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TECHNICAL SPECIFICATION FOR 11 KV COPPER WOUND MEASURING THREE PHASE (THREE SINGLE PHASE CTs AND ONE THREE PHASE STAR/STAR PT) COMBINED C.T.P.T. UNIT OF ACCURACY CLASS 0.5s.

IMPORTANT NOTES:

01 Supplier should submit their details asked in Annexure – I and I-A & I-B.
UGVCL

02 No offer will be considered if it submitted other than above Annexure – I and I-A&I-B.

03 Annexure –I is UGVCL's requirement. If bidder want to offer any deviation in UGVCL's requirement, same should be brought out in Annexure: I-B only with detailed reason. However, deviations should not affect UGVCL technical specification requirements. If Deviations affecting technical specification requirements, it shall not be accepted. If no deviation, then also put this Annexure: I-B with tender indicating no deviation.

04 Though Annexure: I–A is design parameters, supplier has to submit compulsorily for our reference.

05 No subsequent correspondence or any submissions made after opening of Technical Bid will be entertained. The offer will be disqualified if, any such attempt is made by the bidder.

SPECIFICATION FOR 11 KV COPPER WOUND MEASURING THREE PHASE (THREE SINGLE PHASE CTs AND ONE THREE PHASE STAR/STAR PT) COMBINED C.T.P.T. UNIT.

01 SCOPE:

This specification covers design, manufacture, testing at manufacture's works and inspection, supply and delivery of oil filled conventional type outdoor type pole mounted combined 11 KV copper wound CTPT unit.

"The combined CTPT unit shall comprised of three single phase current transformers and one three phase voltage transformers having primary star point of primary winding shall not be EARTHED (i.e. floating Neutral) and

secondary star neutral points shall not to be EARTHED on LV side and shall be brought out in secondary terminal box"

02 OPERATION CONDITION:

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

2.1 AMBIENT CONDITIONS:

(a) Maximum ambient air temperature not exceeding: 55^0 C

(b) Maximum daily average ambient air temperature not exceeding: 35^0 C

(c) Maximum yearly average ambient air temperature not exceeding: 30^0 C

2.2 ALTITUDE: Upto 1000 meters above Mean Sea Level.

2.3 INSTALLATION:

Outdoor pole mounted in atmosphere normally polluted. The CTPT units shall also function satisfactory if installed in Sea Shore area having saline atmosphere and in chemically polluted areas.

2.4 SYSTEM:

3 Phase, Frequency 50 Hz ±5%

Voltage = 11 KV

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.

03 APPLICABLE STANDARDS:

Unless otherwise specifically stated in this specifications of CTPT Units shall conform latest version to the following standards:

IS-2705	Current transformers
IS-3156	Voltage transformers
IS-12943	Brass glands for PVC cables
IS-13730	Requirements for winding wire
IS-5621	Hollow porcelain isolator or bushing
IS-3347	Dimensions for bushings
IS-335	New insulation Oil
IS-2062	Structural Steel (Std. quality)
IS-5	Colors for ready mix paints
IEC-185	Current Transformers
IEC-186	Potential Transformers
IS-2629	Galvanizing

04 RATING AND PERFORMANCE:

	Description	Requirement for CT	Requirement for PT
(a)	Type	Three single phase CTs	One Three phase Star/Star PT.
(b)	Accuracy Class	0.5S	0.5
(c)	Rated 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 Secondary current Amp.	5 Amp.	N / A
(f)	Rated primary voltage	N / A	11000 V (Phase to phase)
(g)	Rated Secondary voltage	N / A	110 V (Phase to Phase)
(h)	Rated burden	5 VA per phase at 0.8 P.F. (Lag)	10VA per Phase at 0.8P.F. (Lag)
(i)	Rated voltage factor	N / A	1.2 times continuous and 1.5 times for 30 seconds for 11 KV
(j)	Short time current rating		
	(i) a. Thermal rating (i) b. Current density at rated current (max)	STC 6.4 KA for 1 second for 10/5 Amp. rating and above for 11 KV 1.5 Amp. Sq. mm or better for both primary and secondary winding	N / A
	(ii) Dynamic rating	2.5 times Ith for 11KV	N / A
(k)	One minute high voltage power frequency withstand voltage On primary winding KV rms On secondary winding KV rms.	28KV(rms) for 1 minute for 11KV (The UGVCL reserves the right to carry out this test, as per IS, after receipt of CTPT unitat UGVCL's Hi-tech/any approved NABLLab. Design of CTPT unit shall be in such a way that it should withstand during test) 3KV(rms) for 1 minute	28KV(rms) for 1 minute for 11KV (The UGVCL reserves the right to carry out this test, as per IS, after receipt of CTPT unit at UGVCLs Hi-tech/ any approved NABL Lab. Design of CTPT unit shall be in such a way that it should withstand during test) 3KV(rms) for 1 minute

