

Vacuum Pumps for Attosecond Beam line at IISER Mohali

Quotations are invited in a two-bid system for vacuum systems for attosecond beam-line at IISER Mohali. Note that technical and financial bids should be in separate envelopes. The vacuum system should have three low-maintenance Turbomolecular pumps (TMP) and a common oil-free backing pump with all the accessories that includes pressure gauges, connectors, flanges as detailed below. There should be an option to connect TMP directly on the chamber as well as via bellows. The detailed specifications are listed below.

Technical and financial quotes should be in separate sealed envelopes.

A. Turbomolecular pump: Three pumps (260l/s, 685l/s and 1200l/s)

1. Three independent TMP with Pumping speeds close to the values below

- (i) 260 liter/sec for nitrogen.
- (ii) 680 liter/sec
- (iii) 1200 liter/sec. This TMP may or may not be magnetically levitated.

Please quote separate prices for each TMPs with different speeds.

- 2. Flanges:** should be based on standard CF technology.
- 3. Run up time:** 2min or less
- 4. Mounting option:** Any
- 5. Connecting option:** It should be possible to connect all TMPs via bellows to the desired experimental chamber. Please also provide appropriate bellows and connectors.
- 6. Driving electronics:** Should be integrated with the entire system. Appropriate ports and automatic venting valves should be provided.
- 7. Splinter shield:** The TMP should be equipped with a splinter shield with the appropriate CF Flange.
- 8. Seals:** Minimum 10 copper seals (CF 150) should be provided for each TMB (total 30).
- 9. Cooling:** The TMP should be cooled by air. Appropriate cooling mechanism (Fan etc.) should be provided. If water cooling is required for larger capacity then the entire cooling setup should be provided.
- 10. Protection:** Standard protection mechanism for protecting the turbo against any adverse conditions (for example, over-pressure, over-heating etc.) should be integrated.
- 11. Additional:** The turbo pump has to be oil free with or without magnetically levitated bearings.
- 12. Please specify the noise level of Turbo pumps.** It should be lowest possible.

B. Backing pumps (oil-free):

One common backing pumps should be offered that can be properly integrated with the three TMP mentioned above with appropriate flanges and metal (preferably stainless steel) hoses. Additional valves should be provided to block each turbo-pump. Both backing pumps should be oil-free pump has to be either a two-stage roots pump or a scroll pump with three years lifetime for the tips or seal changing.

1. Pumping speeds: A common oil-free pumps with capacities:

- i) **37 m³/Hour**

It should be appropriate for backing the above mentioned three TMPs for full efficiency. There should be a provision to keep these backing pumps more than 4 meters from TMB to avoid any vibrations.

- ii) **Flanges:** Should be appropriate for and compatible with the supplied TMPs.
- iii) **Filters:** The pump should be integrated with activated carbon filter and other safety arrangements.
- iv) Should not have any oil or grease of any kind in the pumping module
- v) **Period before first service:** 22000 Hrs
- vi) The pump should be integrated with HV safety valve.

C. Vacuum gauge:

Three vacuum gauges should be provided. The details are described below.

1. **Rough to UHV pressure monitoring:** A single gauge capable of measuring pressure in the full range between 1atm to 5×10^{-8} mbar should be provided. This should have both Pirani and Cold-cathode pressure gauges. The gauges should be insensitive to air-ingress and should be corrosion resistance. This needs to be integrated with the full pumping system with appropriate ports. All the required accessories and connectors for installing this should be provided.
2. **Gauge controller:** A controller for the above gauge should be provided that should display pressure in the entire pressure range. It should be integrable with TMPs. The controller should be able to automatically change over from the roughing gauge (pirani) to the chamber gauge (cold cathode). The controller should have separate displays for the two different gauges and should also have a fast display rate. The controller should be interfaceable through RS-232.

All the above-mentioned items should be integrated as a single pumping assembly with pressure monitor and gauge controller. Appropriate hoses, connectors, adapters, seals and gaskets should be installed. Extra pieces of the clamps and center rings used for the assembly should be provided (at least 5 for each except for the CF 150 flange). 10 extra copper seals for each size should also be provided.

Important points:

1. In case of breakdown, the vendor should be able to offer complete repair of Turbo at our site. The vendor should have service centre and required infrastructure in India.
2. The input power requirement of the system should be 215 V_{ac} at 50 Hz and single phase.
3. The entire system should be assembled by the vendor and the performance for the same should be demonstrated at IISER Mohali.
4. The vendor must specify after sales services and support for any trouble shooting. Please specify how fast the service can be provided.
5. Vendor should specify how many systems they have sold in India.