IITM

भारतीय उष्णदेशीय मौसम विज्ञान संस्थान
(पृथ्वी विज्ञान मंत्रालय, भारत सरकार का एक स्वायत्त संस्थान)
डॉ. होमी भाभा मार्ग पाषाण, पुणे- ४११ ००८
INDIAN INSTITUTE OF TROPICAL METEOROLOGY
(An Autonomous Institute of the Ministry of Earth Sciences, Govt. of India)
Dr. Homi Bhabha Road, Pashan, Pune - 411 008. India

150 YEARS OF CELEBRATING THE MAHATMA

सं. पीएस/125/08/2025

दिनांक – 03 जूलाई 2025

सेवा में / To,

विषय- फेज डॉप्लर इंटरफेरोमीटर प्लस लेजर डॉप्लर वेलोसिमीटर सिस्टम (03 चैनल) की आपूर्ति, स्थापना और कमीशनिंग - मात्रा 01 सेट की खरिद के संदर्भ में।

Sub – Supply, Installation and Commissioning of Phase Doppler Interferometers plus Laser Doppler Velocimeter System (03 Channel) Qty. 01 Set

संदर्भ - इस संस्थान का दिनांक 22/05/2025 समसंख्यक निविदा जांचपत्र

Ref - This Institute's Tender enquiry of even number dated 22/05/2025

प्रिय महोदय/ Dear Sirs,

यह संस्थान उपरोक्त विषयानुसार सामग्री की खरिद करना चाहता है। इसलिए इच्छुक बोलीदाताओं से अनुरोध है कि अपनी तकनिकी तथा कीमत बोली निम्नलिखित निर्देशानुसार प्रस्तुत करें।

This Institute wishes to procure goods as per subject cited above. Therefore, interested bidders are requested to submit their Technical and Price bids as per the instructions given below;

बोली प्रस्तुत करने की अंतिम तिथि 19 जून, 2025 से 17 जूलाई, 2025 को 1500 बजे तक बढाई जाती है।

The last date of submission of bids is extended from 19th June, 2025 to 17th July, 2025 upto 1500 hrs.

तकनिकी बोली उसी दिन 1530 बजे ऑनलाइन पद्धती व्दारा खोली जाएगी ।

Techical Bids will be opened on the same day at 1530 hrs. through online mode only.

तकनिकी विशिष्टीकरण और अन्य सभी विनिमय एंव शर्ते अपरिवर्तित रहेंगी।

Technical specifications and all other terms and conditions will remain unchanged.

बोलीदाता जो उपर्युक्त निविदा में भाग लेना चाहते हैं, उन्हें वेब पोर्टल https://moes.euniwizarde.in पर उपलब्ध सूचना के अनुसार पंजीकृत करना होगा।

Bidders willing to participate for the above tender, has to get registered themselves on web portal https://moes.euniwizarde.in as per the instruction available at there.

धन्यवाद / Thanking you.

भारतीय उष्णदेशीय मौसम विज्ञान संस्थान Indian Institute of Tropical Meteorology आय.आय.टी.एम I.I.T.M. Pune-8 पुणे-8

3/7/2025

(श्रीमति योगिता कड / Smt. Yogita Kad)
प्रशासनिक अधिकारी / Administrative Officer
कृते निदेशक / for Director
ईमेल /e-mail : psu.iitm@tropmet.res.in

Digitally signed by BABASAHEB TUKARAM PAWAR
Date: 2025.07.03 13:22:50 IST

भारतीय उष्णदेशीय मौसम विज्ञान संस्थान, आईआईटीएम

Indian Institute of Tropical Meteorology, IITM

Minutes of the Technical Evaluation Committee (TEC) Meetings No. 07 and 08

TEC Members

The Director, IITM, Pune has constituted the above TEC for processing IITM part of Mission Mausam instruments vide office order no. Comm./2024/208 dated October 28, 2024.

Minutes of Meeting No. 08

Agenda:

1) Review the changes by the PIs and the justifications, if any, and finalize the technical specifications of the 03 instruments - Aerosol Lidar with extended capabilities (02 nos.), and

Impact Disdrometer (JWD, 20 Nos.) and Skycast instrument (02 nos.).

