 100% loading for single phase **10 & 16 & 25 KVA** Transformers at rated voltage, frequency & 75 Deg. C shall not exceed the following values:

Rating in KVA	Voltage ratio in KV	Total losses at 50% loading (Watt) Max.	Total losses at 100% loading (Watt) Max.
10	$11/\sqrt{3}/0.240$	58	180
16	$11/\sqrt{3}/0.240$	90	225
25	$11/\sqrt{3}/0.240$	100	315

These losses are maximum allowable and there would not be any positive tolerance. Transformer with higher losses than the above specified losses would be rejected.

The limit of temperature rise mentioned above will have to be satisfied by the manufacturer by carrying the Heat Run Test by feeding guaranteed losses.

In case the temperature rise exceeds the above values, transformers shall be rejected at risk, cost and responsibility of the supplier.

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.

13.0 IMPEDANCE:

The recommended percentage impedance at rated current and at 75 Deg. C 3.75% (with a tolerance of $\pm 10\%$).

14.0 TEMPERATURE RISE

The temperature rise over ambient shall not exceed the limits described below:

Top oil temperature rise measured by thermometer	:	35 Deg.C
Winding temperature rise measured by method	:	40 Deg.C

The temperature rise test shall be conducted on guaranteed losses.

Bids not conforming to the limits indicated above will be treated as non-responsive.

15.0 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 **Annexure-A**. Complete details shall be furnished. Tolerances on weight quantity and dimension figures shall be $\pm 2\%$ 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.

16.0 TYPE TEST CERTIFICATE

The bidder shall furnish type test certificate(s) of offered design / similar design, wherever available with the bid.

i) DRAWING AND OTHER DOCUMENTS:

One set of dimensional drawing(s) and internal construction drawing of each transformer rating shall be submitted with the tender. The tender shall be accompanied with the following drawings/calculation sheets, as per the offered designs. Size of the drawings shall be A3 (420 x 297 mm) or A4 size only.

- a) Name rating/diagram plate drawings.
- b) Outline and General arrangement drawings
- c) Core coil assembly drawings
- d) Core section along with flux density calculation sheet / drawings.
- 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.mm.

Any delay in submission of drawings shall be to supplier's account.

17.0 PROTECTION:

The transformer shall have the following additional fittings features as its integral part for HV/ LV protection:

The Meter Protection Box shall have one partition to make two portions of the box with two doors. One portion of box shall contain protection equipments (i.e. MCCB and Relay, Ring type LT CT of accuracy of 0.5S, ratio 100/5A and 5 VA burden and provisions for installation of energy meter visible through glass window) to be called as Protection Box. Second portion of box shall contain L.T. distribution terminals (general outline diagram of meter protection box unit shall be as per drawing enclosed). However, there should be provision in meter protection box to install single phase L.T. Shunt Capacitor.

17.1 The transformer shall have the following CSP features:

(a) **INTERNAL HV FUSES ON THE HT SIDE OF TRANSFORMER:**

Specification for the HT fuses: Expulsion / any other suitable fuse placed in series with primary winding. This fuse is mounted normally inside of the primary bushing and is connected to the high voltage winding through a terminal block. This has to protect that part of the electrical distribution system which is ahead of the Distribution transformers from faults which occur inside the Distribution transformers i.e., either the windings or some other part of the transformer. It shall be ensured that this fuse does not blow for faults on the secondary side (LT side) of the transformer i.e., the blowing characteristic of the fuse and LT breaker shall be so coordinated that the fuse shall not blow for any faults on the secondary side of the transformer and these faults shall be cleared by the LT breaker only. The fuse shall be make of ERMCO or any make approved by JVVNL.

(b) **INTERNALLY MOUNTED OIL IMMERSED LT BREAKER ON THE LV SIDE OF THE TRANSFORMER**

LT circuit breaker: All LT faults after the breaker shall be cleared by this breaker. As such, it shall be designed for the perfect coordination with the HT fuse link. The supplier shall furnish the time/current characteristics of LT circuit breaker and 11 kV fuses for various current multiples. The two characteristics shall be drawn on the same sheet to indicate coordination between the circuit breaker and fuse. This shall be based on the type test carried out on one of the transformers. In addition, the supplier shall carry out coordination test as indicated above, and this forms one of the test for acceptance.

The breaker is to be mounted on the secondary side of the transformer under oil to minimize premature operations from primary surges as would be with undersized line fuses. Two single pole elements is preferred. THE BREAKER SHALL BE COORDINATED THERMALLY WITH THE TRANSFORMER RATING TO FOLLOW CLOSELY THE VARIATIONS OF COIL TEMPERATURE DUE TO FLUCTUATIONS IN LOADS AND AMBIENT TEMPERATURES.

This is to be accomplished by connecting the breaker in series between the secondary winding and the load current. The breaker shall be located in the same oil as the core and coil assembly so that the bimetal are sensitive to the temperature of oil as well as the load current.

The circuit breaker may be an electromechanical device with three elements viz. (i) Temperature sensing (ii) latching and tripping and (iii) current interrupting. The temperature sensing function might be accomplished through the use of bimetallic strips, which would be built into the breaker, such that load current of the transformer flows through them. In addition to this, a magnetic tripping device is to be provided for increasing the opening speed of the breaker under high fault conditions. The circuit breaker shall be mounted inside of the transformer so that these bimetallic strips are within the top oil layer of the transformer. The latching and tripping functions of the circuit breaker may be carried out within assembly similar to those used in industrial type air circuit breaker. The circuit breaker shall also be closed and opened manually standing on ground and with a magnetic trip device also. The current interruption element shall consist of copper current carrying parts plus a set of copper tungsten current interrupting contacts. The magnetic element shall increase the opening speed of the circuit breaker under high fault current conditions. The response of circuit breaker to the activity shall remain unchanged by the addition of the magnetic trip element. The specification to which the breakers conform shall be indicated.

ARC DIVERTING MECHANISM: Internal breaker should be fitted with a special Arc Diverting Mechanism which can be able to divert the flow of current at the time of tripping from the circuit breaker inside oil to a different set of contacts placed above the oil level (in dry air) but inside the transformer. This Mechanism should be completely eliminate the contamination of transformer oil if any due to arcing.

