TRAVANCORE TITANIUM PRODUCTS LIMITED
Kochuveli, Thiruvananthapuram 695 021
e-mail: project@ttpltd.in

TENDER NOTICE

Sealed tenders are invited by Travancore Titanium Products Ltd., Kochuveli P.O, Thiruvananthapuram- 695 021 from competent Contractors for executing the following work.

Tender No: TTPL/PROJ/VFD/KV34/2024-25 **Date: 19.02.2025**

1.	Name of Work	Supply installation testing and commissioning of one unit of VFD for slurry tank agitator at TTPL
2.	Estimate Amount (PAC)	Rs.3.60Lakhs (excluding GST)
3.	Earnest Money Deposit (EMD)	Rs.9000 /-
4.	Cost of Tender Form	Rs.850 /- (inclusive of GST)
5.	Period of completion	Three months from the date of issue Work Order
6.	Tender documents	Can be downloaded from the website **www.travancoretitanium.com**
7	Last date and time of Receipt of Tender/Bids	**10/03/2025** upto 12.00 hrs
8.	Date and Time of Opening of Tender	**10/03/2025** at 14.00 hrs

The Tender Form can be had from the office of the undersigned between 10:00 a.m and 3.00 p.m on all working days on remitting the Tender Form cost of Rs.720/- plus GST@18% (Total: Rs.850 /-). Tender document can also be downloaded from our website www.travancoretitanium.com and shall submit the Tender along with DD against the Tender Form cost & EMD in favour of Travancore Titanium Products Limited payable at Thiruvananthapuram. The Tender shall be enclosed in an envelope, sealed and super scribed with **"Tender No.&Date, Due date and the Name of work.** The same shall then be forwarded to the **"Deputy General Manager (Project and S&E.), Project department Travancore Titanium Products Limited, Kochuveli P.O, Thiruvananthapuram, Kerala, Pin.695 021".**
For any technical clarification, please contact Mr. Firoz (9048505626).

Sealed Tenders will be received at our office on all working days and the due date of submitting the same is on **10/03/2025** up to **12.00 noon**. Tenders received after the due date & time will not be accepted. Fax/email offers also will not be accepted. The bids will be opened at **2.00 pm** on **10/03/2025** in the presence of the Tenderers present at that time.

For TRAVANCORE TITANIUM PRODUCTS LTD

Deputy General Manager (Project and S&E)

Signature of the Tenderer:

Tender No: TTPL/PROJ/VFD/KV34/2024-25 **Date: 19.02.2025**

Name of work*:* *"*Supply, installation, testing and commissioning of one unit of VFD for slurry tank agitator at CRP at TTPL"

1. **Pre-Qualification Criteria**:

   1) The bidder shall be authorized dealer/ system house of the Drive unit for which the quotation is being submitted [Certificate of the same as proof shall be submitted along with the offer.]
   2) The bidder should have experience in similar type of work for the last three years and the Bidder should have executed one similar nature of work of value not less than Rs. 2.9 Lakhs in single contract as prime Contractor. [Copy of work order and corresponding work completion certificates to be submitted].
   3) The bidder should submit signed copies of financial statements and income tax returns for the preceding last three years ending 2023-24.

2. **Scope works** : Detailed scope of works and Technical Requirements are enclosed as **Annexure**

GENERAL TERMS & CONDITIONS:-

3. **Price to be quoted:** The basic rates (including transportation, loading, unloading etc.,) should be quoted only in the Proforma enclosed (Page No.6). The bidder shall quote the basic rate per unit as per the rate schedule mentioned in Proforma. GST will be paid separately in addition to the basic price at the prevailing rate. The quoted rate of Contractor must be firm and shall be inclusive of cost of transportation of material to the site.

4. The rates quoted by the Contractor shall be firm throughout the Contract period and there shall be no upward revision of the rates quoted by the Contractor for any reasons what so ever. It should be clearly understood that any claims for extra Goods and Service Tax, or any Additional tax, etc., shall not be entertained in any case whatsoever once the tenders are opened.

5. **Completion Period:** The supply of all items shall be done within **90** days from the date of issue of order. The execution shall be done within 10 Days after getting clearance from TTPL.

6. The contractor shall produce all necessary documents from the Goods and Service tax department.

7. The tenderer should remit the Earnest Money Deposit (EMD) mentioned in this document in cash/DD and proof of thereof should be enclosed along with the tender. Other mode of remittance will not be accepted. Exemption in Tender Form Cost and EMD is as per Govt. rules.

