Sl.No	Equipment name	Requirement	Quantity
1	Digitial Mass Flow Controller (MFC)	Flow Range: 4000 SLPM	1
2		Flow Range: 2000 SLPM	2
3		Flow Range: 1000 SLPM	1
4		Flow Range: 500 SLPM	1
5		Flow Range: 100 SLPM	1
		Warranty: 1 year	

Detailed Specification:

1.	All the Mass Flow controllers should be of multi-gas selectable type. The Non-Corrosive Mass flow controllers should be preferable calibrated gases include for H_2, LPG, N_2, Ar, O_2, He, Air, CH_4, CO, CO_2, C_2H_2 etc.
2.	MFC should have the option for Personalized gas mixing compositions for accurate mixed gas measurement and switch between selected gases on the fly without any need for recalibration of the mass flow controller.
3.	Operating Pressure: Max 160 PSIA
4.	Downstream pressure: 0.25 kg/cm^2 (G) and vacuum
5.	Proof Pressure: 175 psig
6.	Temperature range of operation: -10 $^{\circ}$C to 60 $^{\circ}$C
7.	Wetted and Seal Material: Recommended Body material and seals suitable for the gas (preferably SS302)
8.	Accuracy: ± 1% or (0.8% of Reading ± 0.2% of Full Scale)
9.	Repeatability: ± (0.1% of Reading + 0.02% of Full Scale)
10.	Pressure sensitivity: 0.01% of full scale / PSI
11.	It should have rigid metallic construction
12.	The output of the controller should be 0 – 5v or 4 - 20 mA signals
13.	The controller should be provided with circuit protection
14.	It should be operated in the power supply of 230 V AC, 50 Hz
15.	The controller should have the connection of compression gas fittings
16.	Setting Flow Ramp up programming cycle should be possible by interfacing through the in build keypad with the display on the MFC
17.	Warm-up Time: Time < 1 Second
18.	Typical Response Time <100 ms (Adjustable)
19.	Operating Range : 0.01% to 100% Full Scale
20.	Electrical Connection Options: DB9 Pin
21.	MFC should have the option for Personalized gas mixing compositions for accurate mixed gas measurement and switch between selected gases on the fly without any need for recalibration of the mass flow controller.
22.	Software: A PC based software program that should interface with the RS-232 and RS 485 communication. The graphical

	user interface (GUI) should provide automatic configuration, session saving for easy Configuration and experiment setup reloads, data capturing and logging (including a graphing tool),simple and advanced script building for automating meter sequences, software alarms and support for multiple devices
23.	All connecting cables/chords/interfaces ports and necessary power supply (110V to 230V converter) should be supplied along with the instrument
24.	Detailed service manual and operating manual with circuit diagram should be provided along with the instrument
25.	Necessary accessories such as Power Supply, Communication cable, software should be provided for trouble free operation of the instrument.
26.	Manufacturer should have their own Re-Calibration and Service Centre in India.
27	Installation, commissioning, training and service
28	Vendor must attach the reference of PO copies supplied at least to 5 users in the last 5 years with contact details preferably to IITs, IISC and CSIR Labs
29	Manufacturer should provide minimum 1 year of warranty to the equipment.