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(l)	1.2/50 impulse withstand voltage	75 KV (Peak) for 11KV Class	75KV (Peak) for 11KV Class
(m)	Winding materials	Copper	Copper
(n)	Class of insulation	A	A
(o)	Instrument Security Factor	5 or Less than 5	N / A
(p)	Max. Allowable Temp. rise for winding	55^{o} C	55^{o} C

05 **BUSHING:**

(a) Brown glazed HV bushing of approved make shall mounted as stated in 4(d) of Annexure-I on top cover of tank. The list of approved suppliers for Porcelain insulators may be obtained from this office. The hollow porcelain bushings shall be confirming to IS-5621. The metal parts of the bushings shall be tinned copper with minimum tinning with 50 micron with spring washer and plain washer (minimum 2.0 mm thick electroplated) with 3 (three) nos. nuts, one lock nut and two nuts for terminal connections.

(b) Bushing clamping and accessories together with the connected bolts/studs shall be hot dip galvanized. However, nuts and washers shall be SS-304.

(c) Bushing turret height shall be minimum 20 mm.

(d) Bushing should be inclined outside to have higher clearance between two terminals of same phase. (The minimum distance between two bushing should be 255 mm)

(e) HV Tinned Copper stud/bushing rod of M12 for CTPT below 75/5 Amp and M20 for CTPT of 75/5 Amp and above ratings. For which suitable connectors/lugs are to be supplied by the supplier and the same should be confirmed during inspection.

06 **TRNASFORMER OIL:**

6.1 The transformer oil to be supplied in the CTPT tank shall be New Insulating oil conforming to requirements when tested according to IS-335. (Electric strength- Break down voltage shall be 60 KV (rms) or more)

6.2 The current transformer shall be so constructed as to ensure that the oil does not flow or leak out even when the current transformer is used continuously at the maximum allowable temperature; similarly the potential transformer shall be so constructed as to ensure that the oil does not flow or leak out.

07 TANK:

The tank shall be fabricated from fresh MS Sheet of 4mm, thickness for top cover, flange and bottom of the tank and of 2.5mm thickness for side walls so as to withstand pressure built in during the expansion of oil during temperature rise or forces generated during short circuit. The expose fabricated tank with over and other ferrous fittings shall be thoroughly cleaned, scrapped process and hot dip galvanized as per relevant IS-2629. All nuts, bolts, washers, screws, etc. exposed to the atmosphere shall be of 304 grade of stainless steel.

The curb of the tank shall be minimum 40mm wide. The top cover shall have slope of minimum 10 degree to drain off water in rainy season. The oil resistant gasket of neoprene rubber or nitral or synthetic rubberized cork of minimum 5mm thickness shall be provided. Adequate number of SS-304 grade bolts of M12 x 35mm (length) size bolts at maximum 85mm (with tolerance of ±5 mm) C/C apart with 2 mm thick washer of 304 grade SS shall be provided. Four numbers of lifting lugs of 5mm thickness shall be provided on tank sides and two nos. on top cover. The top cover of the CTPT unit shall be welded with Four nos. of clamps fabricated from MS flat of 4mm x 35mm size after assembly. The method of the same shall be explained at the time of inspection of Proto unit by UGVCL.

