

Annexure-A

Technical specification for 11 kv copper wound measuring Resin cast three nos of single phase, single ratio Current Transformer of accuracy class of 0.5s and three nos of single phase single ratio Potential Transformers with accuracy class of 0.5) to be used with 11 kV HT Metering Cubicle for outdoor application in Power distributin field.

IMPORTANT NOTES:

- 1 Supplier should submit their details asked in Annexure – I and I-A & I-B to DISCOM.
- 2 No offer will be considered if it is submitted other than the above Annexure – I and I-A&I-B.
- 3 Annexure –I is DISCOM’s requirement. If the bidder wants to offer any deviation in DISCOM’s requirement, the same should be brought out in Annexure: I-B only with detailed reasons. However, deviations should not affect DISCOM technical specification requirements. If Deviations affects the technical specification requirements, they shall not be accepted. If there is no deviation, then also it is required to put this Annexure: I-B with tender indicating no deviation.
- 4 Though Annexure: I–A is design parameters, the supplier has to submit the same compulsorily for our reference.
- 5 No subsequent correspondence or any submissions made after the opening of Technical Bid will be entertained. The offer will be disqualified if, any such attempt is made by the bidder.

1.0 SCOPE:

This specification covers design, manufacture, testing at manufacture’s works and inspection, supply and delivery of three nos of resin cast Current Transformers and three numbers of resin cast Potential Transformers to be used in the 11 kV HT Metering Cubicle in the power distribution network of Gujarat DISCOMs for metering purpose.

2.0 OPERATION CONDITION:

The CT-PT units to be supplied against this specification shall be suitable for satisfactory continuous operations under the following tropical conditions.

2.1 AMBIENT CONDITIONS:

Maximum Ambient Air Temperature	55°C
Minimum Ambient Air Temperature	5°C

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Maximum daily average ambient air temperature	35°C
Maximum humidity	99%
Altitude above M.S.L. (maximum)	1000Mtr
Average annual rainfall (mm)	925
Max. wind pressure(Kg/sqm)	260
Average number of rainy days per Annum	90
Seismic level (Horizontal accn.)	0.3 g
Iso-ceraunic level(Days per Year)	50
Average thunder storm days per annum	50
Note: The climatic conditions are prone to wide variations in ambient conditions and hence the equipment shall be of suitable design to work satisfactorily under these conditions.	

2.2 **INSTALLATION:**

The supplied and tested metering CTs and PTs shall be used inside the HT Metering cubicle in the separate compartment with primary protection switch gears of Load Break Switch OR Vaccum Circuit Breaker. The HT Metering Cubicle shall be used in the outdoor atmosphere which may be highly polluted, saline in nature or chemically polluted.

2.3 **SYSTEM PARTICULARS / DISTRIBUTION NETWORK PARAMETERS:**

The normal system parameters of the distribution network are as below.

Max. System Voltage	12 kV
Nominal System Voltage	11 KV
No of phases	Three
System Frequency	50 Hz±3 %
Fault Level (Minimum)	21 KA For 3 sec.

It is also pertinent to state that the system commonly may contained of various type and order of Harmonics generated by consumers. In view of which adequate care shall be taken in design and manufacturing of unit. The remedial measures taken or proposed to be taken shall be intimated in detail with technical write up.

3.0 **APPLICABLE STANDARDS:**

Unless otherwise specifically stated in these specifications of CTPT Units shall conform latest version/amendments to the following standards. All the Indian Electricity rules/Bills/amendments up to date applicable for clearance, safety and operation of the equipment

Sr. No.	List of Standard	Detail of Standard
1)	IS 16227 (Part -I & II)	Requirements for Current transformers
2)	IS 16227 (Part-I & III)	Requirements for Voltage transformers
3)	IS-12943	Brass glands for PVC cables
4)	IS-13730	Requirements for winding wire

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5)	IS-5	Colors for ready mix paints
6)	IS-2629	Galvanizing
7)	IS-3025(2015)	Grain Oriented Electrical Steel Sheets and Strips

