

TECHNICAL PROCUREMENT SPECIFICATION

for

EHV OUTDOOR VOLTAGE TRANSFORMERS

FACT-UC

TPS NO. : SPEC-FACT-UC-EHV-VT-001

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ISSUE	PREPARED BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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1. INTRODUCTION

- 1.1. This specification gives minimum user requirements for new EHV Outdoor Inductive Voltage Transformers (VTs), to be provided in the 110 KV Substation, FACT-UC.
- 1.2. Fertilisers And Chemicals Travancore (FACT) is a Government of India Enterprise engaged in manufacture of fertilizer, chemical & petrochemical products, engineering consultancy and engineering fabrication. FACT-Udyogamandal Complex (FACT-UC) is a division of FACT located at Udyogamandal, Kochi, Kerala that manufactures intermediates and products like sulphuric acid, oleum, ammonia, ammonium phosphate, ammonium sulphate, caprolactum etc.
- 1.3. Vendor's scope shall include design, material, manufacture, testing, and supply of the VTs, as further described in sections that follow.
- 1.4. The workmanship and the entire construction shall be in accordance with IS/IEC.
- 1.5. The vendor shall provide guarantee as specified in section 10 herein.
- 1.6. This is a two part enquiry. The offer shall be submitted strictly as specified in Annexure II. An unpriced copy of the price bid shall be attached with the technical bid for technical evaluation.
- 1.7. Only offers that comply with the requirements as specified in the bid documents and specification shall be considered for further evaluation. If the vendor however finds some deviation unavoidable, such deviations shall be clearly mentioned in the compliance and deviation statement in the specified format with proper justification. The purchaser reserves the right to reject or accept the offer with such deviations.

2. PERIOD OF COMPLETION

- 2.1. The vendor shall complete the supply of the VTs within a period of 12 weeks from date of final drawing review/approval. The drawings for review/approval shall be submitted within 10 days from the date of LOI. Revised final drawings for final approval, after incorporating the all comments/ changes from Purchaser, if any, shall be submitted within 10 days from date of intimation of comments/ changes in drawing from Purchaser.
- 2.2. Time is of the essence of this contract. The vendor shall complete the supply of VTs within the time specified above.
- 2.3. All drawings and documents as per Vendor Data Requirement shall be supplied as specified.

3. SCOPE OF SUPPLY

Bidder's scope shall include:

- 3.1. Design, material, manufacture, testing, documentation, packing, dispatch and supply of PTs as specified

herein.

3.2. Furnishing all drawings and documents as per section 9, 'Vendor Data Requirements'.

3.3. Inspection and tests as per section 7.

3.4. Support structure is not in the scope of bidder.

4. STANDARDS

Requirements laid down in the latest revisions of the following Indian Standards and other relevant standards & regulations shall be strictly adhered to:

4.1. IEC 61869-1: Instrument transformers - Part 1: General requirements

4.2. IEC 61869-3: Instrument transformers - Part 3: Additional requirements for inductive voltage transformers

4.3. IS 4146: Application guide for Voltage Transformers

4.4. IS 3156 : Voltage Transformers specification

5. GENERAL BUSBARS REQUIREMENTS OF EHV INDUCTIVE VOLTAGE TRANSFORMERS

5.1. The Inductive Voltage Transformers (VT) shall be suitable for outdoor service (Electrically exposed).

5.2. The VTs shall be suitable for the environment and power system that specified in the data sheet.

5.3. The VTs shall comply with the data provided in the Data sheet.

5.4. Oil filling plug, drain plug and oil level indicators as per manufacture standards shall be provided.

5.5. VTs shall be provided with polarity markings adjacent to terminals both for primary and secondary as per IEC.

5.6. Primary Terminals shall be mounted on insulated Bushings

5.7. Porcelain (or equivalent) insulators shall conform to IS/IEC.

5.8. Pressure relief mechanism and expansion system shall be as per the manufacture standards.

5.9. Earthing terminals shall be provided as per IEC.

5.10. Lifting lugs shall be provided. Rating plate conforming to IEC shall be provided.

5.11. The secondary terminal box shall be equipped with a detachable, undrilled gland plate, which on installation can be drilled for cable entry. The secondary terminals shall be suitable for connecting 2.5 Sq.mm copper cables.