One no. of oil level gauge shall be provided at the tank to check oil level in the tank. Position and size of the oil level gauge shall be such that, the total windings and core shall be remain inside the oil, even if the oil level is at low oil level marking of gauge.

Pressure Release Valve of suitable size and capacity is to be provided on the tank to release pressure generated due to any abnormalities in CTPT unit.

Note: - No inspection cover on any side / face of the CTPT top or base shall be provided.

7.1 TERMINAL BOX:

The terminal box shall be closed box type, water/vermin proof with tinned copper terminals of minimum 6mm dia. x 35mm with electroplated spring washers and three numbers nuts. The terminal marking and polarity marking shall be done by etched aluminum square plated duly fixed in irremovable manner. The terminal box shall have cable entry hole to accommodate 25 mm size brass gland suitable to termination of 10 cores, 2.5 Sq. mm PVC insulated steel armored cable. The terminal box covers shall have the provision of

sealing the terminal box for which minimum four nos. of corner bolts to be fixed on the flange of the box shall be provided with adequate hole on the bottom for sealing purpose. It should have overlap on box at top and both side to restrict water entry and proper fitting of the secondary cover.

The terminal box with the cover closed and cable in position must have degree of protection conforming to IP-54. The minimum projection of the box shall be 70mm.

The 4 (Four) Nos. of Clamps fabricated from MS flat of appropriate shape of 2.5mm x 15mm size suitable for welding at site shall have to be supplied along with each CTPT unit.

The Serial number, ratio, and date of dispatch shall have to be ENGRAVED on side (opposite to secondary terminal box), of tank with letter of suitable depth and 25mm height filled with RED color.

The fabrication of the CTPT set tank shall be such that there should not be any oil leakage from welded positions as well as from the secondary terminals inside the Terminal Box. The four numbers corner bolts of top cover shall have suitable hole for inserting sealing wire.

08 FITTING AND ACCESSORIES:

The following fittings/accessories are to be provided to the CTPT units.

(a)	Oil level gauge as per requirement stated at cl. no. 7	01 Nos.
(b)	MS earthing terminals with copper lugs with earthing symbol etched on aluminum plate.	02 Nos.
(c)	Rating and terminal marking plate (Etched All) riveted to tank.(The rating plate shall have all details as per IS-2705 and IS-3156 along with order no. of UGVCL and connection diagram).	01 Nos.
(d)	Lifting lugs (Minimum 5mm thick)	02 Nos. on top cover 04 Nos. on tank side
(e)	Base mounting channel MS 75 x 40 x 6mm having length of 410 mm shall be provided and edge to edge distance between two holes (oblum shape with length–50mm) shall be kept 380 mm and same shall be fixed in such a way that 40 mm size of the channel shall be welded with tank bottom and open sides of both the channel shall remain outside.	02 Nos.

(f)	Oil filling hole with cap on tank cover	01 Nos.
(g)	I) HV porcelain bushings of approved make as per Annexure-I. If supplier wants to use any other make bushing, then it should be got approved form UGVCL before use and it should be clearly indicated in Annexure-I-B. HV Porcelain bushing should be fixed with Anti-theft stainless steel fasteners with breakaway nut at least with two sides i.e. at least two in each HV Bushing. II) LV terminals (Minimum 6mm dia) tinned copper with spring washer, plain washer and nuts with phase and polarity marking etched plated. III) HV Tinned Copper stud/bushing rod of M12 for CTPT below 75/5 Amp and M20 for CTPT of 75/5 Amp and above rating with spring washer, plain washer and nuts.	06 Nos. 10 Nos. 06 Nos.
(h)	Double Compression – Flame Proof brass Gland of 25 mm dia. as per IS 12943 with ISI marking.	01 Nos.
(i)	Pressure Release Valve with suitable design to release accidently generated pressure in CTPT unit.	01 Nos.

09 CORE:

9.1 CORE MATERIALS:

Non aging oxide film coated fresh suitable Mu-metal or Mu-metal plus CRGO toroidal cores for CT. For lamination of PT first quality shall be used as core material. All the stresses developed due to cuttings, punching etc. shall be relieved by suitable stress relieving process.

