

# Notice Inviting Global Tender

## Procurement and installation of Particle Image Velocimetry system

Tender No. IISc/ChE/Global/2024/001

Department of Chemical Engineering  
Indian Institute of Science  
Indian Institute of Science  
Bangalore 560012  
27rd February 2024

GTE Approval F. No. 51-03/2023-TS-VII Dated 19 February, 2024.

## Global Tender

This is a Request for Quote (RFQ) from the Indian Institute of Science (IISc), Bangalore, for the procurement and installation of a Particle Image Velocimetry system at the Department of Chemical Engineering, Indian Institute of Science, Bangalore.

1	Section 1	Bid Schedule	
2	Section 2	Eligibility Criteria	As specified by IISc
3	Section 3	Terms and Conditions	As specified by IISc
4	Section 4	Specifications	Technical specifications
5	Section 5	Technical Bid	Annexure 1: Bidder details Annexure 2: Declaration regarding experience of bidder, clean track record, acceptance of tender conditions and details of installations in last 5 years. Annexure 3: Details of items quoted.
6	Section 6	Commercial bid	Quotation with Price, Technical specifications of the Equipment

### Section 1: Bid Schedule

1	Tender No	IISc/ChE/Global/2024/001
2	Tender Date	27 <sup>th</sup> February 2024
3	Item Description	Procurement and installation of Particle Image Velocimetry system
4	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	Chairperson Office, Department of Chemical Engineering, Indian Institute of Science, Bangalore 560012.
6	Last Date & Time for submission	20 <sup>th</sup> March 2024, 5 pm.
7	For further clarification	V. Kumaran, Department of Chemical Engineering, Indian Institute of Science, Bangalore 560012. Email: kumaran@iisc.ac.in

## Section 2: Eligibility Criteria

Prequalification criteria:

1. The Bidder's firm should have been in existence for a minimum of 5 years. (Enclose Company Registration Certificate).
2. The Bidder should have qualified technical service personnel for the instrument(s) based in India.
3. If the Bidder is a local distributor/dealer/Agent, it is mandatory to attach authorization certificate along with the bid from the original equipment manufacturer.
4. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per Annexure 2.
5. 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 must be given as per Annexure 2.
6. Quote should come only from Original Global Equipment Manufacturer (OEM) or their authorized Indian distributor.
7. The quotations should be on CIP/CIF-IISc Bangalore basis in Foreign/Indian currency, OR All imported equipment should be quoted in the currency of the country of origin, and all locally sourced items should be quoted in Indian Rupees

### Section 3: 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) The facility should meet (or exceed) the technical specifications provided in the ‘Technical Specifications’ section 4. Any additional items that are required beyond the list for the successful performance of the High-Speed PIV should be mentioned and provided.
  - (b) Technical specifications are listed for two types of components, ‘Essential component’ and ‘Optional components’. The bidder is required to bid for both Essential components and Optional components.
  - (c) Technical Bid (Part-A) – Technical bid consisting of all technical details and check list for technical specifications. The technical proposal should contain a technical compliance table for all essential components and optional components.
  - (d) The compliance table should have 5 columns.
    - i. The first column must list the technical requirements, in the order that they are given in the Technical specifications (section 4).
    - ii. The second column should provide specifications of the instrument against the requirement. Please provide quantitative responses wherever possible.
    - iii. The third column should describe your compliance with a “YES” or “NO” only. Ensure that the entries in column 2 and column 3 are consistent.
    - iv. The fourth column should state the reasons/explanations/context for deviations, if any.
    - v. The fifth column can contain additional remarks from the Indian Original Equipment Manufacturer (OEM) or from their distributors. You can use this opportunity to highlight technical features, qualify response of previous columns, or provide additional details, compare your solution with that of your competitors or provide details as requested in the technical requirements table below.

