



**Design, Fabrication, Supply, Installation &  
Commissioning of Air Shower for ITMT  
Building  
at  
CREST, Hosakote**

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**Indian Institute of Astrophysics  
Bangalore**

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## 1. Introduction

The required air shower as per the technical specifications (Annexure-1) mentioned in the RFP will be installed I-TMT building at CREST campus of IIA, Hosakote, Bangalore. The detailed view of the I-TMT building where the air shower will be installed is as shown in annexure-2.

## 2. Requirement

Using high-velocity jets of air and HEPA air filter systems, cleanroom air showers remove loose contaminants from people and products before they enter the cleanroom, reducing or eliminating product defects. A modular air shower designed to deliver a spray of moving air at 30m/s with delivery nozzles, suction arrangement, interlocking system & other standard accessories is required.

- The system should be modular, allowing for easy configuration, shipment, and assembly
- The shell of the air shower should be constructed of stainless steel 304.
- Blower system must supply high velocity, high volume air to ensure effective decontamination as per the standards
- Recirculating filtration system should utilize pre-filters, followed by high-capacity HEPA filters
- The air shower should have a high number of adjustable, evenly-spaced air nozzles made of stainless steel
- The unit should have a magnetic door interlock system, with appropriate controls

## 3. Type of Air Shower

Cleanroom air shower ISO class 7 (Class 10,000 as per Fed-Std), Two way entry and one exit as per the concept drawing-1

## 4. Service condition

Ambient Temperature & Relative Humidity : 4 Deg C(Min) - 50 Deg C(Max) & up to 95% RH & ISO 7 class.

## 5. Scope of Supply

**Scope of work:** Design, Fabrication, Supply, Installation, Commissioning, packing, forwarding, transportation to I-TMT site, unloading, furnishing of final drawings and

manuals ,handling at site, erection, commissioning, performance demonstration and performance acceptance etc. of ISO 7 class cleanroom air shower (AS PER THE TECHNICAL SPECIFICATIONS), to make the system complete in all respects & as per the tender document.

## Annexure 1

### 6. Technical Specifications

1. Material of Construction : Stainless Steel 304 grade,  
Thickness 1.2mm
2. Inner working dimension : 2800 x 1000 x 2100 mm (L x D x H)
3. Overall dimension : 3000 x 2200 x 2300 mm (L x D x H)
4. Doors : Two way entry & one exit both with View Panels
5. Door details : With flush double glazing glass, hardware like door closure, D handles, ball bearing butt hinges etc.

#### 6.Pre-filters:

Type : Flange type  
Media : Synthetic, Non-woven Polyester fibre, Washable  
Casing : Aluminium  
Gasket: Neoprene  
Retention : 20 Micron  
Efficiency : 90%  
Pressure drop : 6 to 8 mm

#### 7. HEPA filters:

Type : Box type,  
Media : Ultra clean glass fibre paper-imported  
Casing : Aluminium  
Gasket : Neoprene  
Retention : 0.3 Micron  
Efficiency : 99.997%  
Pressure drop: 25 mm of W.c.

8. Adjustable nozzles  
Blowing Caliber – 30 mm

Material of construction – Stainless steel 304 grade  
Type – Adjustable  
Air Jet velocity : 30m/s +/- 3m/s