9.2 CORE CONSTRUCTION AND DESIGN:

Core is supporting steel and insulation shall be such that harmful changes in electrical and physical properties shall not occur during the life time of the CTPT unit.

Core winding shall be strongly braced so that it shall not get displaced in operation due to shrinkage on short circuit forces. Core assembly shall be rigidly clamped with M.S. Channel and mounted to the tank.

9.3 CORE OF PT:

The core of PT shall be effectively earthed by copper braided flexible wire of minimum area of 40 mm^2 section. The core shall be rigidly branched with insulated bolts and the assembly shall be rigidly clamped with MS Channels and mounted on the tank.

9.4 CORE OF CT:

The tenderer shall provide toroidal core only. It should be same as given in type tested unit.

Core / Winding assembly of CT shall be rigidly mounted in the tank.

10 WINDING:

10.1 PT WINDING:

It shall be of electrolytic grade copper conductor with super enameled Insulation, conforming to relevant IS. The winding design and contraction shall be such that it shall withstand impulse voltage. The details as per Guaranteed Technical Particulars shall be provided. The winding shall be preferable in two sections.

10.2 CT WINDING:

It shall be of electrolytic grade copper conductor with DPC/DCC and super enameled insulation conforming relevant IS. The winding design and construction shall be such that it shall withstand impulse voltage and short circuit currents. The winding shall be provided with rigid insulating supporting hylum sheets of minimum 3 mm thickness on both the sides duly tightened by insulating fasteners only and by cotton cord etc.

(a) Each coil shall be wound of paper insulated, continuously, smooth high grade, electric copper conductor.

(b) The materials used in the insulation and assembly of the winding shall be in-soluble, non-catalytic and chemically in active in the transformer oil.

(c) Winding assembling shall be dried in vacuum thoroughly shrunk to final alignment and vacuum impregnated with tested transformer oil.

(d) Design arrangement, insulated and assembly of the winding on the core shall be so as to ensure uniform distribution of voltage amongst all coils.

11 CONNECTIONS:

No joints in the primary winding of CT shall be acceptable. The connections to bushing terminals shall be with flexible copper strip / rope of adequate current carrying capacity. The leads shall be properly terminated with a crimped lug only.

12 ASSEMBLY:

Three phase CTPT combined units having specification / construction as referred above shall be rigidly fixed in the tank.

The core and coil assembly shall be supported rigidly with suitable M.S. Channels. Suitable guides shall be provided to avoid displacement of active parts.

The inner clearance between live parts to tank shall be minimum 40mm for 11KV CTPT set. The drawings shall clearly indicate the inner clearance in detail. General Arrangement Drawing should be sent with offer for approval.

13 CABLE DETAILS:

The terminal box shall have cable entry hole of appropriate size suitable to double compression flame proof brass cable gland of 25mm dia. to avoid cutting of cable sheath. The terminal box shall have provision to seal the terminal box.

14 CLEARANCE:

The minimum air clearance for HV shall be as per IS-3347.

15 DRAWINGS:

The detailed dimensional drawings: 3copies as listed below shall be furnished along with the offer.

(a) Overall General arrangement drawing showing bushings arrangement with their clearance, terminal box, etc. as per design shown with front side and top views along with list of fittings, material and its composition, nos., make and electrical clearance and creep age distance etc.

(b) Drawing showing internal exposition of CT's and PT's inside tank with cross sectional view of CTs and PT, with dimensions, clearances, mounting arrangement details including details of electric and magnetic circuits.

(c) Diagram showing LT terminal arrangement with phase/ polarity marking and clearances. Minimum clearance (i) between LT terminals of PT should be 50 mm, (ii) From side and upper wall to terminals should be 25 mm and (iii) From bottom wall to terminals should be 85 mm.

(d) Drawing of name plate with minimum dimension 200 x 150 mm showing details of CT and PT ratings & details, insulation class, minimum oil quantity, Total weight, month of supply, Guarantee period in years etc., wiring diagram with terminal / polarity marking.