- (e) Commercial Bid (Part-B) – Indicating price for all the items mentioned in the technical bid, as per the format of quotation provided in tender, and other commercial terms and conditions.
  - (f) The price should be quoted separately for the Essential components and separately for the Optional components. Itemised price quote for for each individual component is preferred.
3. The technical bid and price bid should each be placed in separate sealed covers, superscripting on both the envelopes the Tender number and the due date. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly superscripted with the Tender number, Tender Description & Due Date.
  4. The SEALED COVER superscripting tender number/due date should reach Chairperson Office, Department of Chemical Engineering, Indian Institute of Science, Bangalore 560012, India, on or before due date mentioned in the tender notice. In case due date happens to be 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. All queries are to be addressed to the person identified in ‘Section 1 – Bid Schedule’ of the tender notice.
  6. GST/other taxes, levies etc., are to be indicated separately. The BIDDER should mention GST Registration and PAN in the tender document (Indian Bidders only).
  7. If price is not quoted in Commercial Bid as per the format provided in tender document the bid is liable to be rejected.
  8. The Institute reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time prior to the award of contract, without there by incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders.
  9. The technical proposal must include references of at least 3 previous installations done in India within last 5 years of similar Particle Image Velocimetry equipment from the equipment manufacturer. Please provide the names and contact addresses of the three independent referees,

so that the committee can contact them independently to get reference. Also, kindly provide purchase orders and testimonials if available.

10. Cancellation: 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 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.
11. Validity: The offer shall be valid 90 days from the date of opening of the commercial bid.
12. Evaluation of offer:
  - (a) The technical bid (Part A) will be opened first and evaluated.
  - (b) Bidders meeting the required eligibility criteria as stated in Section 2 of this document shall only be considered for Commercial Bid (Part B) opening. Further, agencies not furnishing the documentary evidence as required will not be considered.
  - (c) Pre-qualification of the bidders shall not imply final acceptance of the Commercial Bid. The agency may be rejected at any point during technical evaluation or during commercial evaluation. The decision in regard to acceptance and/or rejection of any offer in part or full shall be the sole discretion of IISc Bangalore, and decision in this regard shall be binding on the bidders.
  - (d) The award of contract will be subject to acceptance of the terms and conditions stated in this tender.
  - (e) Any offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:
    - i. Non-submission of complete offers.
    - ii. Receipt of bids after due date and time and or by email / fax (unless specified otherwise).
    - iii. Receipt of bids in open conditions.

- (f) In case any BIDDER is silent on any clauses mentioned in these tender documents, IISc Bangalore shall construe that the BIDDER had accepted the clauses as of the tender and no further claim will be entertained.
  - (g) No revision in the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.
  - (h) Lowest bid will be calculated based on the total price of all items tendered for the equipment specified herein along with any required accessories, installation and warranty specified herein.
    - i. The institute may, at its discretion, decide to purchase only the Essential Components in the Technical Specifications. In this case, the total price of Essential components will be considered.
    - ii. The institute may, at its discretion, decide to purchase the Essential Components and some or all of the Optional Components in the Technical Specifications. In this case, the total price of Essential components and the selected Optional Components will be considered.
  - (i) The BIDDER submitting the lowest bid may be called for further negotiations.
13. Pre-requisites: The bidder will provide the prerequisite installation requirement of the equipment along with the technical bid.
  14. In case of foreign bidders, the consignment must be airlifted/sea cargo shipped, insured and transported to the Bangalore International Airport/Sea Cargo (CIP/CIF). Necessary custom clearance will be done by IISc, Bangalore, from Bangalore International Airport/Sea Cargo.
  15. The IISc, Bangalore will furnish the necessary papers for the import and customs clearance of items into India.
  16. Warranty: The complete system is to be under warranty period of minimum 3 year including from the date of handing over. If the instrument is found to be defective, it must be replaced or rectified at the cost of the bidder within 30 days from the date of receipt of written communications from IISc, Bangalore. In case repair/replacement is required

during the first three years, the duration for which the equipment is not operational should be added to the warranty period.

