INSTITUTE OF NANO SCIENCE AND TECHNOLOGY, MOHALI
(An autonomous Research Institute of Department of Science and Technology, Government of India)
Habitat Centre, Sec-64, Phase X, Mohali – 160062, PUNJAB
Phone No: 0172 – 2210075/74/73, Fax No: 0172 – 2211074 Website: www.inst.ac.in

Ref No. INST/12(74)/2020-Pur Date: 06/10/2020

CORRIGENDUM

Reference to NIT no. INST/12(74)/2020-Pur published in national newspapers for purchase of equipment: INSERT GLOVE BOX WORKSTATION WITH ACCESSORIES. Below mentioned technical points may be read and corrected as per following:-

Present Tender Specifications

GLOVE BOX	
Parameter	**Desired Specifications**
Type	Real modular glove box with dismountable side panels; tightness of side panels imperatively secured through O-ring sealing's (non silicon only).
Box material	Should be made of stainless steel materials, quality not less than Stainless steel US304 (1.4301) or better, thickness 3-4 mm. Inside surface should be brushed finish
Box dimensions	Length: 1850-2000 mm Height: 900-950 mm Depth: 750-800 mm
Provision for expandable working area	The glove box must have possibility to dismount a side panel to connect a second module of glove box for expandable working area.
Stand for support	SS with lockable caster wheels
Light	Front panel LED light with on-off switch
Front panel	Front panel should be of Polycarbonate material. Additional coating for chemical and scratch resistance is required. Thickness (mm): 10-14 (± 10%)
Number of glove ports and spare gloves	Four glove port with two spare gloves
Glove ports diameter	220 mm
Gloves	Butyl rubber, 0.4-0.6 mm thickness or better, size: medium or large Should be O-ring sealed against the gloves
Shelves	Height adjustable SS trays (Minimum 3) Should have upgrade option for sliding trays
Feed Through	BANANA feedthrough, double sided , 4 pin 01 No BNC feedthrough, 4 pin 01 No Liquid /Gas/Vacuum feedthrough with manual valve - 02 No Electrical feed through- 01 No, 220V 10-16A

	2 blank leaktight feedthroughs on KF40 flange for future use
Filters	The glove box should have inlet/outlet 0.3 micron HEPA filters, which should be Class H13 or better.
Pipes	All SS (US304 or better)
Box Operating Pressure	Automatic Box pressure range should be from -15 mbar to +15 mbar or wider Able to be operated at over or under pressure Should include Oil free-based pressure relief mechanism.
Heat exchanger	Glove Box should be integrated with heat exchanger

Main Antechamber	
Chamber material	Corrosion/chemical resistant SS (US304) or better
Chamber shape and size	Cylindrical and 600 mm (L) Internal dimension / 375-400 mm (D) Internal dimension
Inside tray	Sliding and made of SS
Operation mode	Must have automated control over vacuum/refill process and also on the no. of cycles
Leak rate	< 10^{-5} mbar.l/s (tested with helium mass spectrometer).

Heated Mini Antechamber	
Chamber material	SS (US304) or better, installed in the same side of the main chamber
Antechamber function	Mini-antechamber oven, up to max. 150°C, 3 way valve for evacuation and venting of the antechamber; including stainless steel extension tray.
Chamber shape and size	Cylindrical and 400 mm (L) / 150 mm (D), Fitted with analog vacuum gauge
Operation type and mode	PID control, 100% outside the box; Cover: bayonet mechanism inside and outside.
Leak r ate	< 10^{-5} mbar.l/s (tested with helium mass spectrometer).

Vacuum Pump	
Pump type	Dual stage vacuum pump
Suction capacity	Flow not less than 17m3/h
Operation mode	The vacuum pump has to stop automatically after cycle in the large vacuum chamber and has to be used only for evacuating vacuum chambers (Economical mode)
Purification unit	< 1 ppm 02 and H20 with minimal capacity of**:** 02 30-45L and H20 1400-1500 g
Purification Loads	Must be between 12-14Kg (Copper Catalyst + Molecular Sieves in equal Proportionate)
Other	All piping and components must be in stainless steel (US304 or better 304L). Integrated recirculation blower, type mounted inside a stainless steel sealed housing, with minimal flow 40m3/h or up to over 100m3/h depending on pressure drop.