16 TESTS & INSPECTION:

16.1 QUALIFICATION:

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

(I) All type tests certificates as listed under Annexure-II for 11KV carried out on ONE single sample unit having class of accuracy– 0.5S, 05 VA for CT and on PT having Class of accuracy – 0.5, 10 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.

(II) The tenderer shall also submit one type test certificate for the test of "Instrument Security Factor" as per the Cl. No. 7.1.2 of IS-2705 (Part-II) 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.

(III) The copy/ proof of bill/ invoice of purchase of core material.

(IV) The copy of BH curve for the core material intended to be used in regular supply of CTPT units.

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

16.1.1 TYPE TEST CERTIFICATE:

The supplier has to submit notarized Test Certificates for all the Type Tests as prescribed under Annexure-II for 11KV CTPT sets with 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.

16.1.2 The UGVCL also reserves the right to carry out all or any type tests on any CTPT set from the lot offered for inspection by the firm at any approved NABL Lab in presence of UGVCL officers and representative of firm at UGVCL's cost. Any decision based on this testing shall be applied to the full ordered quantity. However, if the unit fails in test, then the test charges shall have to be borne by the supplier.

16.2 ACCEPTANCE TESTS:

The tests shall be carried out at 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.

If required, the inspector of UGVCL shall open check any one or more CTPT unit from offered lot to verify winding wire and conductor size, core size, oil quantity and inside design as per UGVCL specification and supplier's offered design. If any deviation will be observed, the entire lot shall be rejected.

(Material must be "Ready to Dispatch" at the time of acceptance test.)

16.3 ROUTINE TESTS:

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

The UGVCL reserve rights to carry out Routine tests, as per Annexure-IV, on all dispatched CTPT units at UGVCL's Hi-tech/ any approved NABL Lab. If any CTPT unit not conforming routine test 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 date of inform to the supplier.

17 PROTO TYPE UNITS:

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

(i). All Acceptance Tests shall be carried out on the proto type unit as per Annexure-III of this specification and temperature rise test at the firm's work

(ii). Total harmonic distortion in 11 KV PT shall not be more than 2.0%

(iii). Ph to Neutral accuracy shall be within relevant accuracy class.

However if required, UGVCL reserve rights to carry out all type tests including the test of ISF on proto type units, as per Annexure-II at any approved NABL Lab(the name of the laboratory shall be decided by UGVCL) in the presence of UGVCL's representative.

The cost of all type testing and its related expenses shall have to be borne by supplier.

All dimensions, constructional features and other requirements outside and inside of CTPT unit laid down in specification shall also be checked during proto type inspection.

After completion of successful testing, the prototype units shall be sealed and kept at firm's premises. During subsequent inspection of CTPT set, any unit

will be opened for comparison with prototype for internal design detail, if required.

The detailed drawings as mentioned at clause no. 15 of this tender specifications 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.
The prototype units shall be dispatched along with last lot only after welding of clamp between top cover and Body of the CTPT Unit.

18 GUARANTEE:

The combined CTPT set offered shall have guarantee for good design, Materials and workmanship. The defective units shall have to be repaired/replaced free of cost if reported within 18 months from the date of dispatch or 12 months from the date of commissioning whichever is earlier. The firm shall be responsible for proper performance of the equipment for 18 months from the date of dispatch or 12 months after commissioning whichever is earlier.

Reported failed units under 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 immediate arrangement for collection of failed unit is not done by Supplier and if the units are not repaired and returned within two months time, the UGVCL will deduct full cost of CTPT unit from the bill.

The UGVCL reserve rights to test/check any/all CTPT units from supplied lot during its guarantee period at UGVCL's own laboratory OR any other approved NABL Lab for conformance of IS 2705, IS 3156 and technical specifications of UGVCL. Failing of any CTPT unit in above test, supplier shall have to repair/replace CTPT units within 30 days from intimation by the UGVCL.

The supplier situated outside Gujarat State shall have to establish 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 guarantee period of supply of last lot.