4.0 RATING AND PERFORMANCE: -

	Description	Requirement for CT	Requirement for PT
(a)	Type/Installation	Three single phase single ratio CTs Indoor in the HT Metering Cubicle/Outdoor	Three single phase single ratio Star/Star PTs. Indoor in the HT Metering Cubicle/Outdoor
(b)	Accuracy Class	0.5S	0.5
(c)	Ref. frequency Hz	50 Hz	50 Hz
(d)	Rated primary / current Amp. for: 11 KV:-	10, 15, 20, 25, 30, 40, 50, 75, 100, 150, 200, 250 Amp.	N / A
(e)	Rated Continuous Thermal Current (A)	120% of the rated Primary current	NA
(f)	Rated Secondary current Amp.	5 Amp.	N / A
(g)	Rated primary voltage	N / A	11000/v3 V (Phase to neutral)
(h)	Rated Secondary voltage	N / A	110/v3 V (Phase to neutral)
(i)	Rated burden	15 VA	15 VA
(j)	Rated voltage factor	N / A	1.2 times continuous and 1.5 times for 30 seconds for 11 KV
(k)	Short time current rating (I_{th})		
	(i) a. Thermal rating	STC 6.4 KA for 1 second for 10/5 Amp. rating and above for 11 KV Upto and including 50/5 :- 6.4 KA for 1 sec >50/5 Upto and including 100/5 :- 13.1 KA for 1 sec >100/5 Upto and including 250/5 :- 18.4 KA for 1 sec	N / A
	(i) b. Current density at rated current (max)	1.5 Amp. Sq. mm or better for both primary and secondary winding	
	(ii) Rated Dynamic	2.5 times rated short time	N / A

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	Current rating	thermal current (I _{th}) for 11KV	
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(l)	<p>One minute high voltage power frequency withstand voltage On primary winding KV rms</p> <p>On secondary winding KV rms.</p>	<p>28KV(rms) for 1 minute for 11KV (Subsequent tests on the CTs should also be performed at 28 KV irrespective of number of tests earlier carried out. This is the special requirement of DISCOM.</p> <p>The DISCOM also reserves the right to carry out this test at DISCOM's Lab/any approved NABL Lab; after receipt of CTPT unit.</p> <p>Design of CTPT unit shall be in such a way that it should withstand stated test)</p> <p>3KV(rms) for 1 minute</p>	<p>28KV(rms) for 1 minute for 11KV (The DISCOM reserves the right to carry out this test, as per IS, after receipt of CT and PT units at DISCOM's Hi-tech/ any approved NABL Lab. Design of CT and PT unit shall be in such a way that it should withstand during test)</p> <p>3KV(rms) for 1 minute</p>
(m)	1.2/50 impulse withstand voltage	75 KV (Peak) for 11KV Class	75KV (Peak) for 11KV Class
(n)	Core Type & Purpose	Single Core for metering	Single core for metering
(o)	Winding materials	High grade electrolytic Copper	High grade electrolytic Copper
(p)	Class of insulation	B	B
(q)	Instrument Security Factor	5 or Less than 5	N / A
(r)	Max. Allowable Temp. rise for winding	55° C	55° C

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5.0 General Technical Requirements of Current Transformers:

5.1 Resin Cast Assembly :- The Resin Cast assembly shall be of a single piece construction without any joint or coupling.

5.2 Insulation Material :- Insulation Material used for Current Transformer should be Cycloaliphatic Epoxy Resin Cast having Insulation Class B. The insulation of the Current Transformers shall be so designed that the internal insulation shall have higher electrical withstand capability than the external insulation. The dielectric withstand values specified in this specification are meant for fully assembled Current Transformer. The temperature rise on any part of equipment shall not exceed the maximum temperature rise limits specified in relevant IS.

5.3 Earthing :-The Current Transformer shall be provided with Two separate Earthing Terminals for bolted connection to MS flat. The size of two numbers of Earthing Terminals shall be 12 mm dia. x 30 mm length, Hot Dip Galvanized with one plain washer and one nut.

