Ref. No.: IISc/AE/Tender/2023/Local/MFC Calibration Bench Date: 03rd July 2023

Tender Notification for the Procurement of a mass flow controller calibration bench (Last Date for Submission: 24th July 2023)

This is a Request for quote (RFQ) from domestic (India-based) manufacturers only for procurement of a calibration bench for mass flow controllers at the department of Aerospace Engineering, Indian Institute of Science, Bangalore. With respect to this tender, the rules laid out by the Government of India in order No. P45021/2/2017-pp-BE-II issued by the Public Procurement Section, Department or Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, dated 4th June 2020 will be followed. As per this order, the government has defined a 'Class-I local supplier' as "a supplier or service provider whose goods, services or work offered for procurement, has local content equal to or more than 50%". A 'Class-II local supplier' is "a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%". Only Class-I and Class-II local suppliers are eligible to participate in this open domestic tender. Any "Non-local supplier" i.e., "a supplier or service provider, whose goods, services or works offered for procurement, has local content less than 20%" is ineligible to participate in this tender. 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 5 PM on 24th July 2023.

The bids should be addressed to:

The Chairman,
Department of Aerospace Engineering
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Dr. Irfan Mulla
email: irfanmulla@iisc.ac.in, chair.aero@iisc.ac.in

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Section 1: Bid Schedule

1.	Tender No	IISc/AE/Tender/2023/Local/ MFC Calibration Bench
2.	Tender date	03rd July 2023
3.	Instrument	A mass flow controller calibration bench
4.	Tender type	i) Technical bid (Part A) ii) Commercial bid (Part B)
5.	Place of tender submission	The Chairman, Department of Aerospace Engineering Indian Institute of Science Bangalore 560012, India. Kind attention: Dr. Irfan Mulla
6.	Last date and time of tender submission	24th July 2023, 5 PM
7.	Contact for further clarification	Dr. Irfan Mulla Department of Aerospace Engineering Indian Institute of Science Bangalore 560012, India. Ph: +91-80-2293-2875 email: irfanmulla@iisc.ac.in

Section 2: Eligibility Criteria

Prequalification criteria:

1. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
2. The quotations should be on FOR-IISc Bangalore basis in INR only.
3. Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.
4. MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.
5. The Bidder should belong to either Class 1 or Class 2 supplier distinguished by their "local content" as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter. Additionally, the bidder should submit – Annexure 6 with details of local contents.
    a. Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
    b. Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.
6. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to Class-1 supplier.
7. The Bidder's firm should have existence for a minimum of 3 years (Enclose Company Registration Certificate).
8. The bidder should sign and submit the declaration of Acceptance of Terms and Conditions as per - Annexure 4.
9. The Bidder must be not blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.

Section 3: Technical Specification for a MFC calibration bench

Submit a quote for mass flow controller (MFC) calibration bench with the following specifications.

The bench should be capable of calibrating gas and liquid flow meters/controllers. Bidder should respond to each point listed below in Secs. T1 to T5.

T1. Calibration unit for gas MFCs with the following mandatory specifications

The bench should be capable of calibrating gas mass flow meters/controllers in the range of 50 Standard cubic centimeters per minute (SCCM) to 5000 standard liter per minute (SLPM).

S.N.	Parameter	Specification
1	Master MFCs and quantity	*As described below with respective quantity*
1a.		50 SCCM 2 nos.
1b.		500 SCCM 2 nos.
1c.		5 SLPM 2 nos.
1d.		10 SLPM 1 no.
1e.		20 SLPM 1 no.
1f.		50 SLPM 2 nos.
1g.		100 SLPM 1 no.
1h.		500 SLPM 1 no.
1i.		1000 SLPM 1 no.
1j.		5000 SLPM 1 no.
2	Measurement principle	Pressure-drop or Coriolis based for faster response
3.	Accuracy at full scale	*As described below at full scale*
3a.	50 SCCM to 20 SLPM MFCs	≤ ±0.6 %
3b.	50 to 5000 SLPM MFCs	≤ ±1 %
4.	Repeatability at full scale	*As described below at full scale*
4a.	50 SCCM to 20 SLPM MFCs	≤ ±0.15%
4b.	50 to 5000 SLPM MFCs	≤ ±0.25%
5.	Flow control range	0.01 to 100% of full scale
6.	Flow control response time for 63% of set value	≤ 150 ms
7.	Temperature sensitivity	*As described below*
7a.	50 SCCM to 20 SLPM MFCs	≤ ±0.01% of full scale per °C
7b.	50 to 5000 SLPM MFCs	≤ ±0.02% of full scale per °C
8.	Pressure sensitivity	≤ ±0.1% of full scale per atmosphere
9.	Operating temperature	0 to 50 °C
10.	Operating Pressure	Up to 160 PSIA or more
11.	Gas temperature measurement	≤ ±1 °C

