



**PASCHIM GUJARAT VIJ COMPANY LIMITED**

REGD. & CORPORATE OFFICE:- "PASCHIM GUJARAT VIJ SEVA SADAN"

OFF NANA MAVA MAIN ROAD, LAXMINAGAR, RAJKOT-360004

CIN U40102GJ2003SGC042908

Telephone Nos:-0281-2380425/427/2360182

Fax No:-0281-2368175

Website:-www.pgvcl.com

E-mail:-proc.pg@gebmail.com

TECHNICAL SPECIFICATION OF 11 KV THREE PHASE FOUR WIRE, THREE CTs COMBINED  
METERING CTPT SET OF ACCURACY CLASS 0.5s

**IMPORTANT NOTES:**

- 01 Supplier should submit their offer in Annexure - I and I-A & I-B only.
- 02 No offer will be considered if it submitted other than above Annexure - I, I-A, and I-B in case of 11 KV.
- 03 Annexure - I is PGVCL's requirement. If any deviation in PGVCL's requirement, same should be brought out in Annexure: I-B only with detailed reason. 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 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.

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

2.1 AMBIENT CONDITIONS:

1. Maximum ambient air temperature not exceeding : 55<sup>0</sup> C
2. Maximum daily average ambient air temperature not : 35<sup>0</sup> C exceeding
3. Maximum yearly average ambient air temperature not : 30<sup>0</sup> C exceeding

2.2 ALTITUDE: Up to 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 + 10%, 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 specification of CT-PT Units shall conform latest version to the following standards:

IS-2705	Current transformers
IS-3156	Voltage transformers
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
IEEE-519	IS for Harmonics

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

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

## TENDER No. PGVCL/RJT/Proc/11KV CTPT/750

(d)	Rated primary / current in 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/110 V (Phase to Phase)
(h)	Rated burden	5 VA at 0.8 P.F. (Lag)	10VA/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	STC 6.4 KA for 1 second for 10/5 Amp. rating and above up to 250/5 for 11 KV	N / A
	(i) b. Current density at rated current (max)	1.5 Amp. Sq. mm	
(ii) Dynamic rating	2.5 times Ith for 11KV	N / A	
(k)	One minute high voltage power frequency withstand voltage On primary winding	28KV(rms) for 1 minute for 11KV class	28KV(rms) for 1 minute for 11KV class
	On secondary winding	3KV(rms) for 1 minute	3KV(rms) for 1 minute
(m)	1.2/50 impulse withstand voltage	75 KV (Peak) for 11KV Class.	75KV (Peak) for 11KV Class
(n)	Winding materials	Copper	Copper
(o)	Class of insulation	A	A
(p)	Instrument Security Factor	5 or Less than 5	N / A
(q)	Max. Allowable Temp. rise for winding	55° C	55° C

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

05 BUSHING:

- (a) Brown glazed HV bushing of approved make shall mounted as stated in 4 (e) 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. (No aluminum parts shall be accepted)
- (b) Bushing clamping and accessories together with the connected bolts/studs shall be hot dip galvanized. However, nuts and washers shall be SS-304.

06 TRANSFORMER OIL:

- 6.1 The transformer oil to be supplied in the CTPT tank shall be new oil conforming to the requirements according to IS-335/1983. (Electric strength-Break down voltage shall be 60 KV (rms))
- 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 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. Drawing of welding of flat is to be provided.

Note:

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

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

## 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. Oil gasket quality of secondary terminals shall be such that oil should not leak from secondary terminals. The terminal marking and polarity marking shall be done by etched aluminum square plated duly fixed in irremovable manner. Terminal shall be marked as r, y & b instead of a, b & c. The terminal box shall have cable entry hole to accommodate metallic gland suitable to termination of 12 (Instead of 10) core, 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. 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 sit 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)	Drain plug 19mm (3/4" size) at the bottom of the tank.	01 Nos.
(b)	Oil level gauge	01 Nos.
(c)	MS earthing terminals with copper lugs with earthing symbol etched on aluminum lates.	02 Nos.
(d)	Rating and terminal marking Plate (Etched All) riveted to tank. (The rating plate shall have all details as per IS-2705 and 3156 along with order no. of PGVCL and connection diagram).	01 Nos.
(e)	Lifting lugs (Minimum 5mm thick)	02 Nos. on top cover
		04 Nos. on tank side
(f)	Base mounting channel MS 75mm x 40mm x 6mm having length of $425 \pm 10$ mm & distance between two holes should be $375 \pm 10$ mm	02 Nos.

