

Department of Chemistry Indian Institute of Technology Kanpur



Enquiry No: CHM/BS/04
Enquiry Date: 14-03-2017
Closing Date: 10-04-2017

Dear Sir or Madam: Quotations are invited for “Glove Box and their accessories”

Glove Box Specifications:

- 3 port Stainless steel **glove box**, quality not less than **US304L** (1.4306) with maximal internal dimensions L/H/P 1500 x 900 x 735 mm.
Real **modular** glove box with dismountable side panels; tightness of side panels imperatively secured through O-ring sealings (no silicon admitted).
The glove box must have possibility to dismount a side panel to connect a second module of glove box for expandable working area.
Stand in stainless steel with rolls and jacks.
All pipings in Stainless Steel US304L (1.4306)
- **Front panel** in Glass, with glove rings in diam.approx.220 mm.
- **Butyl gloves** not less than 0.6 mm thickness (better resistance).
- **Tightness of glove box** according to **O₂-increase method**. Class 1 glove box (according to International Standards **ISO 10648-2** – Leak rate < **0.05 Vol %/h**).
1 leaktight electrical feedthrough Bi + T 220V.
2 extra leaktight blank feedthrough – total 4 blank feedthrough for future use
1 leaktight vacuum feedthrough with ball valve.
Lightning of the working area of the glove box through Led light spots from the ceiling.
- **One automatic vacuum chamber** diam.400 length 600 mm with inner sliding tray.
Mode for manual or automatic cycling (emptying, filling and number of cycles) and heavy-duty solenoid valves.
Adjustable parameters accessible on touch panel with visualization of cycling when proceeding.
Leak rate < 10⁻⁵ mbar.l/s (tested with helium mass spectrometer)
Fitted with analog vacuum gauge.
Equipped with 2 ALUMINIUM doors, both having external lifting mechanism for easy maintenance.
Location of vacuum chamber can be left sided or right sided.
- **One mini vacuum chamber** diam.150 mm, length 400mm
Leak rate < 10⁻⁵ mbar.l/s (tested with helium mass spectrometer).

Equipped with 3 way valve and 2 doors.

Equipped with a sliding tray

Location of vacuum chamber can be left sided or right sided.

- **One dual stage vacuum pump**, flow not less than $17\text{m}^3/\text{h}$ – Heavy duty brand - The vacuum pump has to stop automatically after cycle in the large vacuum chamber and has to be used only for evacuating vacuum chambers (ENERGY SAVING mode).
- **One Purification unit: Single column purification system** < 1 ppm O_2 and H_2O
Minimal capacity of: $\text{O}_2 = 30\text{ L}$ and $\text{H}_2\text{O} = 1400\text{ g}$.
All piping and components must be in stainless steel (**US304L**).
- **Recirculation blower**, type brushless motor mounted inside a stainless steel housing, with flow $40\text{m}^3/\text{h}$ with $\Delta P = 20\text{ mbar}$ (up to $110\text{m}^3/\text{h}$ $\Delta P = 0\text{ mbar}$ at 230V/50Hz).
- **Automatic adjustable recirculation flow** depending on H_2O and O_2 concentration with automatic back flow to 100% of power if necessary.
Manual adjustable recirculation flow with access from touch panel.

Regeneration Process: Automatic process, Inlet and outlet regeneration gas through electro valves (solenoid valves) (ENERGY SAVING mode)

Heating of reactors: Integrated temperature regulation controlled through automatic and temperature cut out.

Tightness: Leak rate < $10^{-5}\text{ mbar.L/ sec}$ (tested with helium mass spectrometer)

Regenerating gas: 95% N_2 or Ar + 5% H_2 .

One built-in air heat exchanger: no water chiller needed or admitted (ENERGY SAVING mode). Air cooled operation even at ambient temperature of 35 Deg C or more.

- **Automatic adjustable pressure regulation**, never connected and never linked to the vacuum pump. Pressure regulation required without foot pedal and the vacuum pump will have to be switched-off when vacuum chamber(s) will not be used (ENERGY SAVING mode).
- **One pressure safety release valve** with HEPA filter for comfort and automatic mechanical discharge of exceeded gases in the glove box (ENERGY SAVING mode) allowing full automatic pressure adjustment with no need for foot pedal, most reactive pressure adjustment, increased comfort in handlings, excess gas discharge possible even in case of power cut.
- **One in-line analysis circuit** with valves enabling in laboratory easy control and calibration without pollution.
- **One O_2 Analyzer:** Electrochemical type - Ranges in ppm: (0-100/1-1000/0-10000), Ranges in %: (0-1/0-10/0-25). Electronics: Integrated microprocessor control, selection of ranges, calibration. Dual display of values – Touch Screen and inline display on the analyzer to verification of values in the touch screen. Data Readings: 2-wire loop powered connection via a 4-20 mA Analog output. Accuracy: +/- 1 ppm in full range. Repeatability: +/- 1% in full range Resolution: 0.1 ppm in full range
- **One H_2O analyzer:** capacitive sensor type, Measuring Range: 0 – 23000 ppm & -100/+20 °C (Dew Point), delivered with calibration certificate – Technology requiring no maintenance with phosphoric acid or similar.
- Glove box controlled through **PLC** – Display on colour touch screen. 7" Colour touch screen with 65K colour screen. LED retro lighting. Resolution 800 x 480 pixels. Windows CE professional interface.