6. INSPECTION AND TESTS

- 6.1. Pre-dispatch inspection is required
- 6.2. Pre-dispatch inspection shall be witnessed by either FACT's representative or FACT approved third party.
- 6.3. Comprehensive Inspection and Testing Plan for VTs shall be submitted by the bidder including testing, inspection & witnessing required by the Purchaser. The Comprehensive Inspection and Testing Plan shall be approved by the Purchaser.
- 6.4. Type Test certificates from NABL accredited LAB shall be submitted along with technical Bid.
- 6.5. All routine tests are to be carried out at manufacturer's testing lab, in the presence of Purchaser for all seven units being supplied. The routine tests that are mandatory for EB (ratio error & phase error) shall be done at NABL accredited LAB only, for all seven units, in the presence of Purchaser.
- 6.6. Routine tests shall be as per IS/IEC.
- 6.7. Bidder shall bear the cost of all the tests. The cost incurred for inspection visit will be borne by the purchaser.
- 6.8. Bidder shall give 15 days advance intimation to Purchaser for inspection and witnessing of routine tests.

7. DATA SHEET

1	Service conditions	
1.1	Location	Udyogamandal, Cochin
1.2	Humidity Min.	64 %
1.3	Humidity Max.	93 %
1.4	Humidity Design	100 % at 40 Degree Celsius
1.5	Ambient Temperature °C - Min.	19.2
1.6	Ambient Temperature °C - Max.	34.3
1.7	Ambient Temperature °C - Design	40
1.8	Rainfall – Max. recorded in an hour	Data shall be collected from Purchaser, If required
1.9	Rainfall – Max. recorded in 24 hours	Data shall be collected from Purchaser, If required
1.10	Altitude	Data shall be collected from Purchase, If required
1.11	Environment	Tropical atmosphere + Corrosive Chemical Plant atmosphere
1.12	Indoor/Outdoor	Outdoor
2	Power System Details	
2.1	Voltage (kV) & Variation (± %)	110 + 10% to -12.5%
2.2	Frequency (Hz)	50, (Variations as permitted by CEA)
2.3	No. of phases	3
2.4	No. of wires	3
2.5	Fault Level (MVA)	6000
2.6	Method of neutral earthing	SOLID
3.0	Inductive Voltage Transformer	
3.1	Type/installation	Single Phase, Oil Impregnated, Hermetically Sealed, Outdoor, Inductive Voltage Transformer
3.2	Standards	IS / IEC
3.3	Highest System Voltage (Phase to Phase) (RMS)	123 kV
3.4	Normal System Voltage (Phase to Phase) (RMS)	110kV
3.5	Rated Frequency	50 Hz
3.6	Type of Insulation	Class A (Oil Impregnated Paper)
3.7	Rated System Voltage (Phase to Earth)(RMS)	110/√3 kV
3.8	No. of Cores	1
3.9	Rated Primary Voltage	110 kV/ √3
3.10	Rated Secondary Voltage	110 V/√3
3.11	Secondary Core – Accuracy Class	0.2
3.12	Secondary Core - Burden	50 VA
3.13	Rated Voltage Factor	1.2 Continuous , 1.5 for 30 Sec
3.16	System Earthin	Effectively Earthed Neutral System
3.17	One Minute Power Frequency Withstand Voltage on Primary (RMS)	230 kV
3.18	Lightning Impulse Withstand Voltage (Peak)	550 kV
3.19	One Minute Power Frequency Withstand Voltage on Secondary (RMS)	3kV

3.20	Total Creepage Distance	3075 mm (25 mm/KV)
3.21	Primary Terminal details	Copper, Vertical. To be supplied with suitable terminal connectors for ACSR.
3.22	Secondary Terminal Box	Lock and Sealable
3.23	Ingress Protection of Terminal Box	IP 54
3.24	Primary & Secondary Terminal Markings	As per Standards
3.25	Oil	Shall Comply with IS 335 & latest Amendments.
3.26	Material of Tank/Housing	Mild steel
3.27	Painting	As per Standards

8. VENDOR DATA REQUIREMENTS

Sl. No.	Description	With offer		After LOI/PO		Final	
		No. of copies	Date	No. of copies	Date	No. of copies	Date
1	Duly filled in Technical Particulars of EHV Outdoor Potential Transformer, as per Annexure I attached.	S	With tech bid				
2	Signed copy of Technical Procurement Specification (SPEC-FACT-UC-EHV-CT-VT-001)	S	With tech bid				
3	Dimensioned general arrangement drawing.	S	With tech bid	S	10 days from LOI	S	As per Clause 2.1
4	Type Test Certificates – Section 7	S	With tech bid				
5	Inspection and Testing Plan			S	10 days from LOI	S	As per Clause 2.1
6	Routine test certificates.					S/1P	Before Supply
7	Installation & Maintenance Manual					S/1P	Along with Supply
8	Duly filled and signed Compliance statement as per format attached. (Annexure IV)	S	With tech bid				
9	Unpriced copy of price bid.	S	With tech bid				

