Request for Proposal (RFP) for Supply, Installation and Commissioning of Gaseous Nitrogen Purity Monitoring and Flow Control System

1. Table of Contents /index:

S. No	Name of the component	No. of Units required
1	Gaseous Nitrogen Purity Monitoring and Flow Control System consists of RGA Pressure Regulator Diaphragm Valve Shut-off Valve with necessary accessories (Detailed technical specifications are given Section-6)	1

2. Technical specifications of the RGA

RGA	
Range	1 - 200amu
Detection Level	Minimum Detectable concentration 3 sigma baseline noise <15ppb
Analyzer	Quadruple Analyzer
Operating Temperature (Turbo pump and electronics)	5-35°C, 20-85% RH (non-condensing)
Oven Temperature (vacuum chamber and inlet interface)	180°C for bake-out, 80°C for operation at elevated temperature
Capillary Inlet	2.0 m long with 1/4″ end connection, heated to 150°C. , for sampling different gas conditions with multiple inlet options: High Purity Stainless steel capillaries with EPI coating
Gas Consumption	20ml/min
Sample Pressure	1- 10 bar nominal
Pumping System	High compression Turbo-Molecular Pump with internal 4-stage diaphragm backing pump.Lubricant free pumping system and no elastomer seals are used in the sample inlet system or in the high vacuum region of the system.
Automated Inlet Pressure Controller	Baratron Capacitor Manometer based automated inlet pressure controller

Detection	Dual Detector System (Faraday Cup and Secondary Electron Multiplier)
Response	>230 data points per second
Power	Universal Mains Input 100-240VAC/ 50-60Hz.
Regulator	
Material	316L Stainless Steel
Finish	Electro polish 10Ra
Maximum inlet Pressure	40 bar
Outlet Pressure Ranges	0-2 bar
Design Proof Pressure	150% of maximum rated
Inboard leak Rate	1 x 10-9 atm cc/sec He
Operating temperature	5°C to 35°C
Flow Capacity	Cv = 0.15 (41.4 bar model)
Diaphragm Valve	
Body and integral end connections	316L VIM-VAR SS/ SEMI F20-0305 Ultrahigh-Purity
Welded VCR end connections	316L VAR SS/ SEMI F20-0305 Ultra High-Purity
Seat	PCTFE/D1430
Diaphragm	Cobalt-based superalloy (UNS R30003)/AMS 5876
Support diaphragm	Silver-plated cobalt-based superalloy (UNS R30003)/AMS 5876
Bonnet	S17400 SS
Bonnet nut	316 SS
Wetted Surface Roughness (Ra)	Electropolished and finished to an average of 5 μin. (0.13 μm)
Cv	0.27
Shut-off Valve	
Grade	SC-01 CLEAN

Additional Requirements:

- **All fittings should be ultra-high pure and EPI coated.**
- All the necessary accessory and fitting kit with interconnecting lead cables, tool kit, controls and gauges for the RGA operation should be provided by the manufacturer.
- The vacuum seal or o-rings should be UHV grade
- All the materials used in building the RGA should be vacuum compatible up to UHV.
- Outer finish/ coatings on RGA and all auxiliary hardware should be compatible with ISO - 3/4 class (as per ISO 14644).
- The vendor should provide an integrated control, data acquisition and analysis software for purity measurements by using the RGA.

Eligibility criteria of vendor:

- The vendor must have knowledge, experience and infrastructure in design, fabrication and installation of mass spectrometers/RGA.
- The vendor should provide the post installation technical support for a minimum period of 10 years from the date of installation.

Expected deliverables:

1. As mentioned in Table of Contents under "**Section -5** " that meets the technical specifications under "**Section-6"**.
2. Conformance test certificates for the properties of optics and detectors as per the specifications mentioned in "**Section-6**"
3. Control, data acquisition and analysis software and hardware for measurements and regulation of RGA.
4. Soft copy and hard copy of all the relevant manuals, soft copy of all control softwares should be supplied by the vendor at the time of delivery.
5. All the necessary controls, gauges, auxiliary hardware and software for the RGA operation should be supplied by the vendor at the time of delivery.

Warranty Clause

Minimum one year from the date of installation

Expected Time Schedule

3-4 months

For any information/clarifications contact the following

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