Gas Purification Unit	
Inert gas usable	Nitrogen or Argon
	Automatic recirculation flow adjustment depending on concentrations H20 and/or O2. Possibility of manual adjustment of recirculation flow (Economical mode).
Achievable purity	System should maintain Less than 1 ppm of oxygen and water
Purification columns and removal capacity	50-60 Liter for O2, or better 1800-2000 g for H2O or better
Catalyst capacity (Amount of materials used for purification)	Total 12 kg, 6 Kg Copper catalyst or more and 6 Kg Molecular sieves or more
Material used for making components and piping	Fully SS
Regeneration of the purifier unit	Automatic process / PLC
Gas for regeneration	N_2/H_2 or Ar/H_2 mixture. H_2 percentage 3 to 5
Circulation of gas	By a recirculation blower
Heating of reactor	Integrated temperature regulation controlled through automatic and temperature cut out.
Recirculation blower	Recirculation blower, type brushless motor mounted inside a stainless steel housing, with flow 40m3/h with ΔP = 20mbar (up to 110m3/h ΔP = 0mbar at 230V/50Hz).

Oxygen & Moisture Analyzers	
HEPA filter	One Oil pressure safety release valve must be present with HEPA filter for automatic discharge of exceeded gases in the glove box even during power break up.
For O_2 Probe	
Measurement range	Fuel Cell O2 analyzer with range: 0-10000 ppm or better

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
For H_2O Probe	
Type	Advance Ceramic Sensor / Hyper Thin film Sensor/ capacitive sensor type.
Measurement range	0 – 23000 ppm & -100/+20 ºC (Dew Point),
Accuracy	±1 ppm in the full range
Resolution	0.1 ppm
Certification	Calibration certificates for the analyzers traceable to suitable international standards should be provided.

Solvent Trap	
Trapping agent and capacity	**Activated Charcoal reactor with capacity 5-7 Kg** with three way valve. Easy replacement of loads by bypassing the circuit and easy conditioning of the charcoal without disturbing glove box atmosphere. Equipped with by-pass valves, three-way valve, vacuum gauge, connection to vacuum pump and two FK40 fittings for replacement of used load.

System integration/Logic control	
Glove box control through	Programmable Logic Controller (PLC). Glove box flushing mode available from touchscreen with adjustable time and automatic stops at the end of elapsed time. Warning display in case of recirculation blower stop.
PLC Features	Display on 7''colour touch panel. Color touch screen with 65K color screen. Led retro lighting. Resolution 800 x 480 pixels. Internal memory and SD 4 Go memory card supplied with the screen.
Display features	O_2, H_2O, Pressure Control: Purging, Regeneration & Purification
PLC aided controls and settings	For main vacuum chamber, purification, flushing, regeneration, and box pressure.
Box pressure regulation during user operation	Automatic without the need of foot pedal and vacuum pump
Box flushing mode	Required and options like adjustable time and auto stop should be provided
Alarm	Required for O_2 and H_2O levels
Control and recording	Continuous control, graphic seeing of data (H2O, O2, Pressure, Temperature.) and automatic recording each 2 minutes. Historical period 2 months.

Data export and Ethernet port	Data export of the different sensors through USB port (data saving and transfer to laptop). Remote additional display of the glove box touchscreen (distance up to 300m) and Ethernet checking diagnosis

Other features	
Noise level	Low noise level 49 dB (A) under purification and pressure regulation (Economical mode) Economical energy mode required
Box Lighting	Manual and/or automatic
Extra Blank feed through	No - 02
Airgun Feed through	No- 01
Extra electrical feed through 230V/50Hz	No – 01
Spare items	Spare gloves – 2 Pairs Spare O ring for gloves – 1 Pair Spare O ring for mini-antechamber – 1 pairs. Spare O ring for Main antechamber – 1 Pair Door Cover for Blocking Glove Port in emergency – 1 Piece
Magnetic stirrer	One magnetic stirrer