5.4 Name Plate and Rating Plate:-The Current Transformer shall be provided with non-corrosive, legible Name plate, with the information specified in relevant standards, duly engraved / punched on it. The Current Transformer shall be provided with a rating plate with dimensions and marking as per IS – 16227. The markings shall be punched and not painted. The serial number and code of the supplier shall also be punched on the Current Transformer to identify the unit in case of loss or damage to the rating plate.

5.5 Mounting Details :- Mounting details for fixing the Current Transformer on supporting base channel shall be strictly in accordance with the specified details as follows:

- The holes for mounting of CT shall be oval shaped with 12mm diameter.
- Base Frame hole mounting centre to centre distance (mm) should be 285 (L) X 140(W).

5.6 Primary Winding :-

5.6.1 Primary winding shall be Wound Type. The primary winding conductor shall be high conductive (electrolytic grade) copper without any joint. Type of insulation used shall be described in the offer. For Primary Winding, current densities shall not exceed the limit 1.5 A/Sq.mm. for highest current ratio.

5.6.2 Enamel, if used for conductor insulation, shall be either polyvinyl acetate type or amide type and shall meet the requirements of IS -4800. Polyester enamel shall not be used.

5.6.3 The design density for short circuit current as well as conductivity of the metal used for primary winding shall meet the relevant requirement of IS: 16227-2016.

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5.6.4 The bidder shall, in his offer furnish detailed calculations for selection of winding cross sections. The cross section area of Primary Winding, cross section area of Secondary Winding, number of Primary Turns, number of Secondary Turns, Current Density etc. shall be mentioned by the bidder. The rating and the diagram plates should indicate the connection arrangement / diagram.

5.6.5 The Primary Winding shall be designed for extended primary current at 120% of rated primary current.

5.7 Secondary Winding :-

5.7.1 Suitably insulated copper wire of electrolytic grade shall be used for Secondary Windings. Type of insulations used shall be described in the offer. The cross section area of Secondary Winding, number of Secondary Turns, Current Density etc. shall be mentioned by the bidder.

5.7.2 The excitation current of the CT shall be as low as possible. The bidder shall furnish, along with his offer, the magnetizing curves for all the cores.

5.8 Primary Terminals :- The primary Terminal shall be of heavily tinned electrolytic copper of 99.9% conductivity. The minimum thickness of tinning shall be 15 microns. C.T.

5.9 Secondary Terminals :-

5.9.1 Secondary Terminals shall be brought out in a weatherproof metallic Terminal box. The Terminal box shall be provided with removable gland and glands. The cable glands shall be suitable for 1100 volts grade plate PVC insulated, PVC sheathed multi core stranded 6 Sq.mm copper conductor cable. This Terminal box shall be dust and vermin proof. The dimensions of the Terminal box and its opening shall be adequate to enable easy access and working space with the use of normal tools.

5.9.2 Secondary Terminal studs shall be provided with at least 3 nuts and adequate plain and spring washer for fixing the leads. The studs, nuts and washer shall be made of brass duly nickel-plated. The minimum outside diameter of stud shall be 6 mm. The length of at least 15 mm shall be available on the studs for inserting the leads. Horizontal spacing between centers of adjacent studs shall be at least 1.5 times the circum dia. of the nuts.

6.0 General Technical Requirements of Potential Transformers:

6.1 Resin Cast Assembly :- The Resin Cast assembly shall be of a single piece construction without any joint or coupling.

6.2 Insulation Material :-

Insulation Material used for Potential Transformer should be Cycloaliphatic Epoxy Resin Cast having Insulation Class B. The insulation of the Potential Transformers shall be so designed that the internal insulation shall have higher electrical

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withstand capability than the external insulation. The dielectric withstand values specified in this specification are meant for fully assembled Potential Transformer. The temperature rise on any part of equipment shall not exceed the maximum temperature rise limits specified in relevant IS.