2) Prepare the pre-bid minutes for the GTE bids of PTRMS, Tomo PIV and PDI+LDV based on the queries raised by the bidders and the responses by the PIs to those queries

3) New proposals of the 05 instruments – (1) Differential Optical Absorption Spectrometer (DOAS, Qty.=03 for ATCOMP and Qty.=04 nos. ACROSS), (2) High Resolution Gas Chromatograph Mass Spectrometer with Thermal Desorption unit (GCMSMS with TD, Qty.=01 nos. for ATCOMP), (3) Integrated Confocal Raman Microscope, Combined Scanning and Transmission Electron Microscope with Shared EDX for Automatic Microplastic and Nanoplastic Particle Identification with Elemental Composition (Integrated Raman Microscope, Qty.=01 nos.), (4) Eddy Covariance Systems (EC systems, Qty.=23 for OBSERVE_ALL, Qty.=05 for ATCOMP, Qty.=04 for WEATHER_MOD) and (5) Aerosol and Ozone Lidar (Qty.=01 nos.).

Meeting No. 08 of the TEC was convened at Sikka Hall on June 12, 2025 from 03:30 pm to 05:30 pm in hybrid mode (online + offline); Shri. V. Gopalakrishnan, Shri. P. Murugavel, Dr. Manish Ranalkar and Prof. Bhas Bapat could not attend the meeting.

At the outset, the Chair extended a warm welcome to all members of the committee. The agenda points were then sequentially discussed and deliberated upon by all members present.

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2. Prepare the pre-bid minutes for the GTE bids of PTRMS, Tomo PIV and PDI+LDV based on the queries raised by the bidders and the respective responses by the PIs

(C) **Prebid minutes of Supply, installation and commissioning of Phase Doppler Interferometers plus Laser Doppler Velocimeter System (03 Channel) - Qty. 01 set -**

For the PDI plus LDV system (PI – Dr. Shivsai Ajit Dixit) that was processed earlier through this TEC, the GTE bid was floated and two bidders (and their Indian Agents) participated in the prebid meeting. TEC noted that the queries by the bidders are mainly technical in nature. TEC carefully went through these queries and scrutinized the draft responses prepared by the PI. The TEC noted that all the queries of both bidders have been satisfactorily addressed. The revised technical specifications of "Supply, installation and commissioning of Phase Doppler Interferometers plus Laser Doppler Velocimeter System (03 Channel) - Qty. 01 set", based on the responses to the bidder queries, are also attached. The TEC recommends the document of prebid queries and IITM responses (attached) and the revised technical specifications (attached) for approval of the Director, IITM. After approval, the prebid responses may be communicated to the bidders. This point (B) along with the prebid queries, IITM responses, and revised technical specifications is the **Prebid minutes** of the "Supply, installation and commissioning of Phase Doppler Interferometers plus Laser Doppler Velocimeter System (03 Channel) - Qty. 01 set" and these **prebid minutes** are recommended by the TEC for approval of the Director, IITM.

Recommendations of TEC after meeting no. 08:

1. The instruments Aerosol Lidar with extended capabilities (02 nos.), and Impact Disdrometer (JWD, 20 Nos.) and Skycast instrument (02 nos.) are recommended by the TEC for further processing after reviewing the justifications (if any) provided by the PIs and the revised technical specifications.
2. The prebid minutes of PTRMS instrument, Tomo PIV system and PDI plus LDV system are prepared by the TEC including the responses to the prebid queries and the revised technical specifications. TEC recommends them for further processing.
3. The instruments Differential Optical Absorption Spectrometer (DOAS, Qty.=03 for ATCOMP and Qty.=04 nos. ACROSS), High Resolution Gas Chromatograph Mass Spectrometer with Thermal Desorption unit (GCMSMS with TD, Qty.=01 nos. for ATCOMP), Integrated Confocal Raman Microscope, AND Scanning and Transmission Electron Microscope with Shared EDX for Automatic Microplastic and Nanoplastic Particle Identification with Elemental Composition (Integrated Raman Microscope, Qty.=01 nos., SEM-EDX Qty.=01 nos.) and Eddy Covariance Systems (EC systems, Qty.=23 for OBSERVE_ALL, Qty.=05 for ATCOMP, Qty.=04 for WEATHER_MOD, Qty.=05 for ACROSS ART) are recommended by the TEC for further processing after reviewing the revised technical specifications.
4. TEC recommends to consider the case of Aerosol and Ozone Lidar (Qty.=01 nos.) in the next meeting.