LOAD MANAGEMENT SIGNAL LIGHT:

A signal light, controlled by a bimetal in the breaker shall switch on when the transformer load reaches a predetermined level indicating that the transformer has been overloaded. The load management signal light shall perform two functions. It shall show visually when the particular transformer has been operating in an overload condition and shall provide knowledge that for good system management, the economical change out point for the transformer is fast approaching. The signal light need not indicate temporary overloads and shall turn on only when the overload condition has existed at a given level for a certain length of time.

The LT circuit breaker shall have a set of auxiliary contacts built in for signal light operation. These, normally open contact, shall form part of the signal light circuit. The signal light circuit shall consist of an auxiliary transformer winding (one or two turns) which generates about 4V, for the signal light contact set within the circuit breaker, and the signal light is to be mounted on the transformer tank. The signal light contact set is mechanically connected to the main circuit breaker latching and bimetal system. The signal light mechanism is adjusted so that the signal light contacts will close at a preset thermal condition which occurs before the main latching system opens the main contact. The net result is a visual external indication that a preset load condition has reached by the transformer. The signal light mechanism does not reset itself when the load drops off, the signal light remains lighted once the signal light contacts closes and can only be turned off by manually operating the external circuit breaker handle.

A distribution box is an enclosure (IP 33) is ready to be used condition and to be mounted on the transformer tank directly. The enclosure shall be made with sheet of thickness not less than 1.6 mm. It shall be painted with colour Shade No. 632 both inside and outside with powder coating. Enclosure shall have provision for pad locking arrangement. Detachable gland plate shall be provided for taking connections from Distribution Box and transformer bushing terminal. The Distribution box shall have Aluminum Bus bars (covered with PVC Insulated tape) along with lugs fitted on bus bar for connecting two or three numbers single core L.T. Aluminum Bunched Cable of size 16 sq.mm for 16KVA/ 25KVA rating transformers respectively.

ALTERNATIVE

EXTENALLY MOUNTED MCCB FOR LV SIDE:

Single pole MCCB is to be provided on LV side with overload trip release with inverse time current characteristics for overload protection and magnetic trip release for instantaneous tripping in the wake of short circuits.

The type test certificate of the MCCB meeting the below mentioned tripping characteristics shall also be furnished with the tender:

Application	Outdoor (enclosed).
Utilization category	A (IS: 13947/1993) as amended upto date.
Type	Magnetic/ ThermalMagnetic trip free mechanism.

Number of poles	One
Reference ambient temperature	40° C.
Rated insulation level	660 V.
Impulse withstand	8 kV peak.
Rated operational voltage	240 V.
Continuous current rating	150 A for 25 KVA, 100 A for 16 KVA & 63 A for 10 KVA
Fixed overload release setting (Amp)	120 Amp for 25 KVA 80 Amp. for 16 KVA 50 Amp. for 10 KVA
Ultimate Short Circuit Breaking capacity (ICU)	18 KA at 0.3 P.F. at 240 V AC.
Rated service Short Circuit Breaking capacity (ICS)	18 KA at 0.3 P.F. at 240 V AC.
Power factor for Short Circuit (Max.)	0.3 (lag.)
Terminal capacity	2x25 sq.mm. Aluminium cable.
Application Standard	IS 13947 Part2 latest.
Time current characteristics	To coordinate with HV fuse.

The MCCB shall not cause any nuisance tripping due to switching current of motor & capacitor load, and shall have the following Time Current Characteristics.

Multiple of normal current setting **Tripping time**

1.05	More than 2.5Hrs.
1.1	Less than 2.5 Hrs
1.15	More than 1Hr.& Less than 2Hrs.
1.2	More than 0.5Hrs.& Less than 2Hrs
1.3	Less than 30 minutes.
1.4	Less than 10 minutes.
2.5	Less than 1 minute.
6.0	Less than 5 seconds.
8.0	Less than 40 milli seconds
12.0	Instantaneous (less than 20 milli seconds)

For the above time / current characteristics reference calibration Temperature of the breaker shall be 50 deg.C. Deration if any upto 60 deg.C ambient Temperature shall not exceed 10% of the current setting indicated above.

The MCCB inverse time current characteristics have to be coordinated with under oil HV fuse and the same shall be submitted along with the offer.

The contacts of MCCB should be selfwiping type so as to keep the contacts clean and milli volt drop low.

MCCB cum distribution box is an enclosure (IP 33) is ready to be used condition and to be mounted on the transformer tank directly. The enclosure shall be made with sheet of thickness not less than 1.6 mm. It shall be painted with

colour Shade No. 220 both inside and outside with powder coating. Enclosure shall have provision for pad locking arrangement. Detachable gland plate shall be provided for taking connections from Distribution Box and transformer bushing terminal. The Distribution box shall have Aluminum Bus bars (covered with PVC Insulated tape) along with lugs.

fitted on bus bar for connecting two or three numbers single core L.T. Aluminum Bunched Cable of size 16 sq.mm for 16KVA/ 25KVA rating transformers respectively.

The following makes of MCCB shall be acceptable :Seimens / L & T / ABB / GE Power / Schneider – CG / SPACEAGE _Hyundai / HAVELLS/ H.B. ELECTRO/ C&S and equivalent make as approved by Discom. The MCCB shall directly be purchased from the manufacturer or the authorized dealer or stockiest, however in every case of purchase of MCCB the delivery shall be from the manufacturer's godown for which a copy of bill shall be given to inspecting officer at the time of inspection.

The bidder shall submit the type test reports as per IS:13947/1993 for test sequence I, II& III complete with certified drawings, Oscillograms and approved drawing from NABL approved laboratory along with the offer.

The successful bidder shall be required to furnish the guarantee certificate of 5 years obtained from the MCCB Manufacturer as per the enclosed format on Rs.100.00 Nonjudicial stamp paper.

Acceptance Tests:

The following test(s) shall be carried out by purchaser's representative on MCCB's on the sample numbers equivalent to the number of transformer samples.

1. Overall Dimensional Checking.
2. High Voltage test at 3 kV for one minute.
3. Insulation resistance test.

Instruction and operation Manual

The successful bidder shall be required to submit 5 copies of Instruction and Operation manual for each lot of 100 Transformers (or part thereof) supplied. This instruction manual should give complete details about the precommissioning tests/checks and the details of preventive maintenance etc.