	accuracy	
12.	Gas pressure sensor accuracy	≤ ±0.5%
13.	Pressure and temperature sensor response time	< 1 ms
14.	Material	Stainless-steel
15.	Warm-up time	< 1 second
16.	Gas types	MFCs should have in-built calibration for all non-corrosive gases, namely, Air, Nitrogen, Oxygen, Carbon dioxide, Hydrogen, hydrocarbon gaseous fuels, and all inert gases. A user should be able to select a gas using software. MFCs should be compatible with common hydrocarbon gaseous fuels and oxygen.
17.	Device control and display	A user should be able to set the desired flow rate using both on-device control and remote control from a computer. The measured quantities, namely, flow rate, temperature, and pressure should be displayed on the unit locally.
18.	Software, cables, power supply	A vendor should provide the necessary hardware and power supply unit and cables to control all MFCs remotely from a computer.
19.	Calibration bench integration	All the above-listed master MFCs should be connected on a single calibration bench. All the cables, hoses, tubing, air filter, and table frame should be provided by the vendor. The bench should have the following features. • Automated master MFC selection through solenoid valve opening from a computer. • Vibration isolation mechanism. • Wheels with locking mechanism for portability.
20.	Calibration software and hardware	Please include calibration software and related hardware to generate the calibration report. Software should be capable of transmitting the calibration parameters to a MFC hardware to compensate for any drift.
21.	Plumbing from existing compressor to calibration bench	About 15-meter stainless-steel tubing of 2 inch to connect compressor output to the calibration bench. Include the material and labour costs.

T2. Calibration unit for liquid MFCs with the following mandatory specifications

The bench should be capable of calibrating liquid mass flow meters/controllers in the range of 100 to 30000 grams/hour (g/hr).

S.N.	Parameter	Specification
1	Master MFCs and quantity	*As described below with respective quantity*
1a.		100 g/hr 1 no.
1b.		1000 g/hr 1 no.
1c.		3000 g/hr 1 no.
1d.		30000 g/hr 1 no.
2.	Measurement principle	Coriolis based
3.	Accuracy for liquid flows at full scale	≤ ±0.6 %
4.	Repeatability	≤ ±0.1 % of full scale
5.	Flow control range	5 to 100% of full scale
6.	Fluid density measurement capability	*As described below*
6a.	Density accuracy	≤ ±5 kg/m^3
6b.	Density range	100 – 2,000 kg/m^3
7.	Viscosity range	0 – 200 centipoises
8.	Flow control response time for 98% of the value	≤ 1 seconds
9.	Temperature sensitivity	≤ ±0.02% of full scale per °C
10.	Operating fluid temperature	0 to 60 °C
11.	Operating pressure	Up to 1400 PSIA
12.	Material	Stainless-steel
13.	Liquid types	MFCs should be compatible with common hydrocarbon combustible liquid and water
14.	Filters	For each MFC, do include compatible inlet filter made up of a sintered stainless-steel material.
15.	Device control	Users should be able to set the desired flow rate from a computer.
16.	Control software, cables, power supply	A vendor should provide the necessary hardware and power supply unit and cables to control all MFCs remotely from a computer.
17.	Calibration bench integration	All the above-listed MFCs should be connected on a single calibration bench. All the cables, hoses, tubing, air filter, and table frame should be provided by the vendor. The bench should have the following features. • Automated master MFC selection through solenoid valve opening from a computer.

		• Vibration isolation mechanism. • Wheels with locking mechanism for portability.
18.	Liquid pressurization and storage	Please include 2 nos. of 15-liter storage capacity vessels with the pressure rating of 100 bar.
19.	Calibration software and hardware	Please include calibration software and related hardware that to generate the calibration report. Software should be capable of transmitting the calibration parameters to a MFC hardware to compensate for any drift.

T3. Mandatory requirements/features:

1. The installation and demonstration should be done by a technical expert of either the manufacturer or their authorized Indian technician. Complete training should be given on the operation and maintenance of the calibration bench, including writing calibration parameters onto an MFC.
2. Manufacturer should have the mass flow controller calibration and servicing facilities within India.
3. All the necessary plumbing, connectors, valves, and regulators should be supplied with the calibration bench. All communication and power cables should be supplied.
4. A document with the calibration reports for all master mass flow controllers should be provided.
5. Delivery: Within 3 to 4 months from the date of purchase order.
6. Product warranty from the date of installation
    a. At least 12 months
7. Servicing/repair: If the need arises, local servicing/repairs should be attended to within five business days. It is mandatory to have a skilled technician/engineer located within India. The local technician should have substantial experience in servicing/repairing the calibration bench. The bidder should provide a letter indicating details of the training received and experience in months. This letter should be endorsed by the manufacturer.