Refrigerator	
Refrigerator:	Deep Freezer of volume at least 25 liters with multiple trays inside with adjustable height. Atlest 3 shelves with 5 variable levels. Temperature Range up to – 35 °C. Integrated into side panel of the glove box.
Warranty	Three Year

Digital Weighing Balance	
Digital balance:	Digital balance with Clear, Reverse Backlit LCD panel, Different Weighing Units, Fast Stabilization at 2 s, frustration-free weighing even at a resolution of 0.1 mg. Automatic Calibration, Sliding Doors,
Warranty	Three Year

Crimping machine:	
Type	Manual crimping
Pressure	Hydraulic pressure up to 8 T
Dimension	Not more than outer dimension: 223mm X 170mm X 325mm
Weight	Weight: 25-40 kg
Die Set & Compatibility	Assembling dies for CR2032, CR2025 & CR2016 coin cells
Coin cell case	100 Nos of CR2032 coin cell case

S.No.	Additional Necessary Requirement:
1.	Glove box and Purification System and Sensors should be from single manufacturer and with minimum 5 years of Glove box and Purifier. experience (documentary evidence to be submitted by manufacturer) .
2.	Installation and Commissioning i) An estimated time schedule for installation, commissioning and training must be provided with free of cost. ii) At least 10 glove boxes installations in India with details to be provided. iii) Vendor should have service center/office in North territory of India.
3.	Catalogues related to quoted machine should be enclosed in the offer. Dimensions of equipment, weight and space requirements should be submitted in technical offer. Pre-installation requirements should be furnished. Hard copy of all the operational manuals related to the system have to be provided while supplying the system.
4.	The compliance statement should include sufficient details in support of the claim against each of the desired specifications. Just mentioning 'complied' against the desired specification will not lead to qualification.
5.	Upgrades / Option items should also be quoted with description
6.	Warranty: 3 yrs or more
7.	Certifications Required from Principal Company: Latest ISO certificate, CE Certificate, TUV Certificate.
8.	Details of Service Back-up with a written assurance of breakdown not stretching beyond 36 Hours
9.	Company must have a direct service support in India along with ready availability of spare parts.

Modified Specifications after pre-bid meeting

GLOVE BOX	
Parameter	**Desired Specifications**
Type	Real modular glove box with dismountable side panels; tightness of side panels imperatively secured through O-ring sealing's (non silicon only).
Box material	Should be made of stainless steel materials, quality not less than Stainless steel US304 (1.4301) or better, thickness 3-4 mm. Inside surface should be brushed finish
Box dimensions	Length: 1800-2000 mm Height: 900-950 mm Depth: 750-800 mm
Provision for expandable working area	The glove box must have possibility to dismount a side panel to connect a second module of glove box for expandable working area.
Stand for support	SS with lockable caster wheels
Light	Front panel LED light with on-off switch

Front panel	Front panel should be of Polycarbonate material. Additional coating for chemical and scratch resistance is required. Thickness (mm): 10-14 (± 10%)
Number of glove ports and spare gloves	Four glove port with two spare gloves
Glove ports diameter	220 mm
Gloves	Butyl rubber, 0.4-0.6 mm thickness or better, size: medium or large Should be O-ring sealed against the gloves
Shelves	Height adjustable SS trays (Minimum 3) Should have upgrade option for sliding trays
Feed Through	BANANA feedthrough, double sided, 4 pin 01 No BNC feedthrough, 4 pin 01 No Liquid /Gas/Vacuum feedthrough with manual valve - 01 No Electrical feed through- 01 No, 220V 10-16A 2 blank leak tight feedthroughs on KF40 flange for future use
Filters	The glove box should have inlet/outlet 0.3 micron HEPA filters, which should be Class H13 or better.
Pipes	All SS (US304 or better)
Box Operating Pressure	Automatic Box pressure range should be from -15 mbar to +15 mbar or wider Able to be operated at over or under pressure Should include Oil free-based pressure relief mechanism.
~~Heat exchanger~~	~~Glove Box should be integrated with heat exchanger~~

Main Antechamber	
Chamber material	Corrosion/chemical resistant SS (US304) or better
Chamber shape and size	Cylindrical and 600 mm (L) Internal dimension / 375-400 mm (D) Internal dimension
Inside tray	Sliding and made of SS
Operation mode	Must have automated control over vacuum/refill process and also on the no. of cycles
Leak rate	< 10^{-5} mbar.l/s (tested with helium mass spectrometer).