Signal Light (LED Indicating Lamp)

The MCCB enclosure shall be provided with LED indicating lamp to indicate tripping of MCCB. An auxiliary relay with changeover contacts can be used to connect LED indicating lamp to the transformer secondary terminals. If MCCB is not having auxiliary contacts. In case the MCCB trips or switched OFF, the relay contacts are closed which turns ON the LED indicating lamp. When the MCCB is reset and switched ON, the indicating lamp switches OFF. Signal light shall be arranged to avoid damages while handling the MCCB enclosure at

site.

18.0 QUALITY ASSURANCE PLAN

The purchaser intends to purchase Transformers only from Quality conscious manufacturers. Preference shall be given to those who possess ISO 9001 / 9002 Certification.

The bidder shall furnish the details in respect of following, in the schedule prescribed herewith this specification, failing which the offer is liable for rejection.

- a) List of testing equipment and instruments available with bidder for inspection, testing and checking the transformers offered, as per tender specification in the schedule of testing facilities (Schedule VIII). The calibration details should also be included.
- b) List of machines. equipment/ T&P available with the bidder for manufacturing the transformers, in the schedule of Plant and machinery (Schedule IX).
- c) Details of type tests conducted on the Transformers offered to supply in the schedule of type tests (Schedule X).
- 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 (Schedule XII).

The bidder 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 instrument /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. Tenderers will have to produce documentary evidence for the purchase of AMORPHOUS metal core laminations, transformer oil and copper conductors.

19.0 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 manufacturer. 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 process. 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 bidder must have adequate set of instruments for conducting testing as per class of 0.5 or better.

The instruments shall be duly calibrated and Calibration certificates 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 only. A comprehensive list of testing equipment / instruments indicating make, Sr.No. type of accuracy, calibrating agency, calibration date etc., should be furnished also with the bid. The calibrated instruments shall be duly sealed by calibrating agency to avoid any tampering with calibration and the details there of 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 arrangement can be made for inspection. The supplier shall give minimum fifteen days advance intimation to enable the purchaser to depute his authorized representative for stage inspection / 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.

20.0 TESTS:

20.1 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.

All the assembled / finished transformers prior to dispatch shall be subjected to all the Routine Tests as per IS: 2026. Minimum 25% of the lot size samples for Routine tests & checking shall be selected by the inspecting officers at random subject to minimum five (5) Nos. The supplier shall invariably furnish manufacturer's Routine test certificates along with inspection call of the offered transformers for pre-despatch inspection.

The selected transformer samples shall be subjected to the following Routine / Acceptance Tests at the manufacturer's works in accordance with relevant ISS:

1. Measurement of Voltage ratio.
2. Measurement of No load losses & No Load current at 100% and 112.5% of rated voltage and normal frequency.
3. Measurement of load losses at rated voltage and normal frequency (at 50% & 100% loading).
4. Measurement of Impedance voltage at rated current and normal frequency.
5. Measurement of windings resistance cold (at or near the test bed temperature).
6. Insulation resistance.
7. Induced over voltage withstand test.
8. Separate source voltage withstand test.
9. Checking of rating and terminal marking plate.
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 reassembly 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 shall be done and copies thereof duly signed by firm's representatives and inspecting officers shall be enclosed with the inspection report.

Invoices of Amorphous/CRGO core 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.

The following tests shall also be carried out at manufacturer's works on one complete unit of each rating of 10KVA, 16 kVA and 25 kVA:

- i) Temperature rise test (in the first lot and may be repeated in subsequent lots if desired by purchaser).
- ii) Air pressure test on empty tank of transformer opened for physical verification test (details below).
- iii) Oil leakage test (details below).
- iv) Salt spray test and Hardness tests as per the relevant standards.

Fifteen days clear notice shall be arranged for predispatch inspection by Purchaser's representative as per General Conditions of Contract.

After successful inspection, the inspecting officer shall seal all the inspected transformers by tamper proof polycarbonate seals **on top cover bolts** of the transformer for identification. Before sealing the inspecting officer will ensure that all the offered transformers are complete and duly fitted with name, rating and diagram plate, identify plate and identification marks, as specified in this specification.

NOTE: Also after inspection/ testing, inspecting officer(s) shall affix Signature Seals also on each Transformer in addition to other seals.

- The Air Pressure Test shall be conducted as Type Test at the time of inspection of first lot, at the manufacturer's works. The pressure gauge and vacuum gauge shall be duly calibrated and sealed by an independent recognized test lab (s).

- The oil leakage test shall be conducted on one unit selected from the offered lot of each rating. Transformer complete in all respects shall be subjected to the pressure corresponding to 0.4 Kg./Cm². and maintained for three hours. No leakage should occur.

20.2 TYPE TESTS & SPECIAL TESTS:

In addition to above tests the following type tests shall be arranged on one transformer only by supplier in accordance with IS 2026 (Part 1 to III) at laboratories accredited by National Accreditation Board/ Govt. approved lab for testing and calibration laboratories (NABL).

(a) SHORT CIRCUIT TEST FOR DYNAMIC AND THERMAL ABILITY:

The Short circuit test for dynamic and thermal ability shall be arranged on one unit of each rating. The transformers for the test shall be selected /sealed by our inspecting officer from the first lot which shall be of minimum 20 Nos. (if ordered quantity is 500 Nos.) OR 50 Nos. (if ordered quantity is more than 500 Nos.). The Short Circuit test shall be conducted only after successful Routine tests including measurement of No Load and Load Losses (at 50% & 100% loading). The supply shall be accepted only after arranging successful type test on the selected transformer(s).

b) IMPULSE VOLTAGE WITHSTAND TEST:

The Impulse Voltage withstand test as per clause No. 13 of IS:2026 (Part-III) – 1981 shall be arranged. Impulse voltage withstand test shall be 95 KVp instead of 75 KVp for 11 KV class transformers. The test shall be conducted on one unit of each rating to be selected by our inspecting officer from the first lot of minimum 20 Nos. (if ordered quantity is 500 Nos.) OR minimum 50 Nos. (if ordered quantity is more than 500 Nos.). The supply shall be accepted only after arranging successful Impulse test on the selected transformer(s).