Meeting ended with thanks to the Chair.

Enclosed:

1. Technical specifications and justifications, if any, signed by the respective PI(s) of the instruments that are recommended by the TEC for further processing.

Director, IITM is requested to kindly **approve** the following:

1. Minutes of the Technical Committee meeting No. 07 and 08 as above.
2. Uploading of the prebid responses and revised technical specifications (from the prebid minutes) for PTRMS, Tomo PIV system and PDI plus LDV system with an extension of 03 weeks, as per requirement, in each of the cases.

Digitally signed by BABASAHEB TUKARAM PAWAR
Date: 2025.07.03 13:22:50 IST

Prebid queries and IITM responses
Supply, installation and commissioning of Phase Doppler Interferometers plus Laser Doppler Velocimeter System (03 Channel) - Qty. 01 set
(PI – Dr. Shivsai Ajit Dixit)

The following technical points are raised / noted by the two firms and the responses by IITM (in italics following >>>) are listed.

(1) M/s Artium Technologies Inc., USA (Indian Agent – Tesscorn AeroFluids Inc., India)

a. Discussed the size of the cloud chamber which will be increased from 1.5 m x 1.5 m to 2 m x 2 m and 16 m in height. Transmitter and receiver units must be positioned at least 100 mm from windows. Window thickness is estimated to be 8-10 mm. Sizes of windows and their positions will need to be optimized based on PDI instruments beam access requirements. Window surface area is estimated to be 1-5% of total chamber surface area.

   >>> *As discussed in the prebid meeting.*

b. There were discussions on the requirements for collection angles. Dr. Bachalo indicated that 40° light scatter detection was optimum and is only needed for the sizing component. 30° is known to be less than optimum due to the interference by the Fraunhofer light scattering component in measuring small droplets (less than 5 µm). The third velocity component transmitter could be located at arbitrary angles but with decreased resolution as the angle between 2D and 1D transmitters decreases. Dantec suggested that they could use collection angles from 30° to 70° for sizing droplets. However, 70° provides an order of magnitude lower light scattering efficiency, potentially compromising the detection of small droplets. They do not seem to be aware of the fact that 30° has problems with Fraunhofer diffraction when measuring small droplets.

   >>> *Noted. Optical access windows shall be positioned taking these into account.*

c. There were discussions regarding the local mine testing field producing periodic explosions that would vibrate the facility. Dr. Bachalo indicated that if vibrations only occurred periodically and no measurements are being made, this would not present a problem. Vibration suppression will be provided.

   >>> It is clarified that the explosions in the mine testing field of a defense lab close to the IITM campus could pose serious concerns regarding loss of alignment of laser beams which is critical for PDI and LDV operations, especially for 3D measurements. Such issues are expected to become more acute given the tall structure of the proposed cloud chamber and possible positioning of PDI and LDV systems at different levels along the

height of the chamber on fabricated platforms. Therefore, vibration isolation pads should be incorporated in the traverse for each PDI+LDV system. This point is included in the revised version of the technical specifications.

d. Dantec objected to several specification requirements, claiming they were extracted from the Artium brochure. Specifically, there were objections to the need for quadrature sampling. Dr. Bachalo explained that reliable phase measurements require quadrature sampling. This information is well known in the signal processing literature. Dantec questioned a top speed requirements of 500 m/s indicating that Denmark may have difficulties with the specification, presumably for dual use concerns.

>>> The technical specifications are revised considering the bidder queries and requirements of the project deemed essential by the technical committee.

e. There was no discussion regarding the instrument's minimum size measurement capability and the dynamic range. However, Dantec's literature indicates that the dynamic range, as seen in their intensity plots, is only a factor of 10 or 20. The Artium instrument can cover a factor of greater than 50 to 1 and potentially 100 to 1. This requirement needs to be emphasized.