6.3 Earthing :-

The Potential Transformer shall be provided with Two separate Earthing Terminals for bolted connection to MS flat. The size of two numbers of Earthing Terminals shall be 12 m dia. x 30 mm length, Hot Dip Galvanized with one plain washer and one nut.

6.4 Name Plate and Rating Plate:-

The Potential Transformer shall be provided with non-corrosive, legible Name plate, with the information specified in relevant standards, duly engraved / punched on it. The Potential Transformer shall be provided with a rating plate with dimensions and marking as per IS – 16227. The markings shall be punched and not painted. The serial number and code of the supplier shall also be punched on the Potential Transformer to identify the unit in case of loss or damage to the rating plate.

6.5 Mounting Details :-

Mounting details for fixing the Potential Transformer on supporting base channel shall be strictly in accordance with the specified details as follows:

- The holes for mounting of PT shall be oval shaped with 12mm diameter.
- Base Frame hole mounting centre to centre distance (mm) should be 280(L) x 190(W).

6.6 Winding :-

Suitably insulated copper wire of electrolytic grade shall be used for Secondary Windings. Type of insulation used shall be described in the offer.

6.7 Primary Terminals :-

The primary Terminal shall be of heavily tinned electrolytic copper of 99.9% conductivity. The minimum thickness of tinning shall be 15 microns. C.T.

6.8 Secondary Terminals :-

6.8.1 Secondary Terminals shall be brought out in a weatherproof metallic Terminal box. The Terminal box shall be provided with removable gland and glands. The cable glands shall be suitable for 1100 volts grade plate PVC insulated, PVC sheathed multi core stranded 6 Sq.mm copper conductor cable. This Terminal box shall be dust and vermin proof. The dimensions of the Terminal box and its opening shall be adequate to enable easy access and working space with the use of normal tools.

6.8.2 Secondary Terminal studs shall be provided with at least 3 nuts and adequate plain and spring washer for fixing the leads. The studs, nuts and washer

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shall be made of brass duly nickel-plated. The minimum outside diameter of stud shall be 6 mm. The length of at least 15 mm shall be available on the studs for inserting the leads. Horizontal spacing between centers of adjacent studs shall be at least 1.5 times the circum dia. of the nuts.

6.8.3 Polarity shall be invariably marked at Secondary terminal in Terminal box.

6.9 Lifting arrangement:

PT shall be provided with lifting lugs suitably located for easy mounting, dismantling & transportation purpose. The lifting arrangement shall be positioned in such a way as to avoid any damage.

7.0 Documentation:-

7.1 List of Drawings & Documents :-

The bidder shall furnish two sets of the following drawings along with his offer.

- a) General outline and assembly drawings of the equipment
- b) Graphs showing the performance of Current Transformer in regard to Magnetization Characteristic.
- c) Sectional views showing :-
 - General Constructional features of Current Transformer, size of conductor, it's cross section, Clearance between live part & ground along with all Technical details.
 - The insulation, the winding arrangements, method of connection of the primary / secondary winding to the primary / secondary terminals etc.
- d) Arrangement of secondary Terminal box & details of connection studs provided.
- e) Name Plate
- f) Schematic drawing
- g) Type Test reports in case the equipment has already been type tested.
- h) Test reports, literature, pamphlets of the bought out items, and raw material
- i) Bill of material and packing list.

7.2 The successful bidders shall submit three sets of final versions of all the above said drawings in line with Technical Specifications & Drawings attached for purchaser's approval after placement of LOA. The supplier shall, if necessary, modify the drawings and resubmit three copies of the modified drawings for purchaser's approval within two weeks from the date of purchaser's comments. The concern DISCOM will process the drawing approval.

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7.3 Adequate copies of acceptance and routine Test Certificates, duly approved by the purchaser, shall accompany the dispatched consignment.

7.4 Approval of drawings by purchaser shall not relieve the supplier of his responsibility and liability for ensuring correctness and correct interpretation of the drawings for meeting the requirement of the Technical Specification, latest revision of applicable standards, rules and codes of practices. The equipment shall conform in all respects to high standards of engineering, design, workmanship and latest revisions of relevant standards at the time of ordering and purchaser shall have the power to reject any work or materials which, in his judgment, is not in full accordance therewith.