9. Motor Blower:

Power supply – 3 phase, 415 volts  
RPM – 2440

10. Audio visual alarm as a safety measure in case motor blower trips.

11. Fault acknowledgement for motor blower tripper

12. Blower/filter. Side mounted

13. Flow: Vertical down and two sides

14. Lighting : LED tubes~ 20W

15. Shower duration : 0-120 seconds (Adjustable)

16. Sound level : 70 db A +/- 5 % at 1m dist with doors closed

17. Motor : Standard make like  
Bharath Bijlee /Kirloskar/Siemens/Cromton/NGEF/  
Astom

18. Air-Velocity : 30m/s +/- 3m/s

19. Controls : Motor by DOL starter, doors by electromagnetic  
inter locking

20. Overload Protection : By thermal relay

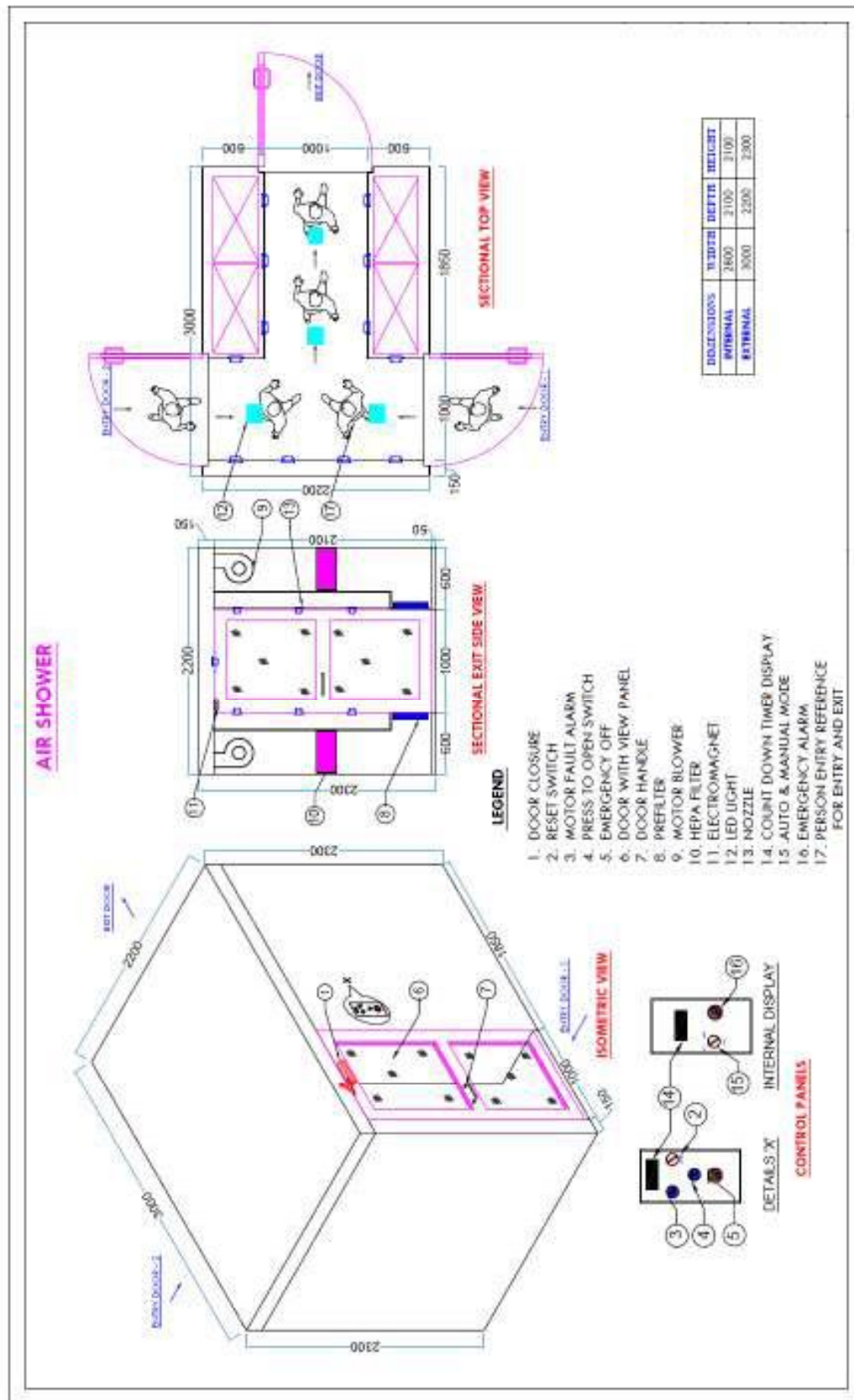
21. Shower duration : By Electronic timer