>>> The revised technical specifications mention the required dynamic range as per the requirements of the project. The system offered by the bidder should comply with those specifications.

f. Dr. Leandro offered to develop a spreadsheet based on the fundamental physics of phase Doppler interferometry that will provide information on the measurement size range for each of the lens combinations indicated in the tender specifications. These tables have now been produced and will be included in Artium's bid.

>>> Noted. This point is added to the revised technical specifications for all bidders to comply with.

g. IITM representatives suggested that control of all three systems by one computer is desired. Artium stated that the three computers will be synchronized to a master computer to output data from all three systems. Dr. Bachalo indicated that the systems will likely also be used independently, so three computers would be needed.

>>> Each channel of the PDI + LDV system (measuring 3D velocity and sizing information) needs to have an independent acquisition and processing system (control computer) as mentioned in the revised technical specifications. However, each acquisition and processing system should have the capability to control all three channels, traverses, etc. for truly simultaneous measurements at different levels along the height of the cloud

chamber. The bidders should fulfil this technical requirement, which is also mentioned in the revised technical specifications.

h. The observations at the Michigan Tech cloud chamber that a Dantec instrument is sitting on the shelf because it cannot measure small drops should be carefully evaluated. If Dantec prevails in this bid, Artium will insist upon a demonstration that their instrument can indeed measure droplets as small as 1 micron in the center of the 2 m x 2 m facility. Dantec suggested that a transceiver system would provide greater ease of use for the LDV component of this tender. They also indicated that their fiber-optic system would be used and thus, the cost of this extended convenience would not be substantial. Artium indicated that they also have a transceiver system but this approach complicates the instrument design and capabilities. The determining factor in this application is a need to cover a very wide droplet size range of 1 to 8000 µm. To cover this range, a number of beam separations and focused beam diameters will be required. Furthermore, the receiver lens diameter must be large to ensure adequate sensitivity to this range of droplet sizes. As seen in the literature, Dantec's fiber optics transceivers do not have this range of lens diameters and the ability to change beam spacing appears to be nonexistent. Given the need for a beam spacing changer and an external optic for further increasing the beam separation, Artium will not provide a transceiver system. If Dantec prevails in this bid, Artium will insist on a confirmation that Dantec can measure 1µm and 8000 µm drops at the center of the cloud chamber.

>>> Technical points in the above comment are noted and appropriately incorporated in revised technical specifications as deemed fit by the technical committee. Director, IITM shall be the final authority to decide upon the final proceedings. Demonstration of the capabilities of the system shall be ascertained from the peer reviewed journal publications (and other documents) that the bidders should submit with the technical bid to support the claims of compliance with the technical specifications.

i. Artium Transmitters have built in computer-controlled beam changers to easily change size range. In a could chamber facility where access is limited, remote selection of the optical setup is critical. Dantec's transmitter will require dismounting, changing the beam expander and realigning the instrument.

>>> Due to the tall design of the cloud chamber, it is very difficult to manually adjust beam and aperture parameters as per the requirements of the measurements. Therefore, the beam and aperture adjustments should be computer controlled to avoid any manual intervention.

j. Discussions of the traversing system were conducted with the observation made that the traverse will need to be carefully designed to cover the 2 m x 2 m cloud chamber

while providing stability. Traversing in the vertical direction will also be problematic and require some additional design of the system to ensure that the optical components remain in alignment throughout the traversing experience.

>>> Noted. Actual measurement volume that could be covered inside the cloud chamber shall depend upon the details of the optical access. However, for the sake of fair evaluation of bids, a traverse system covering a volume of 500 mm(l) x *500 mm(b)* x *500 mm(h) may be considered around the centerline of the cloud chamber. Horizontal movements shall be 500 mm in each of the two orthogonal horizontal directions, and the vertical movement shall also be 500 mm. The traverse should be mounted on anti-vibration pads to isolate the transmitters and receiver from any unwarranted vibrations of the cloud chamber facility and fabricated structure around it.*

k. Dr. Leandro promised to provide a sketch of the possible coverage area within the cloud chamber based on the optical configuration and the optical access available. IITM indicated that they would like to optimize the size of the windows to ensure that the cloud chamber functions properly and is not disturbed by thermal conductivity effects.

