

Tender Notification for the Procurement of Glove Box System (Last Date for Submission: Tuesday, 17th Dec 2019)

Kindly send your best quotation for a two-box argon glove box system with the following technical specifications on C.I.P. Bangalore basis (Air Freight). Your quotation should clearly indicate the terms of delivery, delivery schedule, estimated delivery date, and payment terms. The tender should be submitted in two separate sealed envelopes - one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before 1700 hours on Tuesday 17th Dec 2019.

The bids should be addressed to:

*The Chairman,
Solid State and Structural Chemistry Unit
Indian Institute of Science (IISc)
Bengaluru, India - 560012.*

The sealed bids should be sent to:

*Naga Phani Aetukuri
Assistant Professor,
Solid State and Structural Chemistry Unit
Indian Institute of Science (IISc)
Bengaluru, India - 560012.
Ph: +91-80-2293-3534
email: phani@iisc.ac.in*

Please enclose a compliance statement along with the technical bid in the format provided in Annexure I.

Tender Notification for the Procurement of Glove Box System

1. System Arrangement

There should be two glove boxes, henceforth called Box 1 and Box 2, which can be interconnected via a T-shaped Ante Chamber (see Figure 1). The specifications for each of the boxes is as given below.

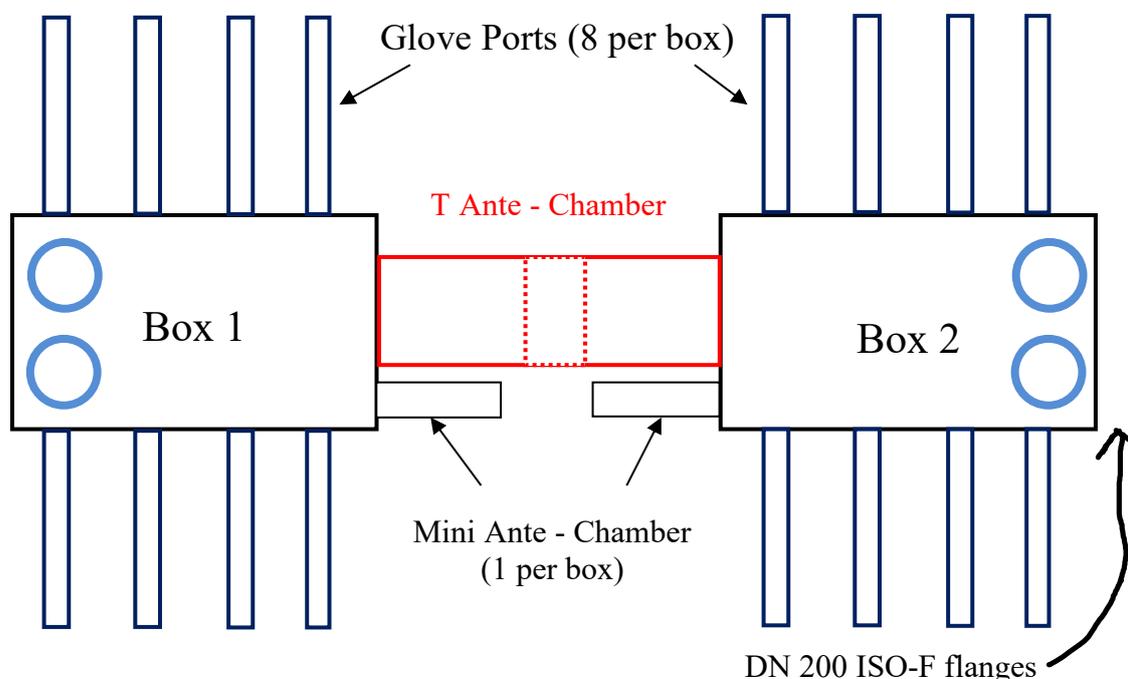


Figure 1. A schematic (not to scale) top-view of the glove box system being specified in this tender request.

Both Box 1 and Box 2 should independently meet all the following specifications unless mentioned otherwise.

2. Dimensions

- 2.1 The working space of each glove box should be at least 900 mm in height, 1800 mm in length and 1200 mm in depth

3. Programmatic Logic Control

- 3.1 Each box should be controllable with independent and fully integrated programmatic logic control (PLC), with a touch panel interface
- 3.2 The touch panel interface should serve as a central control unit for all glove box functions and procedures.
- 3.3 All glove box functions should be accessible via the touch panel.
- 3.4 The PLC should also enable plotting graphical trends of box pressure, oxygen and moisture levels over at least 24 hours. *Data showing recording of O₂, box pressure and moisture simultaneously over a period of 24 hours should be provided. This data must have been recorded on a system which is similar in specifications to this requirement. The data should have been collected within the past six months.*

- 3.5 It should be feasible to remote monitor box parameters. The PLC should have the ability to send notifications and alerts regarding maintenance schedule and box malfunctioning.
- 3.6 Graphical display of the box pressure, O₂ and moisture levels should be available in the touch panel interface.

