



राष्ट्रीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, भुवनेश्वर
(परमाणु उर्जा विभाग, भारत सरकार का एक स्वयं शासित संस्थान)
NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, BHUBANESWAR
(AN AUTONOMOUS INSTITUTE UNDER DEPT. OF ATOMIC ENERGY, GOVT. OF INDIA)

Notice Inviting E-Tender No.: NC-000406-RIN4001-CLF-21-22

INTEGRATED TURBOMOLECULAR PUMPING STATION



**NATIONAL INSTITUTE OF SCIENCE EDUCATION & RESEARCH
JATNI CAMPUS, P.O. – BHIMPUR-PADANPUR, VIA-JATNI
KHURDA – 752050, ODISHA, INDIA**

Notice Inviting E-Tender

For

INTEGRATED TURBOMOLECULAR PUMPING STATION

E- Tenders are invited on behalf of the Director, National Institute of Science Education and Research, Jatni from the manufacturers(Indian or Foreign) and their authorised reseller/Indian agent only for supply & installation of the following items:-

<i>Sl. No.</i>	<i>Name of the Items</i>	<i>Tender No.</i>	<i>Name of Department</i>	<i>Qty. Sets.</i>	<i>Tender Fee in INR</i>
1.	INTEGRATED TURBOMOLECULAR PUMPING STATION (Specification as mentioned in the technical bid)	NC-000406- RIN4001-CLF- 21-22	SPS	As per technical bid	NIL

<i>Sl. No.</i>	<i>Name of the Items</i>	<i>Tender No.</i>	<i>Name of Department</i>	<i>Qty. Sets.</i>	<i>EMD in INR</i>
1.	INTEGRATED TURBOMOLECULAR PUMPING STATION (Specification as mentioned in the technical bid)	NC-000406- RIN4001-CLF- 21-22	SPS	As per technical bid	NIL against Bid Security Declaration as attached

NOTE: Within ten (10) days of the award of contract, the vendor shall furnish a Performance Bank Guarantee amounting to 3% of the purchase order value in the form of Bank Guarantee in favour of “The Director, National Institute of Science Education & Research”, Jatni valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. BG should be from any Nationalised/ Scheduled bank in India.

- Tender Enquiry No : NC-000406-RIN4001-CLF-21-22
- Last date of submission of E-bid : 18/10/2021 up to 11.00 A.M
- Opening of Technical Bid : 22/10/2021 at 11.00 A.M

The details of general tender terms & conditions can be downloaded from <https://eprocure.gov.in/epublish/app> or Tender Free View Link from NISER Website <https://www.niser.ac.in/content/tender>.

FIC (Stores & Purchase)

Bid Security Declaration

(in Company's letter head)

Invitation to Bid/Request for Expression of Interest No. [Insert reference no.]

To

National Institute of Science Education & Research, Bhubaneswar

Post-Bhimpur-Padanpur,

Via- Jatni,

District- Khurda, India

PIN-752050.

I/We understand that, according to your NIT conditions, bids must be supported by a Bid Security. In lieu of the Bid Security, we submit the following undertaking: -

“I/We declare that we will be suspended/ disqualified for tendering with the entity for a period of 1 (One) year from the date of receipt of notice from you, if we withdraw or modify our bid during the validity period **OR** fail to sign the Contract **OR** fail to submit Performance Security (if applicable) before the defined deadline **OR** fail to execute contractual obligation within the stipulated time.”

Date: -

Place: -

Signature of the Bidder

(with Company seal)



**TECHNICAL BID
SUPPLY AND INSTALLATION
OF
INTEGRATED TURBOMOLECULAR PUMPING STATION
FOR
NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, JATNI
Notice Inviting E-Tender No. NC-000406-RIN4001-CLF-21-22**

Vendor Name				
SL. No.	Item Specification	Quantity (In Nos.)	Accepted/Not Accepted (Kindly Mention)	Please specify if any deviation

INTEGRATED TURBO MOLECULAR PUMPING STATION:

consists of the following items

1. Turbo Molecular Pumping System along with accessories for connecting to probe station
2. Rotary Vane along with accessories for connecting to the Chamber:

Item 1. Turbo Molecular Pumping System along with accessories for connecting to probe station
The mobile turbo molecular pumping system with modular design comprising of turbo molecular pump & its drive unit, dry scroll backing pump, and full range vacuum gauge head compatible to display control unit of Turbo Pump shall be fully assembled and mounted on a mobile trolley with caster wheels with locking arrangement. The backing pump will be fixed on vibration isolated intermediate frame. The complete operation of the turbo pumping system (Turbo Molecular Pump & Backing Pump) can be controlled from the Display Control Unit of the Turbo Pumping System. The display unit has the provision to display the pressure reading from a Pirani/Cold Cathode Full Range Vacuum Gauge connected to it through a sensor cable.