8.0 TESTS & INSPECTION:

8.1 QUALIFICATION:

The tenderer shall have to furnish to following test certificates and documents.

- a) All type tests certificates as listed under Annexure-II for 11KV carried out on ONE single sample unit having the class of accuracy– 0.5S, 15 VA for CT and on PT having Class of accuracy – 0.5, 15 VA per phase for PT and tests must not be carried out more than seven years prior to the date of submission of the tender offer. The above test should be carried out in any approved NABL Lab.
- b) The tenderer shall also submit one type test certificate for the test of “Instrument Security Factor” as per the Cl. No. 7.5.2 of IS 16227 (Part-II): 2016 Amended up to date conducted on all phases of the CTs for the sample of 10/5 Amp. of 11KV. The value of ISF must be 5 or less than 5 and the test must have been conducted at any approved NABL Lab not prior to more than seven years from the date of submission of the tender offer.
- c) The copy/ proof of bill/ invoice of purchase of core material.
- d) The copy of the BH curve for the core material is intended to be used in the regular supply of CTPT units.

If the above test certificates/ documents are not submitted, the offer will not be considered as “Qualified”.

8.2 TYPE TEST CERTIFICATE:

8.2.1 The supplier has to submit notarized Test Certificates for all the Type Tests as prescribed under Annexure-II for 11KV CT and PT sets with the ratio as specified under 16.1 above i.e. 10/5 Amp. for 11KV class of supply voltage from any approved NABL Lab. All the Type Tests should not be older than seven years. All type tests should be carried out on a single CTPT unit.

8.2.2 The DISCOMDISCOM also reserves the right to carry out all or any type tests on any CT and PT set from the lot offered for inspection/supplied lot by the

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firm at any approved NABL Lab in presence of DISCOM officers and representative of the firm at DISCOM's cost. Any decision based on this testing shall be applied to the full ordered quantity. However, if the unit fails in the test, then the test charges shall have to be borne by the supplier.

8.3 ACCEPTANCE TESTS:

8.3.1 The tests shall be carried out at the manufacturer's work as "Acceptance Tests" on all CTPT sets offered for inspections as per applicable IS of individual units and this specification as per Annexure-III.

8.3.2 DISCOMDISCOM

8.3.3 Material must be "Ready to Dispatch in all respect at the time of acceptance test.

8.4 ROUTINE TESTS:

The firm shall carry out the routine tests on each CT and each PT set being offered for inspection and submit the routine test certificates along with an inspection call in the form of CD/DVD/Pendrive. Routine tests shall be carried out as per Annexure-IV.

The DISCOM DISCOMshall carry out Routine tests, as per Annexure-IV, on all dispatched CT and PT units at DISCOMDISCOM's Hi-tech/ any approved NABL Lab/meter testing lab, If any of the CT and PT unit does not conform routine tests at the HI-tech/ any approved NABL Lab, the supplier shall have to collect and return after repaired/ replaced at free of cost within 30 days from the date of information to the supplier.

9.0 PROTOTYPE UNITS:

9.1 The successful tenderer shall have to obtain approval of requisite drawings and then prepare prototype unit of the lowest ratio specified in order for 11KV separately conforming to this specification prior to manufacturing of bulk supply.

9.2 All Acceptance Tests shall be carried out on the prototype unit as per Annexure-III of this specification and temperature rise test at the firm's work

9.3 Total harmonic distortion on secondary side with respect to primary side in 11 KV PT shall not be more than + 2.0%. (As per Procedure defined in annexure-VI)

9.4 Ph to Neutral accuracy of PT shall be within the relevant accuracy class.

9.5 However, if required, DISCOM reserves rights to carry out all acceptance/type tests including the test of ISF on proto-type units, as per Annexure-II at any

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approved NABL Lab(the name of the laboratory shall be decided by DISCOM) in the presence of DISCOM's representative.