>>> Noted.

l. Discussions covered the possibility of needing window heating to prevent condensation on the windows. The heating must be minimal to avoid disturbing the cloud chamber environment. Artium is familiar with these problems and can provide optically transparent heaters that can be placed locally over the regions required for optical access to the facility including the range of scanning.

>>> The optically transparent heaters are included as an optional item in the revised technical specifications.

(2) M/s Dantec Dynamics, Denmark (Indian Agent – M/s. Laser Science Services, Pvt. Ltd., India)

a. As highlighted during the pre-bid meeting, technical specifications in lines 2, 3, 4, 6, 7, 8, 9, 10, and 13–25 closely resemble the competition's datasheets (attached for reference). We kindly request a revision of specifications from 13–25 to maintain fairness in the bidding process.

>>> The specifications have been revised considering these inputs and in accordance with the scientific requirements of the project. Due to the tall design of the cloud chamber, it is not possible to manually adjust beam and aperture parameters as per the requirements of the measurements. Therefore, the beam and aperture adjustments should be computer controlled without requiring any manual intervention.

b. Technical Specification 26: The requirement for appropriate hardware cards for camera connections requires clarification or removal if not essential.

>>> This typo has been corrected in the revised specifications.

c. Technical Specification 27: Kindly specify the required travel of the traverse, along with the exact rail size for mounting (if separate from those mentioned in the rails table). Please confirm whether the list of rails/mounts is consistent across both the PIV and PDA systems, considering the inclusion of optics for the YAG laser and the Breadboard column in this tender.

>>> The volume to be covered by traversing the beam intersection point has been mentioned in the revised technical specifications. From this, travel requirements for the traverse are clear. The size of the rails for mounting should be decided by the bidder as per the design of the traverse they wish to offer. The list of accessories is checked and is fine.

d. Technical Specification 7: Regarding post-warranty services, we understand that "Comprehensive Annual Maintenance Contract (CAMC)" will be revised to "Annual Maintenance Contract (AMC)."

>>> This typo has been corrected in the revised specifications. These systems require expert attention, and IITM has the capacity to develop the requisite expertise for that. As such, OMC or CAMC is not required.

(3) Modifications in the Technical Specifications other than those prompted by the bidders

As per the discussions in the Technical Committee regarding the requirements of the project, some modifications, other than those prompted by the queries of the bidders, are made to the technical specifications. The major modifications are listed below:

1. Detailed specifications of the processing unit and storage unit are given to enable a fair comparison of the bids.
2. KVA of the UPS is mentioned.
3. Optically transparent heaters are added as optional items.

Optional items, Factory acceptance test and training, Notes and Cloud Chamber Schematic are all updated.

Revised Technical Specification for
Supply, installation and commissioning of Phase Doppler Interferometers plus Laser Doppler Velocimeter System (03 Channel) Qty. 01 Set. (GTE Bid)

1.	**Vertical(s) of Mission Mausam to which the instrument belongs**	Weather_Mod
2.	**Purpose of the instrument**	For Cloud Chamber
3.	**Brief details about instrument**	PDI (Phase Doppler Interferometer) + LDV (Laser Doppler Velocimetry) System can measure either the 3D velocity or 3D velocity+particle size of individual droplets passing through the interrogation volume defined by the intersection of multiple laser beams. The method of measurement uses information on the changes in the interference pattern of the laser beams due to the passage of droplets to infer the particle velocity and particle size.
4.	**Technical specifications including accessories**	• **PDI+LDV System** The PDI+LDV system should have demonstrated capability to perform the desired measurements of the types supported by all the software and hardware modules mentioned below as evidenced by the published research papers in peer-reviewed journals to be submitted in addition to the technical data sheets, product catalogues and brochures etc. A table should be made listing each technique/capability of the system and citations of the publications supporting it. The system should be 03 channels i.e. able to measure simultaneously 3D velocity and particle sizes at 03 different spatial locations. **Specifications for each channel:** 1. Drop size measurement range 0.5 to > 8000 micrometer or wider (spherical or near-spherical particles). The lower limit may be relaxed to 01 micrometer for longer standoff distances up to 2000 mm. 2. Dynamic range for droplet sizing >= 50:1