T4. Optional requirements/features:

1. An additional two years of warranty for mass flow controllers.
2. Yearly calibration charges for all the above MFCs. A combined price can be provided in the commercial bid.

T5. Commercial bid price break-up

In the commercial bid, please provide the price of individual components, preferably in the following manner.

1. Calibration bench and accessories to mount the gas MFCs without the price of gas MFCs.
2. Calibration bench and accessories to mount the liquid MFCs without the price of liquid MFCs.
3. The price of each gas MFC separately.
4. The price of each liquid MFC separately.
5. Airline plumbing of 15 meters from compressor to the bench.
6. Liquid pressurization and storage vessel.
7. Optional warranty and yearly calibration charge.
8. Any other charges.

Section 4: Terms and Conditions

1. All documentations in the tender should be in English.
2. Tender should be submitted in two envelopes (two bid system).
    a) Technical Bid (Part-A) – Technical bid consisting of all technical details and checklist for conformance to technical specifications. The proposal should contain a compliance table. The compliance table should include all the items of the technical specifications in the same order and format. The first additional column should describe product specifications. The next column should indicate compliance in a "Yes" or "No" response.
    b) Commercial Bid (Part-B) – Indicating item-wise price for the items mentioned in the technical bid, as per the format of quotation provided in tender, and other commercial terms and conditions.
3. The technical bid and price bid should each be placed in separate sealed covers, superscribing on both the envelopes tender no. and the due date. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly superscribed with the Tender No, Tender Description & Due Date.
4. The SEALED COVER superscribing tender number and due date & should reach the office of the Chairman, Department of Aerospace Engineering Indian Institute of Science Bangalore 560012, India. Kind attention: Dr. Irfan Mulla, on or before the due date mentioned in the tender notice. In case the due date happens to be a holiday, the tender will be accepted and opened on the next working day. If the quotation cover is not sealed, it will be rejected.
5. The covering letter should clearly state whether the vendor is a Class-I or Class-II local supplier. Failing this the bid will be automatically rejected.
6. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect should be provided.
7. Time for the delivery of the equipment should be less than 3 to 4 months from the date of release of the PO. It should be clearly mentioned in the technical and commercial bids.
8. The vendor must provide a compliance statement in a tabular form concerning each technical 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 the rejection of the bid.
9. Wherever requested, data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed technically non-compliant.
10. IISc reserves the right to verify the accuracy and seek clarification of submitted specifications after opening the technical bids. Based on such clarification, if specifications are found to be unsuitable, the technical committee reserves the right to disqualify vendors. Any discrepancy between the promised and verified specifications will be deemed as technical non-compliance.
11. The technical bid should also contain warranty details and terms. Further, any periodic maintenance requirements for regular operation should be specified in detail, along with the extent of coverage under warranty for such maintenance activity.
12. The bidder will provide the prerequisite installation requirement of the equipment along with the technical bid. The vendor is responsible for the installation of the system at IISc, along with the training of end-users.
13. In the commercial bid, the price should be inclusive of all discounts. The price quotation should include the cost of installation and training of potential users, if any. Please quote the price of each calibration bench component, separately.
14. The quotations should be on FOR-IISc Bangalore basis in INR only.

15. Any statutory increase in the taxes and duties subsequent to the bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore, subject to the claim being supported by documentary evidence. However, if any decrease takes place, the advantage will have to be passed on to IISc, Bangalore. Any information furnished by the bidder found to be incorrect, either immediately or at a later date, would render the bidder liable to be debarred from the bidding process.
16. The vendor must submit a list of all Indian customers (only Government of India organizations) where similar systems have been installed. References from this list can be used to disqualify vendors with a poor track record of service, build quality, system performance, or poor availability of spares. Additionally, IISc shall have the absolute right to take the opinion of other departments/institutes for their opinion/experience about the bidder's services/sales. Based on such input, IISc may decide about the rejection of a bid of such bidder(s).
17. The vendor shall include up to five testimonials from existing users of a similar system indicating performance and maintenance satisfaction.
18. Notwithstanding anything specified in this tender document, IISc Bangalore, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:
    a) To accept OR reject the lowest tender or any other tender or all the tenders.
    b) To accept any tender in full or in part.
    c) To reject the tender, offer not conforming to the tender terms.
19. IISc reserves the right to relax any or all of the above conditions without assigning any reason.