22. Emergency off : By push Button/knob

23. Occupancy : 4 (Minimum)

24. Maintenance Access : From Inside work area

25. Concept Drawing-1 (Dimensions are critical as they are derived from the available space):



## 26. General Terms:

- a. Catalogue/GA drawings of the air shower along with the dimensional details are to be submitted along with the offer.
- b. The air shower will be inspected and tested by IIA at suppliers works before dispatch.
- c. Warranty shall be for a period of 1 year from the date of commissioning or 18 months from the date of supply.
- d. Delivery period shall be clearly indicated by the supplier. Preferably it shall be 3/4 weeks from the purchase order.
- e. Required spares to maintain the system for the minimum period of 3 years shall be quoted .
- f. Scope of work includes Fabrication, Supply, Installation, Commissioning, packing, forwarding, transportation to I-TMT site, unloading, furnishing of final drawings and manuals ,handling at site, erection, commissioning, performance demonstration and performance acceptance etc.
- g. Company shall have ISO certificate and reputation in manufacturing similar kind of air showers
- h. Since the requirement is customised based on the available space, bidders are strongly advised to visit the site to understand the technical requirements before submitting their quote.

## 7. Submittals along with the offer

**Bidder must submit the following documents, without which, their bid will not be considered.**

- **Details covering all the technical specifications motioned in annexure -1**
- **Company documents like**
  - a.. **Registration Certificates.**
  - b. **Factory License.**

**c. Purchase Order Copies of similar air showers along with the commissioning Certificates & Performance Certificates.**

**d. Appreciation Letters from the Clients.**

**e. ISO Certificate**

- **Design details & Detailed calculations**
- **Catalogue/GA drawings**
- **Wiring and control schematic and detail diagrams.**
- **Electrical requirements.**
- **Civil requirements**
- **Outline of the dimensions of the equipment.**
- **Equipment and component layout.**
- **Details of equipment and controls.**
- **Installation details.**
- **Manufacturers name and catalogue number of any equipment number to be furnished**
- **Critical spare list for minimum period of 3 years**
- **Compliance matrix for the points mentioned in annexure-1**
- **Compliance to the points mentioned in annexure-2**

**Note: A detailed QAP, drawings documentation and calculation for obtaining necessary approval should be submitted to purchaser before taking up air shower fabrication.**

## **Annexure-2**

### **8. Inspection, Commissioning, Testing And General Requirements**

1. All the mechanical and electrical equipment will be tested as per relevant Indian standard/IS standard at premises of manufacturer as well as at I-TMT Building.

2. The air shower shall be inspected and tested during different stages of its manufacture, starting from raw-materials till the completion of the air shower , by IIA representatives at the supplier's works. However, IIA or it's authorized representative is free to enquire any further checks also, if it so desires.
3. Satisfactory operation of each control switch, contactor, inter locks and other control and protective device
4. Satisfactory operation of all nozzles etc.,
5. Dimensional inspection as per the standards
6. All the parameters for testing components of air shower shall be accordance with **ISO 14644** cleanroom standards..

## **9. Spares & AMC**

- 1. Service spares to be quoted separately for three years of maintenance.**
- 2. AMC charges to be quoted separately for three years.**

## **10. Training**

Technical training for IIA employees for operation and maintenance should be arranged at I-TMT premises. Training shall be given by experts who are having full knowledge about design, manufacturing, erection & commissioning of air shower.

## **11. Guarantee**

The supplier shall guarantee for free replacement, repair, and of parts found faulty or defective material, bad workmanship and efficient performance of air shower for one year period (excluding shutdown period due to faults) from the date of acceptance after successful installation and commissioning .The supplier shall have to provide service for faults and replace damage material free of cost during guarantee period.



## 12. Note to the Bidders

1. The following Drawing of I-TMT building are provided with the tender where the air shower would be installed. Proposed location has been shown in the following drawing. PDF version of the same drawing is also attached with the tender.