Signature of the Tenderer:

8. **Security Deposit:** Within five days of award of contract, the successful tenderer shall deposit a sum equivalent to 5% of total contract value towards Security Deposit. This shall be paid in the form of Demand Draft in favour of Travancore Titanium Products Limited payable at Thiruvananthapuram from a Nationalized/ Scheduled Bank. The Security Deposit shall be returned after satisfactory completion and acceptance of all works included in this tender unless the same is forfeited by the company for any breach or towards any amount due to the company. On default of the tenderer to remit the Security Deposit, the EMD withstand forfeited and if any loss or damage is sustained by the company in this regard, the same will also be recovered from him.

9. **Payment Terms**: The terms of payment will be:

   i. Advance Payment: 20% of the contract price as advance, if required shall be paid on submission of bank guarantee for an amount equal to 100% of the advance amount from a nationalized bank.
   ii. On taking over: 70 % of the contract amount shall be paid on completion of testing, trial run and handing over the system, subject to clause on penalty for late delivery.
   iii. On Final Acceptance: 10 % of the contract amount shall be paid on satisfactory commissioning of all the work included in the scope of the contract and issue of the final completion certificate against a performance bank guarantee of an equal amount for 12 months from date of acceptance and final completion of the entire supplies & installation work under contract and further.

   All the payments are made, after deducting there from income tax and other amounts as may be deductible or recoverable in terms of the contract or the laws in force.
   All statutory deductions at the rates applicable shall be made from the amount eligible to the Contractor in each part bill at current rates. Any tax omitted to be deducted in any part bill shall be deducted in the subsequent bills/final bill or from any amount due to the Contractor.

10. **Safety Regulations:** The contractor should adhere to all safety rules and regulations specified by the Safety Department of the Company. The Company is not responsible for any accident occurs during the execution of work.

11. **Liquidated Damages:** Three Months from the date of issue of work order will be considered as the period of completion. The successful tenderer shall be bound to carry out the work within completion period. If the Contractor fails to complete the work within the period of completion Contractor shall pay or allow the Client to deduct the sum equivalent to 0.5% of the contract value per week or part thereof of delay subject to a maximum of 10% of contract value as liquidated and ascertained damages for the period from the date of stipulated completion or such extended time as the case may be during which the work shall remain unfinished.

12. Company reserves the right to accept/reject any of the tender after evaluation with or without assigning reason no matter whether a Tenderer has quoted the lowest rate. All questions/ disputes arising out or in connection with this shall be decided by the Managing Director of the Company and his decision thereof shall be final and binding to all tenderers.

Signature of the Tenderer:

13. Defect liability period : Guarantee & Furnishing of Document

The vendor shall assure 12 months guarantee from the date of completion of the work. If the drive supplied by the vendor fails at site due to manufacturing defects, during erection, commissioning or service (within guarantee period), the vendor shall repair and put back into successful operation at no extra cost to TTP and the guarantee period shall be suitably extended.

All Test Certificates, operation and maintenance manuals, drawings & soft copy shall be furnished along with item/equipment.

14. Contractor shall submit all the relevant documents, operation manuals, certificates and testing reports which are part of this contract.

15. Settlement of disputes: All disputes and questions, claim rights, matters or things whatsoever in any way arising out of or relating to the calling of bids, evaluation of offers, award of contract, change in structure of bids or any other matter relating to the finalization of contract are to be referred to the sole Arbitrator to be appointed by the Managing Director of TTPL as per provisions of Arbitration and Conciliation Act 1996 (Act 26 of 96) and court at Thiruvananthapuram alone will have Jurisdiction to deal with all or any matters arising out of from or in relation to the contract.

16. Jurisdiction: Any dispute or questions relating to or arising out of the finalization of this tender, if remains, shall be subject to the executive jurisdiction of the courts at Thiruvananthapuram. All statutory deductions will be made from the contractor's bill as per rules.

For TRAVANCORE TITANIUM PRODUCTS LTD

Dy. General Manager (Project and S&E)

Signature of the Tenderer:

PARTICULARS OF THE TENDERER

Name of the Bidder:

1. (a) Registered office address of the Bidder:

   (b) Address for correspondence:

2. Mobile Nos.:
3. E-mail address:
4. Status of the tenderer (Individual, Prop. firm, Partnership, Ltd. Company,
5. Registration No.:
6. Year of establishment:
7. Permanent Account No. (PAN issued by Income Tax Dept.):
8. GST Registration No.
9. ESI Registration No.