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

(g)	Oil filling hole with cap on tank cover	01 Nos.
(h)	I) HV porcelain bushings of approved make as per Annexure-I. Any other make bushing if supplier wants to use then it should be got approved form PGVCL before use and it should be clearly indicated in Annexure-I-B. II) LV terminals (Minimum 6mm dia) tinned copper with spring washer, plain washer and nuts with phase and polarity marking etched plated. III) 1” Double Compression - Flame Proof metallic Gland.	01 Nos.
(i)	Arching horns for surge protection at HV bushing.	

09 CORE:

9.1 CORE MATERILAS:

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 PT CORE:

The core of PT shall be effectively earthed by copper braided flexible wire of minimum area of 40 mm<sup>2</sup> 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 CT CORE:

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 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.

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

10.2 CT WINDING :

It shall be of electrolytic grade copper conductor with DPC/DCC and super enameled insulation conforming relevant ISS. 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 size 25 mm dia (suitable for 12 core cable) with double compression flame proof metal cable glands 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.

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

- (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.
- (d) Drawing of name plate showing details of CT and PT ratings, wiring diagram with terminal / polarity marking. Also, month of supply and Guarantee period in years shall be clearly mentioned on the name plate.

16 TESTS & INSPECTION:

16.1 QUALIFICATION:

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

- 1. All type tests certificates as listed under Annexure-II for 11KV carried out on ONE single sample unit CTs having class of accuracy - 0.5S, 5 VA for CT and on PTs having Class of accuracy - 0.5, 10 VA 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 Govt. Test Lab or NABLE accredited lab as indicated above.
- 2. 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 both phase 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 Govt. Testing Lab or NABL accredited lab not prior to more than Seven years from the date of submission of the offer.
- 3. The copy / proof of bill / in voice of purchase of core material.
- 4. The copy of BH curve for the core material intended to be used in regular supply of CTPT units.  
If above test certificates are not submitted the offer will not be considered as "Qualified".

16.1.1 TYPE TEST CERTIFICATE:

The supplier has to submit 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 Government approved Laboratory. All the Type Tests should not be older than Seven years

16.1.2 The PGVCL also reserves the right to carry out all or any type tests on any CTPT set

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



from the lot offered for inspection by the firm at Govt test lab/NABL accredited lab. in presence of PGVCL officers and representative of firm at PGVCL’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.

(Material must be “Ready to Dispatch” at the time of acceptance test. Proof of routine test and test results shall be provided to PGVCL with inspection call of acceptance)

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 certificate to the inspector deputed for inspection of CTPT sets and acceptance of the lot. Routine tests shall be carried out as per Annexure-IV.

17 PROTO TYPE UNITS:

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

However if required, PGVCL reserve rights to carry out all type tests including the test of ISF on proto type units, as per Annexure-II at any Govt. Testing Lab/NABL accredited lab (the name of the laboratory shall be decided by PGVCL) in the presence of PGVCL’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 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.

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

## 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 collected by you and if the units are not repaired within two month's time, the PGVCL will deduct full cost of CTPT unit from the bill. All the suppliers have to give 10% Performance Bank Guarantee in advance as security deposit.

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

The supplier situated outside Gujarat State shall have to establish suitable and adequate arrangement for repairing and testing of failed C.T.P.T. 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

## GUARANTEED TECHNICAL PARTICULARS FOR 11 KV CTPT SET

Sr. No.	DESCRIPTION	PGVCL'S REQUIREMENTS	OFFER OF BIDDER
1	2	3	4
1	Type	Paper insulated, oil cooled, outdoor type	
2	Potential Transformer	Three Phase star / star PT	
	a) Nos. of PTS	Three PTS	
	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	

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

## TENDER No. PGVCL/RJT/Proc/11KV CTPT/750

Sr. No.	DESCRIPTION	PGVCL'S REQUIREMENTS	OFFER OF BIDDER
	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) of tender	
	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	6.4 KA for 1 second for 10/5 Amp. rating and above up to 250/5 Amp.	
	02) Dynamic Rating	2.5 times I <sub>th</sub>	
	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)	
	j) a) Current density at STC for 1 second (max) b) Current density at rated current (maximum)	165 Amp./mm <sup>2</sup> 1.5 Amp./mm <sup>2</sup>	
	k) Type of Core	Toroidal	
	l) Core material	CRGO	
	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	
	b) Oil filling hole with plug	1 Number (1/2" Plug)	
	c) Drain Plug	1 Number (3/4" Plug)	
	d) Oil level gauge	1 Number	