Notes:

- S : Soft copy P: Print Copy
- Vendor shall fill in proposed lead time if different from the required lead time.
- One hard copy of documents against Sl. No, 3 & 4 shall be submitted in a folder and folders shall be packed and dispatched with the equipment.

9. GUARANTEE

- 9.1. The vendor shall provide guarantee for the entire VT and accessories, for a period of 12 months from the date of commissioning or 18 months from date of dispatch, whichever is earlier.
- 9.2. Vendor shall be fully responsible for proper design, manufacture, testing, packing, dispatch and supply of complete system including all accessories.
- 9.3. Equipment and its components shall be guaranteed against faulty design, defective / improper materials poor workmanship or failure from normal use during the guarantee period. The guarantee shall also cover all bought-out items by the vendor, for the same period of one year mentioned.
- 9.4. Vendor shall have full defect liability during the guarantee period. It shall be obligatory on the part of vendor to modify and/ or replace any hardware completely at vendor's cost, in case any malfunction is revealed during the guarantee period.
- 9.5. Other guarantee terms shall be as stated in the Terms and Conditions governing the Purchase Order.

ANNEXURE I
TECHNICAL PARTICULARS (TO BE FILLED BY VENDOR)

1.0	Inductive Voltage Transformer	
1.1	Type/installation	
1.2	Manufacture's Name	
1.3	Standards	
1.4	Highest System Voltage (Phase to Phase) (RMS)	
1.5	Normal System Voltage (Phase to Phase) (RMS)	
1.6	Rated Frequency	
1.7	Type of Insulation	
1.8	Rated System Voltage (Phase to Earth)(RMS)	
1.9	No. of Cores	
1.10	Rated Primary Voltage	
1.11	Rated Secondary Voltage	
1.12	Secondary Core – Accuracy Class	
1.13	Secondary Core – Burden	
1.14	Rated Voltage Factor	
1.15	System Earthing	
1.16	Rated Short Time withstand Current (RMS) & Duration	
1.17	Rated Dynamic Current (Peak)	
1.18	One Minute Power Frequency Withstand Voltage on Primary (RMS)	
1.19	Lightning Impulse Withstand Voltage (Peak)	
1.20	One Minute Power Frequency Withstand Voltage on Secondary (RMS)	
1.21	Total Creepage Distance	
1.22	Primary Terminal orientation	
1.23	Primary terminal material	
1.24	Is secondary terminal box lockable and sealable?	
1.25	Ingress Protection of Terminal Box	
1.26	Primary & Secondary Terminal Markings	
1.27	Oil	
1.28	Material of Tank/Housing	
1.29	Painting	
1.30	Volume of Oil (Liters)	
1.31	Total Weight of Equipment (Kg)	
1.32	Mounting Details	

ANNEXURE II
PRICE BID FORMAT

Sl.	Item	Quantity	Unit Price (Rs)	Total Price (Rs)
1	110 / 123 kV, 50Hz, Single Phase, Oil Impregnated, Hermetically sealed, Outdoor Inductive Voltage Transformer complete with all other accessories as per the detailed specifications attached. (110/ $\sqrt{3}$ kV / 110/ $\sqrt{3}$ V, single core Sec. Windings)	7 Nos	*	*

NOTE :

- Vendor to supply quantities to meet requirements as per specification
- IMPORTANT : Vendor to complete all the columns for each item separately.

ANNEXURE III
COMPLIANCE STATEMENT

ENQUIRY No : _____

We state that our Quotation No.....is in full compliance with the documents issued against the Enquiry No: -----except for the deviations listed below.

LIST OF DEVIATIONS

Sl. No	Description	Reason for deviation

Name of Vendor:

We have read, understood and accepted the terms and conditions of the enquiry as given in the Technical procurement Specification, Instructions to Bidders, Annexures, Terms and Conditions for Purchase attached with the tender documents, except for the deviations distinctively listed above.

Date:

Name & Designation

Seal & Signature