Annexure 1:

Details of the Bidder: The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Sr. No.	Type	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

(Signature of the Bidder)
Name: Date:
Designation, Seal

Annexure 2:

Declaration regarding experience

To,

The Chairman,
Department of Aerospace Engineering
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Supply and installation of a mass flow controller calibration bench

I have carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has ---- years of experience in supplying and installing a calibration bench for mass flow controllers.

I also declare that my company / firm has a skilled technician/engineer located within India. The local technician has ---- years/months of experience in servicing/repairing the calibration bench for mass flow controllers. The details of the training received are ---. The training details are endorsed by the calibration bench manufacturer.

(Signature of the Bidder)
Name: Date:
Designation, Seal

(Signature of the calibration bench manufacturer)
Name: Date:
Designation, Seal

Annexure 3:

Declaration of track record

To,
The Chairman,
Department of Aerospace Engineering
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Supply and installation of a mass flow controller calibration bench

Sir,

I have carefully gone through the Terms & Conditions contained in the above referred tender.

I hereby declare that my company / firm is not currently debarred / blacklisted by any Government / Semi-Government organizations / institutions in India or abroad. I further certify that I am competent officer in my company / firm to make this declaration.

OR

I declare the following:

Sr. No.	Country in which the company is debarred/ blacklisted / having pending case	Blacklisted / debarred by Government / Semi Government Organizations or Institutions / having pending case	Reason	Time Period

(Note: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

(Signature of the Bidder)
Name: Date:
Designation, Seal

Annexure 4:

Declaration of acceptance of terms and conditions

To,
The Chairman,
Department of Aerospace Engineering
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Supply and installation of a mass flow controller calibration bench

Sir,

I have carefully gone through the Terms & Conditions contained in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I am an authorized signatory of my company and am, therefore, competent to make this declaration.

(Signature of the Bidder)
Name: Date:
Designation, Seal

Annexure 5:

Details of items quoted:

a. Company Name
b. Product Name
c. Part / Catalogue number
d. Product description / main features
e. Detailed technical specifications
f. Remarks, if applicable

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.

Annexure 6:

Declaration regarding Class-I or Class-II local supplier

To,
The Chairman,
Department of Aerospace Engineering
Indian Institute of Science
Bangalore 560012, India.
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Class-I or Class-II local supplier declaration

Local content details: The bidder should provide the following details of the local contents. Please indicate the extent of local content in terms of percentage of the total price. Do not disclose the absolute total or local content price in this letter. Only the percentage of local content by price is sufficient. Please describe clearly how your bid satisfies the Class-I or Class-II supplier conditions, in terms of locally manufactured items.

(Signature of the Bidder)
Name: Date:
Designation, Seal

Section 5 – Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned below:
Please provide the price of individual components, preferably in the following manner.

1. Calibration bench and accessories to mount the gas MFCs without the price of gas MFCs.
2. Calibration bench and accessories to mount the liquid MFCs without the price of liquid MFCs.
3. The price of each gas MFC separately.
4. The price of each liquid MFC separately.
5. Airline plumbing of 15 meters from compressor to the bench.
6. Liquid pressurization and storage vessel.
7. Optional warranty and yearly calibration charge.
8. Any other charges.

Items requested in the mandatory specification Sections 3.T1 and 3.T2

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Items noted in the technical specification				
2	… (details of items)				
3.	Warranty (years)				
4.	FOR-IISc Bangalore only				

Items requested in the optional specification Section 3.T4

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Optional items noted in the technical specification				
2	… (details of Optional items)				
3.	Warranty (years)				
4.	FOR-IISc Bangalore only				

Section 6 - Checklist

The following items must be checked before the bid is submitted.

1. Sealed Envelope "A": Technical Bid
   Technical bid (signed by the authorized signatory and sealed) with the below documents:
   a. Annexure 1: Bidders details
   b. Annexure 2: Declaration regarding experience
   c. Annexure 3: Declaration of track record
   d. Annexure 4: Declaration of acceptance of terms and conditions
   e. Annexure 5: Details of item quoted
   f. Annexure 6: Class-I or Class-II supplier declaration

2. Sealed Envelope "B": Commercial Bid

Your quotation must be submitted in two separate sealed envelopes: Technical Bid (Envelope A) and Commercial Bid (Envelope B) super scribing on both the envelopes with Tender No. and due date. These envelopes should be put in a bigger cover which should also be sealed and duly superscribed with Tender No., Tender description & Due Date.