Heated Mini Antechamber	
Chamber material	SS (US304) or better, installed in the same side of the main chamber
Antechamber function	Mini-antechamber oven, up to max. 150°C, 3 way valve for evacuation and venting of the antechamber; including stainless steel extension tray.
Chamber shape and size	Cylindrical and 400 mm (L) / 150 mm (D), Fitted with analog vacuum gauge
Operation type and mode	PID control, 100% outside the box; Cover: bayonet mechanism inside and outside.
Leak r ate	< 10^{-5} mbar.l/s (tested with helium mass spectrometer).

Vacuum Pump	
Pump type	Dual stage vacuum pump
Suction capacity	Flow not less than 17m3/h
Operation mode	The vacuum pump has to stop automatically after cycle in the large vacuum chamber and has to be used only for evacuating vacuum chambers (Economical mode)
Purification unit	< 1 ppm 0_2 and H_20 with minimal capacity of: 0_2 30-45L and H_20 1300-1500 g
Purification Loads	Must be between 10-14Kg or more, (Copper Catalyst + Molecular Sieves in equal Proportionate), higher amount of catalyst will be prefered
Other	All piping and components must be in stainless steel (US304 or better 304L). Integrated recirculation blower, type mounted inside a stainless steel sealed housing, with minimal flow 40m3/h up to over 100m3/h depending on pressure drop.

Gas Purification Unit	
Inert gas usable	Nitrogen or Argon
	Automatic recirculation flow adjustment depending on concentrations H20 and/or O2. Possibility of manual adjustment of recirculation flow (Economical mode).
Achievable purity	System should maintain Less than 1 ppm of oxygen and water
Purification columns and removal capacity	0_2 30-45L and H_20 1300-1500 g ~~50-60 Liter for O2, or better~~ ~~1800-2000 g for H2O or better~~
Catalyst capacity (Amount of materials used for purification)	Must be between 10-14Kg or more, (Copper Catalyst + Molecular Sieves in equal Proportionate), higher amount of catalyst will be prefered
Material used for making components and piping	Fully SS
Regeneration of the purifier unit	Automatic process / PLC
Gas for regeneration	N_2/H_2 or Ar/H_2 mixture. H_2 percentage 3 to 5
Circulation of gas	By a recirculation blower
Heating of reactor	Integrated temperature regulation controlled through automatic and temperature cut out.
Recirculation blower	Recirculation blower, type brushless motor mounted inside a stainless steel housing, with flow 40m3/h with ΔP = 20mbar (up to 110m3/h ΔP = 0mbar at 230V/50Hz).

Oxygen & Moisture Analyzers	
HEPA filter	One Oil free safety release valve must be present with HEPA filter for automatic discharge of exceeded gases in the glove box even during power break up.
For O_2 Probe	
Measurement range	Fuel Cell O2 analyzer with range: 0-1000 ppm or better
Electronics	Integrated microprocessor/PLC 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
For H_2O Probe	
Type	Advance Ceramic Sensor / Hyper Thin film Sensor/ capacitive/solid state sensor type.
Measurement range	0 – 500 ppm & -100/+20 ºC (Dew Point),
Accuracy	±1 ppm in the full range
Resolution	0.1 ppm
Certification	Calibration certificates for the analyzers traceable to suitable international standards should be provided.

Solvent Trap	
Trapping agent and capacity	**Activated Charcoal reactor with capacity 6-7 Kg** with three way valve. Easy replacement of loads by bypassing the circuit and easy conditioning of the charcoal without disturbing glove box atmosphere. Equipped with by-pass valves, three-way valve, vacuum gauge, connection to vacuum pump and two FK40 fittings for replacement of used load.