Note :-If ordered qty. Is less than 500 Nos. In such case first lot shall be of min. One month qty as per scheduled delivery .

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

The programme 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 along with 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 short circuit/ impulse voltage withstand test within last 3 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.

21.0 RANDOM SELECTION AND TESTING (RST):

21.1 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 & load Losses at 50% and 100% loading shall form part of tests conducted before and the after the short circuit test and recorded in the report.
- ii) Impulse test as per Clause No.13 of IS:2026 (Part-III). Impulse voltage shall be 95 KVp instead of 75 KVp.
- iii) 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 short circuit test / impulse type tests, 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, 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).

21.2 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 25 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 25 Nos. from which sample was drawn.
- b) In case if dispatch instructions are less than 25 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 (whose Sr. No. shall be decided by the committee members) shall be selected for physical verification/ checking of window height, limb centre and checking of insulation of HV and LV windings at CTL.

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 is 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.

No tolerance shall be allowed during CTL testing and in case any parameter which are to be tested in CTL are found beyond guaranteed parameters, the lot/ subplot shall stand rejected.

21.3 **CHALLENGE TESTING CLAUSE:**

The other manufacturer can also request challenge testing for any test based on specification and losses. The challenger would request for testing with testing fee. The challenge test fees are proposed at least three times the cost of testing. This is likely to deter unnecessary challenges. The challenger would have the opportunity to select the sample from the store and any such challenge should be made within the guaranty period. The party challenged, challenger and the utility could witness the challenged testing.

The challenged testing would cover the;

- 1) Measurement of magnetizing current.
- 2) No load losses test.
- 3) Load losses test
- 4) Temperature rise test.

The challenge test could be conducted at NABL accredited laboratory, like ERDA and CPRI Bhopal. If the values are within limit, the product gets confirmed else not confirmed. No positive tolerance in losses shall be permitted. If the product is not confirmed the manufacturer would pay the challenge fee and challenger would get the fee refunded. However as a redressal system the challenger (supplier) would be allowed to ask for fresh testing of two more samples from the store and the same be tested in a NABL laboratory (which shall be other than previously selected NABL accredited Lab.) in presence of party challenged, challenger and the utility. If any one or both sample does not confirm the test then the product is said to have failed the test. In such cases the manufacturer will be declared as unsuccessful manufacturer for the said product and balance supply shall not be availed and the order shall be cancelled with levy of maximum penalty.

22. **PRICE:**

The prices shall be quoted on F.O.R. destination basis in the manner detailed in schedule of prices (Schedule-IV) indicating details of ex-works price, excise duty, sales tax and freight & insurance charges and Entry Tax (for outside Rajasthan Firms) for delivery at our stores. The quoted prices shall be variable as per IEEMA price variation formula attached herewith at **Schedule-III-A**, without any ceiling for distribution transformers. The base date for price variation shall be the first date of calendar month previous to the month in which tenders are due to be opened. The prices shall be quoted after considering modvat benefits & benefit of VAT available to the supplier. 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: 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 alongwith receipted challans to the Accounts Officer (CPC), JVVNL, Jaipur.

23. GUARANTEE PERIOD:

Ia) For Out of Rajasthan State Firms

Performance guarantee of the transformer(s) with LT protection unit shall be for the period of 60 (sixty) months from the date of despatch. 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 repaired / rectified free of cost expeditiously.

Firms shall lift G.P. failed Transformers from the stores within 60 days of its intimation positively and deliver the same after repair in next 60 days. In case firm fails to lift G.P. failed Transformer within 60 days, cost of the transformer(s) shall be withheld from its payment bills and in case firm fails to deliver transformer after due repair within 120 days, a penalty at the rate of ½% per week subject to maximum 10%, shall be levied for the late delivery of repaired Transformer(s). Firm shall lift G.P. failed transformers after furnishing safe custody bank guarantee, the slab of safe custody Bank Guarantee shall be as under.

Safe custody Bank Guarantee :-

In case if order is upto 1000 Nos. DT's the firm have to give safe custody Bank Guarantee for Rs.5.00 Lacks 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 Lacks. 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.

FOR JAIPUR DISCOM:

In case a central store is created in Jaipur Discom then all ACOS(s) shall deposit the G.P. failed distribution transformers to Central Store at Jaipur from where respective firm may lift these transformers for repair work after furnishing of required SCBG (as mentioned above). The charges for arranging the transportation of G.P. failed distribution transformers from site to centralize store (to and fro) as decided by JVVNL shall be recovered from you. The separate orders shall be issued by the respective Discoms if central stores is created by them.

Ib) For Rajasthan State Firms

Performance guarantee of the transformer(s) with LT protection unit shall be for the period of 60 (sixty) months from the date of despatch. 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 repaired / rectified free of cost expeditiously.

Firms shall lift G.P. failed Transformers from the stores within 60 days of its intimation positively and deliver the same after repair in next 60 days. In case firm fails to lift G.P. failed Transformer within 60 days, cost of the transformer(s) shall be withheld from its payment bills and in case firm fails to

deliver transformer after due repair within 120 days, a penalty at the rate of ½% per week subject to maximum 10%, shall be levied for the late delivery of repaired Transformer(s). Firm shall lift G.P. failed transformers after furnishing safe custody bank guarantee, the slab of safe custody Bank Guarantee shall be as under.

Safe custody Bank Guarantee :-

In case if order is upto 1000 Nos. DT's the firm have to give safe custody Bank Guarantee for Rs.5.00 Lacks 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 Lacks. 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.

FOR JAIPUR DISCOM:

In case a central store is created in Jaipur Discom then all ACOS(s) shall deposit the G.P. failed distribution transformers to Central Store at Jaipur from where respective firm may lift these transformers for repair work after furnishing of required SCBG (as mentioned above). The charges for arranging the transportation of G.P. failed distribution transformers from site to centralize store (to and fro) as decided by JVVNL shall be recovered from you. The separate orders shall be issued by the respective Discoms if central stores is created by them.