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

TENDER No. PGVCL/RJT/Proc/11KV CTPT/750

Sr. No.	DESCRIPTION	PGVCL'S REQUIREMENTS	OFFER OF BIDDER
	e) 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	Stud of primary connection shall be Duly Tinned Copper with minimum 16 mm dia. for all CT ratio. Each studs shall have 3 Nos. of Nuts, 2 Nos. of plate washers, 1 Nos. of spring washer and 6 Nos. of appropriate size Aluminum lugs	
	Applicable Standard	IS 3347	
	Creepage Distance	As per IS 3347	
	f) Lifting lugs		
	On top cover	2 Number	
	On side	4 Number	
	g) Lifting lug thickness	5 mm	
	h) Rating and terminal marking	1 Number	
	i) Polarity Marking	1 Number	
	j) Size of LT terminal	6.0 mm dia & 35 mm long	
	k) LT terminal material	Tined Copper	
	l) 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 + 5 mm	
	4) Grade of Washer	SS 304 Grade	
	5) Minimum thickness	2 mm	
	6) Gasket (5mm)	Neoprene/Nitral/ Synthatic Rubber Cork	
	m) Double Compression Flame Proof Metallic Gland	1 No.	
	n) MS flat clamps of 2.5mm by 15 mm for welding of terminal cover at site as referred under Cl.- 7.1	4 Nos.	

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

Sr. No.	DESCRIPTION	PGVCL'S REQUIREMENTS	OFFER OF BIDDER
	o) MS flat clamps of 4mm by 35mm size for welding of top cover at works	4 Nos.	

## ANNEXURE: I-A

## TECHNICAL DESIGN PARAMETERS FOR 11 KV CTPT SET

Sr. No.	Description	Offered by bidder
01	02	03
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 Tenderer:		Company's Round Seal:
Date:	Place:	

## ANNEXURE: I-B

## Deviation in offer for 11KV CTPT Sets.

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

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

## ANNEXURE - II

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

1. Verification of terminal marking and polarity.
2. High voltage power frequency tests on primary windings.
3. High voltage power frequency tests on secondary windings.
4. Over voltage inter turn test.
5. Determination of error according to the requirement of appropriate accuracy class.
6. Shot time current test.
7. Impulse voltage test.
8. Temperature Rise Test.
9. 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

1. Verification of terminal marking and polarity.
2. Power frequency dry withstand test on primary winding.
3. Power frequency dry withstand test on secondary winding.
4. Determination of errors according to the requirement of the appropriate accuracy class.
5. Temperature rise test.
6. Impulse voltage test for voltage transformer for service in electricity exposed installation.
7. High Voltage Power-frequency Wet withstand voltage test as per Cl. No. 9.7 of IS-3156 (Part-I).

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

**ANNEXURE - III**

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

1. Verification of terminal marking and polarity.
2. High voltage power frequency tests on primary windings. 28kv shall be applied for 1 minute.
3. High voltage power frequency tests on secondary windings. 3kv shall be applied for 1 minute.
4. Over voltage inter-turn test.
5. Determination of error according to the requirement of appropriate accuracy class. (Accuracy test shall be taken as per table 1C of IS 2705 part 2. This is special requirement of PGVCL)
6. Instrument Security Factor Test on all phase of the CT as per Cl. No. 7.1.2 of Is-2705 (Part-II).
7. Dielectric strength of oil as per IS 335: 1993.

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

1. Verification of terminal marking and polarity.
2. Power frequency dry withstand test on primary winding. 28kv shall be applied for 1 minute.
3. Power frequency dry withstand test on secondary winding. 3kv shall be applied for 1 minute.
4. Induced over voltage test as per IS 3156.
5. Determination of errors according to the requirement of the appropriate accuracy class. (Accuracy test shall be taken as per clause no. 5 of IS 3156 part 2)

**ANNEXURE - IV**

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

1. Verification of terminal marking and polarity.
2. High voltage power frequency tests on primary windings. 28kv shall be applied for 1 minute.
3. High voltage power frequency tests on secondary windings. 3 kv shall be applied for 1 minute.
4. Over voltage inter-turn test.
5. Determination of error according to the requirement of appropriate accuracy class.
6. Instrument Security Factor Test on Both 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

1. Verification of terminal marking and polarity.
2. Power frequency dry withstand test on primary winding. 28kv shall be applied for 1 minute.
3. Power frequency dry withstand test on secondary winding. 3 kv shall be applied for 1 minute.
4. Determination of errors according to the requirement of the appropriate accuracy class.

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