4. Purifier

- 4.1 Each glove box should have at least one independent purifier capable of purifying the glove box ambient to attain a purity of <1 ppm H₂O and O₂.
- 4.2 The removable capacity should be a minimum of 35 liters for oxygen and at least 1300 grams for moisture. *Specification sheets or data sheets attesting to this should be provided.*
- 4.3 The purifier should be fully regenerable with an automatic/programmed control.
- 4.4 The purification system of the glove box should be fully integrated with the heat exchanger and a gas circulation blower.
- 4.5 The gas circulation blower should be capable of a circulation rate of at least 80 m³/hour. *The maximum and minimum circulation rates of the blower should be provided.*
- 4.6 The blower speed should be dynamically controlled via program logic based on the moisture and oxygen content in the glove box so as to make the blower operation power efficient. *Implementation diagrams or specifications that prove this is possible should be provided.*

5. Solvent Absorption Unit

- 5.1 Each box should have an independent, fully regenerable solvent absorption unit.
- 5.2 The solvent trap should be capable of absorbing volatile organic solvents.
- 5.3 Solvent absorption unit should be fully regenerable via PLC with a regeneration option provided in the touch panel controls. *Touch panel implementations showing this should be provided. A copy of relevant documentation in a manual should also be provided.*
- 5.4 The Solvent absorption unit should have both inline and bypass modes (**See Figure 2**).
- 5.5 There should be the option of attaching a solvent sensor, which is capable of indicating when to regenerate the solvent absorption unit. *Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.*
- 5.6 The vendor should provide a list of solvents compatible with the system being quoted. For example, the list of solvents that the moisture and oxygen sensors are compatible with should be given.

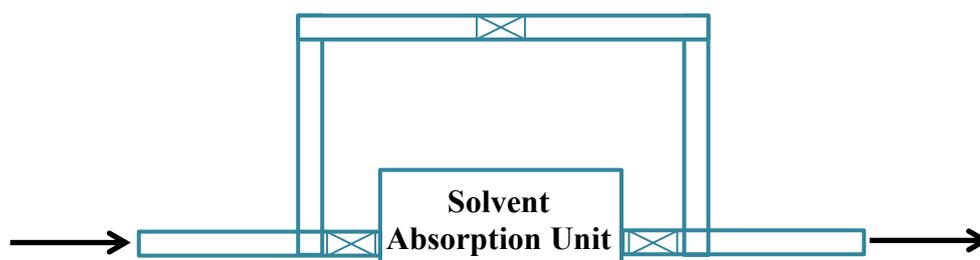


Figure 2. A schematic (not to scale) side-view of the circulation lines for the solvent absorption unit that shows the absorption unit by-pass and inline connections.

6. Box pressure

- 6.1 Box pressure should be controllable automatically (via programmatic logic) within a pressure range of -15 to 15 mbar.
- 6.2 The desired pressure should be settable via the touch panel interface. *Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.*

7. Gloves and Glove Port Covers

- 7.1 There should be at least eight polymer (polypropylene is preferred) glove ports for each box and butyl gloves should be provided for these glove ports.
- 7.2 The size of each glove port should be at least 200 mm.
- 7.3 The glove ports should be O-ring sealed against the gloves.
- 7.4 *At least four additional pairs of butyl gloves should be supplied with each box.*
- 7.5 Each box should be supplied with at least one glove port cover.
- 7.6 The thickness of the butyl gloves should be a minimum of 0.4 mm

8. T-shaped ante-chamber connecting the two boxes

- 8.1 The T-shaped ante-chamber that connects the two glove boxes should have three vacuum doors, which can seal the ante-chamber for evacuation (*see Figure 3*).
- 8.2 The ante-chamber should be cylindrical with a diameter of at least 390 mm and a length of at least 800 mm.
- 8.3 The doors should preferably be with a swing-type opening mechanism to conserve working space.
- 8.4 There should also be a tray preferably mounted on telescopic rails, which can be slid back and forth. The tray should facilitate transfer for tools and chemicals from one glove box to the other.
- 8.5 The pump and purge operations of the ante-chamber should be programmable and be activated via a software controlled touch panel or computer. It should also allow the user to choose between manual control or programmatic control. *Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.*