- 9.6** The cost of all acceptance/type testing and its related expenses shall have to be borne by the supplier.
- 9.7** All dimensions, constructional features, and other requirements outside and inside of the CTPT unit laid down in specification shall also be checked during proto-type inspection.
- 9.8** After completion of successful testing, the prototype units shall be sealed and kept at the firm's premises. During a subsequent inspection of the CTPT set, any unit will be reviewed for comparison with the prototype for design detail, if required.
- 9.9** The detailed drawings as mentioned in clause no. 15 of this tender specification be submitted by the firm along with offer and only after approval of prototype unit and detailed drawings, the firm shall start bulk supply conforming to approved proto type units.
- 9.10** The prototype units shall be dispatched along with last lot only after welding of clamp between top cover and Body of the CTPT Unit.
- 9.11** The successful bidder shall first offer PROTO unit for stage inspection. During stage inspection all the raw material and manufacturing process shall be verified. On clearance of stage inspection bidder shall process for manufacturing of Lot units and offer the same for inspection.

10.0 GUARANTEE:

- 10.1** All single phase single ratio CT and PT offered shall have a guarantee for good design, Materials, and workmanship. The defective units shall have to be repaired/replaced free of cost if reported within 66 months from the date of dispatch or 60 months from the date of commissioning whichever is earlier. The firm shall be responsible for the proper performance of the equipment for 66 months from the date of dispatch or 60 months after commissioning whichever is earlier.
- 10.2** Reported failed units under the guarantee period as above shall be repaired/replaced as early as possible. In any case, it should be repaired/replaced within 30 days. The failed units are to be collected by the supplier from our field offices within 15 days of reporting. If an immediate arrangement for the collection of the failed units are not done by the Supplier and if the units are not repaired and returned within two months time, the DISCOM will deduct the full cost of the CTPT unit from the bill.
- 10.3** The DISCOM reserves rights to test/check any/all CTPT units from supplied lot during its guarantee period at DISCOM's own laboratory OR any other approved NABL Lab for conformance of IS 16227 (Part - I to IV)and technical

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specifications of DISCOM. Failing of any CTPT unit in the above test, the supplier shall have to repair/replace CTPT units within 30 days from intimation by the DISCOM and and if fails to supply within specified period then suitable penalty shall be imposed and recovered from date of intimation as per commercial T&C

10.4 The supplier situated outside Gujarat State shall have to establish a suitable and adequate arrangement for repairing and testing of failed CTPT in Gujarat State at his cost. This arrangement shall have to be continued up to the completion date of the guarantee period of supply of the last lot.

10.5 Each failed CT and/OR PT unit during the guarantee period shall be tested and entrusted for list of acceptance tests as per specifications once repaired at the supplier's works before returning to the purchaser. For Such repaired unit within the guarantee period, the purchaser reserves the right to test at their laboratory. During the testing if the unit/s fails then penalty for the sum of amount equal to the 10% of end cost of the unit shall be liable to recover from the supplier for each such instance as per tender terms and conditions.

10.6 The successful bidder shall have to submit the declaration on the company letterhead regarding the utilization of bought-out raw materials conforming to relevant IS/IEC and applicable rules & regulations with the latest amendments during the inspection as per the format attached as Annexure-III.

ANNEXURE: I :

Guaranteed Technical Particulars of 11kV Outdoor Resin Cast Single Phase, Single Ratio type Current Transformers and Potential Transformer for Metering