II) All the transformers repaired/ rectified by the manufacturer under guarantee clause shall carry a further guarantee of 12 months after repair or unexpired guarantee of 60 months from the date of supply, whichever is later, after repair/ rectification. The bank guarantee equivalent to cost of repaired transformers shall be furnished after expiry of performance guarantee period to cover such repair guarantee. The purchaser also reserves the right to withheld the payment of supplier firm, under any other contract, if the performance of the supplier in repaired the failed transformers is not satisfactory. Each supplier shall invariably furnish the detailed information about the total number of transformers failed and repaired 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:

i) A repair identification steel plate of size 75 x 75 x 2.5 mm duly engraved with following repair details shall be welded on the transformer body.

Firm's Name / Logo

TN

KVA

Sr.No.

Date of supply

	<u>Ist time</u>	<u>IIInd time</u>	<u>IIIrd time</u>
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Date of failure

Date of repair

Guarantee period
extended.

- ii) Such metallic plate fixed on first repair should not be removed at the time of second repair or any subsequent repair. However, necessary details of failure and repair shall be graven on the repair identification plate, each time it is repaired in guarantee.
- iii) The repaired G.P. failed transformer shall be provided with 40 mm wide red colour band all around transformers including radiator each time it is repaired in G.P. Thus if a transformer is repaired three time in G.P. then there should be three coloured bands each of size 40 mm.
- i) All due care should be taken to ensure that the original name plate and identification plate provided should not be removed from the position at which they are fixed originally. In case it is felt that these are loose then it should be repaired suitably by welding or riveting.
- ii) **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 loosing of connections/ replacement of fuse wire/ replacement of MCCB be carried out at Nigam's stores.**
- iii) **G.P. repaired Distribution may be got tested at CTL as per the sampling plan of new transformer except the physical opening test.**
- iv) **An undertaking shall be furnished by the firms, who will supply the amorphous distribution transformers that in case transformer fails beyond guarantee period, it shall be repaired by them on the rates, terms & conditions of Nigams existing CRC for repair of distribution transformers and in case firm denies to repair the transformers under CRC, such firms shall not be awarded order in subsequent tender.**

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

24. 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 issue 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 issue 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.**

25. PERFORMANCE BANK GUARANTEE FOR RAJASTHAN BASED FIRMS:

FOR JAIPUR DISCOM ONLY:

- i) Performance bank guarantee shall be furnished as per provision of relevant clauses of the General Conditions of Contract for amount equivalent to 10% of contract value. The bank guarantee shall be initially valid for 60 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 worth Rs.100.00. 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 a declaration certificate that the bank guarantee is duly stamped as per stamp duty applicable in their state. You shall also furnish manufacturer's warranty on non-judicial stamp paper worth Rs. 100/- of Govt. of Rajasthan as per clause No.1.41.2(a) of GCC in the prescribed proforma.

ALTERNATIVELY

You shall be exempted from furnishing of Performance Bank Guarantee in case you will furnish the Composite Bank Guarantee according to following slab of single order value (total F.O.R. value):

		Amount of Composite Bank Guarantee (CBG) in Rs.
i)	Single order of value upto Rs.1.00 crore	- Rs.5.00 lacs
ii)	Single order above Rs.1.00 crore to Rs.2.00 crores	- Rs.10.00 lacs
iii)	Single order above Rs.2.00 crore to Rs.5.00 crores	- Rs.15.00 lacs
iv)	Single order above Rs.5.00 crore to Rs.10.00 crores	- Rs.25.00 lacs
v)	Single order above Rs.10.00 crore to Rs.15.00 crores	- Rs.35.00 lacs
vi)	Single order above Rs.15.00 crore to Rs.25.00 crore	- Rs.50.00 lacs

This is subject to the condition that total value of orders in hand (under execution) is upto Rs.2.5 crore for each Composite Bank Guarantee (CBG) of Rs.5.0 lac. In case or otherwise, the manufacturer will arrange the CBG of corresponding value or furnish a separate PBG @ 2% of amount exceeding Rs.25.00 crore.

26. QUANTITY:

Sr. No.	Item/ Rating	Quantity in Nos.
1.	11/√3 KV / 240 V, 10 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	8625 Nos.
2.	11/√3 KV / 240 V, 16 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	6750 Nos.
3.	11/√3 KV / 240 V, 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	3825 Nos.

Schedule – I**SCHEDULE OF REQUIREMENT**

11/√3 KV / 240 V, 10, 16 & 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE COPPER WOUND DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION NO.JPD/SE/MM/SPO-VI/TN-2139.

S. No	ITEM	QUANTITY
1	11/√3 KV / 240 V, 10 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	8625 Nos.
2	11/√3 KV / 240 V, 16 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	6750 Nos.
3	11/√3 KV / 240 V, 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE DISTRIBUTION TRANSFORMERS.	3825 Nos.

NOTE:

- i) The quantities as mentioned in the schedule of requirements are tentative and may increase/decrease as per the requirement of the Nigam.

SCHEDULE- II**PRICE VARIATION CLAUSE FOR COPPER WOUND DISTRIBUTION TRANSFORMERS COMPLETE WITH ALL ACCESSORIES AND COMPONENTS****(Of ratings upto 160 KVA AND VOLTAGE UPTO 33 KV)****Supplied against domestic contracts UNDER TN-2139****This price variation clause is applicable for 'Copper Wound Distribution Transformers' with rating up to 160 MVA 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 materials / 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.

$$P = \frac{P_0}{100} \left\{ 13+27 \frac{C}{CO} + 31 \frac{ES}{ES_0} + 9 \frac{IS}{IS_0} + 2 \frac{IM}{IM_0} + 6 \frac{TO}{TO_0} + 12 \frac{W}{W_0} \right\}$$

Wherein

P = Price payable as adjusted in accordance with the above formula.

P0 = Price quoted/ confirmed.

C0 = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, one month prior to the date of tendering.ES0 = C&F price of CRGO Electrical steel Sheets (refer notes)
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.IS0 = Wholesale price index number for 'Iron & steel (Base: 1993-94=100)' (refer notes)
This index number is as applicable for the week ending 1st Saturday of the month, three months prior to the date of tendering.IM0 = Price of insulating Materials (refer notes)
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.TO0 = Price of Transformer Oil (Refer notes)
This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.W0 = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base 2001=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 May, 2008, the applicable price of Copper Wire Bars (C0) and Transformer Oil (TO0), CRGO Steel Sheets (ES0) and insulating material (IM0) should be

as on 1st April, 2008 and wholesale price Index number for 'Iron & steel' (IS0) should be for the week ending first Saturday of February, 2008 and all India average consumer price Index No. (W0) should be for the month of Feb. 2008.