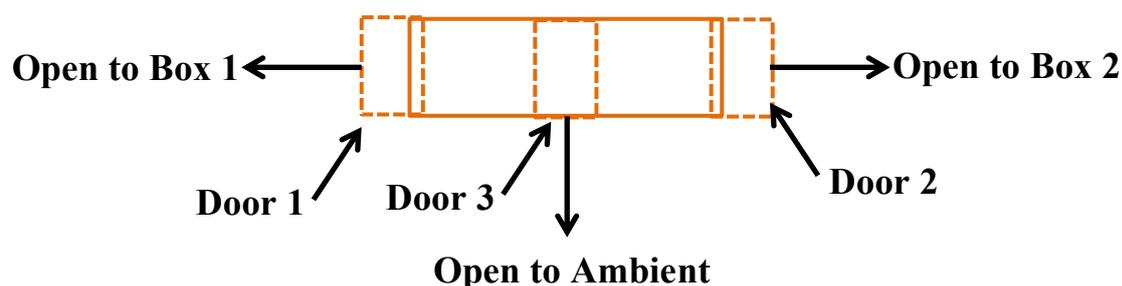


Figure 3. A schematic (not to scale) top-view of the T Ante-Chamber that connects the two glove boxes.

9. Mini Ante-Chambers

- 9.1 Each box should have at least one mini ante-chamber for sample transfer.
- 9.2 The ante-chamber should be at least 150 mm in diameter and 300 mm in length.
- 9.3 The ante-chamber should have a sliding tray to enable sample transfer.
- 9.4 There should be a 3-way valve to enable evacuation and venting of the ante-chamber.

- 9.5 The ante-chamber should have a door that can seal the ante-chamber for evacuation.
- 9.6 The ante-chamber should have a heating jacket which can heat the chamber to at least 120 °C. The temperature should be controllable via programmable PID control. *Photographs from previous installations should be provided.*

10. Box Construction

- 10.1 Both the boxes should have bolted side panels that will enable the boxes to be modular and expandable or enable connection to other similar boxes in the future.
- 10.2 The front panel of each box should be made of polycarbonate.
- 10.3 Inners of the glove boxes, and all ante-chambers should be 304 grade or 316 grade or similar corrosion/chemical resistant grades of brushed stainless steel.
- 10.4 The trays, rails and other components in the ante-chambers should also be of 304 grade or 316 grade or similar corrosion/chemical resistant grades of brushed stainless steel.
- 10.5 The external should either be coated with a chemical/abrasion resistant coating or be the brushed stainless steel of the same or better quality as the inners.
- 10.6 At least two dust filters (HEPA or ULPA filters) should be provided in each box – one for filtering inlet gas (nitrogen or argon) and one for filtering the box ambient before it goes out to the gas circulation system.
- 10.7 Filters should be provided with the glove box. *An additional pair of filters for each box should be supplied with the equipment.*
- 10.8 The box should have at least 6 DN 40 feedthroughs, wherein at least three are electrical feedthroughs with at least 2 being 15 A connectors that are compatible with 220 V – 240 V supply lines should be provided. At least 2 DN 40 feedthroughs should each have at least 4 BNC connectors.
- 10.9 An illumination source that lights up the working space, preferably an LED lamp, should be provided. The light should have a switch (a hardware or a control in the touch panel or in an accessible place near the boxes) to turn on/off.
- 10.10 The circulation system should make it possible to have positive pressure regulation without vacuum pump and should be fully integrated with the heat exchanger. *Documentation supporting this should be provided.*
- 10.11 A foot pedal for controlling box pressure should be provided.
- 10.12 At least two height-adjustable stainless-steel shelves of at least 1800 mm in length and at least 200 mm in depth should be provided. These should be centrally located so that any chemicals or tools are accessible from both the working sides of the box (the sides with gloves/glove ports)

11. Vacuum Pumps

- 11.1 Each box should come with a Rotary vane pump (at least 15 m³/hour capacity) with Oil mist filter and Oil re-circulation.
- 11.2 There should be automatic gas ballast control
- 11.3 The pump ON/OFF should be controllable via the touch panel. *Touch panel implementations showing this should be provided.*
- 11.4 The option of upgrading to an oil-less scroll pump should be available and quoted as an option.

12. Sensors

- 12.1 A solid-state oxygen sensor capable of measuring oxygen levels from 0.1 ppm to 500 ppm should be provided with each box.