		3. Accuracy in size measurement – size uncertainty should be plus or minus 0.5 µm or lesser 4. Resolution in size measurement should be plus or minus 0.5 µm or sharper 5. Velocity measurement range – magnitude from 0 to 500 m/s or higher and direction positive as well as negative for each component of 3D velocity 6. Accuracy of velocity measurement – uncertainty in velocity +/- 0.1% or lesser 7. Measurement of size and velocity should be based on forward scattering 8. Receiver focal lengths (approx.) – 350 mm, 500 mm, 750 mm, 1000 mm, 1250 mm, 1500 mm and 2000 mm 9. Transmitter focal lengths (approx.) – 350 mm, 500 mm, 750 mm, 1000 mm, 1250 mm, 1500 mm and 2000 mm 10. A table needs to be provided showing the minimum and maximum drop sizes that can be measured with fidelity using all different possible combinations of transmitter and receiver lenses offered. Appropriate beam expanders, if required, should also be provided. 11. Laser type - Diode pumped solid state (DPSS) 12. Laser beam delivery to the measurement area – Direct from the laser and through the lenses with minimal loss of laser energy. 13. Beam and aperture adjustments, sample volume adjustment and signal processor setup should all be computer controlled through the software without requiring any manual intervention. 14. Capability to withstand and function accurately in environments with water vapor RH<=90% typical of monsoon indoor ambient conditions in India. Appropriate heating for optics to keep it dry and humidity protection for electronics and laser transmitter and receiver 15. Sampling rate >= 100 MHz for each component of velocity and sizing 16. Dedicated data acquisition and processing system (Qty. 01 set for each channel) – Timing and Synchronization Unit as applicable; Processing Unit - Motherboard - ASUS PRO WS WRX90-SAGE SE or

		more advanced, Processor – AMD Threadripper Pro 7995WX or more advanced, RAM - ECC 1024GB (1TB) or higher with speed 4800MT/s or higher, OS Drive - 1024GB (1TB) NVMe M.2 SSD or higher, Internal Storage Drive - SSD RAID 0 with 4 x 15TB (>= 50TB usable) or higher as per the requirement, GPU - NVIDIA RTX 5090, 32GB VRAM or more advanced, Windows 11 Pro or latest for workstation x64 OEM, appropriate hardware cards, High quality power supply unit, Display > = 32", mouse and backlit keyboard; Storage unit – Cabinet / Enclosure Form Factor – Tower / Rack, Capacity – 512 TB or more usable in RAID 6, Connectivity – Thunderbolt, 10 GbE/25GbE LAN support or better, compatible with Processing Unit. Storage unit to be connected to Processing unit via high-speed connectivity link, high-quality 50 meter Cat6 LAN cable with transfer speed up to 10 Gbps. Each data acquisition and processing system should be able to simultaneously control and operate all the three channels, traverses etc. for truly simultaneous measurements (necessary cables for this should be provided) of drop sizes and 3D velocities at different spatial locations along the height of the cloud chamber. 17. Latest version of system software (03 full standalone license for 03 channels) - capable of automatic setup of signal processor functionalities, beam and aperture adjustments through software computer control, Full Complex Fourier transform processing and signal validation, Lifetime license and free upgrades, all drivers included. 18. Accessories such as a motorized 3D traverse, a UPS (06 kVA) should be provided for each channel separately. The traverse system should be able to cover a volume of 500 mm(l) x 500 mm(b) x 500 mm(h) around the centerline of the cloud chamber. Horizontal movements shall be 500 mm in each of the two orthogonal horizontal directions, and the vertical movement shall also be 500 mm. The traverse should be mounted on anti-vibration pads to isolate the transmitters and receiver from any unwarranted vibrations of the cloud chamber

facility and fabricated structure around it. 95" or larger interactive display (Qty. 03 nos.) for educational and outreach purposes. All necessary cables should be provided of appropriate lengths as per requirement at the time of installation without any additional charges. Any other components or accessories deemed essential for smooth functioning of the entire system should be provided without any additional charges. A list of mounting accessories such as guides, rails, carriages is given below.