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

- C = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, one month prior to the date of delivery.
- ES = C&F price of CRGO Electrical Steel Sheets (refer note)
This price is as applicable on the 1st working day for the month, one month prior to the date of delivery.
- IS = Wholesale price index number for 'Iron & Steel (Base 1993-94= 100)' (refer note)
This index number is as applicable for the week ending 1st Saturday of the month, three months prior to the date of delivery.
- IM = Price of insulating Materials (refer notes)
This price is as applicable on the 1st working days 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 1st working day of the month, one months 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 2001=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. 2008, the applicable prices of Copper Wire Bars (C) and Transformer Oil (TO), CRGO steel sheets (ES) and insulating material (IM) should be as on 1st Nov. 2008 and wholesale price index number for 'Iron & steel' (IS) should be for the week ending first Saturday of Sept. 2008 and all India average consumer price index No. (W) should be for the month of Sept. 2008.

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

The date of delivery (i.e. date of readiness of material) is to be considered as under:

When material is within delivery schedule:- The date of delivery (i.e. date of readiness of material) shall be the date of receipt of inspection offer. In case the date is notified for readiness of material in the inspection offer then the date notified shall be considered as the date of delivery (i.e. date of readiness of material)

When material is beyond delivery schedule:- The date of delivery (i.e. date of readiness of material) shall be the date of receipt of inspection offer or contracted delivery whichever is beneficial to Nigam.

SCHEDULE II A**PRICES & PRICE VARIATION**

- a) The prices quoted shall be variable as per Price Variation Formula given in the Specification (Schedule-III-A) without any ceiling.
- b) If the price variation formula 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 Jaipur 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**JAIPUR 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 which material/equipment/ Machinery/T&P shall confirm confirm	Name of IS/other standard specification to which material should confirm	Other particulars if any.	to
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Certified that we agree to all the aforesaid technical specification except at S.No..... for which our technical specification shall be as under:-

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

Name & Designation
with seal of the bidder.

SCHEDULE-III-A

QUALIFICATION REQUIREMENT FOR 11/√3 KV / 240 V, 10, 16 & 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE COPPER WOUND DISTRIBUTION TRANSFORMERS AGAINST TN-2139.

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 1/3rd of 5 % of tendered quantity, failing which the offer may be considered Non-Responsive.

III) The bidder should have designed, manufactured / fabricated, tested and supplied to utility / Discom / 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). 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.**

iv) The bidder shall furnish valid type test certificates of same rating of offered item from any CPRI / independent NABL Accredited laboratory/ Govt. approved lab. Such type test certificates should not be older than 3 years as on the date of opening of tender. For this purpose date of conducting type test will be considered. Type test conducted at supplier's own NABL accredited lab shall not be considered.

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 gives an undertaking along with BG / DD / Pay Order that type test of rating offered shall be arranged from first lot (without asking for any delivery extension) from CPRI / independent NABL accredited 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 before commencement of scheduled delivery. In case the bidder fails to furnish successful type test certificates from the offered lot(s), their bank guarantee / DD/ Pay Order will be invoked / forfeited (Performa for submitting undertaking a bank guarantee is enclosed at Schedule-III C). The initial validity of B.G. shall be nine months.

Note:- Units located in Raj. which do not meet Qualifying Criteria may be considered for trial order subject to technical competency and furnishing of bank guarantee of Rs.5.0 lac in lieu of non furnishing of type test reports.

VI) 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.

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

VIII) 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.

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.

iii) If a bidder does not fulfill G.P. failed contractual obligations in previous tender(s) then quantity equal to the G.P. failed quantity pending for repair/ replacement shall be reduced from the subsequent new tender quantity for fresh item to be allocated to the bidder. This action will be in addition to the penal provisions applicable in respective tenders where supply is incomplete.

X) POOR RECORD OF PERFORMANCE AND DELIVERY :

The bidder who have been black listed or with whom business relations have been severed in any of the state 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.
ii) When vendor complies with contractual formalities but does not commence supplies.	Levy of maximum recovery on account of delay in delivery along with severment of relations for a period of 2 years from the date of issue of order or in next two bids whichever is later along with forfeiture of EMD / cancellation of vendor registration.

XI) Black Listing:

Bids of the firms black listed shall not be opened. Bidder are liable for black listing for five years in any of the following circumstances ;

- i) There are sufficient and strong reasons to believe that the supplier or his employee has been guilty of malpractices such as bribery, corruption, fraud, vitiating fair under process including substitution of or interpolation in bids, pilfering or unauthorized use or disposal of NIGAM's material issued for specific works etc.
- ii) The supplier continuously refuses to pay Nigam dues after registered notice even after lapse of six months without showing adequate reasons and where the registering authority is satisfied that no reasonable disputes attracting reference to settlement committee or court of law exist for the supplier's action.
- iii) 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 dealings or where security considerations including suspected disloyalty to the Nigam so warrant.
- iv) If a registered supplier being non-renderer for supply but still submits applications giving his offer after receipt / opening of bids received after due process.

NOTE : I. If a supplier after having tendered for a work / supply or after negotiations acceptance of order gives applications voluntarily vitating the fair bidding process, it shall also tantamount to malpractice.

NOTE: II. Severment once done will continue for the notified period of debarment even if the dues are deposited prior to the expiry of such severment period.

However, the relations be deemed to have been restored after expiry of severment period mentioned in the order but the bid of such bidder will not be opened in that Discom where severment was done if the recoverable amount has not been deposited by the firm i.e. severment done by one Discom for non-supply and corresponding recovery will not be effective in other Discom after expiry of notified period but the bid of such bidder will not be opened in that particular discom if the firm has not deposited amount recoverable.

XII) APPEALS AND APPLICATIONS :

Appeal against the order of black listing, debarment and severment can be filed before BOD. The BOD may reduced or waive the penalty if sufficient reasons / supporting documents are furnished by a supplier.