- 12.2 A solid-state moisture sensor capable of measuring moisture levels from 0.1 ppm to 500 ppm should be provided with each box.
- 12.3 A pressure sensor capable of recording box pressure should also be available for each box.
- 12.4 There should be the option of attaching a solvent sensor to trigger an alarm when the solvent absorption unit is full. The price for this should be quoted as an option.
- 12.5 The PLC should be able to show instantaneous readings from the sensor and should also have the capability to record the readings for, at the least, a period of 24 hours. *Documentation and data in support of this should be provided.*

13. Box Purging

- 13.1 Automatic Box purge should be possible via PLC.
- 13.2 PLC should trigger an automatic box purge either due to high O₂ or moisture or both in the glove box or an automatic timer option to trigger box purge at a preset time for a preset duration. *Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.*
- 13.3 Gas (argon or nitrogen) flow rate of 200 liter/min or greater during purging should be possible.
- 13.4 The O₂ and moisture trigger set-point range for automatic box purging should be between 10-999 ppm. *Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.*

14. Other requirements and options

- 14.1 There should be at least 2 single-sided DN200 ISO-F flanges (one side welded onto the glove box side panels) with blanks, on each of the glove boxes (on the top side of each box). This should be included in the quoted price. (see **Figure 1 and Figure 4** for an example implementation on the top panel of the boxes).
- 14.2 Each box should have at least one DN200 ISO-F flange configured with connectors (feedthroughs) as shown in **Figure 5**. Specifically, there should be 2 DA-15 connectors, 2 USB-A connectors, 8 triax connectors, 12 BNC connectors.
- 14.3 Oil bubblers should NOT be used in any of the gas circulation lines. The mechanism for pressure regulation should be clearly mentioned.
- 14.4 NO component in the gas circulation line (except for the vacuum pumps) should use oil or oil containing parts.
- 14.5 There should be the option to add a recirculation chiller to have a stable temperature in the glove box. The recirculation chiller should enable complete temperature control for ambient gas of the glove box and should also maintain the blower temperature so that the glove box ambient temperature is always close to room temperature.
- 14.6 The optional chillers should be able to regulate the temperature between 5 and 30 degrees centigrade.
- 14.7 The chillers should preferably have a cooling capacity of 1000 W at or near room temperature (25 °C). The cost of chillers should be included in the options.
- 14.8 All electrical connections should comply with line power specifications in India. Single phase voltage range is 220-240 Vac and the three phase voltage range is 415 - 440 V_{ac}. The line frequency range is 50-60 Hz.

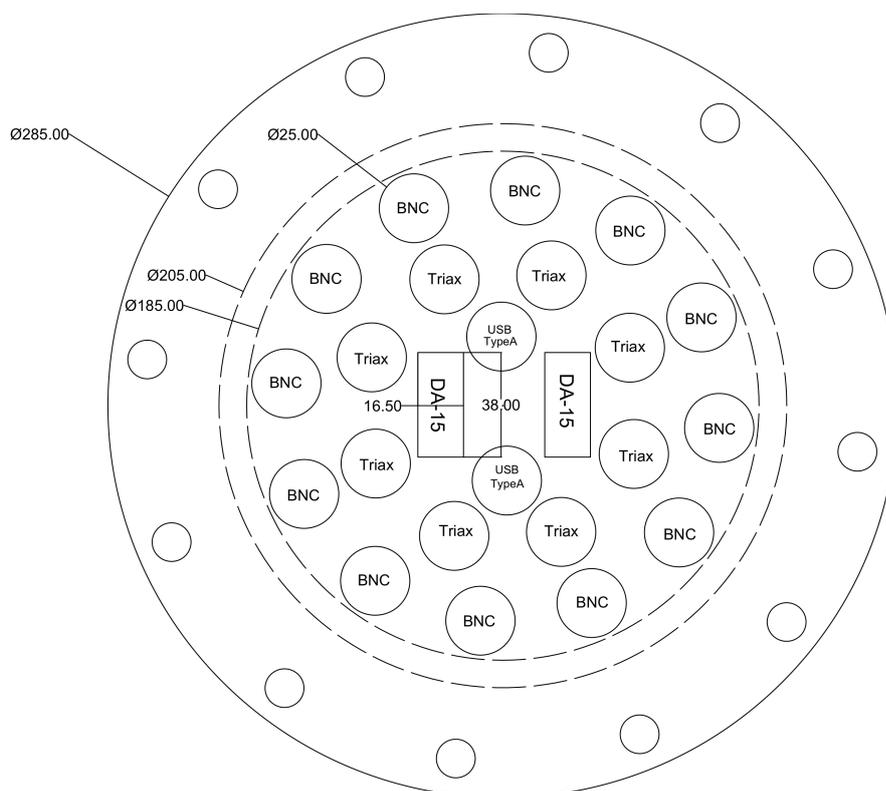
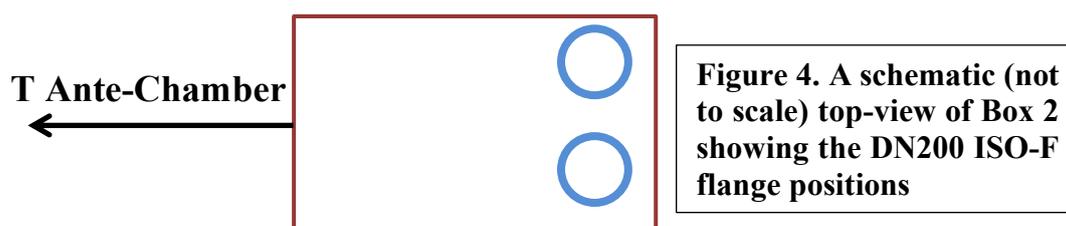