List of mounting accessories:

Item with specs.	Sr. No.	Qty.
X95 Profile		
3m	G026125300	4
2.5m	G026125000	4
2m	G026120000	8
1.5m	G026115000	8
1m	G026110000	10
0.5m	G026105000	10
Carrier X95 w/ hole pattern		
300mm	G026429000	12
200mm	G026428000	20
120mm	G026423000	18
80mm	G026422000	28
50mm	G026421000	28
30mm	G026420000	16
Carrier Positioner X95 – 30		
30mm	G026426000	12
X 95 Clamping Carrier	G026408000	16
Cross Carrier X 95	G026424000	8
X 95 Corner Connector	G026210000	25
X 95 End Plate	G026201000	25
X95 Levelling		
Foot	G026202000	32
Disk	G026261000	32
Mounting Base	G024343000	20
X 95 Double Leg	G026310000	20

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<tr><td></td><td></td><td>
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<tr><td>Mounting Plate MP 80.U</td><td>G024988000</td><td>32</td></tr>
<tr><td>Optical Post 25 mm</td><td>G061201000</td><td>16</td></tr>
<tr><td>X 95 Hinged Connector</td><td>G026218000</td><td>16</td></tr>
<tr><td colspan="3">FLS95 Rail System</td></tr>
<tr><td>2m</td><td>G022087000</td><td>12</td></tr>
<tr><td>1m</td><td>G022083000</td><td>12</td></tr>
<tr><td>0.5m</td><td>G022081000</td><td>16</td></tr>
<tr><td colspan="3">Right-Angle Prism Mirrors for Nd:YAG Laser along with cage mounting system with fine adjustments (Thor Labs)</td></tr>
<tr><td>Damage threshold >= 7 J/cm2 for 532 nm</td><td>MRA25-K13</td><td>8</td></tr>
<tr><td colspan="3">Motorized Lab-Jack</td></tr>
<tr><td></td><td>MLJ300-300</td><td>8</td></tr>
<tr><td colspan="3">Breadboards</td></tr>
<tr><td>900x1200x50mm</td><td>G437513512</td><td>2</td></tr>
<tr><td>600x1200x50mm</td><td>G437511912</td><td>2</td></tr>
<tr><td>600x900x50 mm</td><td>G437511512</td><td>2</td></tr>
<tr><td>450x600x50mm</td><td>G437510412</td><td>2</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>Other Remarks</td><td>Optional Items:
1. Optically transparent heaters (Qty. 32 nos.) of appropriate sizes for fixing on the optical access windows so that condensation of cloud droplets on those areas can be prevented for PDI and LDV measurements.</td></tr>
<tr><td>6.</td><td>Installation, Testing of equipment and calibration, details of training, etc.</td><td>1. Factory Acceptance Testing and Training (01 week) for IITM persons (02 nos.) before dispatch to be included in the bid free of cost. Expenses of IITM personnel to IITM account.
2. Installation for minimum 10 working days and onsite training at IITM, Pune to be included in the bid.
Both 1 and 2 to be quoted separately in the bid.</td></tr>
<tr><td>7.</td><td>Warranty</td><td>01-year warranty (w.e.f. the date of acceptance)</td></tr>
<tr><td>8.</td><td>Post Warranty Services</td><td>(i) 01-year extended warranty for the entire system.
(ii) 05 years of AMC for Lasers (02 visits/year for inspection,</td></tr>
</table>

		optics alignment etc., visiting and inspection charges to be included, replacement of consumable items such as laser chiller filters, desiccants, anti-algae agents etc. in every visit to be included, other spare parts not to be included). Rate for each year to be quoted separately.

Notes: Price of each item and subitem to be quoted individually and separately in the commercial bid. Prices of local supply items to be quoted in INR and prices of foreign supply items to be quoted in foreign currency. The commercial evaluation will be done considering the AMC rates and optional items. During commercial discussions, the committee may remove some items or subitems or add optional items.

Schematic of the proposed Cloud Chamber:

Optical access windows are tentatively sized to be 500 mm x 100 mm each and their positions shall be decided strategically to maximize the utility for different kinds of optical measurements.