Schedule – III -B**BANK GUARANTEE IN LIEU OF FURNISHING OF TYPE TEST CERTIFICATE**

(On Rajasthan Non-Judicial Stamp Paper worth Rs.100/-)

To,

The Chief Engineer (MM)
 Jaipur Vidyut Vitran Nigam Limited
 Old Power House Premises,
 Near Ram Mandir, Bani Park,
 JAIPUR.

Dear Sir,

Whereas Jaipur Vidyut Vitran Nigam Limited, Jaipur (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 Chief Engineer (MM), Jaipur Vidyut Vitran Nigam Limited, Jaipur 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 Chief Engineer (MM), Jaipur Vidyut Vitran Nigam Limited 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 JAIPUR in Rajasthan.

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

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),
Jaipur Vidyut Vitran Nigam Limited,
Jaipur.

Dear Sir,

With reference to your invitation to tender against specification No. JPD/SE/MM/TN-2139 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. The offer is valid for a period of 120 days from the date of opening of this tender.
2. The prices are variable with base date _____(one month prior to the date of opening of tender).
3. It is noted that the quantities as mentioned in the specification are approximate and we agree to supply any quantity as per your requirement.
4. 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. JPD/SE/ MM/TN-2139 and as per relevant ISS in all respect.
5. We confirm that we agree to all the terms & conditions as well as the technical stipulations of your specification No. JPD/SE/MM/TN-2139 and there are no deviations other than as specified in the **Schedule VI (A&B)**.

Yours faithfully,

Signature of tenderer
with stamp
Dated

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

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

S.No. Particulars of technical & other performance data guaranteed.

Certified that we agree to all the aforesaid technical particulars and other performance data
 except following :-

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)


ANNEXURE-A
 MANUFACTURER'S GUARANTEED TECHNICAL PARTICULARS

11/√3 KV / 240 V, 10, 16 & 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE COPPER WOUND DISTRIBUTION TRANSFORMERS AGAINST TN-2139

SI. No.	DESCRIPTION	PARTICULARS		
		10 KVA	16 KVA	25 KVA
	Rating in KVA			
1	Name of the manufacturer and place of manufacturer			
2	Continuous max rating as per this specification (KVA)			
3	Normal ratio of transformer (KV)			
4	Method of connection HV/LV			
5	Max. Current density in windings a. High voltage Amp/Sq.mm b. Lower voltage Amp/Sq.mm			
6	Max hot spot temp Deg.C (Ambient air temp on which above is based Deg.C)			
7	a. Max. observable oil temp in Deg.C (Ambient air temp on which above is based Deg.C)			
	b. Maximum winding temperature in Deg. C (Ambient air temp on which above is based Deg.C)			
8	i) No Load Losses at normal voltage frequency, rated current (Max).(watts)			
	ii) Total losses at normal voltage frequency, rated current and 75 Deg.C at 50% & 100% loading (Max).(watts)			
9	Flux Density(Max)(Tesla)			

10	<p>Efficiency at normal voltage:</p> <p>i. Unity power factor</p> <p>a. At 50% load %</p> <p>b. At 75% load %</p> <p>c. At full load %</p> <p>ii 0.8 power factor</p> <p>a. At 50% load %</p> <p>b. At 75% load %</p> <p>c. At full load %</p>	
11	<p>Regulation as % of normal voltage</p> <p>a. At unity power factor %</p> <p>b. At 0.8 power factor lagging %</p>	
12	<p>Impedance voltage at normal ratio between HV and LV winding %</p>	
13	<p>Type of transformer, Shell type/Core type Wound core.</p>	
14	<p>Type of insulation used in</p> <p>a. HV winding</p> <p>b. LV winding</p>	
15	<p>Impulse test voltage level (KVrms)</p> <p>HV winding</p> <p>LV winding</p>	
16	<p>Characteristics of transformer oil</p>	
17	<p>Total content of oil in litres</p>	
18	<p>i) Approximate overall dimensions</p> <p>a. Height in mm</p> <p>b. Breadth in mm</p> <p>c. width in mm</p> <p>ii) Tank dimensions</p> <p>a) Diameter mm</p> <p>b) Height mm</p>	
19	<p>Weight of insulated conductor</p> <p>a. HV (min) kg</p> <p>b. LV (min) kg</p>	
20	<p>Weight of core (min.) kg (AMT)</p>	

21	Weight of complete transformer arranged for transport kg	
22	Resistance for windings at 75 Deg.C per phase a. HV Ohms b. LV Ohms	
23	Material of bushing rod and nuts & Bushing caps HV LV	
24	Make , type of MCCB/ L.V Breakers	
25	Particulars of HV fuse	
a)	System voltage	
b)	Current	
c)	Max. Design voltage	
d)	Min. Melting time	
e)	Total clearing time	
f)	Interrupting rating	
g)	Mounting	
h)	Make	

(Signature)

Name & Designation
with seal of the bidder

Schedule – VI (A)**JAIPUR 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)**JAIPUR 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:-

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**JAIPUR 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 MT	Order No. & Date	Name & details of purchasing authority	Date of Completion
1	2	3	4	5	6

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

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

Signature)

Name & Designation with seal of the bidder.

SCHEDULE-VIIA**TN-2139****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 Electrical 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 up to		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

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 C.A. certificate 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**JAIPUR VIDYUT VITRAN NIGAM LIMITED****A Govt. of Rajasthan Undertaking****DELIVERY SCHEDULE****PART-A**

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

S.No. of Material	Particulars	Commencement period per Month.	Rate of supply per Month material	Period for completion of delivery of entire
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PART-B

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

S.No. of Material	Particulars	Commencement period per Month.	Rate of supply per Month material	Period for completion of delivery of entire
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- Note:**
1. During the commencement period the process of model assembly and submission of B.O.M. for approval shall be got completed.
 2. During the commencement period the contractual formalities shall be got completed.

(Signature)

Name & Designation
with seal of the bidder.