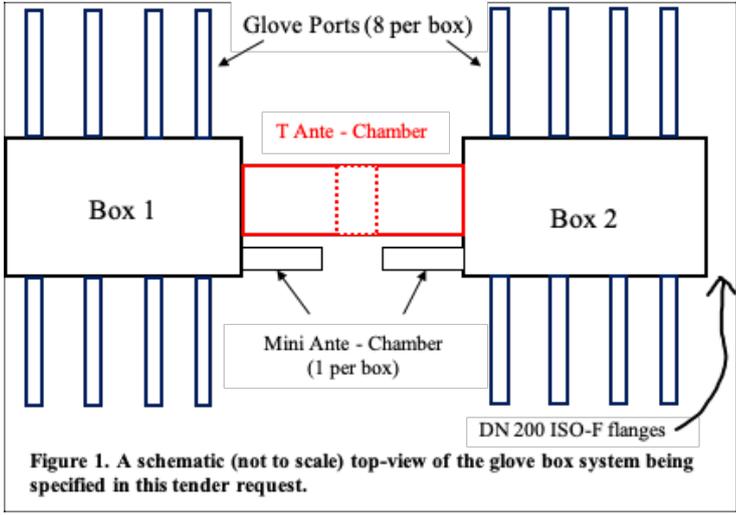
Figure 5. A schematic (not to scale) top-view of connectors required on the DN200 ISO-F flange.

15. Terms and conditions

- 15.1 The vendor is responsible for the installation of the system at the institute.
- 15.2 The price quotation should include the cost of installation and training of potential users.
- 15.3 The system should be provided with at least two years of warranty, on all parts and labor, from the date of installation.
- 15.4 The vendor should have a track record of having previously supplied at least five equipment similar to the requirements in the tender document. *Details of such systems with model numbers and users should be provided.*
- 15.5 The vendor should have qualified technical service personnel for the equipment based in India and *should assure a response time of <2 business days after receiving a service request.*
- 15.6 Vendor must provide a user list (with contact details including emails and phone numbers) of at least 50 customers from Indian Institutes/Labs where similar measurement systems are installed.

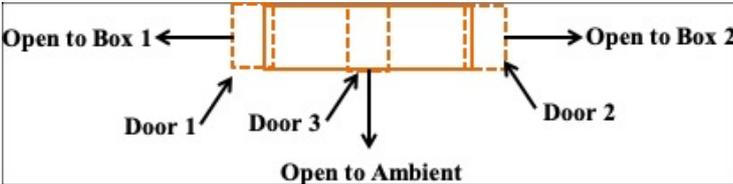
- 15.7 The lead-time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.
- 15.8 The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason is reserved.
- 15.9 *Wherever requested in this specifications sheet, data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.*
- 15.10 All guaranteed specifications will have to be demonstrated, upon request, in an active installation. *Failure to demonstrate any promised specifications will be deemed as technical non-compliance.*
- 15.11 Printed literature and published papers in support of all compliance to the prescribed specifications may be provided.
- 15.12 The vendor must provide compliance statement in a tabular form with respect to each technical hardware and software specification in the tender document duly supported by the manufacturer's literature and published papers. Any other claim will not be accepted and may lead to rejection of the bid.
- 15.13 Technical evaluation by the institute may include demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the promised specifications and demonstrated specifications will be deemed as technical non-compliance.
- 15.14 The vendor must quote, as an option, for a non-comprehensive irrevocable AMC price beyond the 2-year warranty, with a price lock in for 2 years beyond the standard 2-year warranty period. 2 services per year should be included in the AMC.
- 15.15 The quote should also include additional spares sufficient for two years of system usage assuming an average usage of 120 hours of operation per week.
- 15.16 The ***validity of commercial quotation should be at least 60 days*** from the last date for the submission of tender documents. The validity of the quotation should be clearly mentioned in the technical bid.