1

1 Set

Turbo molecular Pump with Controller:

Inlet flange:: 40 ISO-KF

Inlet pumping speed of Nitrogen:: 35 liter/sec

Compression ratio of Nitrogen: > 1x10¹¹

Gas throughput at full rotation speed of Air: > 1 mbar l/s

Cooling of turbo pump: Air cooling

continuous backing pressure: > 17 mbar

Normal rotation speed: 90,000 rpm or higher.

Ultimate vacuum: < 1 x10⁻⁷ mbar (with 40 ISO-KF flange) or better

Bearing Mechanism: Dry permanent magnetic

bearing at high vacuum side; Oil lubricated ceramic bearing at other side

Turbo controller: Suitable controller to power the turbo pump

Safety features: Stop rotation when the turbo is over heated

Power: single phase AC 220 V 50 Hz

Rotation Speed of TMP variable by Controller: 50 – 100%

Protection Category: Protection Against water spillage i.e. IP 54 or better

Control unit should display: Rotation speed, Current drawn by the pump, Temperature of Motor, Bearing, Electronics, Rotor and Bottom part of Turbo Pump etc.

Accessories:

These accessories are included in the Turbo Pump : Mesh (for DN 40 ISO-KF Inlet Flange) , Air Cooling Kit , Automatic Venting Valve , Any other extra accessories

Dry Scroll backing pump:

Pump Type : Dry Scroll Vacuum Pump

Inlet Flange: DN 25 ISO-KF

Outlet Flange: DN 25 ISO-KF

Pumping speed: 6 m³/h or higher

Final pressure without gas ballast : 2×10^{-2} mbar

Final pressure with gas ballast level 1 : 7×10^{-2} mbar

Final pressure with gas ballast level 2: 4×10^{-1} mbar

Gas ballast flow stage 1 : 11 liter/min

Gas ballast flow stage 2 : 16 liter /min

Leak Integrity : 5×10^{-6} mbarl/s

Inbuilt Check valve / Non return valve. : In the event of Power failure, the valve should be closed to prevent the Airinrush into the vacuum system.

Inlet Pressure, max: 1,100 mbar or better

Continuous Inlet Pressure, max : 200 mbar

Exhaust pressure, max : 1,000 mbar or better

Sound Level(w/o gas ballast): ≤ 48 dB(A) or better

Standby Mode with variable speed : 1000 – 2500 rpm

Integrated Pressure measurement : Should have Provision to integrate a gauge in the Scroll Pump and control by the integrated electronic drive unit of Scroll pump

Interface: RS 485

Operating Temperature : $5 - 40$ °C

Cooling Method: Air Cooling

Power: Single phase AC 220 V 50 Hz

Weight: < 27 kgs

Integration and Ease of Operation with above mentioned Turbo Pump:: It should be possible to operate the scroll backing pump by single button operation from the Turbo Pump Controller for ON/OFF and speed control of scroll backing pump in remote mode of operation. It should be possible to operate the scroll pump from built-in push button switch independent of the Turbo Pump in local mode (ON/OFF and Stand by Button).

Vacuum Gauge: Pirani & Cold cathode Full Range Combination Gauge:

Vacuum connector: - 25 ISO-KF

Pressure range: - 1000 mbar to 5×10^{-9} mbar

Accuracy: 30% (10-8 mbar to 100 mbar)

Bake out temperature:- 150 0C (Electronics removed)

Pressure max:- 10 bar

Corrosive resistant Gauge

Switching over different pressure range should be seamless and continuous

Sensor cable length 3 meter included

Manual Right angle Valve:

Inlet/Outlet: ISO 25 KF-NW

Actuation Manual

Leak Rate: Body, Seat < 1 x10-9 mbar-l/s

Operating Pressure: 1 x10-8 mbar to Atmospheric Pressure

Body Material: Aluminium

Seal : FPM

Cycles until first service: > 2 million cycles

Max Differential pressure: 1 bar in either direction

Other accessories for assembling to the Probe station:

Manual Right angle Valve

Inlet/Outlet: ISO 25 KF-NW

Actuation Manual

Leak Rate: Body, Seat: < 1 x10-9 mbar-l/s

Actuation : Manual

Operating Pressure: 1 x10 -8 mbar to Atmospheric Pressure

Body Material : Aluminium

Seal FPM : Cycles until first service: > 2 million cycles

Max Differential pressure: 1 bar in either

direction

Accessories for integration of Turbo Pumping System:

1. Conical Reducer DN 40 / 25 ISO-KF
Stainless Steel 304/1.4301 :1
Number
2. Corrugated Hose, DN 25 ISO-KF
Stainless steel, flexible, length 750
mm :1 Number
3. Tee DN 25 ISO KF Stainless Steel
304/1.4301: 1 Number
4. Clamping Ring, 40 ISO-KF : 1
Number
5. Centering Ring, 40 ISO-KF Stainless
Steel 304/1.4301, O-Ring FKM: 1
Number`
6. Clamping Ring, 25 ISO-KF- 4
Numbers
7. Centering Ring, 25 ISO-KF Stainless
Steel 304/1.4301, O-Ring FKM- 4
Numbers
8. Conical Reducer DN 25 / 16 ISO-KF
Stainless Steel 304/1.4301 - 1
Number
9. Clamping Ring, 16 ISO-KF- 1
Number
10. . Centering Ring, 16 ISO-KF
Stainless Steel 304/1.4301, O-Ring
FKM -1 Number
11. Tee DN 25 ISO KF Stainless Steel
304/1.4301- 1 Number
12. Corrugated Hose, DN 25 ISO-KF
Stainless steel, flexible, length 750
mm - 1 Number
13. Clamping Ring, 25 ISO-KF -2
Numbers
14. Centering Ring, 25 ISO-KF Stainless
Steel 304/1.4301, O-Ring FKM -2
Numbers

Item 2: Rotary Vane along with accessories for connecting to the Chamber:

- A. Rotary Vane Vacuum Pump - 1
Number

Salient Features:

- 1• No oil mist pollution at the exhaust: the natural lubrication design offers the lowest

oil mist level, even with high throughputs or frequent cycling between atmosphere and ultimate pressure.

- Compact design: reduced dimensions, choice of horizontal or vertical inlet and exhaust ports,
- Optimized tightness: integrated anti-suck back; all static sealings secured by O-rings; external shaft seal can be renewed easily, without dismantling the pump.
- Universal single-phase motor
- Completely field serviceable
- Quiet operation < 50 dB(A) for minimal environmental impact

2. Pumping speed (50 Hz) -12 m³ /h or higher
3. Inlet and Outlet Flange - 25 ISO-KF
4. Ultimate pressure without Gas ballast - 2×10^{-3} mbar
5. Ultimate pressure with gas ballast- 1×10^{-2} mbar
6. Ultimate Partial Pressure - 5×10^{-4} mbar
7. Water vapor capacity- 110 gram/hr or better
8. Water vapor pressure- 12 mbar or higher
9. Integrated with high speed hydraulically controlled high vacuum safety valve.

ACCESSORIES & SPARES:

1. Portable Digital Vacuum Gauge with appropriate connectors to monitor the pressure from
2. Spare Rotary vane pump Oil - For 2 fills
3. Oil Mist Filter for Exhaust Port- 1 No.
4. flexible Corrugated Stainless steel bellow, DN 25 ISO-KF, length 1000 mm - 1 No.
5. Aluminum Clamp DN 25 ISO-KF - 4 No.

6. Stainless steel Centering ring with Viton O-ring -4 No.

Vacuum Isolation Valve:

7. Type - Ball valve

8. Inlet/Outlet: ISO 25 KF-NW

9. Flange, material- Stainless steel 1.4301

10. Actuation – Manual

11. Actuator - 90° rotation of hand lever

12. Pressure range - 1×10^{-5} mbar to 500 mbar over pressure

13. Leak Rate: Body, Seat : $< 1 \times 10^{-6}$ mbar-l/s

14. Seal :PTFE (glass fiber reinforced)

15. Service life : 20000 cycles

16. Temperature range: -20-80 °C

Vacuum Gauge and connectors:

Portable total pressure Pirani gauge with all controllers and accessories to monitor pressure from $5E-4$ to 1000 mbar - 1 No

Tee, DN 25 ISO-KF Stainless Steel 304/1.4301, length 100 mm - 1 No

Tee, DN 25 ISO-KF Aluminum EN AW-6082 /3.2315, length 100 mm - 1 No

Clamping Ring, DN 20 / 25 ISO-KF Aluminum ADC 12, for Elastomer Seal - 4 No

Centering Ring, DN 25 ISOKF Stainless steel 304/1.4301, O-Ring FKM - 4 No

OPTIONAL ACCESSORIES & SPARES:

Spare Rotary vane pump Oil - 10 Liter

Additional requirements:

- All the items should be provided by a single vendor
- Service and support should be

	<p>provided by local engineers placed in India, for complete repair of turbo pump (rotor and stator replacement of turbo pump, bearing replacement, motor replacement of turbo pump), dry scroll pump (tip seal replacement, bearing replacement, replacement of motor) pump and gauge (Complete Cleaning & Repair) and rotary vane pump at NISER Bhubaneswar</p> <ul style="list-style-type: none"> • The vendor should have provided similar pumping stations at 5 or more government organization and the user report should be provide if asked for. • Appropriate certification of the pumping system and its components should be provided which should be consistent with international standards. • The vendor is responsible for complete installing and commissioning of the pumping system at NISER. • The pumping system should be placed on a trolley for improved mobility. This completely assembled trolley with pumping system should be provided by the vendor. • Detailed training for operation of the pumping system should be provided to atleast 2 users at NISER. 		
2	<p>Above items should carry 1 year or more free comprehensive warranty from the date of installation. In case the tenderer provides warranty less than 01 year then he has to give justification for lesser period of warranty. Without justification his tender is liable to be rejected.</p>		

Contact for information: (Only E-mail enquiries will be entertained)

For Technical Information:-

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