System integration/Logic control	
Glove box control through	Programmable Logic Controller (PLC). Glove box flushing mode available from touchscreen with adjustable time and automatic stops at the end of elapsed time. Warning display in case of recirculation blower stop.
PLC Features	Display on 7''colour touch panel. Color touch screen with 65K color screen. Led retro lighting. Resolution 800 x 480 pixels. Internal memory and SD 4 Go memory card supplied with the screen.
Display features	O_2, H_2O, Pressure Control: Purging, Regeneration & Purification
PLC aided controls and settings	For main vacuum chamber, purification, flushing, regeneration, and box pressure.
Box pressure regulation during user operation	Automatic without the need of foot pedal and vacuum pump

Box flushing mode	Required and options like adjustable time and auto stop should be provided
Alarm	Required for O_2 and H_2O levels
Control and recording	Continuous control, graphic seeing of data (H_2O, O_2, Pressure, Temperature) and automatic recording each 2 minutes. Historical period 2 months.
Data export and Ethernet port	Data export of the different sensors through USB port (data saving and transfer to laptop). Remote additional display of the glove box touchscreen (distance up to 300m) and Ethernet checking diagnosis

Other features	
Noise level	Low noise level 49 dB (A) under purification and pressure regulation (Economical mode) Economical energy mode required
Box Lighting	Manual and/or automatic
Spare items	Spare gloves – 2 Pairs Spare O ring for gloves – 1 Pair Spare O ring for mini-antechamber – 1 pairs. Spare O ring for Main antechamber – 1 Pair Door Cover for Blocking Glove Port in emergency – 1 Piece

Refrigerator	
Refrigerator:	Deep Freezer of volume at least 25 liters with multiple trays inside with adjustable height. Atlest 3 shelves with 5 variable levels. Temperature Range up to – 35 °C. Integrated into side panel of the glove box.
Warranty	Three Year

Crimping machine:	
Type	Manual crimping
Pressure	Hydraulic pressure up to 8 T
Dimension	Not more than outer dimension: 223mm X 170mm X 325mm
Weight	Weight: 25-40 kg
Die Set & Compatibility	Assembling dies for CR2032, CR2025 & CR2016 coin cells
Coin cell case	100 Nos of CR2032 coin cell case

S.No.	**Additional Necessary Requirement:**
1.	Glove box, Purification System and Sensors should be from single manufacturer and with minimum 5 years of Glove box and Purifier experience (documentary evidence to be submitted by manufacturer).
2.	Installation and Commissioning i) An estimated time schedule for installation, commissioning and training must be provided with free of cost.

	ii) At least 15 glove boxes installations inresearch Institutes in India, like IIT's, IISER's, DST labs, CSIR labs, etc. with details to be provided. iii) Vendor should have service center/office in North territory of India.
3.	Catalogues related to quoted machine should be enclosed in the offer. Dimensions of equipment, weight and space requirements should be submitted in technical offer. Pre-installation requirements should be furnished. Hard copy of all the operational manuals related to the system have to be provided while supplying the system.
4.	The compliance statement should include sufficient details in support of the claim against each of the desired specifications. Just mentioning 'complied' against the desired specification will not lead to qualification.
5.	Upgrades / Option items should also be quoted with description
6.	Warranty: 3 yrs or more
7.	Certifications Required from Principal Company: Latest ISO certificate, CE Certificate, TUV Certificate.
8.	Details of Service Back-up with a written assurance of breakdown not stretching beyond 36 Hours
9.	Company must have a direct service support in India along with ready availability of spare parts.

Optional items:

Extra Blank feed through	No - 02
Airgun Feed through	No- 01
Extra electrical feed through 230V/50Hz	No – 01
Magnetic stirrer	One magnetic stirrer will be using inside the glovebox

Digital Weighing Balance	
Digital balance:	Digital balance with Clear, Reverse Backlit LCD panel, Different Weighing Units, Fast Stabilization at 2 s, frustration-free weighing even at a resolution of 0.1 mg. Automatic Calibration, Sliding Doors,
Warranty	Three Year

The last date for receipt of tender has been extended upto **28/10/2020 till 2:00PM** which will be opened on the same date at **3:00PM** at INST, Mohali. The other details of the tender shall remain unchanged.

Sd/-

H.O.O