Annexure I: Technical Compliance Sheet

Sl.no	Technical Specification	Complied? Yes or No.	Data or Specs Provided where requested? (please write NA if data is not requested)
1.	<p>System Arrangement</p> <p>There should be two glove boxes, henceforth called Box 1 and Box 2, which can be interconnected via a T-shaped Ante Chamber (see Figure 1). The specifications for each of the boxes is as given below:</p>  <p>Figure 1. A schematic (not to scale) top-view of the glove box system being specified in this tender request.</p>		
<p><i>Both Box 1 and Box 2 should independently meet all the following specifications unless mentioned otherwise.</i></p>			
2.	Dimensions		
2.1	The working space of each glove box should be at least 900 mm in height, 1800 mm in length and 1200 mm in depth.		
3.	Programmatic Logic Control		
3.1	Each box should be controllable with independent and fully integrated programmatic logic control (PLC), with a touch panel interface.		
3.2	The touch panel interface should serve as a central control unit for all glove box functions and procedures.		

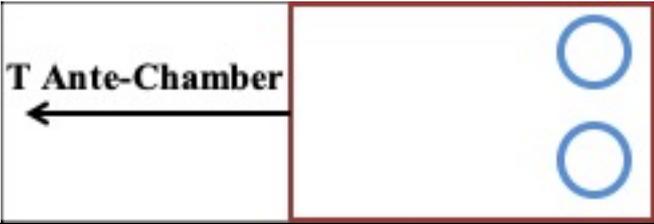
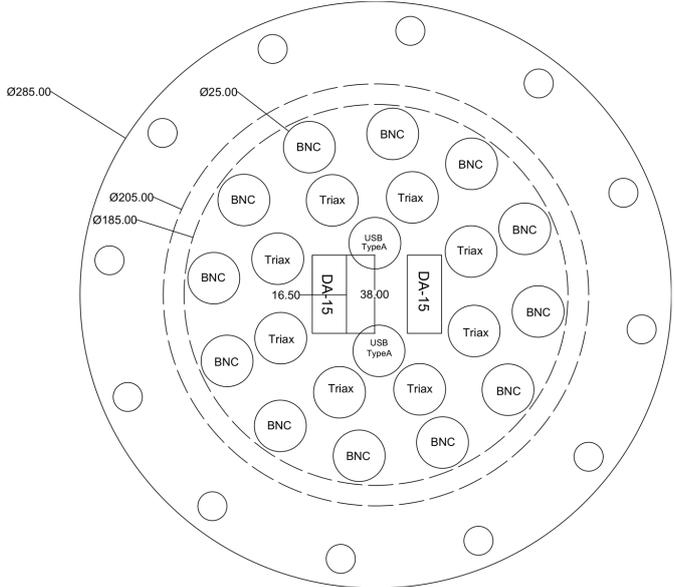
3.3	All glove box functions should be accessible via the touch panel.		
3.4	The PLC should also enable plotting graphical trends of box pressure, oxygen and moisture levels over at least 24 hours. Data showing recording of O ₂ , box pressure and moisture simultaneously over a period of 24 hours should be provided. This data must have been recorded on a system which is similar in specifications to this requirement. The data should have been collected within the past six months.		
3.5	It should be feasible to remote monitor box parameters. The PLC should have the ability to send notifications and alerts regarding maintenance schedule and box malfunctioning.		
3.6	Graphical display of the box pressure, O ₂ and moisture levels should be available in the touch panel interface.		
4.	Purifier		
4.1	Each glove box should have at least one independent purifier capable of purifying the glove box ambient to attain a purity of <1 ppm H ₂ O and O ₂ .		
4.2	The removable capacity should be a minimum of 35 liters for oxygen and at least 1300 grams for moisture. Specification sheets or data sheets attesting to this should be provided.		
4.3	The purifier should be fully regenerable with an automatic/programmed control.		
4.4	The purification system of the glove box should be fully integrated with the heat exchanger and a gas circulation blower.		
4.5	The gas circulation blower should be capable of a circulation rate of at least 80 m ³ /hour. The maximum and minimum circulation rates of the blower should be provided.		
4.6	The blower speed should be dynamically controlled via program logic based on the moisture and oxygen content in the glove box to make the blower operation power efficient. Implementation diagrams or specifications that prove this is possible should be provided.		
5.	Solvent Absorption Unit		
5.1	Each box should have an independent, fully regenerable solvent absorption unit.		
5.2	The solvent trap should be capable of absorbing volatile organic solvents.		
5.3	Solvent absorption unit should be fully regenerable via PLC with a regeneration option provided in the touch panel controls. Touch panel implementations showing		