Declaration

We confirm that we have read and understood all tender conditions and we accept all tender conditions in its entirety.

Date:

Signature:

Tenderer's Name and address with seal:

Signature of the Tenderer:

PROFORMA

Sl. No.	Item description	**Quantity**	Unit	**Price/unit**	Total
1	**Supply of VFD & its panel with all accessories as per given specifications**	1	No		
2	**Installation, Testing, programming and commissioning of the whole system**	**1**	Lump sum		

* GST will be paid separately in addition to the basic price at the prevailing rate

Tender cost remittance details:

EMD remittance details:

Name & Signature of the Tenderer:

Signature of the Tenderer:

ANNEXURE

Scope of Works & Technical Requirements

1. Scope of Works

1.1 The vender shall do supply, installation, testing and commissioning of 45 kW heavy duty drive of at least 90A rating.

1.2 The contractor shall design , supply, erection, testing and commissioning of VFD (45 kW heavy duty with both control unit & Basic Operation Panel) and its control panel to operate 45kW (60HP), 1440 rpm (4 pole) induction motor.

1.3 The motor is located at around 70 meters from the VFD panel , all inherent protection such as input /output chocks of defined capacity shall be provided

1.4 The drive shall be capable of driving the motor at different specified fixed speeds and shall deliver the motor power and torque for the complete speed – torque characteristics of the load .Range of operating speed required is in between 350 rpm to 1450 rpm. Inherent cooling system shall be provided in the motor to cool down the same during low RPM.

1.5 VFD shall inherently protect motor from high voltage stress, independent of cable length to motor. Input & Output filter shall be an integral part of the VFD system and shall be housed inside the VFD panel. The detailed specification of drive unit is attached as Annexure l.

1.6 The contractor shall supply of dedicated basic energy meter of reputed make to measure the energy consumption of the whole unit including power consumed by VFD. Also one RPM meter shall also be incorporated in the panel to display the motor speed.

2. Technical Requirements

Detailed VFD specification

1. General requirement

a) The equipment shall comply with the requirement of latest revision of codes and standards listed under **part –II** of this specification.

b) The AC drive shall be designed to operate under site condition as specified in this specification. De-rating if any required for service in ambient condition shall be clearly specified.

c) Input voltage; 415Volts, 3 phase, 50Hz with a voltage variation of +10% on voltage and + 5% on frequency

d) Ambient temperature with rated output shall be: 50 deg. Celsius

e) The device shall be designed with sufficient current available at starting to meet the starting torque requirement consistent with acceleration time permitted within thermal withstand characteristics of motor

f) The drives shall be suitable for a 3 phase 3 wire supply system. Hence bidder shall provide for a control transformer of suitable rating

2. Basic Features

The drive shall be energy efficient, provide very high reliability, high power factor, low harmonic distortion, wear and noise.

The drive shall be designed to deliver the motor power and torque for the complete speed – torque characteristics of the load. It shall be capable of withstanding the thermal and dynamic stress resulting from short circuit.

The controller output overload capacity shall be 150 % of rated current of motor for one minute. If the motor load exceeds the limit, the drive shall automatically reduce the frequency and voltage to the motor so as to guard against overload.

Fault diagnostic feature shall be built into the system to supervise the operation and failure of the system.

All necessary control gear for switching should be provided inside the panel in wired condition

3. Equipment Specification

a. Power Converter

Normally for all output short circuits, the inverter shall interrupt the current before any semi conductor fuse blows.

All the power transistors, thyristors and diodes shall be protected with high speed semiconductor grade fuses.

The rating of the converter's semi- conductor components shall not be less than 120% of the nominal current flowing through the element at full load of the VFD throughout the complete speed range.

The power converter circuit shall be designed so that motor can be powered at its full nameplate rating continuously without exceeding its rated temperature rise due to harmonic current generated by the inverter operation.

The cooling system of the electronic components, if provided, shall be monitored and alarm shall be generated before occurrence of any consequential damage to the power control devices.

b. Harmonics

Harmonics at the supply side of the drive shall be restricted to the maximum allowable levels of current and voltage distortion as per recommendation of the latest IEEE-519 .The values of percentage voltage and current harmonics at the input point of drive as the point of common coupling shall be furnished.

c. DC link / AC line Reactor / Output filter

Smoothing reactors for the DC link shall be designed for sufficiently decoupling the rectifier and the inverter portion of the converter and to limit fault currents in this circuit. AC line reactors shall be provided and the same shall be suitable for harmonic suppression and fault current limitation.

