

## Tender specifications for proposed “Inert Gas Workstation”

Sr. No.	Specification
1	<p><b>Glove Box (2 port) -</b>                      Stand having castors and machine feet and following specifications                      Inner Box Dimensions 900-950 mm x 1150-1250 mm x 775-800 mm [H x L x D]                      Two Aluminum glove ports (diameter~220mm) with anti-corrosion coating,                      One pair gloves should be supplied with the system.                      Glove box should be modular and expandable with bolted side panels.                      Inside surface Brushed finish Ra 1.2 µm                      Outside surface Coated,                      Leak rate &lt; 0.05 Vol %/h or lower                      Front Window safety glass with interior anti-corrosion film.                      Dust filter 0.3 micron, class H13 should be included in the work station                      Stainless Steel sliding shelves (3 Nos) should to be included in the work station.                      Automatic Box pressure range ±15mbar with oil-free pressure relief valve                      Automatic positive pressure regulation system without vacuum pump should be possible.                      It should include Water proof Foot pedal for box pressure manipulation                      Glove box should have 3 DN 40 feed through, one should be electrical                      Fluorescent lamp should be front mounted with Automatic switch off facility</p>
2	<p><b>Large Antechamber:</b>                      Cylindrical type made of 2.5mm SS, steel and brush- finished interior                      Dimensions, Inner diameter 390 to 400mm and Length 600 to 625mm                      Sliding tray stainless steel should be included with antechamber                      Doors should be Aluminum, anodized, thickness 10mm with spindle lock                      Pressure gauge, analog display to be included in the antechamber                      Vacuum/ Refill process Handling: Manual operation</p>
3	<p><b>Mini Antechamber:</b>                      Mini- Antechamber – Inner dimenions , diameter 150 to 160mm and Length 400 to 425mm                      Hinged doors and Stainless sliding tray and 3 way valve</p>

<p><b>4</b></p>	<p><b>Gas purification</b>  Should be located underneath the Glove box to save space  PLC Controlled with Color Touch panel for operation of all purification and regeneration system functions including box pressure, oxygen and moisture levels. With facility for remote monitoring of glove box parameters and provision for sending alerts and notifications about upcoming service schedule and ready upgrade facility of voice assisted control of the glove box is required.  PLC controlled purifier and to maintain purity &lt; 1ppm H<sub>2</sub>O and O<sub>2</sub> (at complete pressure range)  Automatic PLC controlled regeneration sequence with nitrogen N<sub>2</sub> /Argon and Hydrogen (5-10%)  Circulation unit speed between 90 to 100 m<sup>3</sup>/hour speed  Blower speed reduction, user-defined O<sub>2</sub> and H<sub>2</sub>O level for auto increase of blower speed  Positive Pressure regulation without vacuum pump should be possible.  Activation of above features should be possible at user's Set Time.  Vacuum pump Rotary vane pump with Oil mist filter, Oil re-circulation and automatic gas ballast control, 17m<sup>3</sup>/h pumping capacity, dual stage required to connect the pump to the system. Automated Switch off of Vacuum pump should be possible.</p> <p>Heat Exchanger should be integrated with the box</p> <p>Solvent adsorption unit with suitable adsorbent 5Kg minimum, should be integrated with Glove Box Should include inline and bypass valves. Upgrade Provision for PLC controlled re-generable solvent trap and PLC controlled inline in circulation piping positioned solvent sensor range 0 to 500ppm are needed.</p>
<p><b>5</b></p>	<p><b>Purging Mechanism:</b>  Purging to be automatically activated, when the Oxygen in the glove box is exceeded the set limit, able to set between (10-999ppm) and continuously purging till the set point is reached and automatically start the circulation of the gas purifier.  Automatic and adjustable mechanism for regular gas purge with time, duration and the day.  Glove box purging to be operated by the operational panel of the purifier up to 200l/min with PLC control as well as manual regulation valve</p>
<p><b>6</b></p>	<p><b>Oxygen Sensor:</b>  PLC controlled and operated by the system touch panel  Inline positioned in circulation line before the purifier  Solid state sensor  Measuring range: 0-1000 ppm  Maintenance and calibration free</p>

7	<p><b>Moisture Sensor:</b>          PLC controlled and operated by the system touch panel          Inline positioned in circulation line before the purifier          Solid state sensor          Measuring range: 0-500 ppm          Maintenance and calibration free</p>
8	<p><b>Refrigerator</b>          Refrigerator -35°C          integrated on side panel          18 to 20L, 3 shelves, Variable 5 positions          PLC control</p>
9	<p><b>Recirculating Chiller</b>          Temperature Range 5 to 25° C          Temperature Controller Microprocessor Digital PID          controller cum Indicator, Accuracy +/-1 °C          Temp. Stability +/-0.1 °C, Sensor PT100 Sensor          Cooling Capacity at 0°C 1500 watts          Bath Volume 10 - 12 Ltrs, Flow rate 15 Ltrs per minute or more          Pump Type should be Chemical resistant magnetic pump          Pump Pressure 2 bar</p>
10	<p><b>Balance</b>          Branded Semi-micro balance          220 / 82 g capacity, 0.1 / 0.01          mg readability, high resolution weighing          cell, FACT, ergonomic doors, pipette-check          application</p>
11	<p><b>Magnetic Stirrer</b>          Branded Semi-micro magnetic stirrer          Speed Range/accuracy: 100-1400 (rpm)/ ± 2 (%)          Heating power: 800 (W)          Display: Digital Temp. Accuracy with ext temp sensor: ± 1 (°C)          Hot plate temperature/accuracy: 20-300 (°C)/± 5 (°C)          Temp. control: Micro controller          Safety circuit hot plate: 25°C over hot plate temperature (°C)          Stirring cap. max. (H2O) : 20 (l) Load max. : 25 (kg).</p>

12	<p><b><u>Optional items and accessories to be quoted separately:</u></b>  <b><u>(It is mandatory for the bidder to quote for optional items)</u></b></p> <p>7.5 KVA online UPS with minimum one-hour backup  Nitrogen cylinder with ultrahigh pure nitrogen  Nitrogen dual stage regulator  Nitrogen cylinder with 95% nitrogen and 5% hydrogen  Nitrogen/hydrogen dual stage regulator  Extended warranty rate after two years.  Price of upgradation to a four-port system</p>
13	<p><b><u>Terms &amp; Conditions:</u></b></p> <ol style="list-style-type: none"> <li><b>i. Glove box, Purification System and Sensors should be from single manufacturer</b></li> <li><b>ii. Vendors are required to provide brochures / literature while complying the specifications.</b></li> <li><b>iii. Manufacturers must have supplied &gt; 10 glove box any model with purifier and sensors especially in premier institutes and should have satisfactory running of the system at purchaser's site in last 5 years. Performance certificate from the end-user should be submitted.</b></li> <li><b>iv. Vendor must be able to perform factory acceptance testing of the product and demonstrate all the features prior to the dispatch</b></li> <li><b>v. The technical and price bid should indicate the model and part numbers of items</b></li> <li><b>vi. Upgrade options should be readily available and should be quoted with full information</b></li> <li><b>vii. Local service centre is required</b></li> <li><b>viii. Two years warranty</b></li> <li><b>ix. Pre-installation requirements should be clearly mentioned by the bidder.</b></li> <li><b>x. The system should be installed at IIT Madras</b></li> <li><b>xi. Training should be provided to the student/staff/faculty of IIT Madras, post-installation.</b></li> </ol>