	<p>this should be provided. A copy of relevant documentation in a manual should also be provided.</p>		
5.4	<p>The Solvent absorption unit should have both inline and bypass modes. (See Figure 2).</p> 		
5.5	<p>There should be the option of attaching a solvent sensor, which is capable of indicating when to regenerate the solvent absorption unit. Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.</p>		
5.6	<p>The vendor should provide a list of solvents compatible with the system being quoted. For example, the list of solvents that the moisture and oxygen sensors are compatible with should be given.</p>		
6.	Box pressure		
6.1	<p>Box pressure should be controllable automatically (via programmatic logic) within a pressure range of -15 to 15 mbar</p>		
6.2	<p>The desired pressure should be settable via the touch panel interface. Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.</p>		
7.	Gloves and Glove Port Covers		
7.1	<p>There should be at least eight polymer (polypropylene is preferred) glove ports for each box and butyl gloves should be provided for these glove ports.</p>		
7.2	<p>The size of each glove port should be at least 200 mm.</p>		
7.3	<p>The glove ports should be O-ring sealed against the gloves.</p>		
7.4	<p>At least four additional pairs of butyl gloves should be supplied with each box.</p>		
7.5	<p>Each box should be supplied with at least one glove port cover.</p>		
7.6	<p>The thickness of the butyl gloves should be a minimum of 0.4 mm.</p>		
8.	T-shaped ante-chamber connecting the two boxes		

8.1	<p>The T-shaped ante-chamber that connects the two glove boxes should have three vacuum doors, which can seal the ante-chamber for evacuation (see Figure 3).</p> 		
8.2	<p>The ante-chamber should be cylindrical with a diameter of at least 390 mm and a length of at least 800 mm.</p>		
8.3	<p>The doors should preferably be with a swing-type opening mechanism to conserve working space.</p>		
8.4	<p>There should also be a tray preferably mounted on telescopic rails, which can be slid back and forth. The tray should facilitate transfer for tools and chemicals from one glove box to the other.</p>		
8.5	<p>The pump and purge operations of the ante-chamber should be programmable and be activated via a software controlled touch panel or computer. It should also allow the user to choose between manual control or programmatic control. Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.</p>		
9.	<p>Mini Ante-Chambers</p>		
9.1	<p>Each box should have at least one mini ante-chamber for sample transfer.</p>		
9.2	<p>The ante-chamber should be at least 150 mm in diameter and 300 mm in length.</p>		
9.3	<p>The ante-chamber should have a sliding tray to enable sample transfer.</p>		
9.4	<p>There should be a 3-way valve to enable evacuation and venting of the ante-chamber.</p>		
9.5	<p>The ante-chamber should have a door that can seal the ante-chamber for evacuation.</p>		
9.6	<p>The ante-chamber should have a heating jacket which can heat the chamber to at least 120 °C. The temperature should be controllable via programmable PID control. Photographs from previous installations should be provided.</p>		
10.	<p>Box Construction</p>		
10.1	<p>Both the boxes should have bolted side panels that will enable the boxes to be modular and expandable or enable connection to other similar boxes in the future.</p>		
10.2	<p>The front panel of each box should be made of polycarbonate.</p>		

10.3	Inners of the glove boxes, and all ante-chambers should be 304 grade or 316 grade or similar corrosion/chemical resistant grades of brushed stainless steel.		
10.4	The trays, rails and other components in the ante-chambers should also be of 304 grade or 316 grade or similar corrosion/chemical resistant grades of brushed stainless steel.		
10.5	The external should either be coated with a chemical/abrasion resistant coating or be the brushed stainless steel of the same or better quality as the inners.		
10.6	At least two dust filters (HEPA or ULPA filters) should be provided in each box – one for filtering inlet gas (nitrogen or argon) and one for filtering the box ambient before it goes out to the gas circulation system.		
10.7	Filters should be provided with the glove box. An additional pair of filters for each box should be supplied with the equipment.		
10.8	The box should have at least 6 DN 40 feedthroughs, wherein at least three are electrical feedthroughs with at least 2 being 15 A connectors that are compatible with 220 V – 240 V supply lines should be provided. At least 2 DN 40 feedthroughs should each have at least 4 BNC connectors.		
10.9	An illumination source that lights up the working space, preferably an LED lamp, should be provided. The light should have a switch (a hardware or a control in the touch panel or in an accessible place near the boxes) to turn on/off.		
10.10	The circulation system should make it possible to have positive pressure regulation without vacuum pump and should be fully integrated with the heat exchanger. Documentation supporting this should be provided.		
10.11	A foot pedal for controlling box pressure should be provided.		
10.12	At least two height-adjustable stainless-steel shelves of at least 1800 mm in length and at least 200 mm in depth should be provided. These should be centrally located so that any chemicals or tools are accessible from both the working sides of the box (the sides with gloves/glove ports).		
11.	Vacuum Pumps		
11.1	Each box should come with a Rotary vane pump (at least 15 m ³ /hour capacity) with Oil mist filter and Oil re-circulation.		
11.2	There should be automatic gas ballast control.		
11.3	The pump ON/OFF should be controllable via the touch panel. Touch panel implementations showing this should be provided.		