Continuous control, graphic viewing of data (O₂, Pressure, Temperature) and automatic recording each 2 minutes. Historical period 2 months, adjustable alarms for oxygen and moisture concentrations. One Ethernet and one USB port on touch panel for data saving and transfer.

- Glove box **flushing** mode available from touchscreen with adjustable time and automatic stop at the end of elapsed time.
- Warning display in case of recirculation blower stop.
- **Low noise level 49 dB (A)** under purification and pressure regulation (ENERGY SAVING mode)
- **ENERGY SAVING mode** required ensuring low power consumption features (max power consumption around 500W, in Energy saving mode around 40W, i.e. around 90% energy saving).
- Lighting of the working area of the glove box through Led light spots from the ceiling of the glove box for improved brightness.
- **One solvents trapping unit** : activated charcoal reactor with capacity >6 Kg with by-pass valves and three way valve. Easy replacement of loads by bypassing the circuit and easy conditioning of the charcoal without disturbing glove box atmosphere.
- **One freezer** with temperature range – **40 °C**,
 - two shelves, volume 25-28 Liters.
 - The installation must be vibration free and therefore cooling unit layout should be on the ground (not on the glove box or freezer itself). **Leak proof system should be mandatory** and there should not be any leakage or moisture condensed from the freezer, whatsoever be the temperature or humidity.
- At least 10 satisfied glove boxes installations in India with details to be provided.
- Full Warranty – **3 years** from the date of installation.
- Extended free services for another 3 years.
- A Conformity letter that the spare parts and accessories will be available for at least 15 years.
- Spare gloves – 2 pairs
- Copper catalyst and Molecular sieves should be provided minimum of 6 Kgs each in addition to the initial loading.
- Spare O ring for gloves – 2 Pairs
- Spare O ring for mini anti-chamber – 2 pairs.
- Spare package of activated charcoal – 2 full loads.

Terms and Conditions:

1. Your quotation shall include Authorization Letter from manufacturer if you are a local agent. Include proprietary item certificate if applicable.
2. Technical and financial details should be in separate envelope. The Technical bid should contain the detailed technical specifications of the proposed machine, photographs of the machine and other accessories offered. The Technical Bid should not contain any prices. In the document for technical bid, mention in tabular form the compliance to each of the above specifications. Any quotation that does not carry technical and commercial bid separately or not accompanied with proper certificate will not be considered. The Price Bid should contain the technical specifications as well as prices in details. Send complete details of the product(s).
3. The prospective supplier should have supplied the offered machine to at least 3 government or government-affiliated institutes, which should be either an IIT, IISc, NIT or a national laboratory like NML, NCL etc. The list of such personals having this machine and their contacts should be included in the Technical Bid.

4. In financial bid, mention price for Glove box with Accessories and each optional item price separately other than the above-mentioned specifications.
5. Tendered price should include delivery, installation, commissioning and training at customer's location.
6. Supplier should provide 1 set of installation manual, user manual, operation and troubleshooting manuals along with their soft copies along with equipment delivery.
7. Vendor to provide both on-site and operator training for users on the system start-up, usage, maintenance, quality control, trouble shooting, etc. including comprehensive classroom training.
8. Maximum discount should be offered. Institute is exempted for partial custom duty. Prices quoted should be FOB (indicating port of shipment) and CIF (New Delhi) values separately.
9. The warranty shall commence only upon successful completion of the Acceptance Test or commissioning. Warranty period for the instrument should be for three years at least after installation and the after sales service and application support capabilities should be specified.
10. Payment terms will be as per IIT Kanpur rules.
11. All quotations must reach undersigned on or before **10/04/2017 at 1700 hrs.**
12. Quotations should have a validity of a minimum of 90 days.
13. Delivery period should not be more than **12 weeks.**
14. The Institute reserves the right of accepting or rejecting any quotations without assigning any reason thereof.

Kindly mention **"Glove Box and accessories (CHM/BS/04)"** on sealed envelope-carrying quotation, literature and send your best offer so as to reach us on before Mar 27, 2017 to the following address.

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