

**SECTION - C****TECHNICAL SPECIFICATIONS OF STORES AND DRAWINGS.****Technical Specifications for Supply, Installation & Commissioning and Final Acceptance Tests of Complete Turbo-Molecular Pump, Electronic Drive / Control Unit and UHV Compatible Electro-Pneumatically Operated Gate Valve****Technical specification of Turbo Molecular Pump (TMP)**

<b>s.n</b>	<b>Specifications</b>	<b>IPR Requirements</b>	<b>Offered Technical Specification</b>
<b>1</b>	Size of gas intake port/ flange of the TMP	DN 200 ISO CF or Nearest standard size as per vendor	
<b>2</b>	Required pumping Speed (Nitrogen)	~1100 l/s	
<b>3</b>	Required Pumping Speed (Helium)	~1200 l/s	
<b>4</b>	Ultimate vacuum with baking	~1.0 X 10 <sup>-8</sup> mbar	
<b>5</b>	Mounting Orientation	Vertical/ Horizontal installation should be possible	
<b>6.</b>	Main Bearing Type	Magnetic Bearing	
<b>7</b>	Cooling	water cooled	
<b>8</b>	Baking Temp	100° C ( This value is for body temperature of TMP and temperature at pumping port)	
<b>9</b>	Sound level	~50 dB (at a distance of 1 m from TMP Unit)	
<b>10</b>	Splinter Shield	To be provided by vendor	
<b>11</b>	Heating Jacket	To be provided by vendor	
<b>12</b>	Suitable Backing pump	suitable baking pump should be provided by vendor	
<b>13</b>	Gate Valve	Suitable bellow sealed gate valve of size DN200, ISO CF, electro-pneumatically actuated, should be provided by vendor (As per specification, included in this document)	

**Electronic Drive / Control unit**

<b>S.</b>	<b>Specifications</b>	<b>Requirements</b>	<b>Offered Technical Specification</b>
<b>1</b>	Control unit	Display and Control unit suitable for above pump (Optional: provision of port for interfacing with external PLC should be included and for this if price is different, its price should be separately quoted)	
<b>2</b>	Available electrical power at IPR	440 V ± 10%, 50 Hz ± 5Hz , 3 phase and 230 V ± 10%, 50 Hz ± 5Hz , single phase.	
<b>3</b>	Interlock provision for failure of backing Pump and venting valve of	To be provided by Vendor	

	the pumping Unit		
4	Control logic for automatic Gate valve Opening & Closing linked with speed of TMP and vacuum level in the application	To be provided by Vendor	
5.	Required connecting power supply cables	~3 m (to be provided by vendor)	

**Specification for UHV compatible, electro-pneumatically operated gate valve**

Sr. No.	Specifications	Requirements	Offered Technical Specification
1.	Size of Flange	DN 200 ISO CF	
2.	Orientation	Any	
3.	Actuator	Pneumatic double acting cylinder	
4.	Shaft Sealing	Bellow shaft seal	
5.	Material of main parts	(a) Valve body and moving mechanism :SS304 (b) Bellow: 304L (c) Gate Plate: Aluminium alloy or suitable Stainless Steel	
6.	Sealing material	(a) Bonnet: Metal (b) Gate: Viton	
7.	Helium leak tightness	(a) Body: $\leq 1 \times 10^{-10}$ mbar l/sec (b) Valve Seat : $\leq 1 \times 10^{-9}$ mbar l/sec	
8.	Operating Pressure	(a) 1100 mbar to $\leq 1 \times 10^{-9}$ mbar	
(b)	Available compressed air pressure at IPR for electropneumatic	4-5 bar(absolute)	

IPR	Offered Technical Specification
<b>Accessories: - 1 set of suitable and essentially required spare parts should be quoted along with your offer. Features and specifications of these spares parts should include by vendor</b>	
<b>Installation and Acceptance Tests: -</b> The final acceptance will be given after successful operation and achieving the required performance of the TMP unit. Installation will be done by vendor with the vacuum chamber/system available at IPR after which vendor will carry out acceptance tests at IPR for following parameters.	
1. Specified ultimate pressure at the suction port of pump	
2. Functioning of control logic and safe operation of TMP in nominal and fault conditions	
3. Noise level should not be more then as per the vendor's specification.	
4. Leak tightness of housing and seat of gate valve should not be more then specified by the vendor.	
5. Maximum and minimum differential pressure at which gate valve can open and it should be as per vendor's specification.	

**Documents to be provided to IPR**

Sr. No	IPR	Offered Technical Specification
1	1. The offer must be submitted with all necessary technical details, literature, user manual and related documents to the corresponding model	
2	2. The offer must have a document giving details of spec and its values item wise similar to the format of this document for the offered product. This document is necessary even though vendor is providing literature, brochure and manuals of the product.	
3	3. Detailed information on operation, maintenance and troubleshooting should be provided.	
<b>General Terms:</b>		
	1. Vendor has to install the pumping system and gate valve with the vacuum chamber available at IPR site for acceptance tests and carryout the different tests required for acceptance at IPR.	

Sr. No.	IPR	Vendor Specification
<u>1.</u>	<b>Spare parts:</b> Vendor should provide required spare parts and consumables (like gaskets, lubricating oils etc., for total operation of about 7500 hours distributed over five years. Maximum duration of operation continuously could be for about one week. Separate price list for each spare part for TMP and gate valve should be provided along with the quotation.	
<u>2.</u>	<b>Warrantee / Guarantee :</b> The vendor must guarantee/warrantee the equipment, supplied for a period of one years starting from the date of acceptance by IPR.	

Authorized Singatory

Official Seal

Date :-