11.4	The option of upgrading to an oil-less scroll pump should be available and quoted as an option.		
12.	Sensors		
12.1	A solid-state oxygen sensor capable of measuring oxygen levels from 0.1 ppm to 500 ppm should be provided with each box.		
12.2	A solid-state moisture sensor capable of measuring moisture levels from 0.1 ppm to 500 ppm should be provided with each box.		
12.3	A pressure sensor capable of recording box pressure should also be available for each box.		
12.4	There should be the option of attaching a solvent sensor to trigger an alarm when the solvent absorption unit is full. The price for this should be quoted as an option.		
12.5	The PLC should be able to show instantaneous readings from the sensor and should also have the capability to record the readings for, at the least, a period of 24 hours. Documentation and data in support of this should be provided.		
13.	Box Purging		
13.1	Automatic Box purge should be possible via PLC.		
13.2	PLC should trigger an automatic box purge either due to high O ₂ or moisture or both in the glove box or an automatic timer option to trigger box purge at a preset time for a preset duration. Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.		
13.3	Gas (argon or nitrogen) flow rate of 200 liter/min or greater during purging should be possible.		
13.4	The O ₂ and moisture trigger set-point range for automatic box purging should be between 10-999 ppm. Touch panel implementations showing this should be provided. A copy of relevant documentation from the user manual should also be provided.		
14.	Other requirements and options		
14.1	There should be at least 2 single-sided DN200 ISO-F flanges (one side welded onto the glove box side panels) with blanks, on each of the glove boxes (on the top side of each box). This should be included in the quoted price. (see Figure 1 and Figure 4 for an example implementation on the top panel of the boxes).		

			
14.2	<p>Each box should have at least one DN200 ISO-F flange configured with connectors (feedthroughs) as shown in Figure 5. Specifically, there should be 2 DA-15 connectors, 2 USB-A connectors, 8 triax connectors, 12 BNC connectors.</p> 		
14.3	<p>Oil bubblers should NOT be used in any of the gas circulation lines. The mechanism for pressure regulation should be clearly mentioned.</p>		
14.4	<p>NO component in the gas circulation line (except for the vacuum pumps) should use oil or oil containing parts.</p>		
14.5	<p>There should be the option to add a recirculation chiller to have a stable temperature in the glove box. The recirculation chiller should enable complete temperature control for ambient gas of the glove box and should also maintain the blower temperature so that the glove box ambient temperature is always close to room temperature.</p>		
14.6	<p>The optional chillers should be able to regulate the temperature between 5 and 30 degrees centigrade.</p>		
14.7	<p>The chillers should preferably have a cooling capacity of 1000 W at or near room temperature (25 °C). The cost of chillers should be included in the options.</p>		
14.8	<p>All electrical connections should comply with line power specifications in India. Single phase voltage range is 220-240 Vac and the three phase voltage range is 415 - 440 V_{ac}. The line frequency range is 50-60 Hz.</p>		

15.	Terms & conditions		
15.1	The vendor is responsible for the installation of the system at the institute.		
15.2	The price quotation should include the cost of installation and training of potential users		
15.3	The system should be provided with at least two years of warranty, on all parts and labor, from the date of installation.		
15.4	The vendor should have a track record of having previously supplied at least five equipment similar to the requirements in the tender document. Details of such systems with model numbers and users should be provided.		
15.5	The vendor should have qualified technical service personnel for the equipment based in India and should assure a response time of <2 business days after receiving a service request.		
15.6	Vendor must provide a user list (with contact details including emails and phone numbers) of at least 5 customers from Indian Institutes/Labs where similar measurement systems are installed.		
15.7	The lead-time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.		
15.8	The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason is reserved.		
15.9	Wherever requested in this specifications sheet, data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant		
15.10	All guaranteed specifications will have to be demonstrated, upon request, in an active installation. <i>Failure to demonstrate any promised specifications will be deemed as technical non-compliance.</i>		
15.11	Printed literature and published papers in support of all compliance to the prescribed specifications may be provided.		
15.12	The vendor must provide compliance statement in a tabular form with respect to each technical hardware and software specification in the tender document duly supported by the manufacturer's literature and published papers. Any other claim will not be accepted and may lead to rejection of the bid.		
15.13	Technical evaluation by the institute may include demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the		

	promised specifications and demonstrated specifications will be deemed as technical non-compliance.		
15.14	The vendor must quote, as an option, for a non-comprehensive irrevocable AMC price beyond the 2-year warranty, with a price lock in for 2 years beyond the standard 2-year warranty period. 2 services per year should be included in the AMC.		
15.15	The quote should also include additional spares sufficient for two years of system usage assuming an average usage of 120 hours of operation per week.		
15.16	The validity of commercial quotation should be at least 60 days from the last date for the submission of tender documents. The validity of the quotation should be clearly mentioned in the technical bid.		