17. Purchase order:

- (a) The order will be placed on the bidder whose bid is accepted by IISc after negotiations and based on the terms & conditions mentioned in the tender document.
- (b) If the quality of the product and service provided is not found satisfactory, IISc, Bangalore reserves the right to cancel or amend the contract

18. Delivery, installation and training: The bidder shall provide the lead time to delivery, installation and made functional at IISc, Bangalore from the date of receipt of purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and inspection of all the items and features/capabilities tested by the IISc, Bangalore. After successful installation and inspection, the date of taking over of entire system by the IISc, Bangalore shall be taken as the start of the warranty period. The bidder should also arrange for technical training to the local facility technologists and users.

19. Payment terms: The payment will be through a Letter of Credit after successful installation, and the payment schedule will be determined after the mutual discussions with the successful bidder.

20. Statutory variation: Any statutory increase in the taxes and duties subsequent to 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.

21. Dispute and Jurisdiction: Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore, India.

22. General:

- (a) All amendments, time extension, clarifications etc., within the period of submission of the tender will be communicated electronically. No extension in the bid due date/time shall be considered on account of delay in receipt of any document(s) by mail.
- (b) The bidder may furnish any additional information, which is necessary to establish capabilities to successfully complete the envisaged work. It is however, advised not to furnish superfluous information.
- (c) The bidder may visit the installation site before submission of tender, with prior intimation.
- (d) 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 tendering/taking up of work in IISc, Bangalore.

## Section 4: Technical Specifications

The item-wise list of core components and their specifications are listed below, and bidders are expected to meet or exceed the specifications of each of these components.

The components are divided into two types—essential components and optional components. Bidders should quote separately for essential components and optional components.

The bidders are expected to quote for and supply any unlisted accessories for the proper functioning of the PIV system.

### Essential Components

#### 1. Laser (One unit)

##### (a) Laser unit:

- i. Dual laser head.
- ii. Laser wavelength: 527 nm
- iii. Pulse Repetition rate: Single shot to 10 kHz.
- iv. Pulse energy: 30mJ/pulse/head at 1 kHz.
- v. Power: 90 W at 3 kHz.
- vi. Beam diameter  $\leq 5$ mm.
- vii. Pulse width at 1 kHz  $\leq 200$ ns.
- viii. Divergence  $< 12$  mrad.
- ix. Beam stability  $< 25$   $\mu$ rad.
- x. Pulse stability  $< 0.5\%$  rms.
- xi. Beam roundness  $> 85\%$ .
- xii. Power supply unit.
- xiii. 200-240 V AC 50-60 Hz power supply.
- xiv. Cooling: Air/water cooled. Please attach quotation for external cooling water chiller separately, if required.

##### (b) Accessories:

- i. An optical breadboard to mount the laser and light arm.
- ii. Long laser guiding arm (approximately 1.5 m in length) with accessories to connect it with the laser source unit at one end

and the light sheet optics at the other end. The light guide should be flexible and the laser arm should allow  $360^\circ$  of light sheet rotation.

- iii. Light sheet optics: combination of lenses with variable focal lengths that will allow to focus laser light sheet from 300 mm to 3000 mm.
- iv. All required accessories for mounting aforementioned lenses compatible with laser guiding arm.

## 2. Camera (One unit)

- (a) High speed CMOS camera.
- (b) 4Mpx resolution at 1000 fps with 32GB on-camera memory.
- (c) Global shutter  $< 1\mu\text{s}$ .
- (d) Straddle time  $< 2.5\mu\text{s}$ .
- (e) Interchangeable F-mount and C-mount adapter.
- (f) 50 mm f 1.4 lens.
- (g) Ethernet interface, all connectors and cables.
- (h) Bandpass filter  $527 \pm 10\text{nm}$ .
- (i) Safety goggles (2).