The reactor shall be dry type, air cooled, and located within the panel.

VARIABLE FREQUENCY DRIVE PART – II			
General	01	Make of VFD	ABB / SIEMENS /Fuji/ equivalant
	02	Application	Slurry Tank Agitator
	03	Motor	3 phase induction motor
	04	Rating	45 KW (atleast 90A rating) Heavy Duty with both control unit & basic operation panel
	05	Design ambient temp	50 deg C
	06	De-rating required for the design ambient temp.	Shall be complied
	07	Panel location	Indoor
	08	All PCB Control card protection	Shall have Conformal coating, 3C2 original from the manufacturer, Also its certificate shall be submitted
Codes and standards	09	Semiconductor converters	IEC-146- 1,4,5,6 with the latest amendment
	10	General requirement of switchgear and control gear	IS 4237 and IS 13947 with the latest amendment
	11	Electromagnetic compatibility	IEC 61000-4-7 with the latest amendment
	12	Harmonics	IEEE 519, with the latest amendment
Input data	13	Voltage and variation	415 Volts, 3 phase +/- 10%
	14	Frequency and variation	50 Hz +/- 5 %
	15	Power factor at full load	Min 0.85 at full load
	16	THD (Current) fed back to source	As per IEEE limits
	17	Input/Output side choke to reduce	Required

		harmonics	
	18	Type of isolating device in VFD panel	MCCB
Inverter data	19	Type of Inverter	Voltage Source inverter, Sine wave PWM
	20	Control performance	V/F or Space vector control
	21	Devices used for construction	IGBT (Third generation)
	22	Overload capacity	150 % for 1 minute
Control characteristics	23	Slip compensation	Required
	24	Switching frequency (2 -16 KHz)	*
	25	Frequency accuracy (min 0.1 Hz)	*
	26	Starting torque	Min 200 % of the rated value
	27	Jump frequency	Required
	28	Torque boost	Required
Protection	29	Thermal overload and short circuit protection	Required
	30	Over and under voltage	Required
	31	Single phasing/ unbalance /stall	Required
	32	Cooling system failure	Required
	33	DC link over voltage	Required
	34	VFD module internal failure	Required
	35	Incoming line surge protection	Required
Metering and diagnostics	36	Remote HMI panel mounted	Required
	37	Display and diagnostics including KW,PF, Amp, Volt, RPM, elapsed KWh	Required (With Modbus RTU RS-485 communication)
	38	Indicating lamps (LED) for Run, Stop, fault, mains on,	Required
Control	39	Speed Set from panel,	• Shall have a rotary switch with four selector points to run the motor at 3 different fixed speeds points and one variable speed point. Also have provision to lock/unlock this rotary switch. • Two push buttons are required to increase and decrease speed of the motor when the selector switch is positioned to 4^{Th} position (variable speed point) • Shall have provision to programme the motor speed at any desired speed with in the speed limit of the motor whenever required. • Potentiometer with suitable rating shall be provided to increase and

			decrease the speed of motor whenever required by selecting selector switch to a particular point
	40	Digital input	Two (Min)
	41	Digital output, Relay	Two(Min)
	42	Analog output 4-20 mA	One(min)
Cabinet	43	Type	Floor mounted type with hinged doors
		Make	Rittal/ Siemens/ Elsteel
	44	Degree of protection	IP 56
	45	Cable entry	Bottom with removable undrilled gland plates
	46	Sheet steel material CRCA	Two mm Thick
	47	Local ON /OFF pushbuttons & fault reset button	Required
	48	Provision for remote ON / OFF	Required
	49	Busbar	Copper
	50	Bus bar Size	*
	51	AC power switch socket inside panel	Required
	52	Overall dimensions	*
	53	Panel Cooling	* (Provide min two no of cooling fans)
Make of Misc	56	Push Buttons , SFU/MCCB	Siemens Make
	57	Contactors	Siemens Make
	58	Terminal blocks	Phoenix / Wago Make
Documents	59	Schematic, and wiring diagram	Required – 5 sets
	60	Literature and catalog of all components	Required – 1 No
	61	Operation and maintenance manual	Required – 1 No
	62	Test certificates	Required – 1 No
	63	Inspection test procedure	*
Site tests	64	Functional tests	*
	65	Load test with actual load	*
	66	Harmonic measurement THD V & I	*
	67	Current limit / over current test	*

Note
For items marked (*), data to be furnished / confirmed by vendor.