ANNEXURE: I : 11 KV CTPT

SUB: GUARANTED TECHNICAL PARTICULARS FOR 11 KV CTPT SETS:

Sr. No.	DESCRIPTION	UGVCL'S REQUIREMENTS	TO BE OFFERED BY BIDDER
1	2	3	4
1	Type	Paper insulated, oil cooled, outdoor type	
2	Potential Transformer		
	a) Nos. of PTs	One Three Phase star/star PT	
	b) Rated voltage	11 KV	
	c) Type	Paper insulated, oil cooled, outdoor type	
	d) Vector group	Star / Star	
	e) PT Ratio	11 KV / 110 Volts	
	f) PT burden/phase	10 VA at 0.8 PF (lag)	
	g) Accuracy class	0.5	
	h) Applicable Standard	IS-3156	
	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)	
	l) Core clamping arrangement	MS channel with rigid fixing	
	m) Insulation Class	A	
3	Current Transformer	Single ratio	
	a) Nos. of CTs	Three Single Phase CTs	
	b) Type	Paper insulated, oil cooled, outdoor type	
	c) CT ratio	As per Cl. No. 4(d)& (e)	
	d) CT burden/phase	5 VA at 0.8 PF (lag)	
	e) Accuracy Class	0.5S	
	f) Applicable standard	IS-2705	
	g) Short Time Current		
	01) Thermal Rating	6.4KA for 1 second for all ratings.	
	02) Dynamic Rating	2.5 times Ith	
	h) One minute Power Frequency Dry withstand test		
	01) Primary Winding	28 KV (rms)	
	02) Secondary Winding	3 KV (rms)	
	i) Impulse Withstand test	75 KV (Peak)	

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	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	Toroidal	
	l) Core material	CRGO/Mu-metal	
	m) Core Clamping Arrangement	With bakelite sheet	
	n) Insulation Class	A	
	o) Instrument Security Factor	5 or less than 5	
4	Fitting and Mounting		
	a) Earthing terminals	2 Number (1.5" X 0.5")	
	b) Oil filling hole with plug	1 Number (1/2" Plug)	
	c) Oil level gauge	1 Number	
	d) HV Bushing		
	Number	6 Number	
	Make	Bhel/Luster Ceramic/Jayshree/ WS/BPPL Bikner/Agrawal salt Co Bikaner/Venkateshwara Ceramics – Warangal/BEP Co/Associate Procelain/Jaipur Glass/CJI Porcelain/Seshasayee/Max Well (11KV)/Ravi Kiran (11KV) Insulator	
	Metal Parts	Each HT Stud (M12: below 75/5 Amp & M20: 75/5 Amp and above ratings), Duly Tinned Copper with 3 Nos. of Nuts, 2 Nos. of plate washers, 1 Nos. of spring washer and Aluminum lug (95 mm^2: below 75/5 Amp & 120 mm^2: 75/5 Amp and above ratings) (Total 6 Nos. of HT Studs & 6 Nos. of Aluminum lugs)	
	Applicable Standard	IS 3347	
	Creepage Distance	As per IS 3347	
	e) Lifting lugs		
	On top cover	2 Number	
	On side	4 Number	
	f) Lifting lug thickness	5 mm	

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	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	
	6) Gasket (5mm)	Neoprene/Nitral/Synthatic Rubber Cork	
	l) Double Compression Flame Proof brass Gland of 25mm dia. as per IS 12943 with ISI marking	1 No.	
	m) MS flat clamps of 2.5mm by 15mm for welding of terminal cover at site as referred under Cl. No. 7.1	4 Nos.	
	n) MS flat clamps of 4mm by 35mm size for welding of top cover at works	4 Nos.	

Signature of the Supplier

Signature of Tenderer Company's Round Seal Date: Place:

ANNEXURE: I-A : 11KV CTPT

Sub: Technical Design parameters for 11 KV CTPT set.

Sr. No.	Description	Offered by supplier
1	PT HV winding (a) HV conductor size (b) Nos. of coil per phase (c) Nos. of Turns per phase	
2	PT LV Winding (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	
5	Qty. of first filling of transformer oil	
6	Tank (a) Tank sheet size (i) Top and bottom thickness (ii) Side wall thickness (b) Tank Size (i) Overall Dimension (ii) Inside Dimension	

N.B. Please offer Technical Particulars in this sheet only.