## 3. Synchroniser (One unit)

- (a) Computer controlled, fully programmable synchronization of laser pulse, multiple high-speed cameras, image acquisition etc.
- (b) Pulse width  $\geq 10$  ns.
- (c) 2 inputs, 8 outputs.
- (d) Resolution 250 ps.
- (e) TTL compatible pulse.
- (f) RMS jitter  $\leq 50$  ps.
- (g) Communication through ethernet or USB.

## 4. PIV software (One unit)

- (a) Software for driving camera, laser and synchroniser, image acquisition and processing.
  - (b) 2D 2C PIV and software with multi-pass and multi-grid. Additional PTV option is preferred.
  - (c) Output in one of the image formats .bmp, .jpg, .tiff, .png.
  - (d) Support for TecPlot/Matlab interface.
  - (e) Support for batch processing of images.
  - (f) Licence for parallel processing by CPU or added GPU card.
5. Workstation (One unit)
- (a) Intel Xeon processor with minimum 3.0 GHz.
  - (b) 4 TB HD.
  - (c) 128 GB RAM.
  - (d) 512 GB SSD.
  - (e) Monitor, keyboard mouse.

### **Optional components**

1. Camera (one unit) with same specifications as item (2) of essential components, but without the lens.
2. Tilt/Shift lenses (two units).
  - (a) Focal length in the range 45-50 mm suitable for Scheimpflug adjustment.
3. 3D (Stereo) PIV Software module (one unit).
  - (a) 3D image auto calibration, support Scheimpflug image capture.
  - (b) Support for TecPlot/Matlab interface.
  - (c) Licence for parallel processing by CPU or added GPU card.
4. 3D PIV calibration set (one unit).
  - (a) Calibration plate for 3D (stereo) PIV calibration including high precision manual traverse
  - (b) Accessories for calibration.

## Annexure-1

### Details of the Bidder

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

#### Details of the Bidder

Sl. No	Items 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

Designation, Seal Date:

## Annexure 2

### Declarations

To,  
The Chairperson,  
Department of Chemical Engineering,  
Indian Institute of Science,  
Bangalore – 560012, India  
Ref: Tender No: XXXXXXXXXXX Dated: XXXXX

Sub: Supply and installation Particle Image Velocimetry system at the  
Department of Chemical Engineering, IISc Bangalore.

Sir,

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

I hereby declare that my company / firm has — years of experience in supplying and installing Particle Image Velocimetry systems.

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'm competent officer in my company/firm to make this declaration.

The details of supply and installation of three similar Particle Image Velocimetry equipment in India within last 5 years, along with the contact person in each case, are as follows.

- 1.
- 2.
- 3.

Signature of the Bidder  
Name

Designation, Seal Date:

### **Annexure 3: Details of items quoted**

1. Company Name
2. Product Name
3. Part/Catalogue number
4. Product description/main features
5. Detailed technical specifications
6. Remarks

#### 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.

### Section 6: Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned under:

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Essential items noted in the technical specification				
1.a	... (details of essential items)				
1.b	...				
2.	Optional items noted in the technical specification				
2.a	... (details of essential items)				
2.b	...				
3.	Accessories for operation and installation				
4.	All Consumables, spares and software to be supplied locally				
5.	Warranty (3 years)				

Any additional items

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total

## **Section 7: Checklist**

(This should be enclosed with technical bid- Part A)

The following items must be checked before the Bid is submitted:

1. Sealed Envelope “A”: Technical Bid:
  - (a) Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:
    - i. Annexure 1: Bidders details
    - ii. Annexure 2: Declaration regarding experience, clean track record, acceptance of terms and conditions, details of previous installations.
    - iii. Annexure 3: Details of items quoted.
  - (b) Copy of this tender document duly signed by the authorized signatory on every page and sealed.
2. Sealed Envelop “B”: Commercial Bid  
Section 6: Commercial Bid

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