JAIPUR 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 & 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. Name and Address of Manufacturer.
2. Place where works exist.
3. Details of machinery particularly with B.H.P. of each item installed.
4. Details of staff employed in the works.
5. Date when started the manufacturing of item under reference.
6. List of items manufactured.
7. Literature and drawings of items manufactured showing their description, size, design and other important technical particulars.
8. Details of order so far, executed alongwith the names of organization to whom supplied.
9. Manufacturing capacity.
10. Is the workshop open for inspection by the representative of the board, if required?
11. Statement of financial resources and Banking Reference alongwith Balance-Sheet for previous two years.
12. Testing facilities available for the manufactured articles in the testing laboratory of works.
13. Whether the Firm is a small/medium/large scale industry.
14. 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**

**JAIPUR VIDYUT VITRAN NIGAM LIMITED
(MATERIAL MANAGEMENT)
NEAR RAM MANDIR , BANI-PARK, JAIPUR-302006**

TELEPHONE: - 0141-2202607**FAX: - 0141-2202025**

SPECIFICATION FOR SUPPLY OF 11/√3 KV / 240 V, 10, 16 & 25 KVA RATING OUT DOOR TYPE COMPLETELY SELF PROTECTED SINGLE PHASE COPPER WOUND DISTRIBUTION TRANSFORMERS UNDER SPECIFICATION NO.JPD/SE/MM/SPO-VI/TN-2139.

LAST DATE OF RECEIPT OF TENDERS:	10.06.2011 up to 2.30 PM
DATE OF OPENING OF TENDER:	10.06.2011 (AT 3.00PM)
EARNEST MONEY TO BE DEPOSITED	Rs.7,50,000.00(Rs. Seven Lac Fifty Thousand only/ Exemption Certificate or Vender Registration of class "A" category)
COST OF SPECIFICATION:	Rs.2500.00 (non refundable)
VALIDITY	120 DAYS FROM THE NEXT DATE OPENING OF TECHNO-COMMERCIAL BID.

NOTE : The bidders, in their own interest are requested to read very carefully Section-I (Instruction to Bidders), Section-II (General Condition of Contract) & Section-III (Technical Specification) before filling the bid. The Bid documents be downloaded from JVVNL website www.jaipurdiscom.in . No hard copy of the bidding documents will be provided to the bidders through this office. In case of any discrepancy found in the bidding documents downloaded from the website and appended with the bid (as a bid document) and the original copy of such document available in the office of Superintending Engineer(MM), Jaipur discom, Jaipur then the copy available with Superintending Engineer(MM), Jaipur discom, Jaipur will be considered as final document for all purposes. The cost of Bid document as published in NIT shall be furnished along with downloaded bid document in the manner prescribed in bid document.

1. **Furnishing of Proof of deposition of Cost of Bid Document, Earnest Money/ exemption certificate as per Clause 1.03 & 1.16 of Section-I (Instruction to Bidder) along with downloaded Bid Document is essential otherwise the "BID OFFER" will not be opened. However the bidders who get themselves registered with JVVNL as per Clause No. 1.5.3 of Section-II (General Condition of Contract) before submitting of bid documents against this bid enquiry for supply of quoted items under appropriate category are not required to furnish Earnest Money Deposit. They shall furnish the proof of such valid registration with their bid. Cost of Bid Document shall be furnished in the form of Crossed Bank Draft / Bankers Cheque payable in the name of "A.O(MM), JVVNL, JAIPUR". EMD if required shall be furnished in accordance with Clause No. 1.03.1 of Section-I (Instruction to Bidders)**

2. The Central and State Govt. undertakings are exempted from furnishing of Earnest money subject to furnishing of such certificate / documentary evidence in support of their being Govt. (Central/State) undertaking.

3. The bidder shall quote the Prices strictly in the manner prescribed in Clause No. 1.09 of Section-I (Instruction to Bidders) & Clause No. 1.33 of Section-II (General Conditions of Contract) in **Schedule-IV** otherwise their bid is liable for rejection. The price quoted should be variable without any ceiling as per IEEMA price variation formula annexed in **Schedule - II**. Base date for price variation shall be the first day of calendar month, one month prior to the date of tender opening.

4. **The bid offer shall be furnished in two parts & shall comply all provisions of Clause No. 1.02 Section-I (instruction to Bidders) and the Bid offer shall be furnished in the following manner :-**

- i) **First envelope containing proof of deposition of cost of Bid documents & EMD. Name of item, bid no., time of bid submission, due date for opening of bid and the word 'Envelope-I & Cost of bid documents and Earnest Money / Valid Registration Certificate under relevant class / A certificate of being a Rajasthan / Central Govt. undertaking' should be clearly written on the front side of the envelope.**
- ii) **Second envelope for techno-commercial bid. Name of item, bid no., time of bid submission, due date for opening of bid and the word 'Envelope – II & Techno-Commercial Bid' should be clearly written on the front side of the envelope.**
- iii) **Third envelope for price bid. Name of item, bid no., time of bid submission, due date for opening of bid and the word 'Envelope – III & Price Bid' should be clearly written on the front side of the envelope.**

Note : Envelope III containing price bid will be kept in the safe custody of the concerned engineer / officer. It will be opened at a later date in respect of those bidders whose offers are found / adjudged technically and commercially acceptable. The date of opening of "Price Bid" shall be intimated to successful bidders in due course of time. In case of deviation from the stipulated clauses of bid specifications, price bid of the bidder will not be opened.

- iv) **Fourth envelope containing above three envelopes. Name of item, bid no., time of bid submission and due date for opening of bid should be clearly written on the front side of the envelope. (All the above envelopes shall be duly sealed individually).**
- v) **The bidder shall ensure that bid is furnished / submitted strictly in the manner detailed in the Specification.**

(PLEASE NOTE THAT BID RECEIVED AFTER SPECIFIED TIME ON DUE DATE OF OPENING WILL NOT BE ACCEPTED AND SUCH OFFERS SHALL BE IGNORED)

5. 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 / Discoms 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.
 - iv) Quality assurance plan.
 - v) Complete guaranteed technical particulars, out lines and general arrangement drawings along with Bill of Material.
6. Bids without Section-I, II, III & Schedules (I to X) shall be rejected.
7. Bids shall be furnished in single copy.
8. JVVNL 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.
9. JVVNL 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 **(Schedule-III)**.
10. Deviation of any kind shall not be quoted in price bid, if found quoted, the same shall be ignored.

11. The following facilities are to be provided by the supplier at his own cost to the inspecting officer of Nigam (JVNL).

- 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