Signature of Supplier

Signature of Tenderer Company's Round Seal Date: Place:

ANNEXURE: I-B : 11 KV CTPT

Sub: Deviation in offer for 11KV CTPT Sets.

Sr. No.	Descriptions	UGVCL'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.

Signature of Tenderer Company's Round Seal Date: Place:

ANNEXURE – II

Schedule of Type Test for CT as per clause No. 16.1

01 Verification of terminal marking and polarity.
02 High voltage power frequency tests on primary windings.
03 High voltage power frequency tests on secondary windings.
04 Over voltage inter turn test.
05 Determination of error according to the requirement of appropriate Accuracy class.
06 Shot time current test.
07 Impulse voltage test.
08 Temperature Rise Test.
09 Instrument Security Factor Test on all phase of the CT as per Cl. No.7.1.2 of IS-2705 (Part-II).
10 High Voltage Power-frequency Wet withstand voltage test as per Cl. No.9.9 of IS-2705 (Part-I).

Schedule of Type Test for P.T as per Clause No. 16.1

01 Verification of terminal marking and polarity.
02 Power frequency dry withstand test on primary winding.
03 Power frequency dry withstand test on secondary winding.
04 Determination of errors according to the requirement of the appropriate Accuracy class.
05 Temperature rise test.
06 Impulse voltage test for voltage transformer for service in electricityExposed installation.
07 High Voltage Power-frequency Wet withstand voltage test as per Cl. No.9.7 of IS-3156 (Part-I).

Over & above additional tests due to amendment in IS, if any should also be carried out.

ANNEXURE – III

Schedule of Acceptance Test for CT as per clause No. 16.2

01 Verification of terminal marking and polarity.
02 High voltage power frequency tests on primary windings.
03 High voltage power frequency tests on secondary windings.
04 Over voltage inter-turn test.
05 Determination of error according to the requirement of appropriate accuracy class as per Table 1C of IS-2705 (Part-II).
06 Instrument Security Factor Test on all phase of the CT as per Cl. No.7.1.2 of IS-2705 (Part-II).

Schedule of Acceptance Test for P.T. as per Clause No. 16.2

01 Verification of terminal marking and polarity.
02 Power frequency dry withstand test on primary winding.
03 Power frequency dry withstand test on secondary winding.
04 Induced over voltage test as per IS-3156.
05 Determination of errors according to the requirement of the appropriate accuracy class.

Schedule of Acceptance Test for CTPT as per Clause No. 16.2

(A) Test to be carried out on one CTPT Unit randomly selected from offered lot:-

01 Dielectric strength of oil as per IS-335.
02 Verification of oil quantity as per bidder's offer

(B) Test to be carried out on All CTPT Unit of offered lot:-

01 Verification of the Serial number, ratio, and date of dispatch which is to be ENGRAVED on side (opposite to secondary terminal box), of tank with letter of suitable depth and 25mm height filled with RED color.
02 Verification of Fitting and Accessories as per specification cl. no.8(a to i)
03 Verification of leakage of oil.

Over & above additional tests due to amendment in IS, if any should also be carried out.

Signature of Tenderer Company's Round Seal Date: Place:

ANNEXURE – IV

Schedule of Routine Test for CT as per clause No. 16.3

01 Verification of terminal marking and polarity.
02 High voltage power frequency tests on primary windings.
03 High voltage power frequency tests on secondary windings.
04 Over voltage inter-turn test.
05 Determination of error according to the requirement of appropriate accuracy class as per Table 1C of IS-2705 (Part-II).
06 Instrument Security Factor Test on all phase of the CT as per Cl. No. 7.1.2 of IS-2705 (Part-II).

Schedule of Routine Test for P.T. as per Clause No. 16.3

01 Verification of terminal marking and polarity.
02 Power frequency dry withstand test on primary winding.
03 Power frequency dry withstand test on secondary winding.
04 Determination of errors according to the requirement of the appropriate accuracy class.

Over & above additional tests due to amendment in IS, if any should also be carried out.