Sr. No.	DESCRIPTION	DISCOM'S REQUIREMENTS	TO BE OFFERED BY BIDDER
1	2	3	4
1	Type	Outdoor Type with HT Metering Enclosure Type	
2	Potential Transformer		
	a) Nos. of PTs	Three nos of single phase single ratio	
	b) Rated voltage	11 KV	
	c) Type	Resin Cast	
	d) Vector group	Star / Star	
	e) PT Ratio	11 KV/ $\sqrt{3}$ / 110/ $\sqrt{3}$ Volts	
	f) PT burden/phase	15 VA	
	g) Accuracy class	0.5	
	h) Applicable Standard	IS 16227 (Part-I to III)	
	i) Rated Voltage factor & time	1.2 times continuous, 1.5 times for 30 seconds	
	j) One minute power frequency dry withstand test for		
	1) Primary winding	28 KV (rms)	
	2) Secondary winding	3 KV (rms)	
	k) Impulse withstand test volt	75 KV (Peak)	
	m) Insulation Class	B	
3	Current Transformer	Single ratio	
	a) Nos. of CTs	Three Single Phase CTs	
	b) Type	Resin Cast	
	c) CT ratio	As per Cl. No. 4(d)& (e)	
	d) CT burden/phase	15 VA	
	e) Accuracy Class	0.5S	
	f) Applicable standard	IS 16227 (Part-I to II)	
	g) Short Time Current		
	01) Thermal Rating a.for each offered rating	Upto and including 50/5 :- 6.4 KA for 1 sec >50/5 Upto and including 100/5 :- 13.1 KA for 1 sec >100/5 Upto and including 250/5 :- 18.4 KA for 1 sec	
	02) Dynamic Rating	2.5 times I _{th}	
	h) One minute Power Frequency Dry withstand test		

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	01) Primary Winding	28 KV (rms)	
	02) Secondary Winding	3 KV (rms)	
	i) Impulse Withstand test	75 KV (Peak)	
	j) a) Current density at STC for 1 second (max) b) Current density at rated current (maximum)	165 Amp./mm ² 1.5 Amp./mm ²	
	k) Type of Core	Single core for commercial metering	
	l) Core material	CRGO/ μ metal	
	n) Insulation Class	B	
	o) Instrument Security Factor	5 or less than 5	
4	Fitting and Mounting		
	a) Earthing terminals	2 Number (1.5" X 0.5")	
	g) Rating and terminal marking	1 Number	
	h) Polarity Marking	1 Number	
	i) Size of LT terminal	6.0 mm dia & 35 mm long	
	j) LT terminal material	Tined Copper	
	k) Bolts, Nuts, Washer		
	1) Grade of Bolts	SS 304	
	2) Size of Bolts	M 12x35mm length	
	3) Center to Center distance between adjacent bolts	85 \pm 5 mm	
	4) Grade of Washer	SS 304 Grade	
	5) Minimum thickness	2 mm	

Signature of the Supplier

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Date:

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ANNEXURE: I-A : 11KV CT and PT Units

Sub: Technical Design parameters for 11 KV CT and PT .

Sr. No.	Description	Offered by supplier
1	PT HV winding (Primary) (a) HV conductor size (b) Nos. of coil per phase (c) Nos. of Turns per phase	
2	PT LV Winding (Secondary) (a) LV conductor size (b) Nos. of Turns per phase	
3	PT Core (a) Core Characteristic as per core material supplier's data i.e. BH curve (Please enclose curve) (b) Cross section of area of core	
4	C.T. (a) Instrument security factor (ISF) (b) CT primary conductor size (c) Nos. of turns of Primary Winding (d) CT secondary conductor size (e) Nos. of turns of secondary winding (f) Nos. of parallel paths used in secondary winding	
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N.B. Please offer Technical Particulars in this sheet only.

Signature of Supplier

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ANNEXURE: I-B : 11 KV CT and PT Units

Sub: Deviation in offer for 11KV CTPT Sets.

Sr. No.	Descriptions	DISCOM's requirement	Deviated parameter	Reasons for deviation
01	02	03	04	05

Signature of Supplier

N.B. Please offer deviation from technical particulars in this sheet only. If there is no deviation, please indicate clearly in this Annexure that our offer have no deviation from Technical Specification of this tender.