2. Power supply would be provided at one Point. The bidder needs to provide us the details of specific power requirement.
3. Materials should be offered strictly conforming to the specifications within acceptable tolerance level given in specifications / drawings given in tender document. Deviations, if any, should be clearly indicated by the bidder in their bid. The supplier should also indicate the Make/Type number of the materials offered and catalogues, technical literature and samples, wherever necessary should accompany the quotation.
4. Any fittings or accessories which may not be specifically mentioned in the Specifications or Particulars but which are usual or necessary for proper and efficient functioning of the Stores as per the specifications of the tender shall be supplied by the Contractor without extra charge to the Purchaser; the Stores supplied shall be complete in all respects.

5. IIA has the right to ask for the minor modifications at any stage even after the design is mutually agreed. As from the date, the Stores shall be in accordance with the specifications, patterns and drawings so altered, which the contractor is bound to comply with. In the event of such alteration involving a revision in the cost, or in the delivery period, the same shall be discussed and mutually agreed to, taking into account the unit rates of similar items in the Contract. In case of disagreement, the decision of IIA, in the cost or the delivery period, shall be final and conclusive.
6. Minor modifications / Additional Scope of Work: Minor modifications /additional scope of work to the tune of 2% of the total contract value shall be carried out by the contractor without any extra cost to IIA.
7. Subletting or Assignment of Contract: The Contractor shall not sublet, transfer or assign the Contract or any part thereof or bills or any other benefits, accruing there from or under the contract without the prior written consent of IIA (All Subcontractors are required to be appraised and approved by IIA before placement of orders by the Contractor/Supplier). However, such consent shall not be unreasonably withheld by IIA, if such stores are not normally manufactured by the Contractor, such assignment or subletting shall not relive the Contractor from any contractual obligation or responsibility under the Contract.

Any breach of this condition shall entitle IIA to cancel the Contract or any part thereof and to purchase from other sources at the risk and cost of the Contractor and shall recover from the Contractor damages arising from such cancellations.

In case the Contractor sublets, transfers or assigns any part of the Contract with the prior written consent of the Purchaser, all payments to the Sub-Contractor shall be the responsibility of the Contractor and any requests from such sub-Contractor shall not be entertained by IIA.

8. Past performance: In case the past performance of the tenderer is not found to be satisfactory with regard to quality, delivery, warranty obligation and non-fulfilment of terms and conditions of the contract, their offer is liable to be rejected by IIA.
9. Primarily the air shower will be used inside a class 10,000 clean room. Hence designer should consider the best quality materials with required factor of safety with maximum possible compactness. It should not become the source of contamination to the facility like particulate or molecular. Care shall be

taken while deciding the secondary process like painting etc for the internal equipments.

10. Bidder should be a manufacturer and should have ISO Certificate and satisfactory evidence to show that they are licensed manufacturer, has adequate plant and manufacturing capacity and has a quality assurance programme. Copy of valid ISO certificate and manufacturing licence issued by the competent authority & company profile should be submitted as a proof.
11. Bidders should have prior work experience of similar kind of work and must have supplied and commissioned at least one similar air shower or more in the past three years (2015--2018) and such unit is presently working satisfactorily for more than one year after commissioning. Copies of Purchase order with technical details along with work completion/installation certificate/performance certificate should be submitted as a proof.
12. Bidder may visit the project site to evaluate site requirements after obtaining prior permission from IIA.
13. Bidder shall arrange required lifting equipments, tools etc required during the installation. Transportation from factory to site is in bidder scope.
14. Bidder shall take responsibility of material stores at site.
15. Bidder shall provide safety devices (helmets, safety belts, gloves etc.) for personnel carrying out installation as per the safety standards.
16. Bidder shall give the schedule for Procurement of raw materials, Testing, manufacturing, Assembly, Factory acceptance test, transportation to site, installation& commissioning at site, etc.,
17. The bidder is required to submit all supporting documents as proof for the compliance. Bids received without valid documents and/or incomplete and irrelevant documents are likely to be rejected.
18. IIA's decision to consider as to whether a bidder has met with the eligibility criteria or not is final.
19. The Equipment should be completely designed and made as per the relevant I.S/ISO Specifications(ISO 14644).
20. IIA may visit the vendor's manufacturing facility or clients (visit to be co-ordinated by the bidder), at its discretion, during the evaluation phase.