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ANNEXURE – II (Type Tests)

List of Type Test for single phase single ratio resin cast current transformer and potential transformer for metering purpose (As per the applicable standards mentioned in Clause No:3 of the specifications)

- 01** Verification of Markings
- 02** Temperature Rise Test
- 03** Impulse voltage test on primary terminals [
- 04** Wet test for outdoor type transformers
- 05** Tests for accuracy
- 06** Verification of the degree of protection by enclosure
- 07** Short time current tests [
- 08** Short circuit withstand capability tests
- 09** Partial Discharge Measurement test
- 10** Instrument Security Factor Test for Current transformer
- 11** Interturn Overvoltage Test
- 12** Power frequency voltage withstand test on primary wterminals.
- 13** Power frequency voltage withstand test on secondary terminals.

ANNEXURE – III (Routine Tests)

List of Routine Test for single phase single ratio resin cast current transformer and potential transformer for metering purpose (As per the applicable standard mentioned in Clause No:3 of the specifications)

1. Power frequency voltage withstand test on primary terminals
2. Power frequency voltage withstand test on secondary terminals.
3. Tests for accuracy
4. Verification of Markings Determination of the secondary winding resistance
Interturn Overvoltage Test
5. Instrument Security Factor Test for Current transformer (Determination of the instrument security factor (FS))
6. Additionally following routine tests shall be carried out on all CTPT units considering special requirement of purchaser.
 - I. Total harmonic distortion in 11 KV PT shall not be more than + 2.0% THD with respect to primary side. (As per Procedure defined in annexure-VI)
 - II. Ph to Neutral accuracy of PT shall be within the relevant accuracy class.

ANNEXURE – IV (Acceptance Tests)

List of Acceptance Test for single phase single ratio resin cast current transformer and potential transformer for metering purpose (As per the applicable standards mentioned in Clause No:3 of the specifications)

1. Dielectric strength of oil (BDV test) as per IS 1866:2017
2. Temperature Rise Test
3. Power frequency voltage withstand test on primary terminals.
4. Power frequency voltage withstand test on secondary terminals.
5. Tests for accuracy
6. Verification of Markings [IS 16227(Part-4), CL No.7.3.6]
7. Determination of the secondary winding resistance
8. Interturn Overvoltage Test
9. Instrument Security Factor Test for Current transformer
10. Physical verification test to confirm requirements of technical specifications & relevant standards.
11. Additionally following acceptance tests shall be carried out on CTPT units considering special requirement of purchase.
 - I. Total harmonic distortion in 11 KV PT shall not be more than + 2.0% THD with respect to primary side. (As per Procedure defined in annexure-VI)
 - II. Ph to Neutral accuracy of PT shall be within the relevant accuracy class.

Signature of Tenderer Company's Round Seal

Date:

Place:

Annexure-V
(ON COMPANY LETTER HEAD)

**DECLARATION REGARDING UTILIZATION OF BOUGHT OUT RAW MATERIALS
CONFORMING TO RELEVANT IS/IEC AND APPLICABLE RULES & REGULATIONS WITH
LATEST AMENDMENTS**

Reference:

- (1) Master LOA no. _____
(2) DISCOM LOA no. _____
(3) AT no. _____
(4) Supplier inspection call letter no. _____

In connection with the above subject and reference I/ We declare & undertake the following.

I / We, _____ the under signed & authorized signatory of the Company have confirmed the technical specification & GTP of the tender no. _____ in all respect during tender process.

Accordingly, I / We hereby declare & undertake that all the bought out raw materials which are utilized in the manufacturing of the distribution transformers supplied against AT and inspection call mentioned under references are conforming to relevant IS/IEC and applicable rules & regulations with latest amendments.

I / We, declare that our supplied material is strictly in line with the tender technical specifications and GTP requirements.

Signature of the Authorised Signatory of the Supplier Seal of the Supplier

Name:

Designation:

Date:

Name of Supplier:

Address of works at which inspection conducted:

Signature of Tenderer Company's Round Seal	Date:	Place:
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Annexure-VI: OPERATING PROCEDURE for the Measurement of Total Harmonics Distortion on secondary side of PT with respect to primary side of PT in 11 KV Resin Cast Potential Transformer using 3 Phase 11 KV Source
